

# Appendix F

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## Response to Comments on the DEIS



## **Appendix F**

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# **Appendix F1**

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## **Introduction and Overview**



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**List of Acronyms**

DEIS	Draft Environmental Impact Statement
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
ROS	Reservoir Operations Study
TVA	Tennessee Valley Authority
USFWS	U.S. Fish and Wildlife Service

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### F1 Introduction and Overview

The Draft Programmatic Environmental Impact Statement (DEIS) on the Tennessee Valley Authority's (TVA's) Reservoir Operations Study (ROS) was distributed in July 2003 for review and comment. Approximately 1,530 copies of the DEIS were sent to affected tribal governments, agencies, organizations, and individuals. The Notice of Availability of the DEIS was published in the *Federal Register* on July 3, 2003. The comment period closed on September 4, 2003, but TVA continued to accept comments through mid-October from tribes and persons who informed the agency that their comments would be late.

Appendix F contains TVA responses to substantive comments on the ROS DEIS. In response to some comments, changes were made to improve the content of this Final Programmatic Environmental Impact Statement (FEIS). Regardless of whether a comment generated a modification to the FEIS text, TVA provided a response to the issue raised.

Comments were provided by members of the public, organizations, and interested agencies at 12 interactive workshops held around the Tennessee Valley region after the DEIS was released. Approximately 1,700 individuals registered at the workshops (Table F1-01). Attendees were able to discuss issues with TVA and EIS contractor staffs, obtain material about the study, and view information displays and a short video. Workshop participants learned the results of analyses performed, including model results of the impacts of the policy alternatives on pool elevations, flow releases, and power generation for specific reservoirs. During these workshops, comments could be made in writing, using comment cards; given to court reporters; or entered on computer terminals through an interactive software program that was specially designed to assist the public in providing comments. TVA posted a copy of the DEIS on its official agency internet web site, where comments also could be made. In addition, TVA accepted comments by surface or electronic mail, telephone, and facsimile.

While the ROS proceeded, TVA continued to meet with its cooperating agencies and with members of the Public Review Group and Interagency Team to receive their input on the DEIS. TVA conducted special briefings with resource agency staffs, including the U.S. Environmental Protection Agency, to apprise them of ROS analyses and progress. These briefings provided interested agencies multiple opportunities to help direct and influence the scope and substance of the study, the EIS process, and associated analyses. TVA also held briefings with about 200 community leaders and representatives of interest groups to share information and to receive their input on the DEIS (Table F1-02).

The U.S. Fish and Wildlife Service (USFWS) has served multiple roles in the ROS. It provided input as part of the Interagency Team and submitted comments on the DEIS that were part of the letter from the U.S. Department of the Interior. This letter is reproduced in Appendix F4. The USFWS is also obligated to respond to TVA's determinations about potential impacts on threatened and endangered species under the Endangered Species Act (ESA). This is fulfilled by the USFWS's Biological Opinion in Appendix G. TVA's response to the USFWS's ESA determinations and comments on the DEIS are in the text of the EIS and Appendix F4, as appropriate.

## Appendix F1 Introduction and Overview

**Table F1-01 ROS Community Workshop Attendance**

Date	Location	Attendance
July 21, 2003	Murfreesboro, TN	30
July 22, 2003	Knoxville, TN	58
July 24, 2003	Bristol, TN	299
July 28, 2003	Morristown, TN	479
July 29, 2003	Murphy, NC	53
July 31, 2003	Blairsville, GA	407
August 5, 2003	Chattanooga, TN	53
August 7, 2003	Decatur, AL	106
August 12, 2003	Gilbertsville, KY	105
August 14, 2003	Pickwick, TN	70
August 19, 2003	Muscle Shoals, TN	54
August 21, 2003	Columbus, MS	10
<b>Total workshop attendance</b>		<b>1,724</b>

**Table F1-02 ROS Special Stakeholder Briefings Attendance**

Date	Location	Attendance
July 17, 2003	Morristown, TN	55
July 21, 2003	Murphy, NC	15
July 22, 2003	Blairsville, GA	28
July 24, 2003	Dalton, GA	6
July 29, 2003	Guntersville, AL	27
July 29, 2003	Decatur, AL	24
July 31, 2003	Gilbertsville, KY	14
August 6, 2003	Columbus, MS	6
August 6, 2003	Muscle Shoals, AL	25
<b>Total briefing attendance</b>		<b>200</b>

TVA and the cooperating agencies sincerely appreciate the time and effort of private citizens representing different stakeholder interests on the Public Review Group, as well as those agency representatives who participated as part of the Interagency Team. Their involvement ensured continued public and agency involvement throughout the ROS, and provided independent oversight of study activities and analyses.

### F1.1 Overview of Comments Received on the DEIS

Including form letters and petitions, TVA received a total of 2,320 sets of comments on the DEIS (Table F1-03). These sets of comments included input from almost 7,000 individuals, 7 federal agencies, 14 state agencies, 1 tribal government, 8 county and local government agencies, and 42 other organizations. TVA has carefully reviewed all of the comments, has identified specific comments about the EIS contained in each of them, and has associated similar comments to produce a list of approximately 3,264 separate comments (Table F1-04). These comments are arranged in three major sections: general comments, issues, and concerns; specific public comments; and federal and state agency comments. Comments received from federal and state agencies were also published separately.

Due to their large volume and similarity, the general comments, issues, and concerns were summarized and combined into categories of comments (Table F1-05; also see Section F2). These general comments were categorized for easier public review and to avoid repetition. A single response is provided for comments that fell into each category. The names of people who provided comments under each category are listed following the summary of comments within the category. Additionally, 4,602 individuals signed a petition supporting pool stabilization during fish spawning, and multiple individuals signed form letters supporting specific alternatives or resource concerns.

Because the general comments, issues, and concerns were summarized, the exact wording of the comments was not always used. Also, in many cases, the commenters listed with a combined comment may not have raised all of the points in the comment summary, but they supported the primary premise or issue captured by the combined comment. For example, most of the comments that TVA received simply "voted" for one or more of the identified alternatives. A large number of individuals supported Reservoir Recreation Alternatives A and B. Many of those supporting these alternatives said they did so because reservoir levels would be held up longer in summer, thereby increasing recreation opportunities, lake-front property values, scenic beauty, and recreation-related expenditures.

Other commenters listed under the combined comment, Support for Reservoir Recreation Alternative A, however, may have simply stated, "I support Recreation A" and did not give a reason or did not mention any of the other points in the combined comment. Therefore, it should not be assumed that all commenters identified with a combined comment necessarily support all facets of that comment. While summarizing and combining comments, TVA has attempted to retain all important discrete nuances or differences among comments. A number of summarized comments may still be somewhat repetitious because further refinements could have distorted an important element of a specific combined comment.

## Appendix F1 Introduction and Overview

**Table F1-03 ROS DEIS Comment Source and Number of Comment Segments**

Source of Comment	Number of Sets
Comment card	57
Court report transcript	140
E-mail	27
Fax	13
Governmental	22
Letters from general public	268
Telephone	31
Internet web site	825
Workshop—Blairsville, GA	306
Workshop—Bristol, TN	111
Workshop—Chattanooga, TN	51
Workshop—Columbus, MS	3
Workshop—Decatur, AL	42
Workshop—Florence	13
Workshop—Gilbertsville, KY	72
Workshop—Knoxville, TN	29
Workshop—Morristown, TN	261
Workshop—Murfreesboro, TN	16
Workshop—Murphy, NC	19
Workshop—Pickwick Dam, TN	14
<b>Total number of comments</b>	<b>2,320</b>

## Appendix F1 Introduction and Overview

**Table F1-04 Number of Comments on Alternatives and Resource Areas**

Subject	Number of Comments
<b>Alternatives</b>	
Base Case	148
Reservoir Recreation A	916
Reservoir Recreation B	307
Summer Hydropower	33
Equalized Summer/Winter Flood Risk	26
Commercial Navigation	54
Tailwater Recreation	41
Tailwater Habitat	16
<b>Study Areas</b>	
Air resources	13
Aquatic plants	23
Aquatic resources	44
Climate	1
Cultural resources	14
Dam safety	4
Flood control	155
Groundwater resources	2
Invasive terrestrial and aquatic animals and terrestrial plants	8
Shoreline development and land use	6
Managed areas and ecological significant sites	13
Navigation	30
Power	32
Prime farmland	3
Recreation	80
Fishing	89
Shoreline erosion	68
Social and economic resources	86
Terrestrial ecology	70
Threatened and endangered species	27
Vector control	23
Visual resources	13
Water quality	51
Water supply	24
Wetlands	31
Water levels	571
Cumulative impacts	2
Mitigation	8
NEPA process	163
Minimum flow	3
Out of scope	48
Policy	5
Authority	13
<b>Total number of comments</b>	<b>3,264</b>

## Appendix F1 Introduction and Overview

**Table F1-05 General Comments, Issues, and Concerns Raised by Members of the Public**

<b>Environmental Review Process and Public Involvement</b>	
1.	EIS and public involvement
2.	Operating priorities
3.	Changes to the environmental impact statement
4.	Communications
<b>Alternatives</b>	
1.	Base Case <ul style="list-style-type: none"> <li>- Support for Base Case; prefer Base Case</li> <li>- Opposed to Base Case</li> </ul>
2.	Reservoir Recreation Alternative A <ul style="list-style-type: none"> <li>- Support for Reservoir Recreation Alternative A</li> <li>- Opposed to Reservoir Recreation Alternative A</li> </ul>
3.	Reservoir Recreation Alternative B <ul style="list-style-type: none"> <li>- Support for Reservoir Recreation Alternative B</li> <li>- Opposed to Reservoir Recreation Alternative B</li> </ul>
4.	Summer Hydropower Alternative <ul style="list-style-type: none"> <li>- Support for Summer Hydropower Alternative</li> <li>- Opposed to Summer Hydropower Alternative</li> </ul>
5.	Equalized Summer/Winter Flood Risk Alternative <ul style="list-style-type: none"> <li>- Support for Equalized Summer/Winter Flood Risk Alternative</li> <li>- Opposed to Equalized Summer/Winter Flood Risk Alternative</li> </ul>
6.	Commercial Navigation Alternative <ul style="list-style-type: none"> <li>- Support for Commercial Navigation Alternative</li> <li>- Opposed to Commercial Navigation Alternative</li> </ul>
7.	Tailwater Recreation Alternative <ul style="list-style-type: none"> <li>- Support for Tailwater Recreation Alternative</li> <li>- Opposed to Tailwater Recreation Alternative</li> </ul>
8.	Tailwater Habitat Alternative <ul style="list-style-type: none"> <li>- Support for Tailwater Habitat Alternative</li> <li>- Opposed to Tailwater Habitat Alternative</li> </ul>
9.	Prefer Reservoir Recreation Alternatives A or B, A over B, B over A, or B or Tailwater Recreation Alternatives <ul style="list-style-type: none"> <li>- Prefer Reservoir Recreation Alternative A or Reservoir Recreation Alternative B</li> <li>- Prefer Reservoir Recreation Alternative A over Reservoir Recreation Alternative B</li> <li>- Prefer Reservoir Recreation Alternative B over Reservoir Recreation Alternative A</li> <li>- Prefer Reservoir Recreation Alternative B or Tailwater Recreation Alternative</li> <li>- Other preferences</li> </ul>
10.	Higher and longer reservoir pool levels
11.	Proposed combination/modification of alternatives
12.	Proposed project modifications
<b>Study Areas</b>	
1.	Water levels for fish spawning
2.	Migratory shorebirds
3.	Shoreline erosion
4.	Economic analysis and adverse effects on jobs and local economy
<b>Out of Scope</b>	
1.	Logs and debris
2.	Boater safety
3.	Jet skis
4.	Water pollution

Specific public comments are organized into 35 sections, generally matching the major subject areas and sections in the EIS. Within the subject areas, comments are ordered based on similarity and not according to the number of people who made a comment. At the end of each comment is the name of the author and an identifying number (#XX) that refers to the number of the original comment segments (numbers reflect the order in which the comments were received).

Except for letters from state and federal agencies, comments received from workshops, letters, and other sources are all categorized and listed together. Agency comments are reprinted verbatim in Appendix F4. Responses to individual agency comments are included after each letter.

Some comments were extensive and contained many sub-issues or elements. Not all sub-issues or elements were separately answered if TVA's primary response was applicable.

To assist the reader with navigating the appendix, along with a table of contents, Appendix F includes an index (Appendix F5). The index provides a list of commenters and references page number(s) where commenters are listed throughout Appendix F.

### **F1.2 How TVA Responded to Comments Received**

Since its inception, the ROS process has been driven by public values and concerns. Without public participation, it would be difficult for TVA to attain its goal of identifying changes to existing operating policies that would improve the overall public value of the TVA reservoir system. Issues and concepts identified by public and agency comments during scoping—along with input from the Public Review Group and Interagency Team—helped define the scope of the study and the contents of the DEIS. Several issues and concepts presented in comments on the DEIS have been used to improve the content of the FEIS. Comments on the DEIS will also assist TVA and other agencies as they make more detailed decisions about how to manage the operation of the Tennessee River in such a way that will increase its value for the people of the region.

TVA developed a Preferred Alternative that combines and adjusts desirable features of the alternatives identified in the DEIS to create a more feasible alternative that is responsive to public comments. TVA has also attempted to capture the characteristics of the preferred alternative in succinct, understandable ways to aid the TVA Board to better appreciate the implications of the decisions it will be asked to make by TVA staff, as a result of this process.

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## **Appendix F2**

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### **Response to General Comments, Issues, and Concerns**

**Tennessee Valley Authority  
Reservoir Operations Study – Final Programmatic EIS**



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## APPENDIX F2 Response to General Comments, Issues, and Concerns

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**List of Acronyms**

Corps	U.S. Army Corps of Engineers
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
ROS	Reservoir Operations Study
TVA	Tennessee Valley Authority

### F2 Response to General Comments, Issues, and Concerns

Most of the public comments simply voiced support for or objections to one or more alternatives. Typically, reasons were also given for the stated positions. This type of comment is referred to as "voting" for or against alternatives. Such comments have unique value in a study and process of this kind because they provide expressions of value or preferences. The actual number of commenters supporting or opposing specific alternatives (or raising discrete issues), however, has less importance. By the very nature of Environmental Impact Statement (EIS) processes, commenters are self-selected and they do not necessarily reflect the values of the public at large. No matter how extensive the effort made by federal agencies to obtain the broadest possible public involvement in their decisions and EIS processes, only a relatively small number of individuals choose to participate. Recognizing this, TVA strives to be guided by the substance of comments rather than the number of comments.

While voting comments were considered in completing this EIS and formulating the Preferred Alternative, they do not require a substantive response from TVA. The responses to such comments simply acknowledge that we have received them and counted them. Although most of the comments were of this nature, it is noteworthy that when voting for specific alternatives, many people recognized that trade-offs are involved in how TVA "spends" the water in its reservoir system. Even individuals with strong views about certain alternatives frequently qualified their support by stating that they did not want TVA to implement their chosen alternative in ways that would worsen water quality or increase flood risk. When formulating the Preferred Alternative, TVA took these concerns into consideration.

Similar to comments received during scoping, a large number of commenters expressed preferences for alternatives that improved recreation—either on the reservoirs or below dams in the tailwaters. A large number of commenters supported actions that would afford greater environmental protection of reservoir system natural resources, especially water quality. A smaller number of individuals endorsed the Base Case, as did most of the commenting agencies.

#### F2.1 Environmental Review Process and Public Involvement

##### EIS and Public Involvement

###### Summary of Comments

Of those who commented on the EIS process, 34 individuals expressed their appreciation for TVA's efforts in considering the views of the public and 20 individuals complimented the agency on its efforts in undertaking the study and developing the EIS. Five individuals questioned whether TVA would really change its policy, two others thought that the information and alternatives presented were overly complicated and biased, and two thought that there was not enough time to fully understand all the information provided.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### Commenters

Barbara A. Walton, Oak Ridge, TN  
Beth Carey, Woodstock, GA  
Bill Parker, Blairsville, GA  
Bob Garrison, Blairsville, GA  
Bob Graham, Harrison, TN  
Brian L. Thomas, Hiawassee, GA  
Bruce and Emma Anderson, Talbott, TN  
Bruce M. Proske, Sr., Murphy, NC  
Carolyn Lakes, Bean Station, TN  
Charles and Kristie Wallis, Sevierville, TN  
Chip Miller, Hixson, TN  
Colman B. Woodhall, Johnson City, TN  
David Trotter, D.D.S., Sevierville, TN  
Dan Owens, Woodstock, GA  
Diane Layton, Dandridge, TN  
Erik Brinke, Murphy, NC  
Franklin D. Brown, Bristol, TN  
Gary and Myran Rosenbalm, Seymour, TN  
Gary Hauser, Knoxville, TN  
John Honey, Dandridge, TN  
John S. McClellan, Dandridge, TN  
Juanita Phillips, Paducah, KY  
Kathy Pearce, Cumming, GA  
Kevin M. McCarthy, Peachtree City, GA  
Larry Allbritten, Dandridge, TN  
Linda Wingo, Blairsville, GA

Marianne O. Hatchett, Hayesville, NC  
Marilyn Allbritten, Dandridge, TN  
Mickey Carter, Knoxville TN  
Mike Harris, Knoxville, TN  
Mr. and Mrs. Schaffer  
Norman K. Owen, Murphy, NC  
Paul Morris, Benton, KY  
Ray Murphy, Dandridge, TN  
Robert E. Craig, Decatur, AL  
Robert MacDonald, Baneberry, TN  
Roger Gant, Corinth, MS  
Scott Davis, Executive Director, Tennessee  
Chapter of The Nature Conservancy,  
Nashville, TN  
Steve and Becky Mishket, Dandridge, TN  
Susan Kuehl, Dandridge, TN  
Terry Peters, Elizabethton, TN  
Thomas H. Hollingsworth, Rogersville, AL  
Thomas L. Parker, Murphy, NC  
Tim Allbritten, Dandridge, TN  
Tom Fitzgerald  
Richard C. "Dick" Crawford, President & CEO,  
TVPPA, Chattanooga, TN  
Vincent L. and June D. Greaves, Blairsville, GA  
W. G. Cahoon, Dandridge, TN

### **RESPONSE TO COMMENTS**

TVA appreciates the feedback on its efforts in conducting the study, producing the EIS, and involving the public in the process.

### **Operating Priorities**

#### Flood Control

##### *Summary of Comments*

Most individuals who commented on flood control indicated that, as it has historically, flood control should continue to be TVA's number one priority. Several individuals mentioned the critical importance of flood control to the region and its economy. A number of individuals expressed surprise that TVA would consider options that increase flood risk in order for a few people in the region to participate in recreation activities. One individual acknowledged that flood control is critical, but that there will always be flood risk to those who choose to live within the floodplain. Other comments provided on flood control are listed below.

- Flood damage is long-lasting, and emotionally and financially burdensome.
- Flood control should not be compromised for recreation benefits.

## APPENDIX F2 Response to General Comments, Issues, and Concerns

- The purpose of dams in general is for the protection of people and their livelihoods downstream.
- Protection of human life is paramount.
- Many jobs, family farms, and billions of dollars of economic activity depend on reliable flood control.
- Flood control has critical impacts on navigation, a clean water supply, sustainable economic development, agriculture, and recreation.
- It is imperative that no restriction be placed on TVA concerning reservoir levels.
- No alternative should be considered that increases flood damages; some additional flood risk could be accommodated, while avoiding property damage.
- With increased development, proliferation of litigation, and selective memories on what a floodplain means, there is a need to preserve or even improve the ability to protect properties.
- Stop flooding or pay us for what we lose.
- Recreation for some is not worth the flood risk to the many downstream.

### Commenters

#### *Anonymous (2)*

*Ben Robinson, Rogersville, AL  
Betty M. Fulwood, Corinth, MS  
Caruthersville Marine Service, Inc,  
Caruthersville, MO*

*Charles Robinson, Morristown, TN  
Clifford J. Rabalais, Counce, TN  
Clinton Horton, Benton, KY  
David Madison, Caruthersville, MO  
Dean and Mary Jane Heavener, Chattanooga,  
TN*

*Doug Goodman, Hickman, KY  
Douglas Lawler, Abingdon, VA  
Glenn Howell, Fulton, KY  
Gwen Thomas, Morristown, TN  
Jack C. Cole, Abingdom, VA  
Jerri Mitchell, Abingdom, VA  
Jim L. Collins, Decatur, AL  
Jimmy and Amy Owens, Dandridge, TN  
Jimmy W. Peoples, Talbott, TN  
Joe Brang, Dandridge, TN  
John W. Musser, Soddy Daisy, TN  
John Ashe, Hayesville, NC  
Daryl Carpenter*

*Lane Marte, Decatur, AL  
Marianne T. Helton, Chattanooga, TN  
Mark Seaton, Eva, TN  
Mark Wiggins, Cordova, TN  
Michael Sledjeski, Del Rio, TN  
Mike, Huntsville, AL  
Mike Harriss, Knoxville, TN  
Mike Major, Hickman, KY  
Paul Howell, Selmer TN  
Richard Simms, Chattanooga, TN  
Robert A. Lamm, Hiawassee, GA  
Ron Boyd, Athens, AL  
Stephen L. Keever, Chattanooga, TN  
Suzie Reed, Louisville, TN  
The Honorable Zach Wamp, U.S. House of  
Representatives, Washington, DC  
Thomas L. Parker, Murphy, NC  
Richard C. "Dick" Crawford, President & CEO,  
TVPPA, Chattanooga, TN  
W. L. Panter, Soddy Daisy, TN  
Walter E. Flood, Friendsville, TN  
Wendell Choate, East Prairie, MI  
Winona and Hilton Tunnell, Powell, TN*

### RESPONSE TO COMMENTS

Section 9a of the TVA Act establishes the priorities for operation of the TVA reservoir system. The primary priorities are navigation, flood control, and the generation of power. Consistent with meeting those priorities, TVA also operates the system to meet other goals such as water quality and recreation. Under the Preferred Alternative, potential damages from flood events with less than a 500-year frequency are lower than under the other action alternatives and essentially the same as under the Base Case.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### Power Generation

#### *Summary of Comments*

Comments about power generation as a priority indicated that it should be TVA's second priority after flood control, that cheap electricity was a primary purpose of TVA—along with flood control, and that power rates should not increase. Several people mentioned that the entire TVA customer base should not be penalized with higher generating costs in order to satisfy a small number of landowners in the upper reservoirs, who knew the drawdown schedules when their property was purchased.

#### *Commenters*

*Ben Robinson, Rogersville, AL  
Betty M. Fulwood, Corinth, MS  
David Cook, Blairsville, GA  
Doug Goodman, Hickman, KY*

*Richard Simms, Chattanooga, TN  
Suzie Reed, Louisville, TN  
Terry C. Smith, Killen, AL  
Winona and Hilton Tunnell, Powell, TN*

### **RESPONSE TO COMMENTS**

TVA formulated its Preferred Alternative to reduce potential cost impacts on power generation; however, increased costs could not be entirely eliminated.

### Water Quality and Water Supply

#### *Summary of Comments*

Individuals who commented on water quality and water supply as a priority identified these issues as their major concerns. They did not want to see any changes that would degrade water quality or affect water supply—most to the extent that they supported making no changes to the existing policy, which effectively is the Base Case.

#### *Commenters*

*Alice Russell, Hayesville, NC  
Angela Boyda, Abingdon, VA  
Anonymous  
Betty M. Fulwood, Corinth, MS  
Charlotte E. Lackey, for WNC Group, NC  
Chapter, Sierra Club, Asheville, NC  
Dean and Mary Jane Heavener, Chattanooga, TN  
Don A. Brown  
Herbert and Lois Hill, Cherokee, AL*

*Jane A. Rowe, Decatur, AL  
Jean Prater, Athens, AL  
John Allen Moore, Hayesville, NC  
John J. Ross, Savannah, TN  
Katie Dalton, Corinth, MS  
Linda Coons, Decatur Athens, AL  
Stephen L. Keever, Chattanooga, TN  
Steven J. Milcheck, Mooresburg, TN  
Terry Sisk, Gray, TN*

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### **RESPONSE TO COMMENTS**

Good water quality is an important public value. TVA carefully studied and considered water quality as it developed alternatives and created the Preferred Alternative. TVA formulated the Preferred Alternative to avoid or reduce impacts that would substantially degrade water quality and, in fact, to enhance water quality at certain locations. However, given the inherent uncertainties with any environmental analyses, TVA has identified monitoring and mitigation measures that would help offset potential adverse impacts on water quality should they occur.

#### **Recreation**

##### ***Summary of Comments***

Individuals who commented on recreation as a priority indicated that they wanted TVA to give it a higher priority than in the past for in decisions about water levels. A number thought that recreation should be second in priority to flood control. One individual noted that it should not be given priority over protection of the environment, especially water quality and aquatic habitat protection.

##### ***Commenters***

*Barbara Cavagnini, Dandridge, TN*  
*Bob Harrell, Dalton, GA*  
*Carol McKee, Dandridge, TN*  
*Chris Offen, Blairsville, GA*  
*Edwin D. Breland, Jr., Rogersville, AL*  
*Ivey Wingo, Blairsville, GA*  
*Jeff Ramsey, Kodak, TN*

*Joe Brang, Dandridge, TN*  
*John J. Ross, Savannah, TN*  
*Kevin Abel, Abingdon, VA*  
*Marianne T. Helton, Chattanooga, TN*  
*Michael P. Van Winkle, Clarkesville, GA*  
*Richard Simms, Chattanooga, TN*  
*Steven J. Milcheck, Mooresburg, TN*

### **RESPONSE TO COMMENTS**

One of the driving issues that prompted the Reservoir Operations Study (ROS) was stakeholder concerns about the summer drawdowns and the resulting adverse impact on recreation. TVA developed the Preferred Alternative in the Final EIS (FEIS) to reduce flood damage to acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives.

#### **Changes to the EIS**

##### **Summary of Comments**

Several individuals suggested changes to the Draft EIS (DEIS). Specific comments regarding resource issues are addressed in Appendices F3 and F4. The more general comments and those including the Executive Summary were:

- Make the document less complicated.
- Table ES-01 – highlight flood risk.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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- Table ES-02 - errors in using [brackets] for negative numbers in gross regional product and employment (3).
- Cite information as a range of values, including error terms, variances, and other sources of uncertainty.
- Use one description for current operations—Base Case, no-policy alternative, or no-action alternative.
- Use scientific data in the determination of which alternative to use.
- Provide site-specific spatial and temporal information concerning projected water elevations and releases for each reservoir and associated tailwater for all alternatives.
- Clarify the difference in information presented in material entitled "Weighing the Alternatives" containing charts listing Base Case and seven policy alternatives—as distributed in color handouts and as part of the video—and the same document presented on the TVA web site.
- Include charts that represent drawdown dates and summer pool dates compared to Base Case (4).
- Include copies of curves used at workshops to show different alternatives.
- Graphically depicted impacts of each alternative on lake levels could be in the handouts and supporting materials. It can be challenging to determine what the impact of each alternative is predicted to be on lake levels.
- Explain how the identified objectives were ranked.
- Further delineate the summary of projected impacts (i.e., explain better what is meant by "slightly adverse" or "beneficial").

### Commenters

*Barbara A. Walton, Oak Ridge, TN*  
*Colman B. Woodhall, Johnson City, TN*  
*David Slagle, Hayesville, NC*  
*Janice L. Jones, Executive Director, Tennessee*  
*River Valley Association, Decatur, AL*  
*Jim L. Collins, Decatur, AL*

*John De Freitas, Gilbertsville, KY*  
*Robert MacDonald, Baneberry, TN*  
*Valerie Smith, Chattanooga, TN*  
*W. H. Cross, Hiawassee, GA*  
*W. L. Panter, Soddy Daisy, TN*  
*John Defratsu*

### **RESPONSE TO COMMENTS**

The text has been changed to correct these errors. As suggested, Appendix C provides copies of elevation probability plots along with flood guide curves for tributary reservoirs, operating guide curves for mainstem reservoirs for the Base Case and the Preferred Alternative, and elevation data and box plots for all alternatives.

### **Communications**

#### Summary of Comments

Several individuals requested that TVA provide early or daily notification through the media of projected changes in reservoir levels to prevent their boats from being stranded and docks from being damaged:

## APPENDIX F2 Response to General Comments, Issues, and Concerns

- Provide notification of when you plan to drop the water level (i.e., earlier than is presently done).
- Provide projected reservoir water level fluctuations on radio, weather channel, and/or internet on a daily basis (4).
- Provide advance storm warnings for major storm events if Alternative A is selected.

### Commenters

*Anonymous*  
*Bob Holdman, Gilbertsville, KY*  
*Clay Wright Rock Island, TN*  
*Charles Wallis, Sevierville, TN*  
*Greg Batts, Cadiz, KY*

*L. Sean Mullins, Bristol, TN*  
*Mike Kelley, Savannah, TN*  
*Roy Baker, Eddyville, KY*  
*Sandy Roberson, Abingdon, TN*  
*William Schneider*

### RESPONSE TO COMMENTS

Water release schedules and reservoir system data are routinely posted on TVA's external web site and also accessible via TVA's toll-free reservoir information phone line. Storm notification is provided by the U.S. Weather Service.

## **F2.2 Alternatives**

### **Base Case**

#### Support for Base Case

#### *Summary of Comments*

Most individuals who made comments supporting the Base Case thought that the changes proposed under the action alternatives would deprive migratory shorebirds and wading birds of critical habitat, and result in other unacceptable impacts. Several individuals thought that the existing system, as defined by the Base Case, works well and accomplishes the primary purposes for which the system was constructed: flood control, commercial navigation, and power generation. Furthermore, several individuals thought the system should be managed to address the overall needs of the people of the region and not just the needs of a select few. The comments that supported the Base Case are summarized below.

#### BALANCED APPROACH

- Balances well all constraints on the system.
- Benefits of recreation alternatives will never outweigh adverse effects on flood control, water quality, and power supply.
- Meets the needs of all users, including recreation, barge traffic, power generation, and economic development; and reduces the risk of flooding to valuable wildlife habitat along the Tennessee River system.
- All other alternatives have too high a cost or too negative an impact on the environment.
- Why do we look at extended levels when benefits accrue to a few?

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### ENVIRONMENTAL CONCERNS

- Creates great habitat for migratory shorebirds, including flats and sandbars that sandhill cranes rely on for roosting and feeding.
- Action alternatives are detrimental to plant life, as well as nesting grounds for many aquatic birds.
- Maintains high fish productivity.
- Protects water quality and electricity production over needs of recreation.
- Protects water supply.
- Avoids degradation of both state and federal major game and non-game wildlife areas.
- Changing reservoir levels would negatively affect a wide variety of resources, ranging from shoreline habitat loss to flooding of wetlands and farmland along the Tennessee River, especially on Kentucky Reservoir.
- Longer levels would increase the use of fossil-fueled generation.

### RECREATION

- The existing reservoir system provides prime bird-watching habitat.

### ECONOMIC

- Is the least expensive.
- A 9-foot navigation channel is adequate.

### FLOOD CONTROL

- Reduces flooding.

### Commenters

Alfred Denny, Oak Ridge, TN  
Anonymous (6)  
Anonymous, Chattanooga, TN (2)  
Anthony Morris, Muscle Shoals, AL  
Barbara G. McMahan, Chattanooga, TN  
Barbara A. Walton, Oak Ridge, TN  
Barron Crawford, Paris, TN  
Benny Thatcher, Knoxville, TN  
Bettie Mason, Knoxville, TN  
Bill Sullivan, Knoxville, TN  
Brenda Cummings, Huntsville, AL  
Brian Sullivan, Bristol, VA  
Bunny Johns, Chair, Swain County Economic Development Commission, Bryson City, NC  
C. Terry Wallace, President, Decatur-Morgan County Convention and Visitors Bureau, Decatur, AL  
Carole Gobert, Knoxville, TN  
Charles, Maryville, TN  
Christine Liberto  
City of Guntersville Alabama  
Clayton Ferrell, New Johnsonville, TN  
Clifford J. Rabalais, Counce, TN  
Cynthia Mitchell, Clarksdale, MS  
Dan Feather, Nashville, TN  
Dan Fuqua, Paris, TN

Jim Garner, Madison, MS  
John Taylor, Springville, TN  
John W. Musser, Soddy Daisy, TN  
Juanita Phillips, Paducah, KY  
Junior Miller, Honaker, VA  
Karen Schultz, Louisville, TN  
Karl Forsbach, Jr., Savannah, TN  
Katie Dalton, Corinth, MS  
Ken Shepard, Kingston, TN  
Kenneth Dickerson, Paducah, KY  
Larry Waters, County Mayor, Sevier County, TN  
Leslie J. Gibbens, Del Rio, TN  
Linda Coons, Decatur Athens, AL  
M. Stroup, Newport, TN  
Marian Fitzgerald, Maryville, TN  
Marvin and Lili Scott, Chattanooga, TN  
Mary Stevens, Jackson, MS  
Michael A. McMahan, Chattanooga, TN  
Michael Smith, Ballatin, TN  
Michael Sylva Sledjeski, Del Rio, TN  
Mike H. Eddings, Jr., Blairsville, GA  
Mike Kelley, Savannah, TN  
Mike Major, Hickman, KY  
Michael Todd, McKenzie, TN  
Monte Doran, Savannah, TN

## APPENDIX F2 Response to General Comments, Issues, and Concerns

David A. Aborn, Ph.D, Chattanooga, TN  
David Cook, Blairsville, GA  
David Vogt, Chattanooga, TN  
Debbie Blackwelder, Savannah, TN  
Dennis Bain, Savannah, TN  
Don Waldon, Columbus, MS  
Donald Blackwelder, Savannah, TN  
Doris and Richard Wheeler, Blairsville  
Dr. K. Dean Edwards, Knoxville, TN  
Dwight Cooley, Athens, AL  
Earl Nyman, Abingdon, VA  
Elizabeth Wilkinson-Singley, Kingston, TN  
Gary Hauser, Knoxville, TN  
Gaynell Thomas, Del Rio, TN  
Guy Larry Osborne, Jefferson City, TN  
H Ray Threlkeld, Loudon, TN  
Holly Jones, Knoxville, TN  
Howard Lowden, Rome, GA  
J. Don Burgess, Killen, AL  
James Brooks, Jonesborough, TN  
James W. Elliott, Jr., Bristol, TN  
Jason P. Smith, Blairsville, GA  
Jay Desgrosellier, Nashville, TN  
Jerry Hadder, Oak Ridge, TN  
Jim Carpenter, Knoxville, TN

Richard Vornehm, Knoxville, TN  
Richard Connors, Nashville, TN  
Richard Holland, Env. Mgr., Counce, TN  
Robert Wheat, Paris, TN  
Roger Gant, Corinth, MS  
Roger W. Hill, Jr., Blairsville, GA  
Roseanna Denton, Science Hill, KY  
Ruth Pullen  
Stanley L. McClellan, Hartselle, AL  
Stephen L. Keever, Chattanooga, TN  
Steve McCadams, Paris, TN  
Suzie Reed, Louisville, TN  
Terry C. Smith, Killen, AL  
Thomas L. Parker, Murphy, NC  
Tony E. Branan, Hiawasse, GA  
W.L. Panter, Soddy Daisy, TN  
Walter E. Flood, Friendsville, TN  
Wendell Choate, East Prairie, MI  
William Dearing, Chattanooga, TN  
William DeLoch  
William H. Dyer, Paducah, KY  
William L. Hoover, Naples, FL  
Charles Muise  
Noreen Kenny  
Jim Crigger, Knoxville, TN

### RESPONSE TO COMMENTS

TVA's Preferred Alternative was formulated in part to address these recommendations and concerns.

#### Opposed to Base Case

##### *Summary of Comments*

The majority of individuals who opposed TVA continuing to operate the system as it has been in the past indicated that the Base Case is not acceptable or needs to be changed. A limited number of those opposing the Base Case provided a reason for doing so. Typical reasons are given below.

#### MANAGEMENT APPROACH

- Needs to be abandoned for better ways to spend the water.
- Outdated and needs to be changed.
- Flats and mud holes are detrimental to TVA's and East Tennessee's image.
- Detrimental to overall economic activity.
- Creates erosion.
- Not a good alternative for South Holston.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### RECREATION USE

- Diminishes recreation use and enjoyment during the peak summer period.
- Needs to be changed to enhance recreational opportunities and beauty of tributary reservoirs.

### *Commenters*

*Angela Yates, Abingdon, VA*

*Carolyn Varner, Ocala, FL*

*Chris Offen, Blairsville, GA*

*Christine M. Robinson, Abingdon, VA*

*Curtis E. Johnson*

*Dalie T. Thomas, Bristol, TN*

*Dean Henderson, Richlands, VA*

*Doug Triestram, Blairsville, GA*

*Doyle and Pat Ricks, Memphis, TN*

*Greg Robinson, Abingdon, VA*

*Harold L. Oliver, Marietta, GA*

*Jeff Blankenship, Cedar Bluff, VA*

*Jeff Ramsey, Kodak, TN*

*Jimmy and Amy Owens, Dandridge, TN*

*Joe Brang, Dandridge, TN*

*John W. Musser, Soddy Daisy, TN*

*Joseph A. Robinson, Jr., Abingdon, VA*

*Kathy Mesmer, Oak Ridge, TN*

*Marjorie C. Wintermute, Blairsville, GA*

*Marti Steffen, Dandridge, TN*

*Mary M. Johnson, Bristol, VA*

*Michael A. O'Brien, Kennesaw, GA*

*Richard Wagner, Blairsville, GA*

*Robert O. Bruce, Bristol, TN*

*Roger Williams, Knoxville, TN*

*Ron Toney, Cedar Bluff, VA*

*S. Dean Yates, Abingdon, VA*

*Sandy Robinson, Abingdon, VA*

*Taulbee Lester, Honaker, VA*

*Teddy Murrell, Sevierville, TN*

*Theresa Toney, Cedar Bluff, VA*

*Thomas Carey, Woodstock, GA*

*Tom A. Yates, Bristol, VA*

*Tom Carlton, Blairsville, GA*

### **RESPONSE TO COMMENTS**

TVA's Preferred Alternative was formulated in part with these comments in mind.

### **Reservoir Recreation Alternative A**

#### Support for Reservoir Recreation Alternative A

#### *Summary of Comments*

Most individuals who commented on the reservoir operations policy alternatives endorsed Reservoir Recreation Alternative A (extending tributary and mainstem summer pool levels to Labor Day, increasing and limiting minimum flow releases to 25,000 cfs August 1 to Labor Day, raising tributary winter flood guides equal to Base Case March 15 levels, and raising main river winter flood guides by 2 feet with a 1-foot operating range). The reasons most widely cited by almost 800 individuals supporting this alternative are listed below.

#### PROVIDES A BALANCED APPROACH

- Provides an excellent balance of competing factors for reservoir operations and a substantial improvement to lake levels—both in summer and winter—without major impacts to those downstream.
- Provides an excellent compromise, giving consideration to flood control, power generation, water supply, and the environment, as well as recreation.

## **APPENDIX F2: Response to General Comments, Issues, and Concerns**

- Provides flood control and hydropower, while still giving the public a full summer use of the reservoirs.
- Benefits the most people in the TVA system with the least negative impacts.
- Best fits the overall needs of our community and surrounding property owners.
- Fairest of the alternatives that were presented.

### **INCREASES RECREATION VALUE AND USE**

- Places a higher priority on recreation.
- Provides recreational users of the reservoirs maximum benefit of facilities.
- Improves recreation opportunities year-round while minimizing impacts on safety, economic and environmental concerns.
- Provides a longer period of recreation opportunities for both residents and visitors.
- Gives boaters more recreational time in summer and fall.
- Increases season for fishing, boating and other water sports.

### **SCENIC BEAUTY**

- Improves aesthetics of area and region.
- Rivers and lakes provide a place to relax from ever-increasing stress levels of work.
- Eliminates flats.
- Improves the looks of the lake during winter months.
- Leaves reservoir at a fairly good place.

### **ENVIRONMENTAL BENEFITS**

- Offers the least undesirable impacts—less adverse impacts on flood control, water, fish, and aquatic vegetation.
- Helps fish and improves aquatic life and water quality.
- Satisfies the need for flood control, even though flooding could be increased.
- Reduces shoreline erosion.
- Solves some of the problems created by the Base Case.
- Increases economic benefits.
- Benefits local and surrounding businesses, including everyone in the real estate business.
- Increases property value and development—enhancing the tax base.
- Increases revenue for local area with minimal effects.
- Benefits local communities, counties, the region, and TVA.
- Benefits tourism of the area, extends tourist season, and generates more income from tourism.
- Stimulates investment to encourage economic growth.
- Keeps folk in county and region, rather than having them move elsewhere.
- Allows for more jobs and navigational benefits.
- Allows hydropower units to operate more efficiently.
- Eliminates choke points on main river for navigation.
- Reduces damage to boat docks and marinas.
- Relieves political pressure to make recreation a primary purpose for the TVA lakes and rivers.

### **USE OF PROPERTY**

- Allows use of boats and dock until Labor Day.
- Produces greater return on investments.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

- Increases usage of facilities.
- Reduces navigation hazards.

### *Commenters*

*Anonymous (14)*

*Anonymous, Blairsville, GA (18)*

*A. G. Sherman, Blairsville, GA*

*A. Hurn, Atlanta, GA*

*Alberta Bavis, Blairsville, GA*

*Alice Russell, Hayesville, NC*

*Aline Hail, Gilbertsville, KY*

*Allan Nelson, Atlanta, GA*

*Amy Stevenson, Blairsville, GA*

*Andrew Atkins, Morristown, TN*

*Andrew Drkae, Atlanta, GA*

*Andrew Fogle, Madison, AL*

*Andy and Jocelyn Kutler*

*Andy Williams, Blairsville, GA*

*Angela Yates, Abingdon, VA*

*Ann Bridges, Blairsville, GA*

*Ann R. Warner, Memphis, TN*

*Ann W. Roginsky, Blairsville, GA*

*Ann and Charles Wooten, Jr., Blairsville, GA*

*Anna Medlin, Smyrna, TN*

*Anne Gunderson, Marietta, GA*

*Anne Lee*

*Anonymous (18)*

*Anthony Lambert, Bristol, VA*

*Anthony Lester, Hanover, WV*

*Anthony Childress II, Abingdon, VA*

*Anthony Lagratta, Blairsville, GA*

*Arlene Gray, Blairsville, GA*

*Arlene Loesel, Blairsville, GA*

*Arlene Hodgson, Blairsville, GA*

*Audrey Fincher, Mosheim, TN*

*Austin Foreman, Blairsville, GA*

*B. Gray Appleton, Hayesville, NC*

*Barbara Dean, Powder Springs, GA*

*Barbara Merriken, Dandridge, TN*

*Barbara Tigrett*

*Barron Crawford, Paris, TN*

*Barry & Lynn Varian, Blairsville, GA*

*Barry Hinkle, Bristol, TN*

*Ben Keeler*

*Ben Sharrett, Abingdon, VA*

*Beth Carey, Woodstock, GA*

*Betty Lavelle, Dandridge, TN*

*Betty Sullivan, Franklin, NC*

*Beverly Wooten, Blairsville, GA*

*Bill and Deborah Eisel*

*Bill Delashmutt, Dandridge, TN*

*Bill Harwood, Columbia, SC*

*Bill Herold, Hiawassee, GA*

*Bill Hintermister*

*Bill Pave, Blairsville, GA*

*Billie D. Elliott, Blairsville, GA*

*Kathryn A. Jones, Blairsville, GA*

*Kathryn Foreman, Blairsville, GA*

*Kay Elgin, Hendersonville, TN*

*Kelly and Bo Hairston*

*Kelly Larrison, Bristol, VA*

*Ken and Sandy Russell, Dandridge, TN*

*Ken Horton*

*Ken Newsome, Cumming, GA*

*Kenneth A. Turner*

*Kenneth Story, Pickwick Dam, TN*

*Kevin and Tracy Swain, Blairsville, GA*

*Kevin Miller, Bristol, VA*

*Kim Shipley, Hayesville, NC*

*Kirk Peterson, Woodstock, GA*

*Kristen N. Morgan, Marietta, GA*

*Kristen Yartz, Dandridge, TN*

*Kryssa Cooper, Alpharetta, GA*

*L. Ross Whatley III, M.D., Blairsville, GA*

*L. Sean Mullins, Bristol, TN*

*Lamar and Jackie Franklin, Blairsville, GA*

*Lamar Franklin, Blairsville, GA*

*Larry and Amelie Hagen, Blairsville, GA*

*Larry Johnson, Decatur, AL*

*Larry Mero, Blairsville, GA*

*Laurie Danko, Dandridge, TN*

*Lawrence Wright, Warner Robins, GA*

*Lawton Wofford, Hiawassee, GA*

*Leah Viersh, Vansant, VA*

*Lee and Betty Harrell, Rome, GA*

*Lee Ann Geisenhaver, Abingdon, VA*

*Lee S. Horne, Lebanon, VA*

*Leigh Ann Alexander, Atlanta, GA*

*Leon Bobo, Canton, GA*

*Leon Bryant, Dandridge, TN*

*Lesley Ann Wheeler, Blairsville, GA*

*Leslie Wickham, Hayesville, NC*

*Leslie Forthman, Hiawassee, GA*

*Leslie Leduc, Bradenton, FL*

*Leslie Shamblin, Dandridge, TN*

*Lester Deaver, Blairsville, GA*

*Lewis E. Blair, Morristown, TN*

*Lewis O'Donnell, Blairsville, GA*

*Lillian and R. K. Buchanan, St. Lucie, FL*

*Linda and Eldon Achbuger*

*Linda Bell, Hiawassee, GA*

*Linda Dale Squires, Dandridge, TN*

*Linda R. Witaker, Atlanta, GA*

*Linda Ray, Monroe, GA*

*Linda Wingo, Blairsville, GA*

*Lindsay Blackwell, Blairsville, GA*

*Lloyd and Holly Massman, Blairsville, GA*

*Lloyd V. Bible, Dandridge, TN*

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Billy and Eva Dicker, Blairsville, GA  
Billy Keaton, Bluff City, TN  
Billy Payne, Blairsville, GA  
Bob Anderson, Hiawasse, GA  
Bob Dorman, Blairsville, GA  
Bob Garrison, Blairsville, GA  
Bob Harrell, Dalton, GA  
Bob Lee, Dalton, GA  
Bob Russum, Piney Flats, TN  
Bobbie Davis, Dandridge, TN  
Bobby Joe Dishner, Blountville, TN  
Bobby Keene, Abingdon, VA  
Bona Allen, Young Harris, GA  
Brian and Lynn Batko  
Brian Mazzei, Abingdon, VA  
Brian Roberge, Lavergne, TN  
Brian Thurman, Cherry Log, GA  
Bruce Tuthill, Blairsville, GA  
Bud Mcneal, Savannah, TN  
C. P. Brindle, Crandall, GA  
C. Vaughn Leslie, Dandridge, TN  
Calisse Finchum, Newport, TN  
Camille Little, Heyworth, IL  
Candy Cox Ellis, Bristol, VA  
Carl and Rebecca Foutz, Marietta, GA  
Carl Hatfield, Dandridge, TN  
Carol Kutzner, Hayesville, NC  
Caroline Goins, Dandridge, TN  
Carolyn Miller  
Carolyn R. Clarkson, Blairsville, GA  
Carolyn Varner, Ocala, FL  
Cathleen and Bill Carpenter, Alexandria, TN  
Cathy Cooper, Morristown, TN  
Cecil G. Boland, Blairsville, GA  
Chad and Kristi Lariscy, Blairsville, GA  
Charles A. Goins, Dandridge, TN  
Charles and Marylou Pentico, Blairsville, GA  
Charles B. and Eileen Davis  
Charles Butler, Powder Springs, GA  
Charles E. Hulten, Blairsville, GA  
Charles Hamilton, Blairsville, GA  
Charles Wooten, Jr., Blairsville, GA  
Charlie Davis, Blairsville, GA  
Charlie Pollett, Blairsville, GA  
Charlotte Israel  
Charlotte Licata, Cherry Log, GA  
Cheryl Askew, Dandridge, TN  
Cheryl L. Prosak, Dandridge, TN  
Cheryl S. Smith, Blairsville, GA  
Chip Sparks, Abingdon, VA  
Chris and Margaret Offen, Blairsville, GA  
Chris McLean, Blairsville, GA  
Chris Offen, Blairsville, GA  
Chris Perkins, Florence, AL  
Christine M. Robinson, Abingdon, VA  
Cindy Pack, Blue Ridge, GA  
Cindy Perry  
Clarence and Patricia Ricketts, Blairsville, GA  
Lowell Smith, Raven, VA  
Loyd and Mona Prewitt, Seneca, SC  
Luella Windham, Rutledge, TN  
Lyndon and Laura Sidelinger, Roswell, GA  
Lynn and Barry Varian, Blairsville, GA  
Lynn and Donald Fountain, Blairsville, GA  
Lynn Peterson, Blairsville, GA  
M'liss and Stephen Miller, McMinnville, TN  
Madeline Roose, Blairsville, GA  
Mae Musick, Bristol, TN  
Major M. Pounders, Abingdon, VA  
Malcolm P. Cotton, Dandridge, TN  
Marcus Fortier  
Margaret H. Schramke, Blairsville, GA  
Margaret L. McCamy, Hiawasse, GA  
Margaret White, Dandridge, TN  
Margy King, Dandridge, TN  
Marie E. Geesa, Blairesville, GA  
Mark and Melanie Midkiff, Roswell, GA  
Mark Donahue, Blairsville, GA  
Mark Heatherly, Sevierville, TN  
Mark Patterson, Brentwood, TN  
Mark Weddle, Marion, VA  
Mark Wiggins, Cordova, TN  
Marsh and Julia Freemyer, Marietta, GA  
Marsha Dorta, Young Harris, GA  
Martha Jarrard, Hiawasse, GA  
Martha Sunyog, Blairsville, GA  
Martin Milkman, Murray, KY  
Marty Godfrey, Blairsville, GA  
Mary and Herbert Arnold, Blairsville, GA  
Mary Bondurant, Bristol, TN  
Mary C. Cook, Bryson City, NC  
Mary D. Milh, Blairsville, GA  
Mary Dishner, Blountville, TN  
Mary Hopper, Dandridge, TN  
Mary Horne, Lebanon, VA  
Mary Lou Stager, Blairsville, GA  
Mary M. Johnson, Bristol, VA  
Mary MacDonald, Baneberry, TN  
Mary Twiggs, Blairsville, GA  
Matthew and Patti McIsaac, Blairsville, GA  
Matthew Stricklin, Murfreesboro, TN  
Matthews Gwynn, Blairsville, GA  
John R. McCamy III, Charlotte, NC  
Megan Peterson, Woodstock, GA  
Melissa White  
Mia Crowe, Blairsville, GA  
Micah and Misty Garrison  
Michael and Patricia Cole, Blairsville, GA  
Michael and Evelyn Fink, Dandridge, TN  
Michael Brock, Hiawasse, GA  
Michael Gailey, Dunwoody, GA  
Michael Guffey, Seymour, TN  
Michael Mekas  
Michael P. Van Winkle, Clarkesville, GA  
Michael R. Adamson, Blairsville, GA  
Michael Schutt, Blairsville, GA

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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Claude D. Keaton, Dandridge, TN  
Cliff Nelson, Hayesville, NC  
Clyde Long, Blairsville, GA  
Colman B. Woodhall, Johnson City, TN  
Connie and Jim Varian, Blairsville, GA  
Corrie Zylstra, Blairsville, GA  
Craig and K.K. Wiseman, Rock Island, TN  
Curtis E. Johnson  
Dale Elliott, Blairsville, GA  
Dale Hartsell, Newport, TN  
Dalie T. Thomas, Bristol, TN  
Dan Watson, Blairsville, GA  
Dan and Sophia Brown, Blairsville, GA  
Dan Kauffman, Ducktown, TN  
Dan Meek, Kodak, TN  
Dan Meek, Knoxville, TN  
Daniel and Karen Malte  
Daniel D. Phelan, Morganton, GA  
Dave Baxter, Eddyville, KY  
Dave Cooper, Alpharetta, GA  
David and Melody Snidgrass, Brentwood, TN  
David B. Smalley  
David DeLong, Bryson City, NC  
David E. Larson, Hayesville, NC  
David Graves, Acworth, GA  
David Herndon, Greeneville, TN  
David J. Spacek, New Market, AL  
David P. Montieth, Bryson City, NC  
David R. Chrisman, New Market, TN  
David Verble, Sevierville, TN  
Dean Henderson, Richlands, VA  
Dan Owens, Woodstock, GA  
Deborah Austin, Morristown, TN  
Debra Jensen, Young Harris, GA  
Debra Williams, Morristown, TN  
Denise Endsley, Snellville, GA  
Dennie Stone, Blairsville, GA  
Dennis Moorehead  
Dewey Ragwell  
Diana Swindel, Hiawassee, GA  
Diane Daige  
Diane Layton, Dandridge, TN  
Diann Stone, Atlanta, GA  
Dianna Mullins, Bristol, TN  
Dick and Jane Soehnere  
Dixie A. Cantley, Bluff City, TN  
Don Barnette, McDonough, GA  
Don W. Harrison, Blairsville, GA  
Donald McGlynn, Hiawassee, GA  
Donald E. Webb, Powder Springs, GA  
Donald Hauber, Rock Island, TN  
Donald Ruth, Hiawassee, GA  
Donia R. Prada, Morristown, TN  
Donna Corn  
Dorothy D. Brock, Blairsville, GA  
Dorothy D. Byrd, Blairsville, GA  
Doug and Judy Leman, Blairsville, GA  
Doug and Nancy Triestram, Blairsville, GA

Michelle Batko, Retired  
Michelle K. Maloney, Blairsville, GA  
Mickey Carter, Knoxville, TN  
Mike Fishman, Morristown, TN  
Mike Murphy, Hayesville, NC  
Mike Perssley, Canton, NC  
Miranda Burnett, Calvert City, KY  
Molly Ann Zeuch  
Mr. and Mrs. Gerald W. Might, Blairsville, GA  
Mr. and Mrs. Kevin Smith, Marietta, GA  
Mr. and Mrs. Robert E. Smith, Blairsville, GA  
Mr. and Mrs. David W. King, Blairsville, GA  
Mr. and Mrs. Don Lachman, Blairsville, GA  
Mr. and Mrs. Haskel Drake, Blairsville, GA  
Mr. and Mrs. Mark J. Versharm, Blairsville, GA  
Mr. and Mrs. Richard Davis, Blairsville, GA  
Mr. Charles Arnold, Lawrenceville, GA  
Mr. William J. Gray, Blairsville, GA  
Mr. and Mrs. Joseph L. Johnson, Jr., Newport News, VA  
Mrs. Darlene Helton  
Mrs. Julia Freemyer, Marietta, GA  
Mrs. Linda Hammond, Young Harris, GA  
Muriel Jefferson, Blairsville, GA  
Myron Engebretson, Marietta, GA  
Myron Squires, Dandridge, TN  
Nancy Frazier, Hayesville, NC  
Nancy Triestram, Blairsville, GA  
Neal D. Stone, Jr.  
Neil and Ruby McCullough, Hiawassee, GA  
Norman Cooper  
Norman Kaye, Blue Ridge, GA  
Norris Wood  
Not Legible, Blairsville, GA  
Paige Brown, Cumming, GA  
Pam Mero, Blairsville, GA  
Pamela Fairfax, Rock Island, TN  
Pamela R. Brownhill, Blairsville, GA  
Parmelle and Edwina Ward, Blairsville, GA  
Pat and Deb Robinson, Clarkston, MI  
Pat Davis, Dandridge, TN  
Pat Unferth, Morristown, TN  
Patricia L. Neubert, Hiawassee, GA  
Patricia M. Karpick, Dandridge, TN  
Patricia M. Smith, Blairsville, GA  
Paul and Marcy Erwin  
Paul Brownhill, Blairsville, GA  
Paul Chapman, Russellville, TN  
Paul Dumbacher, Huntsville, AL  
Paul Gunderson, Marietta, GA  
Paul Howell, Selmer, TN  
Paul Morris, Benton, KY  
Paul Tucker, Fernandina Beach, FL  
Paul Williams, Atlanta, GA  
Peg Flora  
Peggy Ferguson, Hayesville, NC  
Peggy Smith, Blairsville, GA  
Penny and Al Caudill

## APPENDIX F2 Response to General Comments, Issues, and Concerns

Doug Roe  
Doug Triestram, Blairsville, GA  
Douglas E. Bondurant, Bristol, TN  
Douglas Lawler, Abingdon, VA  
Doyle and Pat Ricks, Memphis, TN  
Dr. Judy K. Campbell, Hiawassee, GA  
Drew Danko, Dandridge, TN  
Drucille J. Fox, Blairsville, GA  
Dwayne and Antoineet Boudreaue  
E. Bloom, Blairsville, GA  
Earle Seaverns, Hayesville, NC  
Ed Moore, Hiawassee, GA  
Ed Prieto, Blairsville, GA  
Ed Rains  
Eddie Allen, Blairsville, GA  
Edward and Mary Hoefs, Blairsville, GA  
Edward Cozart, Abingdon, VA  
Edward L. and Melissa F. Parrish, Walling, TN  
Edward L. Hollen, Blairsville, GA  
Edward MacDonald, Morganton, GA  
Edwina Johnson, Atlanta, GA  
Elaine Farris, Bristol, VA  
Elizabeth Gunderson, Marietta, GA  
Elizabeth Southers, Dunwoody, GA  
Ellen C. Montieth, Bryson City, NC  
Ellen Moore, Hiawassee, GA  
Ellen Sullivan, Blairsville, GA  
Elmer Simmons, Abingdon, VA  
Eric J. Benz, Ormond Beach, FL  
Ervell and Salena Arnold, Blairsville, GA  
Eugene Beatty, Cumming, GA  
Flake and June Hewett, Blairsville, GA  
Floretta Campbell, Blairsville, GA  
Floyd Abrams, Bristol, TN  
Frank and Patricia Seidel, Blairsville, GA  
Frank Howell, West Palm Beach, FL  
Frank Pack, Blairsville, GA  
Franklin D. Brown, Bristol, TN  
Fred and Marie Geesa, Blairsville, GA  
Fred Maloney, Blairsville, GA  
Fred T. Necessary, Abingdon, VA  
Frederic R. Guyonneau, Rosewell, GA  
G. J. Ashworth, Hiawassee, GA  
Gail Galloway, Knoxville, TN  
Gail Poteet, Blairsville, GA  
Gale and Anne Roberts, Dandridge, TN  
Gary and Ruth Peitsch, Hiawassee, GA  
Gary Sherrod, Knoxville, TN  
Gary Silver, Atlanta, GA  
George F. White, Cordele, GA  
George Pisciotta, Marietta, GA  
George Vonnoh, Blairsville, GA  
George Ward, Dandridge, TN  
Gerald and Aleta Richardson, Murfreesboro, TN  
Gerald T. Burger, Blairsville, GA  
Geraldine Phebus, Blairsville, GA  
Gerldine Preston, McMinnville, TN  
Gigi Garrett, Blue Ridge, GA  
Penny F. Wilson, Canton, GA  
Peter G. Ferre, Nashville, TN  
Peter Reilly, Alpharetta, GA  
Peter Robinson, Norcross, GA  
Phil Fauver, Roswell, GA  
Phillip Davis, Dandridge, TN  
Phyllis Williamson  
Phyllis J. Jones, Blairsville, GA  
Phyllis Miller, Bristol, VA  
Piper Solomon, Blairsville, GA  
R. Joseph, Dandridge, TN  
R. Trent Sipsy  
R. J. Hampton  
Ralph Sheets, Abingdon, VA  
Randy and Judy Reck, Nashville, TN  
Randy Cress, Grayson, GA  
Ray and Elsie Johnston, Blairsville, GA  
Raymond G. Morris, Cartersville, GA  
Rebecca St. John, Blairsville, GA  
Regina Frisbey, Blairsville, GA  
Reileen and Eugene Beatty, Blairsville, GA  
Reileen Beatty, Cumming, GA  
Renee Mason-Mazzei, Abingdon, VA  
Rex Mallory, Bristol, VA  
Rich Gilbert, Blairsville, GA  
Richard and Janet Davis, Almont, MI  
Richard and Lisa Nesz, Marietta, GA  
Richard and Claire Sterline, New Concord, KY  
Richard Bell, Blairsville, GA  
Richard Burnell, Blairsville, GA  
Richard Simms, Chattanooga, TN  
Richard Smith, Blue Ridge, GA  
Richard Sullivan, Hayesville, NC  
Richard T. Braun, Bowling Green, KY  
Richard Wagner, Blairsville, GA  
Rick and Judy Butler, Dandridge, TN  
Rita Gunter, Blairsville, GA  
Robert and Florence Campbell, Blairsville, GA  
Robert and Jacquelyn Crupi, Dandridge, TN  
Robert and Shelia Garrison, Blairsville, GA  
Robert A. Lamm, Hiawassee, GA  
Robert A. Rohde, Dandridge, TN  
Robert and Mary Jane McGuire, Blairsville, GA  
Robert Berlin, Bryson City, NC  
Robert Bray, Murfreesboro, TN  
Robert Canaan, Hiawassee, GA  
Robert E. Craig, Decatur, AL  
Robert E. Sanchez, Blairsville, GA  
Robert J. Reynolds, Morristown, TN  
Robert Kazmier, Roswell, GA  
Robert M. Misdorn, Blairsville, GA  
Robert MacDonald, Baneberry, TN  
Robert O. Bruce, Bristol, TN  
Robert P. Gill, President, Blue Ridge Mountain  
Chapter, Trout Unlimited  
Robert P. Taylor, Hamlin, KY  
Robert Pardue, Dandridge, TN  
Robert Schaefer, Blairsville, GA

## APPENDIX F2 Response to General Comments, Issues, and Concerns

Glen and Janet Withre, Blairsville, GA  
Glen Boland, Blairsville, GA  
Glenda B. Owens, Woodstock, GA  
Glenn Jones, Bryson City, NC  
Glenn L. Schuman, New Smyrna, FL  
Grant Treiber, Blairsville, GA  
Greg Robinson, Abingdon, VA  
H. D. Windsor, Blairsville, GA  
H. L. and P. J. Williams, Blairsville, GA  
Hans and Wendy Tremel, Sharpsburg, GA  
Harold J. Williams, Blairsville, GA  
Harold L. Oliver, Marietta, GA  
Harry E. Hodgson, Blairsville, GA  
Harry Smith, Blairsville, GA  
Harry Williams, Blairsville, GA  
Harvey and Cindy Cohen, Blairsville, GA  
Harvey and Wendy Holden, Blairsville, GA  
Hattie Moon  
Helen Hewitt, Knoxville, TN  
Henry Glore, Blairsville, GA  
Herman A. Moon  
Howard C. Davis, Blairsville, GA  
Howard Smrz, Young Harris, GA  
Howard T. and Linda R. Sartain, Chattanooga, TN  
Howard W. Walters, Blairsville, GA  
Hugh Newsom, Knoxville, TN  
Ivey Wingo, Blairsville, GA  
J. D. Smith, Doran, VA  
J. C. Perry  
J. Cathryn Christopher, Murray, KY  
J. Dan Gladney, Lawrenceville, GA  
J. Mike Alters  
Jack and Mary Couch, Hiawassee, GA  
Jack C. Etheridge, Blairsville, GA  
Jack Miller, Kennesaw, GA  
Jack Miller, Hiawassee, GA  
Jack Moody, Hayesville, NC  
Jacquelina Maloney, Woodstock, GA  
James A. Doughty, Young Harris, GA  
James A. Savage III, Bone Cave, TN  
James B. and Elizabeth F. Eppes, Hiawassee, GA  
James B. Dore  
James E. and Sandra L. Grantham, Blairsville, GA  
James Finchum, Newport, TN  
James H. Wheeler, M.D., Atlanta, GA  
James Hall, Smyrna, TN  
James J. Morris, Blairsville, GA  
James L. Clonts, Blairsville, GA  
James M. Galloway, Knoxville, TN  
James Malte, Blairsville, GA  
James Seaver, Morristown, TN  
Jamie Whitman, Bluff City, TN  
Jan Dalton, Murray, KY  
Jan Hackett, Morganton, GA  
Jan Simon, Blairsville, GA  
Robert W. Boyd, Blairsville, GA  
Roberta Baxter, Eddyville, KY  
Roger Helton, Honaker, VA  
Roger Williams, Knoxville, TN  
Ron and Judi Smith, Blairsville, GA  
Ron and Martha Sunyog, Blairsville, GA  
Ron and Janet Lander, Blairsville, GA  
Ron Gillespie, Blue Ridge, GA  
Ron Voyle  
Ronald A. Burke, Cumming, GA  
Ronald E. Exum, Franklin, TN  
Ronald Frohlich, Blairsville, GA  
Ronald H. McKuew, Blairsville, GA  
Ronald Huffaker, Knoxville, TN  
Ronald Morgan, Marietta, GA  
Ronald Whitener, Dandridge, TN  
Ronnie Offen, Blairsville, GA  
Ronnie Offen, Marietta, GA  
Roy and Beverly Cardell, Blairsville, GA  
Roy Walker, Franklin, TN  
Ruby Warren  
Rufus H. Stark II, Hayesville, NC  
Russell Stevenson, Hayesville, NC  
Ruth Kwapinski, Sec., Rock Island, TN  
Ryan J. Morgan, Blairsville, GA  
Ryan Morgan, Marietta, GA  
S. Dean Yates, Abingdon, VA  
Sabrina Brown, Bristol, TN  
Samantha Morgan and Family, Marietta, GA  
Sandi Jernigan, Cumming, GA  
Sandy Robinson, Abingdon, VA  
Sara R. Troemel, Blairsville, GA  
Scott Thomas  
Sharon Robish, Morristown, TN  
Shawn Maloney, Woodstock, GA  
Sheila Garrison, Blairsville, GA  
Sheila White, Cordele, GA  
Shelby Morris, Cartersville, GA  
Shelia Bondurant, Bristol, TN  
Sherri Hinkle, Bristol, TN  
Sherry D. Barnes, Blairsville, GA  
Shirley Dominick, Dandridge, TN  
Shooks Marina, Murphy, NC  
Sondra Judy Sharp, Dandridge, TN  
Stan Gunter, Blairsville, GA  
Stefan A. Prada, Morristown, TN  
Steve and Becky Mishket, Dandridge, TN  
Steve and Karen Osborn, Rock Island, TN  
Steve and Meredith Driskill, Andersonville, TN  
Steve Marshall, Dandridge, TN  
Steve Petty, Bell Buckle, TN  
Steve Setlock, Blairsville, GA  
Stone Brown, Cumming, GA  
Sue Hill, Blairsville, GA  
Sue Turner  
Susan DeLong, Bryson City, NC  
Susan Quinn, Harrison, TN  
Susanna White

## APPENDIX F2 Response to General Comments, Issues, and Concerns

Jane O. Stone  
Jane Stone, Blairsville, GA  
Janet Penilo, Dandridge, TN  
Janice Boland, Blairsville, GA  
Jean Stone, Blairsville, GA  
Jeff and Jan Jensen, Blairsville, GA  
Jeff Blankenship, Cedar Bluff, VA  
Jeff Maples  
Jeff Ramsey, Kodak, TN  
Jeff Stevenson, Atlanta, GA  
Jeffery P. Jones, Blairsville, GA  
Jerome Alton Connor, Jr., Powder Springs, GA  
Jeri Mitchell, Abingdon, VA  
Jerry and Brenda Snow, Dandridge, TN  
Jerry F. Taylor, Athens, AL  
Jerry Powers, Bristol, VA  
Jessica MacLean, Zionsville, IN  
Jetta J. Cooper, Blairsville, GA  
Jill Blake, Davidson, NC  
Jim and April Russell, Dandridge, TN  
Jim and Nancy Malte, Blairsville, GA  
Jim and Ruth Flemister  
Jim Davis, Dandridge, TN  
Jim Ebert, Lilburn, GA  
Jim Fields, LaFollette, TN  
Jim Mootrey, Blairsville, GA  
Jo Ann Strickland  
Jo Ellen Young, Rock Island, TN  
Joan Freisen, Hayesville, NC  
Joan Tuthill  
Joanne K. Morris "Whistlestop", Blairsville, GA  
Joanne Klingbeil, Hiawassee, GA  
Joanne Ward, Blairsville, GA  
Jocelyn and Jamie Richards, Washington, DC  
Joe Chase, Abingdon, VA  
Joe Hill, Nashville, TN  
John and Kathryn Williams, Blairsville, GA  
John and Linda Jackson, Marietta, GA  
John C. Ashe, Hayesville, NC  
John Delk, Alpharetta, GA  
John Jones, Birmingham, AL  
John N. Gillham, Jr., Hayesville, NC  
John Olexick, Blairsville, GA  
John R. McCamy, Stone Mountain, GA  
John Sillay, Marietta, GA  
John W. Musser, Soddy Daisy, TN  
Jonathan Brown, Bristol, TN  
Joseph A. Robinson, Jr., Abingdon, VA  
Joseph Lindahl, Gallatin, TN  
Joseph Reback, Iebulou, NC  
Josephine Williams, Murphy, NC  
Joy Lyle, Ellijay, GA  
Joyce Morgan, Marietta, GA  
Judi Stevenson, Franklin, NC  
Judith Mills, Damascus, VA  
Judy Dyer, Blairsville, GA  
Judy Keane, Baneberry, TN  
Judy Myers, Blairsville, GA  
Swaim, Blairsville, GA  
Taulbee Lester, Honaker, VA  
Ted Bollman, Morristown, TN  
Tennessee Valley Towing, Inc., Bill Dyer,  
Paducah, KY  
Teresa Joel, Atlanta, GA  
Teresa Mears, Benton, KY  
Terry Topjun, Dandridge, TN  
Thomas C. Roberts, Morganton, GA  
Thomas Carey, Woodstock, GA  
Thomas E. Karpick, Dandridge, TN  
Thomas H. Windham, Rutledge, TN  
Thomas L. Parker, Murphy, NC  
Thomas M. Malafronte, Dandridge, TN  
Thomas Peters, Franklin, TN  
Thomas Robinson, Morristown, TN  
Thomas Whitman, Bluff City, TN  
Tim and Patrice Pollock, Blairsville, GA  
Timothy R. Murry, Blairsville, GA  
Todd Nelson  
Tom and Martha Scissom and Allison Carlton,  
Blairsville, GA  
Tom A. Yates, Bristol, VA  
Tom Carlton, Blairsville, GA  
Tom Gunderson, Marietta, GA  
Tom Murphy, Blairsville, GA  
Tony and Suzanne Lagratta, Blairsville, GA  
Tony E. Branan, Hiawassee, GA  
Top of Georgia Tech, Inc., Blairsville, GA  
Tracy A. Swatt, Blairsville, GA  
Vern Barnes  
Vern On, Morristown, TN  
Veronica Brown, Cumming, GA  
Vert and Elaine Morris, Dandridge, TN  
Virginia Sisson-Jewell, Morristown, TN  
Vivian Keling, Blairsville, GA  
Vivian R. Hopkins, Blairsville, GA  
W. J. Flora  
Wade J. Cook, Bryson City, NC  
Walter Lake, Dandridge, TN  
Walter Layton, Dandridge, TN  
Walter Mitchell, Dunwoody, GA  
Walter Thomson, Murray, KY  
Warren, Blairsville, GA  
Warren Schwartz, Blairsville, GA  
Warren T. Zeuch, Jr.  
Wayne and Mary Ann Anderson, Hiawassee, GA  
Wayne Chaney, Bristol, TN  
Wayne DeMars, Blairsville, GA  
Wayne Hellaud, Blairsville, GA  
Wayne Reynolds, Chattanooga, TN  
Wes and Jennifer King, Blue Ridge, GA  
William and Martha Sue Shelton, Crandall, GA  
William Brown, Cumming, GA  
William E. Underwood, Iuka, MS  
William Eckstein, Blairsville, GA  
William Edwards, Mt. Juliet, TN  
William H. Jones, Blairsville, GA

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

*Julia Householder, Pigeon Forge, TN*  
*Julie Morgan, Marietta, GA*  
*June H. Lich and Doris Hays, Dandridge, TN*  
*June Kephart, Blairsville, GA*  
*June Parks, Hiawassee, GA*  
*Junior Miller, Honaker, VA*  
*K. Pindzola, Johnson City, TN*  
*K. E. Competiello, Atlanta, GA*  
*Kaitlin Louise Smalley*  
*Karen Adamson, Blairsville, GA*  
*Karen McKin, Young Harris, GA*  
*Karen Rohde, Dandridge, TN*  
*Karin Davis, Hiawassee, GA*  
*Katherine B. McNeil, Dandridge, TN*  
*Katherine Marshall, Dandridge, TN*  
*Jonathon Brown*  
*Steve Burnett*  
*Andrew Drake*  
*Bill Harold*  
*Cheryl S. Himson*  
*Joseph R. Lavelle*  
*Spencer Overstreet*  
*Terry C. Wallace, President, Morgan County*  
*Convention & Visitors Bureau, Decatur, AL*  
*Bunny Johns, Chair, Swain County Economic*  
*Development Commission*

*William H. Dietrich, Hayesville, NC*  
*William Harvey, Rock Island, TN*  
*William J. Smith, Blairsville, GA*  
*William L. Hoover, Naples, FL*  
*William L. Reeves, Blue Ridge, GA*  
*William M. Brown, Murray, KY*  
*William Vander-Ryder, Blairsville, GA*  
*Willie Mae Ayers, Rouston, GA*  
*Wills Brown, Cumming, GA*  
*Windel Lester, Iaeger, WV*  
*Windle Nelson*  
*Winona Bailey, Blue Ridge, GA*  
*Wn. F. Walsh, Chattanooga, TN*  
*Woody Chastain, Athens, GA*  
*Yvonne Carney, Bryson City, NC*  
*Zoe W. Horton*  
*Zondra H. Leazer, Baneberry, TN*  
*Gwen Bushyhead, Director, Chamber of*  
*Commerce Center, Swain County, NC*  
*Charles Kelly*  
*Donald McGlynn*  
*James Phelps*  
*Josh Smalley*  
*Thomas Vernon*  
*Virginia B. Williams*  
*Geraldine Preston*

### **RESPONSE TO COMMENTS**

The comments cited by those supporting Reservoir Recreation Alternative A express the intent of this alternative (i.e., to enhance reservoir recreation opportunities). A number of those commenting recognized the trade-offs that are involved in operating the reservoir system but indicated that the benefits to be gained from increased recreation opportunities would more than compensate for any adverse environmental impacts. TVA's Preferred Alternative was formulated to enhance recreational opportunities and to achieve many of the benefits sought by these commenters.

#### **Opposed to Reservoir Recreation Alternative A**

##### ***Summary of Comments***

Most individuals who made comments opposing Reservoir Recreation Alternative A cited environmental degradation as their primary reason—specifically loss of flats habitat for migratory bird species. This and other reasons are listed below.

##### **ENVIRONMENTAL IMPACTS**

- Results in loss of flats that are important to a variety of wildlife, including waterfowl, eagles, wading birds, and shorebirds.
- Adverse impact on the willow/buttonbush community, which is a major nesting area for a number of uncommon bird species and an important component of the fishery.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

- Reduces spawning habitat.
- Reduces water and air quality.
- Increases flood risk.
- Increases shoreline erosion, affecting cultural resources.

### RECREATION IMPACTS

- Decreases waterfowl hunting, birding, and fishing.

### SOCIAL AND ECONOMIC TRADE-OFFS

- Increases in revenue are offset by the adverse environmental consequences.
- Lakeshore property owners and developers get all the benefits; everyone else in the population served by TVA has to bear the burden.
- Lowers gross regional product.
- Increases power costs; best to use the hydropower when temperature and climate conditions predispose to highest pollution levels.
- Damage to public areas by increased erosion.

### Commenters

*Barron Crawford, Paris, TN  
Bettie Mason, Knoxville, TN  
Bob Graham, Harrison, TN  
Guy Larry Osborne, Jefferson City, TN*

*John Taylor, Springville, TN  
Michael A. McMahan, Chattanooga, TN  
Michael Sylva Sledjeski, Del Rio, TN  
Robert Wheat, Paris, TN*

## **RESPONSE TO COMMENTS**

Most of the individuals opposing Reservoir Recreation Alternative A thought that benefits to be gained by a limited few were offset by the adverse environmental impacts on local areas and the region. The Preferred Alternative was formulated to enhance recreational opportunities, while reducing potential environmental impacts associated with Reservoir Recreation Alternative A.

### **Reservoir Recreation Alternative B**

#### Support for Reservoir Recreation Alternative B

##### *Summary of Comments*

About 250 individuals supported Reservoir Recreation Alternative B (extending tributary and main river summer pool levels to Labor Day; raising tributary winter flood guides to levels needed to store only inflow volume of the 7-day, 500-year storm; and raising main river winter flood guides by 2 feet with a 1-foot operating range). Similar to those supporting Reservoir Recreation Alternative A, most individuals cast their vote or stated their preference for Reservoir Recreation Alternative B as the best plan for the region. When given, the primary reasons cited by those supporting Reservoir Recreation Alternative B are listed below.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### **PROVIDES A BALANCED APPROACH**

- Pros outweigh cons; provides the most positive effects with fewer adverse effects than other alternatives.
- Provides a good balance between recreational use and flood control.
- Better for the economy, scenic beauty, recreation, property values, aquatic life, and shoreline erosion.
- Addresses increasing value of recreation on the lakes, while still providing adequate protection from floods and also providing a water source for communities along the river system.
- Broadest range of benefits with least damage to the system as it now exists.

### **INCREASES RECREATION VALUE AND USE**

- Enhances recreational use; provides additional recreations opportunities.
- Improves fall fishing and reduces fish kill.
- Increases recreation and visual benefits.
- Allows full use of the lake (reservoir) during the traditional summer season.

### **SCENIC BEAUTY**

- Enhances beauty of the lake.
- Reduces the amount of bare shore that develops as water levels are drawn down.
- Attracts tourist to area.

### **ECONOMIC EFFECTS**

- More recreation dollars.
- Enhances property values.
- Helps local and regional economy.
- Creates more jobs.
- Spurs future growth and development.
- The cost to the average electric user of \$3.66 per year in rate increase is offset by the improvement in the local economy.

### **ENVIRONMENTAL EFFECTS**

- Little if any negative environmental effects.
- Places high priority on water quality; no major effects to water quality.
- Helps aquatic life.
- More stable environment improves fish spawn.
- Reduces shoreline erosion.
- No impact on flooding; later drawdown allows adequate time to prepare for winter and spring floods.
- Improves navigation with reduced cost.
- Safer for boaters with less chance of grounding.

### **USE OF PROPERTY**

- Allows year-round personal dock access to lake.
- Allows use of boats and docks until Labor Day.
- Allows maintenance of pier.

## APPENDIX F2 Response to General Comments, Issues, and Concerns

### Commenters

Alice Jane Jessee, Abingdon, VA  
Allan B. Brown, Gilbertsville, KY  
Andrew Newton, Weldon, IL  
Angela Boyda, Abingdon, VA  
Angela Mack, Huntsville, AL  
Angie Borst, New Market, TN  
Anonymous (10)  
Barbara Garrow, Dandridge, TN  
Beltz, Richard and Kay, Abingdon, VA  
Ben Robinson, Rogersville, AL  
Bennett G. Arvey, Fletcher, NC  
Beverly Cardell, Blairsville, GA  
Bill Coward, New Market, TN  
Bill Dearing, Soltewah, TN  
Bill Evans, Iuka, MS  
Billy Hughes, Heiskell, TN  
Bob Graham, Harrison, TN  
Bob Mc Alister, Athens, AL  
Bob Mc Alister, Athens, AL  
Bob McDonald, Blairsville, GA  
Bob Robertson, Dandridge, TN  
Bob Weaver, Gainesville, GA  
Brad Davenport, Seymour, TN  
Brandon Grimsley, Blairsville, GA  
Brian L. Thomas, Hiawassee, GA  
Bryan Arnold, Bristol, VA  
Bud Mcneal, Savannah, TN  
Carl Fleischer, Roswell, GA  
Carol Repovich, Gilbertsville, KY  
Charles and Kristie Wallis, Sevierville, TN  
Charles Fudge, Dandridge, TN  
Charles Patton, Talbott, TN  
Cheryl Harrison, Blairsville, GA  
Chip Miller, Hixson, TN  
Chris Berry, Blue Ridge, GA  
Christopher Plemons, Knoxville, TN  
Christy Tucker, Knoxville, TN  
Connie Burlingham, Sevierville, TN  
Dan McArthur, Dandridge, TN  
Danny L. Smith, Bristol, TN  
Dave Baxter, Eddyville, KY  
Dave Cooper, Morristown, TN  
David Deutsch, Blue Ridge, GA  
David L. Schmitz, Memphis, TN  
David Meek, Sevierville, TN  
Dedra Anderson, Talbott, TN  
Denny Lambert, Bristol, VA  
Derek Wintermute, Blairsville, GA  
Dexter Douglas, Hardin, KY  
Dick Robish, Morristown, TN  
Don Baldus, Bean Station, TN  
Don Harrison, Blairsville, GA  
Don Morrell, Athens, AL  
Don Wintermute, Kennesaw, GA  
Don Wintermute Jr., Colorado Springs, CO  
Kathy Leedy, Sevierville, TN  
Kathy Miller, Dandridge, TN  
Kathy Pearce, Cumming, GA  
Kay, 2517 Hills Chapel, TN  
Ken Cole, Dandridge, TN  
Ken Thompson, Benton, KY  
Kenneth A. Turner  
Larry Akins, Blairsville, GA  
Larry Allbritten, Dandridge, TN  
Larry Rinaca, Georgetown, TN  
Leroy Miller, Dandridge, TN  
Leslie Leduc, Bradenton, FL  
Lorraine Shaffer, Murphy, NC  
Lynn Swanson, Hiawassee, GA  
MacDonald Pickens, Dandridge, TN  
Marilyn Allbritten, Dandridge, TN  
Marjorie C. Wintermute, Blairsville, GA  
Mark D. King, Conyers, GA  
Mark Shope, Morristown, TN  
Marlin Seaton, Calvert City, KY  
Martha McDonald, Blairsville, GA  
Martin Milkman, Murray, KY  
Mary Miller, Hiawassee, GA  
Max Fuller, Bristol, VA  
Melinda Baumunk, Dandridge, TN  
Melissa Harrison, Bristol, VA  
Michael Houser, Bristol, TN  
Michael K. Smith, Morristown, TN  
Michael Ryan, Dandridge, TN  
Mike McWilliams  
Milton Akins, Blairsville, GA  
Mitch Rader, Sevierville, TN  
Mr. and Mrs. Jackie C. Kelley, Dandridge, TN  
Mrs. Jean Roberts, Morristown, TN  
Name Not Provided  
Nancy Fudge, Dandridge, TN  
Nita Wintermute, Blairsville, GA  
Norman Findley, Atlanta, GA  
Norman K. Owen, Murphy, NC  
Pam Brownhill, Blairsville, GA  
Pat Finch, Brentwood, TN  
Patricia E. Yates, Baneberry, TN  
Patricia Burdett, White Pine, TN  
Patricia Rippetoe, Dandridge, TN  
Patsy Stuart, Blue Ridge, GA  
Pattie Heitzman, Sand Springs, OK  
Paul Baker, Big Sandy, TN  
Paul Q. Merritt, Rutledge, TN  
Pete and Mary Jo Zurcher, Sevierville, TN  
Pete Barile, Morristown, TN  
R. P. DeCicco, Ooltewah, TN  
Rachel Baumunk, Dandridge, TN  
Randy Newcomb, Gilbertsville, KY  
Rick Rice, Marietta, GA  
Richard and Linda Larson, Dandridge, TN

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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Donald Cook, Abingdon, VA  
Donna Akins, Blairsville, GA  
Douglas Rippetor, Dandridge, TN  
Edd White, Blairsville, GA  
Eddie Fisher, Kodak, TN  
Edward J. O'Neill, Abingdon, VA  
Edward Reynolds, Hiawassee Ga  
Edwin D. Breland, Jr., Rogersville, AL  
Elizabeth O'Donnell, Blairsville, GA  
Erma Robb, Benton, KY  
Fane Fisher, Kodak, TN  
Forrest Liles, New Concord, KY  
Frank Aparicio, Sevierville, TN  
Frank Dahlberg, Dandridge, TN  
G. W. Bud McCoig, Dandridge, TN  
Gary Holiway, Dandridge, TN  
Gary Jordan, Bryson City, NC  
Gary Whitaker, Morristown, TN  
George and Betty Lowers, Dandridge, TN  
George Pisciotta, Marietta, GA  
Gerard Gadbois, Dandridge, TN  
Gill Davidson, Dawsonville, GA  
Glesma Davis, Dandridge, TN  
Gloria Dahlberg, Dandridge, TN  
Harry Johnson, Dandridge, TN  
Helen Dearing  
Howard Mauney, Morristownhoo.Com, TN  
J. B. Harmon, Mayfield, KY  
Jackie Baker, Big Sandy, TN  
James and Lavada Mansfield, Benton, KY  
James E. Barker, Kodak, TN  
James Froyd, Bryson City, NC  
James W. McCabe, Dandridge, TN  
James Wheeler, Dandridge, TN  
Janna Davenport, Blairsville, GA  
Jeremy Tucker, Knoxville, TN  
Jerry Messick, Bristol, TN  
Jill Parker, Blairsville, GA  
Jim and Pat Halloran, Hiwassee, GA  
Jim Folck, President, Norris Lake Marina Association, Norris TN  
Jim Miscichoski, Dandridge, TN  
Jim Prosak, Dandridge, TN  
John and Beverly Kramer, Strawberry Plains, TN  
John Ashe, Hayesville, NC  
John Baumunk, Jr., Dandridge, TN  
John De Freitas, Gilbertsville, KY  
John Stafford, Sevierville, TN  
John S. McClellan, Dandridge, TN  
Joseph L. Mansell, Largo, FL  
Joyce Balin, Bryson City, NC  
Judy Akin, Marietta, GA  
Judy Delashmutt, Dandridge, TN  
Judy Edwards, Murphy, NC  
Kathryn Johnson, Dandridge, TN  
Kathryn Miller, Dandridge, TN  
Kathy Napier, Blairsville, GA  
Rita Dumbacher, Huntsville, AL  
Robert A. Rohde, Dandridge, TN  
Robert E. Mitchell  
Robert Haist, Rome, GA  
Robert L. Seeley, Young Harris, GA  
Robert Leduc, Bradenton, FL  
Robert Rohde, Dandridge, TN  
Roberta Baxter, Eddyville, KY  
Roger W. Dixon, Young Harris, GA  
Ron Boyd, Athens, AL  
Ronald J. Leduc, Dandridge, TN  
Roy Sanders, Dandridge, TN  
Russell Foust, Morristown, TN  
Sandra Marinucci, Orland Park, IL  
Scott Bardenwerper, Helen, GA  
Scott Pisciotta, Marietta, GA  
Sharon Smith, Birchwood, TN  
Sharon Chilson, Bryson City, NC  
Sharon L McCabe, Dandridge, TN  
Sheila Cochran, New Market, TN  
Sherry Ryan, Dandridge, TN  
Shirley Cook, Abingdon, VA  
Shirley Hartsell, Dandridge, TN  
Steve Drake, Blairsville, GA  
Steven L Grubb, Knoxville, TN  
Steven Cook, Kingsport, TN  
Steven L. Matney, Abingdon, VA  
Tad Byrd, Sevierville, TN  
Teddy Murrell, Sevierville, TN  
Terry Weingarten, Hiwassee, GA  
Thomas Cernilli, Roswell, GA  
Thomas H. Hollingsworth, Rogersville, AL  
Thomas Hodge, Dandridge, TN  
Thomas R. White, Hampton, TN  
Tim and Betty Lynne Leary, South Berwick, ME  
Tim Allbritten, Dandridge, TN  
Tim Doyle, Dandridge, TN  
Todd Forthman, Hiwassee, GA  
Tom and Judy Wolterman, Dandridge, TN  
Tom Carlton, Blairsville, GA  
Tom Fowler, Fontana Lake Estates, NC  
Tom Gladfelter, Hiwassee, GA  
Tommy Vann, Knoxville, TN  
Tony Whitfield, Gilbertsville, KY  
Troy Ward, Blairsville, GA  
Unknown, Decatur, TN  
Vernon Roberts, Morristown, TN  
Vickie Stanton, Sevierville, TN  
Victoria Witkowski, Bryson City, NC  
Vonda M. Laughlin, Jefferson City, TN  
Walter Carpus, Bean Station, TN  
Waylon Spurgeon, Athens, AL  
Wayne and Sigrid Burge, Athens, AL  
Wayne Gallik, Dandridge, TN  
Wayne Goodwin, Bristol, TN  
Wes Davis, Gilbertsville, KY  
William Wood, Bryson City, NC  
William M. Thompson, Morristown, TN

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

*Richard Wagner, Blairsville, GA  
Rick Lewis, Dandridge, TN  
Bob McAlister  
Don Wintermute, Jr.*

*William McIntosh, Blairsville, GA  
Wm. F. Walsh, Chattanooga, TN  
Terry Wenberg*

### **RESPONSE TO COMMENTS**

Most individuals who gave reasons for supporting Reservoir Recreation Alternative B thought the higher reservoir levels and delayed drawdown until after Labor Day would improve the local area by increasing recreational opportunities, property values, and the local economy. A number of individuals questioned the study's conclusions that fewer recreational jobs would be created. This issue is addressed in Section F2.3 under "Economic Analysis and Adverse Effects on Jobs and Local Economy." Others mistakenly thought that since flooding occurs in spring and never in fall, Reservoir Recreation Alternative B would not affect flood control because water would be released after Labor Day to create flood storage. The Preferred Alternative was formulated to enhance recreational opportunities while reducing potential environmental impacts associated with Reservoir Recreation Alternative B.

#### **Opposed to Reservoir Recreation Alternative B**

##### *Summary of Comments*

Several of the individuals who made comments opposing Reservoir Recreation Alternative A also opposed Reservoir Recreation Alternative B for basically the same reasons: environmental degradation, specifically loss of flats habitat for migratory bird species. This and other reasons cited by those opposing Reservoir Recreation Alternative B are listed below.

##### **ENVIRONMENTAL IMPACTS**

- Results in loss of flats that are important to a variety of wildlife, including waterfowl, eagles, wading birds, and shorebirds.
- Adverse impact on the willow/buttonbush community, which is a major nesting area for a number of uncommon bird species and an important component of the fishery.
- Reduces spawning habitat.
- Reduces water and air quality.
- Increases flood risk.
- Increases shoreline erosion, affecting cultural resources.

##### **RECREATION IMPACTS**

- Decreases waterfowl hunting, birding, and fishing.

##### **SOCIAL AND ECONOMIC TRADE-OFFS**

- Increases in revenue would be offset by the adverse environmental consequences.
- Lakeshore property owners and developers get all the benefits; everyone else in the population served by TVA has to bear the burden.
- Lowers gross regional product.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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- Increases power costs; best to use the hydropower when temperature and climate conditions predispose to highest pollution levels.
- Damage to public areas by increased erosion.

### *Commenters*

*Barron Crawford, Paris, TN  
Bettie Mason, Knoxville, TN  
Bob Russum, Piney Flats, TN  
Danny Farmer, Camden, TN*

*David Cook, Blairsville, GA  
John Taylor, Springville, TN  
Mae Musick, Bristol, TN  
Michael Sylva Sledjeski, Del Rio, TN*

### **RESPONSE TO COMMENTS**

Compared to those supporting Reservoir Recreation Alternative B, individuals opposing this alternative thought that benefits to be gained by a limited few were offset by the adverse environmental impacts on local areas and the region. The Preferred Alternative seeks to enhance recreational opportunities, while reducing the potential for environmental impacts associated with Reservoir Recreation Alternative B.

### **Summer Hydropower Alternative**

#### Support for Summer Hydropower Alternative

##### *Summary of Comments*

Most individuals who made comments supporting the Summer Hydropower Alternative cited its benefits for water quality and aquatic life. This and other reasons are listed below:

- It is best overall for the system because it is as close to a natural river system as possible.
- It provides benefits for freshwater mussel populations, shorebirds, wildlife, waterfowl, and fisheries.
- It decreases power costs; and it provides better water quality.

### *Commenters*

*Chris Perkins, Florence, AL  
David Cook, Blairsville, GA  
Joan Ayer, Hiawassee, GA*

*Mark Seaton, Eva, TN  
Tony Arnold, Russellville, KY*

### **RESPONSE TO COMMENTS**

The Preferred Alternative was formulated to reduce potential impacts on hydropower. Unfortunately, not all increases in power costs could be eliminated without substantially reducing opportunities for increased recreation on the river system.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### Opposed to Summer Hydropower Alternative

#### *Summary of Comments*

Most individuals who opposed the Summer Hydropower Alternative considered this alternative to be unacceptable and recommended that it be removed from consideration because of the asserted devastating impacts on many businesses, property values, and the region. They considered the negative impacts on recreation, navigation, flood risk, water quality, fish habitat and spawning, and scenic beauty unacceptable, given no appreciable advantage to hydropower.

#### *Commenters*

##### *Anonymous*

*Anthony Morris, Muscle Shoals, AL  
Austin Carroll, Hopkinsville, KY  
Barron Crawford, Paris, TN  
Bill Dearing, Ooltewah, TN  
Bob Russum, Piney Flats, TN  
Bud McNeal, Savannah, TN  
Dave Baxter, Eddyville, KY  
George Pisciotta, Marietta, GA  
Ivey Wingo, Blairsville, GA  
Jerri Mitchell, Abingdon, VA  
Joe Brang, Dandridge, TN  
John Ashe, Hayesville, NC  
John Olexick, Blairsville, GA*

*John Taylor, Springville, TN  
Joseph A. Robinson, Jr., Abingdon, VA  
Kathy Mesmer, Oak Ridge, TN  
Michael A. McMahan, Chattanooga, TN  
Robert Pardue, Dandridge, TN  
Roberta Baxter, Eddyville, KY  
Scott Pisciotta, Marietta, GA  
Tom and Martha Schlechty  
Tom Carlton, Blairsville, GA  
Tom Hampton, Marion, VA  
Vonda M. Laughlin, Jefferson City, TN  
W. L. Panter, Soddy Daisy, TN  
Wayne and Sigrid Burge, Athens, AL  
William Dearing, Chattanooga, TN*

### **RESPONSE TO COMMENTS**

The Preferred Alternative was formulated to reduce potential power cost impacts while enhancing potential recreational opportunities compared to the alternatives identified in the DEIS.

### **Equalized Summer/Winter Flood Risk Alternative**

#### Support for Equalized Summer/Winter Flood Risk Alternative

#### *Summary of Comments*

Most individuals endorsing the Equalized Summer/Winter Flood Risk Alternative cited the lack of negative impacts while extending the recreation season. These and other comments are listed below:

- Extends the recreation season the longest with only minimal cost impact and minimal water impacts.
- Flood condition seems to be tolerable.
- Is consistent with the original goal of TVA.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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- Is best alternative with few negative effects to help reduce downstream flooding and loss of crops.
- Stops most of the flooding.
- Makes less of lake usable.

### *Commenters*

*Fran D'Antonio, Atlanta, GA  
Lane Marte, Decatur, AL  
Max Wilson, Hickman, KY  
Paul Howell, Selmer, TN*

*Scott Pisciotta, Marietta, GA  
Terry C. Smith, Killen, AL  
Walter E. Flood, Friendsville, TN*

### **RESPONSE TO COMMENTS**

The Preferred Alternative was formulated to avoid or reduce the potential for increased flood risk that was associated with the policy alternatives that would improve recreation opportunities. As explained in Section 5.22, the Preferred Alternative would reduce flood risk to acceptable levels.

#### Opposed to Equalized Summer/Winter Flood Risk Alternative

##### *Summary of Comments*

Most individuals opposing the Equalized Summer/Winter Flood Risk Alternative thought that this alternative should never have been considered and should be deleted. They noted that it offers no appreciable benefits, costs too much in power benefits, reduces recreational opportunities due to lower and shorter summer pool levels, and drastically affects area businesses. One individual also noted the adverse impact on migratory shorebirds and on wetlands that support a variety of wildlife.

### *Commenters*

*Austin Carroll, Hopkinsville, KY  
Bob Russum, Piney Flats, TN  
Dave Baxter, Eddyville, KY  
Douglas Lawler, Abingdon, VA  
Jerri Mitchell, Abingdon, VA  
Joe Brang, Dandridge, TN  
John Taylor, Springville, TN  
Julia Householder, Pigeon Forge, TN  
Kathy Mesmer, Oak Ridge, TN*

*Kenneth Story, Pickwick Dam, TN  
Michael A. McMahan, Chattanooga, TN  
Robert Pardue, Dandridge, TN  
Roberta Baxter, Eddyville, KY  
Tom Carlton, Blairsville, GA  
Wayne and Sigrid Burge, Athens, AL  
William Dearing, Chattanooga, TN*

### **RESPONSE TO COMMENTS**

The Preferred Alternative was formulated in part to address these concerns.

## APPENDIX F2 Response to General Comments, Issues, and Concerns

### Commercial Navigation Alternative

#### Support for Commercial Navigation Alternative

##### *Summary of Comments*

Most individuals who made comments endorsing the Commercial Navigation Alternative (raising mainstem winter flood guides by 2 feet, where possible, to provide a 13-foot navigation channel; reducing winter operating range to 1 foot for those reservoirs raised 2 feet in winter; and increasing minimum flows at several key lower river projects with major navigation locks) recognized the increased economic benefits and minimal environmental impacts. The primary reasons given by those supporting this alternative are listed below:

##### ECONOMIC EFFECTS

- Only alternative that offers positive economic benefits to the region.
- Supports commercial navigation.
- Greater economic impact now and in the future; very important to local economy.
- Lower river shipping costs will allow businesses to remain competitive.
- Slightly improves number of jobs and provides good-paying jobs.

##### USE OF FACILITIES

- Provides greater access to docks at minimal winter pool level.

##### ENVIRONMENTAL EFFECTS

- Positive effects on water quality.
- Fewer negative effects than other alternatives.
- Improves navigation and safety.

##### *Commenters*

*Aline Hail, Gilbertsville, KY*

*Anonymous*

*Austin Carroll, Hopkinsville, KY*

*Cargill Decatur, Decatur, AL*

*Clifford J. Rabalais, Counce, TN*

*Dana J. Mullins, Hillsboro, AL*

*David Edgin, Charlotte, TN*

*Donna Long, Haertselle, AL*

*Grant Posey, Town Creek, AL*

*J. Richard Hommrich, Nashville, TN*

*Jack D. Wycoff, Abingdon, VA*

*Janice L. Jones, Executive Director, Tennessee*

*River Valley Association, Decatur, AL*

*Jim Loew, Florence, AL*

*Joe Vancil, Tiline, KY*

*John De Freitas, Gilbertsville, KY*

*Joseph A. Robinson, Jr., Abingdon, VA*

*K. Pritchard, Decatur, AL*

*Larry Pawlosky, Bridgeport, AL*

*Lynn Fowler, Mayor, City of Decatur, Decatur, AL*

*Mark Hommrich, Nashville, TN*

*Nancy Muse, Florence, AL*

*Patsy K. Cornelius, Savannah, TN*

*Robert Brewer, Paducah, KY*

*Russ Randall, Gibertsville, KY*

*Richard C. "Dick" Crawford, President & CEO,*

*TVPPA, Chattanooga, TN*

*Wayne and Sigrid Burge, Athens, AL*

*Jim Loew*

### RESPONSE TO COMMENTS

The Preferred Alternative contains elements to enhance commercial navigation.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### Opposed to Commercial Navigation Alternative

#### *Summary of Comments*

Most individuals who made comments opposing the Commercial Navigation Alternative simply stated that they are against it, or that it is not acceptable, or that it should be deleted. Primary reasons given by others opposing this alternative included adverse impacts on shoreline erosion, commercial fishing, migratory shorebirds, water quality, and other environmental resources—including increased flood risk to public lands during winter. Those commenting thought that these negative impacts outweigh the economic gains to commercial navigation. Three individuals made reference to this alternative further subsidizing the navigation industry.

#### *Commenters*

*Anonymous*  
*Bill Dearing, Ooltewah, TN*  
*Donald Blackwelder, Savannah, TN*  
*George Pisciotta, Marietta, GA*  
*Joe Brang, Dandridge, TN*  
*John Ashe, Hayesville, NC*  
*John Taylor, Springville, TN*  
*Kathy Mesmer, Oak Ridge, TN*

*Maudie Melson, Savannah, TN*  
*Michael A. McMahan, Chattanooga, TN*  
*Scott Pisciotta, Marietta, GA*  
*Steve McCadams, Paris, TN*  
*Terry C Smith, Killen, AL*  
*Tom Carlton, Blairsville, GA*

### **RESPONSE TO COMMENTS**

The Preferred Alternative was developed in part to better balance operating objectives for the TVA system. Navigation would be enhanced under the Preferred Alternative, while potential adverse impacts on flood risk and other resources would be substantially reduced.

### **Tailwater Recreation Alternative**

#### Support for Tailwater Recreation Alternative

#### *Summary of Comments*

Most individuals who commented in favor of the Tailwater Recreation Alternative (extending the summer pool period to Labor Day; changing winter tributary flood guides to the 7-day, 500-year storm inflow and raising winter mainstem reservoir levels by 2 feet, where possible; maintaining minimum releases from June 1 to Labor Day; and giving priority to providing additional recreational releases at specific projects) asked that TVA adopt this alternative and provide additional recreation releases. A number of individuals asked that presently scheduled releases be modified to provide a range of flows. Reasons why individuals endorsed this alternative are listed below:

- Helps local communities; benefits economic development.
- River releases are critical to the economy and survival of Polk County and its neighbors.

## **APPENDIX F2 : Response to General Comments, Issues, and Concerns**

- The Ocoee River has the potential to become the premier whitewater center in the world.
- Provides recreational flows that balance beneficial uses, while providing ecological functions in the Apalachia Bypass.
- Provides additional benefits; rivers are not just for power production.
- Addresses needs of water quality.
- Improves scenic quality.
- A compromise that TVA desperately needs.
- Negative impacts are overstated.

### *Commenters*

*Angelina Carpenter, Jefferson City, TN*  
*Anonymous*  
*Chris Lyles, Atlanta, GA*  
*Elyse Lee, Nashville, TN*  
*Ira Smith, Knoxville, TN*  
*J. C. Goodwin, Tuscaloosa, AL*  
*Kathy Pearce, Cumming, GA*

*Mark Weddle, Marion, VA*  
*Michael Jackson, Jr., CPA, Vestavia Hills, AL*  
*Nancy MacNair, Athens, GA*  
*Richard Simms, Chattanooga, TN*  
*Richard Wagner, Blairsville, GA*  
*Roy Teal, Signal Mountain, TN*  
*Wayne and Sigrid Burge, Athens, AL*

### **RESPONSE TO COMMENTS**

The Preferred Alternative contains elements to enhance tailwater recreation at selected locations.

#### Opposed to Tailwater Recreation Alternative

##### *Summary of Comments*

Most individuals opposing the Tailwater Recreation Alternative indicated environmental concerns (loss of flats and wildlife habitat, increased shoreline erosion, impacts on water quality, and increased flood risk). Other reasons noted by those opposing this alternative included: that it was not a good alternative systemwide, but might be reasonable in discrete locales such as Apalachia; the cost was too much for someone trying to pay a power bill on a fixed income; and the alternative provides too much emphasis on rafting.

### *Commenters*

*Austin Carroll, Hopkinsville, KY*  
*Barron Crawford, Paris, TN*  
*Bill Dearing, Ooltewah, TN*  
*David Slagle, Hayesville, NC*  
*Erik Brinke, Murphy, NC*  
*Joe Brang, Dandridge, TN*

*John Ashe, Hayesville, NC*  
*John Taylor, Springville, TN*  
*Joseph A. Robinson, Jr., Abingdon, VA*  
*Michael A. McMahan, Chattanooga, TN*  
*Scott Pisciotta, Marietta, GA*  
*Tom Carlton, Blairsville, GA*

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### **RESPONSE TO COMMENTS**

The Preferred Alternative was developed in part to address these concerns while still enhancing tailwater recreation opportunities.

#### **Tailwater Habitat Alternative**

##### Support for Tailwater Habitat Alternative

###### *Summary of Comments*

The individuals who made comments endorsing the Tailwater Habitat Alternative (retaining 75 percent of reservoir inflow and releasing Base Case minimum flows, or 25 percent of the inflow—whichever is greater, as a relatively continuous minimum flow with no turbine peaking) found it acceptable given the benefits to aquatic resources, including biodiversity and federal-protected species. They considered those benefits worth the trade-offs. One individual noted that this alternative offers a reasonable solution to seasonal drawdown and that it would provide year-round access to his property.

###### *Commenters*

*Bill Dearing, Ooltewah, TN  
Jeff Garner, Florence, AL*

*Joe Payne, Knoxville, TN  
John J. Ross, Savannah, TN*

### **RESPONSE TO COMMENTS**

This alternative resulted in a number of potential impacts that could not be reduced to acceptable levels, such as the impact on flood risk. However, the Preferred Alternative includes a commitment to provide minimum flows in the Apalachia tailwater, and TVA remains committed to providing minimum flows in a number of tailwaters to improve aquatic habitat.

##### Opposed to Tailwater Habitat Alternative

###### *Summary of Comments*

Individuals who made comments opposing the Tailwater Habitat Alternative stated that the alternative is not acceptable, not important, or inferior to other alternatives; costs too much in terms of power costs and benefits few users; and increases flood risk to public lands.

###### *Commenters*

*Austin Carroll, Hopkinsville, KY  
Bettie Mason, Knoxville, TN  
John Ashe, Hayesville, NC*

*John Taylor, Springville, TN  
Joseph A. Robinson, Jr., Abingdon, VA*

## **APPENDIX F2 : Response to General Comments, Issues, and Concerns**

### **RESPONSE TO COMMENTS**

See response to previous comment. The Preferred Alternative was formulated to better balance operating objectives for the TVA system.

#### **Prefer Reservoir Recreation Alternatives A or B, A over B, B over A, or B or Tailwater Recreation Alternative**

##### **Prefer Reservoir Recreation Alternative A or Reservoir Recreation Alternative B**

###### *Summary of Comments*

Most individuals preferring Reservoir Recreation Alternative A or B simply stated their preference. Some indicated that keeping lake (reservoir) levels up to Labor Day would increase recreational opportunities and improve the local and regional economy. These and other reasons stated for their preference are listed below:

###### **PROVIDES A BALANCED APPROACH**

- Maximizes benefits, while giving some consideration to recreation users.
- Allows for some benefits, while minimizing negative effects on power cost.

###### **ENVIRONMENTAL EFFECTS**

- Would not hurt flood risk in August and September because it is typically lower in those months.

###### **ECONOMIC EFFECTS**

- Improves economy of local area and region due to increased recreation opportunities.
- Improves tourism development.
- Is invaluable to local businesses.

###### **USE OF PROPERTY**

- Provides potential to expand docks and marinas.

###### **Commenters**

Andy Hardin, Nashville, TN

Brett Hadley, Dandridge, TN

Carroll and Gail Johnson, Dandridge, TN

Dan Meek, Kodak, TN

David B. Seifert, Sevierville, TN

Dennis Yates, Baneberry, TN

Donald Blackweider, Savannah, TN

Erik Brinke, Murphy, NC

Gary and Myran Rosenbalm, Seymour, TN

Gerald McKinney, Bryson City, NC

Joe and Julia Moon, Dandridge, TN

Lamar Paris, Sole Commissioner, Union County, GA

[I] Tolly G. Shelton, Decatur, AL

Nanette M. McCarthy, Peachtree City, GA

O. M. and Susan Goodman, Dandridge, TN

Parmelle and Edwina Ward, Blairsville, GA

Paul Hargrove, Athens, AL

Robert Brock

Robert Hilty, LaFollette, TN

Teresa Joel, Atlanta, GA

Terry Coil, Blairsville, GA

Tom Jirik, Blairsville, GA

Vicky Murrell, Sevierville, TN

Vivian Hill, Blairsville, GA

William Deloch

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### **RESPONSE TO COMMENTS**

Comment noted. Several individuals questioned the adverse impact on flood risk and jobs under Reservoir Recreation Alternatives A and B. Sections 5.22 and 5.25 describe these impacts. The alternative identified in the FEIS as TVA's Preferred Alternative is a hybrid or blend of the recreation and other alternatives. It was formulated to address these and other adverse impacts of the action alternatives in the DEIS, while still enhancing recreational opportunities and providing other benefits.

#### **Prefer Reservoir Recreation Alternative A over Reservoir Recreation Alternative B**

##### *Summary of Comments*

A small number of individuals who commented on the alternatives stated that Reservoir Recreation Alternative A was their first choice and Reservoir Recreation Alternative B would be their second choice. They noted that Reservoir Recreation Alternative A would provide ample recreational opportunities without producing the adverse environmental impacts of Reservoir Recreation Alternative B—including adverse impacts on flood control, power supply, water quality, shoreline erosion, and fish and wildlife.

##### *Commenters*

*Anonymous*  
*Bob Anderson, Hiawassee, GA*  
*Bruce O. Anderson, Emma L. Anderson,*  
*Talbott, TN*  
*Carolyn Varner, Ocala, FL*  
*Christine Robinson, Abingdon, VA*  
*David and Marilyn Miles, Dandridge, TN*  
*Greg Robinson, Abingdon, VA*

*Joseph A. Robinson, Jr., Abingdon, VA*  
*Michael and Evelyn Fink, Dandridge, TN*  
*Robert L. Stump, Jr., Marion, VA*  
*Sandy Robinson, Abingdon, VA*  
*Steve Poole, Bethlehem, GA*  
*Suzy Jenkins, Blairsville, GA*  
*Teresa Joel, Atlanta, GA*  
*Wes and Jennifer King, Blue Ridge, GA*

### **RESPONSE TO COMMENTS**

Comment noted.

#### **Prefer Reservoir Recreation Alternative B over Reservoir Recreation Alternative A**

##### *Summary of Comments*

Reasons given by those who preferred Reservoir Recreation Alternative B over Reservoir Recreation Alternative A included more stable and longer summer pool levels, resulting in less shoreline erosion, improved scenic beauty, safer fishing and boating, and greater recreation opportunities provided under Reservoir Recreation Alternative B. Others expressed that Reservoir Recreation Alternative B was better for the area economy and would result in an insignificant power loss.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### *Commenters*

*All Westlake, Athens, AL  
Anthony Lambert, Bristol, VA.  
Bill Beutjer, Athens, AL  
Bruce and Emma Anderson, Talbott, TN  
Fran D'Antonio, Atlanta, GA  
Glenn Glafenhein, Knoxville, TN  
Jeff Ramsey, Kodak, TN  
Jack C. Cole, Aingdon, VA.  
John and Lisa Keith, Bristol, TN  
Larry Allbritten, Dandridge, TN  
Linda and Jackie Stump, Abingdon, VA*

*Lynn Swanson, Hiwassee, GA  
Myron Engebretson, Marietta, GA  
Parmelle and Edwina Ward, Blairsville, GA  
Paul Reams, Macon, GA  
Robert Hilty, Lafollette, TN  
Robert Leduc, Bradenton, FL  
Scott Pisciotta, Marietta, GA  
Terry Topjun, Dandridge, TN  
Thomas Cernilli, Roswell, GA  
Wayne and Sigrid Burge, Athens, AL*

### **RESPONSE TO COMMENTS**

Comment noted.

#### Prefer Reservoir Recreation Alternative B or Tailwater Recreation Alternative

##### *Summary of Comments*

Reasons given by those who preferred Reservoir Recreation Alternative B or the Tailwater Recreation Alternative included economic and recreation benefits with few impacts on other factors, including flooding.

### *Commenters*

*Kathy Pearce, Cumming, GA  
Patti Grubb, Knoxville, TN*

*Paul Howell, Selmer, TN*

### **RESPONSE TO COMMENTS**

Comment noted.

#### Other Preferences

##### *Summary of Comments*

A few individuals listed a number of alternatives in the order of preference that they would favor:

- Reservoir Recreation Alternative B, Commercial Navigation Alternative, and Tailwater Recreation Alternative.
- Tailwater Recreation Alternative, followed by Reservoir Recreation Alternative B and Reservoir Recreation Alternative A.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### *Commenters*

*Robert A. Lamm, Hiawassee, GA  
Wayne and Sigrid Burge, Athens, AL*

*William Dearing, Chattanooga, TN*

### **RESPONSE TO COMMENTS**

Comment noted.

### **Higher and Longer Reservoir Pool Levels**

#### Support for Higher and Longer Summer and Winter Pool Levels

##### *Summary of Comments*

Most individual who made comments endorsing higher pool levels did not mention specific dates; most wanted higher levels through the fall color season or as long as possible, if not year-round. Of those who mentioned a specific drawdown date, about 100 individuals favored Labor Day, three favored September 15, 69 favored October 1, five favored October 15, 12 favored November 1, and one favored December 1. Additionally, 28 individuals specifically mentioned favoring higher winter levels and 13 individuals favored earlier (March to May) fill dates. Those who objected to higher pool levels were identified earlier in this section under "Support for Base Case." Reasons given to support higher pool levels are listed below:

##### RECREATION IMPACTS

- Provides year-round recreation opportunities.
- Improves opportunities for boating and fishing.
- Improves quality of the region.

##### SCENIC BEAUTY

- Eliminates flats.
- Improves the looks of the lake during winter months.
- Provides more desirable vacation spots.
- Minimizes impacts on boater safety.

##### ENVIRONMENTAL EFFECTS

- Minimal adverse impacts.
- Critical of flood control impacts.
- Reduces shoreline erosion.
- Improves fishing.

##### ECONOMIC EFFECTS

- Improves economy; adds tax revenue.
- Encourages tourism; extends tourist season.
- Helps area businesses; allows for more jobs.
- Keeps people in the area.
- Improves property values.

## APPENDIX F2 Response to General Comments, Issues, and Concerns

- Reduces damage to boat docks and marinas.
- Reduces navigation hazards.
- Reduces dock maintenance.
- Improves commercial navigation.

### USE OF PROPERTY

- Increases use of boats and marinas.

### Commenters

#### A. Mack

Al Caudell, Marietta, GA  
Alan Click, Bryson City, NC  
Alice Jane Jesseel, Abingdon, VA  
Alice Russell, Hayesville, NC  
Aline Hail, Gilbertsville, KY  
Allan Nelson, Atlanta, GA  
Amy Barnette, McDonough, GA  
Andrew Akins, Blairsville, GA  
Andrew Atkins, Morristown, TN  
Ann Bitting, Hiawassee, GA  
Anne H. Brindle, Crandall, GA  
Anonymous (9)  
B. Governale, Buford, GA  
Barb Banghart, Blue Ridge, GA  
Barbara Banghart, Blue Ridge, GA  
Barbara Cavagnini, Dandridge, TN  
Barbara Mason Poole, Blairsville, GA  
Barbara Phillips, Lexington, KY  
Bart Dastolfo, Dandridge, TN  
Ben Robinson, Rogersville, AL  
Ben Sharrett, Abingdon, VA  
Bernard Johnson, Dandridge, TN  
Beth Russum, Piney Flats, TN  
Beth Smith, Sevierville, TN  
Betty Whillock, New Market, TN  
Bill Beutjer, Athens, AL  
Bill Coward, New Market, TN  
Carl Hatfield, Dandridge, TN  
Carl Lakes, Bean Station, TN  
Carol Ann Mancini, Blairsville, GA  
Carol McKee, Dandridge, TN  
Carol Repovich, Gilbertsville, KY  
Carol Roberts, Dandridge, TN  
Carol Simon, Young Harris, GA  
Carolyn Henderson, Kodak, TN  
Carolyn Ippisch, Morgantown, GA  
Carolyn Lakes, Bean Station, TN  
Carolyn R. Clarkson, Blairsville, GA  
Carolyn Varner, Ocala, FL  
Cecil G. Boland, President, Blairsville, GA  
Chad Armstrong, Talbott, TN  
Chad Necessary, Abingdon, VA  
Charles & Kristie Wallis, Sevierville, TN  
Charles Wooten, Jr., Blairsville, GA

Bill Delashmutt, Dandridge, TN  
Bob Anderson, Hiawassee, GA  
Bob Garrison, Blairsville, GA  
Bob Graham, Harrison, TN  
Bob Holdman, Gilbertsville, KY  
Bob Milhorn, Abingdon, VA  
Bob Reynolds, Morristown, TN  
Bobbie Merritt, Dandridge, TN  
Bonnie Morris, Dandridge, TN  
Bonnie Ragland, Bryson City, NC  
Brad Malone, Blairsville, GA  
Brian Beisel, Golden Pond, KY  
Brian Cavagnini, Avon, IN  
Brian L. Thomas, Hiawassee, GA  
Brian Mazzei, Abingdon, VA  
Bruce and Alyssa Crowder, Knoxville, TN  
Bryon Horner, Morristown, TN  
Burley Miller, Honaker, VA  
C. D. Wallin, Blue Ridge, GA  
C. W. West, Guntersville, AL  
Calisse Finchum, Newport, TN  
Cargill Decature, Decatur, AL  
Carl and Joy Meade, Property Owners,  
Sevierville, TN  
Ed Orton  
Edda S. Miracle, Sevierville, TN  
Eddie Atzenhofer, Blairsville, GA  
Eddie Graham, Blairsville, GA  
Eddie Fisher, Kodak, TN  
Edward Stricklin, Murfreesboro, TN  
Elaine Dilbeck, Blue Ridge, GA  
Eleanor McRae, Cadiz, KY  
Elizabeth G. Roberts, Appalachia, VA  
Eric Brown, Knoxville, TN  
Eugene Beatty, Cumming, GA  
Eugene Hendereson, Kodak, TN  
Floyd Cross, Blairsville, GA  
Frank Aparicio, Sevierville, TN  
Fred A. Murray, Dandridge, TN  
Fred Overbay, Talbott, TN  
Fred Schaffer, Dandridge, TN  
Frederick Steel, Kodak, TN  
G. L. and Billie Bowman, Dandridge, TN  
G. W. Norton, Dandridge, TN  
G. W. Bud McCoig, Dandridge, TN

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Chip Miller, Hixson, TN  
Chuck Albury, Young Harris, GA  
Clarence R. Bailey, Dandridge, TN  
Claudette Geoffrion  
Colman B. Woodhall, Johnson City, TN  
Conley Miracle, Sevierville, TN  
Connie Burlingham, Sevierville, TN  
Curtis E. Johnson  
D.C. Robinson, Weaverville, NC  
D. W. Campbell, Blairsville, GA  
Dalie T. Thomas, Bristol, TN  
Dan Hartley, Dandridge, TN  
Dan Meek, Kodak, TN  
Dana Etheridge, Blairsville, GA  
Daniel B. Harris Jr., Morristown, TN  
Danny Matas, Richland, VA  
Darcelle Green, Palmetto, GA  
David and Sandra Jamison, Dalton, GA  
David B. Seifert, Sevierville, TN  
David C. Johnigk, Cadiz, KY  
David Jones, Hiwassee, GA  
David Slagle, Hayesville, NC  
Dean and Mary Jane Heavener, Chattanooga, TN  
Debbie Sims  
Denise N. Gladfelter, Hiwassee, GA  
Dennis Mack, Huntsville, AL  
Diane Layton, Dandridge, TN  
Dixie A Cantley, Bluff City, TN  
Don Cross, Bluff City, TN  
Don Helton, Old Hickory, TN  
Don Ratliff and Family  
Donna Lee Demuth, Hiwassee, GA  
Dorie Stratton, Blairsville, GA  
Dorothy McArthur, Dandridge, TN  
Dot Goins, Dandridge, TN  
Doug Reffitt, Baneberry, TN  
Ed Murrey, Pulaski, TN  
E. Bloom, Blairsville, GA  
Earl J. Munro Jr., Baneberry, TN  
Earl Nyman, Abingdon, VA  
James Blankenship, Cedar Bluff, VA  
James F. Smith, Ringgold, GA  
Jane Chinnici, Hiwassee, GA  
Janelle Neas, Dandridge, TN  
Janet Kammann, Baneberry, TN  
Janet Penilo, Dandridge, TN  
Jay and Libby Wise, Johnson City, TN  
Jean Christian, Marietta, GA  
Jean Prater, Athens, AL  
Jeff Blankenship, Cedar Bluff, VA  
Jeff Cabe, Robbinsville, NC  
Jeff Ramsey, Kodak, TN  
Jennifer Huskey, Sevierville, TN  
Jeri Peterson, Dandridge, TN  
Jerry Dyer, Blairsville, GA  
Jerry Huskey, Sevierville, TN  
Jerry Powers, Bristol, VA  
Garland Wyatt, Benton, KY  
Gary Connaughty, Hiwassee, GA  
Gary Holiway, Dandridge, TN  
Gary Thurston, Hayesville, NC  
Gene and Gina Rossetti, Bristol, TN  
George A. GAntte, Dandridge, TN  
George F. White, Cordele, GA  
George Gantte, Dandridge, TN  
George Pisciotta, Marietta, GA  
George Plack  
George Turnis  
George Ward, Dandridge, TN  
Gilbert Moebes, Decatur, AL  
Glen and Janice Boland, Blairsville, GA  
Glenda Wade, Bristol, TN  
Gordon Conklin, Dandridge, TN  
Gordon Marshall, Dandridge, TN  
Greg Puett, Blairsville, GA  
Greg Robinson, Abingdon, VA  
Greg Worley, White Pine, TN  
Gwen Thomas, Morristown, TN  
H. Lee Fleshood, Nashville, TN  
H. E. Wayt, Haley Cricle, Blairsville, GA  
Harold E. Jackson, Jr., Nashville, TN  
Harry and Sharon Thompson, Blairsville, GA  
Harry Nolan, Atlanta, GA  
Harvey and Wendy Holden, Blairsville, GA  
Heath Alvey, Dandridge, TN  
Helen Atzenhofer, Blairsville, GA  
Howard Miracle, New Market, TN  
J. H. Derden, Sevierville, TN  
J. D. Matney, Abingdon, VA  
J. D. Smith, Doran, VA  
Jack Moody, Hayesville, NC  
Jackie Baker, Big Sandy, TN  
Jackie F. and Brenda Sise, Dandridge, TN  
Jackie Scarborough, Dandridge, TN  
Jacquelyn O'Connell, MCcaysville, GA  
K Pindzola, Johnson City, TN  
Karen A. Spence, Sevierville, TN  
Karl Kammann, Baneberry, TN  
Kathy Joseph, Decatur, AL  
Kathy Mesmer, Oak Ridge, TN  
Kathy Pearce, Cumming, GA  
Kathy Schubert, Dandridge, TN  
Kelli Carr, Knoxville, TN  
Kelly Brawner Chadwick, Buchanan, TN  
Ken Thompson, Benton, KY  
Kenneth Norton, Sevierville, TN  
Kenny Stuart, Blue Ridge, GA  
Kevin Abel, Abingdon, VA  
Kim Hatcher, Bluff City, TN  
Kimberly S. Brackett, Hixson, TN  
Lamar Franklin, Blairsville, GA  
Lamar Paris, Sole Commissioner, Union County, GA  
Larry and Shirley Anglea, Jefferson City, TN  
Larry Akers, Abingdon, VA

## APPENDIX F2 Response to General Comments, Issues, and Concerns

Jerry Stephens, Bluff City, TN  
Jim and April Russell, Dandridge, TN  
Jim Crigger, Knoxville, TN  
Jim Davis, Dandridge, TN  
Jim Fields, LaFollette, TN  
Jim and Pat Gantt, Sevierville, TN  
Jim Graham Jr., Memphis, TN  
Jimmy & Amy Owens, Dandridge, TN  
Jimmy W. Peoples, Talbott, TN  
Joan M. Garlock, Sevierville, TN  
Joan McCoig, Dandridge, TN  
Joanne Wenberg, Blairsville, GA  
Joe and Julia Moon, Dandridge, TN  
Joe Brang, Dandridge, TN  
Joe Depew, Kodak, TN  
Joe L. Chase, Abingdon, VA  
Joe Nicholson, Maryville, TN  
John and Riki Falvey, Louisville, KY  
John Archambault, Dandridge, TN  
John Ashe, Hayesville, NC  
John C. Ashe, Hayesville, NC  
John Honey, Dandridge, TN  
John James III, Piney Flats, TN  
John McNeill, Blue Ridge, GA  
John Parker, Dandridge, TN  
John Sillay, Marietta, GA  
Joseph A. Robinson, Jr., Abingdon, VA  
Joseph Nofil, Hayesville, NC  
Juanita Phillips, Paducah, KY  
Judith A and Ronald W. Acks, Hayesville, NC  
Judy Akin, Marietta, GA  
Judy Cosby, Dalton, GA  
Judy Cosby, Dalton, GA  
Judy Delashmutt, Dandridge, TN  
Judy Edwards, Murphy, NC  
Judy Kirchner, Huntsville, AL  
Judy M. Munro, Baneberry, TN  
Judy Myers, Blairsville, GA  
Julia Schneider, Dandridge, TN  
Julius Papatyi, Blairsville, GA  
Michael Guffey, Seymour, TN  
Michael Kovich, Benton, KY  
Michael Ryan, Dandridge, TN  
Michael R. Adamson, Blairsville, GA  
Micheal R. Williams, Maynardville, TN  
Michelle Maloney, Blairsville, GA  
Mike, Blairsville, GA  
Mike, Huntsville, AL  
Mike Cassidy, Waverly, TN  
Mike Everett, Kingsport, TN  
Mike Harriss, Knoxville, TN  
Mike Johnson, Bristol, TN  
Mr. and Mrs. John Bayme, Dandridge, TN  
Mr. and Mrs. John R. Scott, Dunwoody, GA  
Mr. and Mrs. Richard Roach, Dandridge, TN  
Mrs. Jean Roberts, Morristown, TN  
Nadien T. Brown, Sevierville, TN  
Nancy B. Cosentino, Dandridge, TN  
Larry Clark, Dandridge, TN  
Larry Mancini, Blairsville, GA  
Larry Pawlosky, Bridgeport, AL  
Larry Rinaca, Georgetown, TN  
Larry Sample, Blairsville, GA  
Lavada Mansfield, Benton, KY  
Lee Harrell, Big Sandy, TN  
Linda Bartolini, Blairsville, GA  
Linda Wingo, Blairsville, GA  
Lori Miller, Dandridge, TN  
Louis Duval, Dandridge, TN  
Louis Murray, Dandridge, TN  
Lowell Smith, Raven, VA  
Lucille Canter, Dandridge, TN  
Lynn Archambault, Dandridge, TN  
Lynn Johnson, Bristol, VA  
Lynn Peterson, Blairsville, GA  
Madeline Roose, Blairsville, GA  
Marcia Kammann, Baneberry, TN  
Marcia Papatyi, Blairsville, GA  
Marcie Lanz, Morristown, TN  
Margaret B. Howard, Dandridge, TN  
Marianne O. Hatchett, Hayesville, NC  
Marie E. Geesa, Blairsville, GA  
Mark and Patti Heitzman, Sand Springs, OK  
Mark A. Jackson, Dandridge, TN  
Martha Jarrard, Hiwassee, GA  
Mary and Herbert Arnold, Blairsville, GA  
Mary Crosby, Dandridge, TN  
Mary Jones, Gatlinburg, TN  
Mary Kitchen, Blairsville, GA  
Mary Lou Stone, Clarkesville, GA  
Mary M. Johnson, Bristol, VA  
Mary Teaster, Kodak, TN  
Melvin Peterson, Dandridge, TN  
Merlin W. Larimer, Benton, KY  
Michael A. O'Brien, Kennesaw, GA  
Michael and Evelyn Fink, Dandridge, TN  
Michael Aparicio, Seveirville, TN  
Richard West, Jackson, TN  
Ricky and Sabrina Rich, Blairsville, GA  
Rita Dumbacher, Huntsville, AL  
Ron Boyd, Athens, AL  
Robert A. Costner, Jr., Oak Ridge, TN  
Robert Browning, Hayesville, NC  
Robert Hinton, Thompsons Station, TN  
Robert J. Reynolds, Morristown, TN  
Robert McNamara, Dandridge, TN  
Robert Owens, Marietta, GA  
Robert Pardue, Dandridge, TN  
Robert Penilo, Ft. Oglethorpe, GA  
Robin Gantte, Dandridge, TN  
Rod Ogan, Blountville, TN  
Rodney Napier, Jr.  
Ron Gillespie, Blue Ridge, GA  
Ron Witkowski  
Ronald Harrison, Birmingham, MI  
Ronald Morgan, Marietta, GA

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Nancy Bryant, Dandridge, TN  
Nancy Malte, Blairsville, GA  
Nancy Winter, Sevierville, TN  
Nancy Zambonie, Ex. Director, Morriston, TN  
Norma Gailey, Dunwoody, GA  
Norman Findley, Atlanta, GA  
Norton Samples, Dandridge, TN  
Pat Allen  
Pat McAlister, Athens, AL  
Patricia Osborn  
Patsy Stuart, Blue Ridge, GA  
Pattie Heitzman, Sand Springs, OK  
Paul Baker, Big Sandy, TN  
Paul Brownhill, Blairsville, GA  
Paul Hargrove, Athens, AL  
Paul Morris, Benton, KY  
Pete and Diane Heinen, Dandridge, TN  
Peter Skop, Norcross, GA  
Phil Kammann, Baneberry, TN  
Quillian and Linda Millsap, Cartersville, GA  
R. A. Kyker, Sevierville, TN  
Ralph Davis, Sevierville, TN  
Ralph Duff, Saltville, VA  
Randomseye Ra, Athens, AL  
Randy Newcomb, Gilbertsville, KY  
Randy Palmer, Huntsville, AL  
Ray Fabery, Decatur, AL  
Raymond Phillips, Dandridge, TN  
Reileen Beatty, Cumming, GA  
Rene Conklin, Dandridge, TN  
Renee Mason-Mazzei, Abingdon, VA  
Richard and June Peterson, Hiawassee, GA  
Richard and Linda Larson, Dandridge, TN  
Richard and Margaret Harwood, Dandridge, TN  
Richard C. Kammann, Owner/Manager,  
Banesberry, TN  
Richard L. King, Dandridge, TN  
Richard P. Emigholz, Pres. Funtimers Fishing  
Club, Kuttawa, KY  
Richard Rodriguez, Sevierville, TN  
Thomas G. Sandvick, Morganton, GA  
Tim Kirchner, Huntsville, AL  
Tom A. Yates, Bristol, VA  
Tom Loesel, Blairsville, GA  
Tom Murphy, Blairsville, GA  
Tom Nichols  
Tommy Stephens, Blairsville, GA  
Tony Carruth, Rome, GA  
Tonya G. Whillock, New Market, TN  
Vincent L. and June D. Greaves, Blairsville, GA  
Vonda M. Laughlin, Jefferson City, TN  
W. E. Wade, Bristol, TN  
W. H. Cross, Hiawassee, GA  
Walter E. Flood, Friendsville, TN  
Walter Lake, Dandridge, TN  
Walter Mitchell, Dunwoody, GA  
Bill Dearing, Ooltewah, TN  
Bill Dyer, Paducah, KY  
Rosa Yellig, Evansville, IN  
Ross Demuth, Hiawassee, GA  
Roy and Beverly Cardell, Blairsville, GA  
Roy and Vitron Wilmont, Blairsville, GA  
Roy Baker, Eddyville, KY  
Roy Keith Stepp, Athens, AL  
Ruth Ann Parker, Dandridge, TN  
S. Dean Yates, Abingdon, VA  
Sam and Billie Hammond, Jefferson City, TN  
Sandra Lawson, Eddyville, KY  
Sandra Whitener, Dandridge, TN  
Sandy Robinson, Abingdon, VA  
Sara Harris Mullins, Johnson City, TN  
Scott McKee, Dandridge, TN  
Sharon L. McCabe, Dandridge, TN  
Stan Veltkamp, Baneberry, TN  
Stanley L. McClellan, Hartselle, AL  
Stephen D. Hiland, Eddyville, KY  
Steve and Becky Mishket, Dandridge, TN  
Steve Marshall, Dandridge, TN  
Steven J. Milcheck, Mooresburg, TN  
Sue and Michael Wade, Raven, VA  
Sue King, Dandridge, TN  
Sue King, Dandridge, TN  
Susan D. Jones, Dandridge, TN  
Susan Kuehl, Dandridge, TN  
Susan Chase, Abingdon, VA  
Taulbee Lester, Honaker, VA  
Terry Aparicio, Sevierville, TN  
Terry Glass  
Terry Matney, Abingdon, VA  
Terry Peters, Elizabethton, TN  
Terry Schwartz, Blairsville, GA  
Terry Sisk, Gray, TN  
Terry, Frank, Lizette Aparicio, Sevierville, TN  
The Honorable Zach Wamp, U.S. House of  
Representatives, Washington, DC  
Theresa Toney, Cedar Bluff, VA  
Thomas T. Kitchen, Blairsville, GA  
Thomas Atkinson, Blairsville, GA  
Thomas Browning, Hayesville, NC  
Thomas C. Roberts, Morganton, GA  
Walter Shubert, Dandridge, TN  
Wayne DeMars, Blairsville, GA  
Wayne King, Dandridge, TN  
Wes Hardy, Atlanta, GA  
Wilbur Neil, Gilbertsville, KY  
William and Velda Clayton, Dandridge, TN  
William Wood, Bryson City, NC  
William Cleveland, Montrose, AL  
William Dearing, Chattanooga, TN  
William DeLoch  
William Gazda, Bryson City, NC  
William T. Moon, White Pine, TN  
Wm. F. Walsh, Chattanooga, TN  
Woody Chastain, Athens, GA  
Wooten, Beverly, Blairsville, GA  
Worth Mason, Blairsville, GA

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

*Bill Frisbey, Blairsville, GA  
Bill Parker, Blairsville, GA  
Sydney Y. Cole  
Mike Priven  
Jill Henderson*

*Wynn Beidleman, Piney Flats, TN  
Justin Broadway  
Mary Ones  
Eugene Henderson  
Charles R. Perry*

### **RESPONSE TO COMMENTS**

Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels on a number of reservoirs under median conditions. The results of these evaluations are discussed in the EIS.

#### **Proposed Combination/Modification of Alternatives**

##### Summary of Comments

Most individuals who made comments on modifications to the alternatives addressed in detail in the DEIS suggested combining or modifying the alternatives to reduce adverse effects (e.g., flooding) or to focus on specific priorities (e.g., recreation and/or environmental improvements). Eleven individuals suggested combining one or more of the recreation alternatives (Reservoir Recreation Alternatives A or B, or Tailwater Recreation Alternative) with the Commercial Navigation Alternative in an effort to offset the adverse environmental impacts of those alternatives. A number of individuals recognized the complexity of the reservoir system and suggested a "test" or "pilot program" to evaluate the real-world impacts of the selected alternative. Other comments addressed optimizing individual reservoirs, being more equitable in drawing down pool levels, and studying how Federal Energy Regulatory Commission (FERC) rules would affect operations of the reservoir system.

##### *Hybrid of Base Case*

- Minimize impacts and provides more enhancement.
- Tweak reservoir operations to better benefit flood control, hydropower, and navigation – the real purposes of why the projects were built in the first place.

##### *Hybrid of Reservoir Recreation A Alternative*

- Provide some benefit to Boone Reservoir (e.g., extend summer pool level to October 1).
- Allow winter pool levels to be dropped on Cherokee and Douglas Reservoirs to their current winter pool levels.
- Provide 1.5 feet (18 to 24 inches) more water at winter pool on Kentucky Reservoir.

##### *Hybrid of Reservoir Recreation B Alternative*

- Modify to extend tributary summer pool to October 1 and restrict drawdown until October 1.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### *Hybrid of Tailwater Recreation Alternative*

- Provide range of recreation flows that balances beneficial uses while providing ecological functions.

### *Hybrid of Tailwater Habitat Alternative*

- Modify to achieve objectives and mitigate environmental consequences.

### *Blend of Alternatives Considered*

- Blend Base Case and Commercial Navigation Alternative.
- Blend Reservoir Recreation A and Commercial Navigation Alternatives.
- Blend Reservoir Recreation Alternative B and Commercial Navigation Alternative.
- Blend Tailwater Recreation and Equalized Summer/Winter Flood Risk Alternatives to bring reservoir up slower in spring in order to reduce the likelihood of spring flooding and to hold summer pools longer to improve recreation.

### *Modified to Accomplish Designated Purposes*

- Modify to optimize environmental improvements.
- Review possibility of special flushing releases during major rain events, when extended minimum flows are in effect in order to remove deposited sediment.
- Blend alternatives with flood control and protection of the environment (including water supply and quality) as highest priorities, followed by navigation and recreation (note that the relative priority of these will vary with location).
- Optimize navigation and water quality.
- Manage water levels to benefit fish and wildlife.
- Modify to hold water levels more stable during spawning season.
- Manipulate water levels to enhance sport fisheries and overall fish community.
- Modify 2-foot increase in winter pool to reduce impacts on flood control; try 1-foot increase to help winter recreation and aid navigation.
- Consider two or three plans of action, depending on the actual water levels and conditions; design alternatives that are triggered when certain rain and water level conditions are met.

### *Other Alternatives*

- Begin with a commitment to keep flood levels the same as Base Case, then determine what winter levels should be and then summer levels.
- Consider alternatives with the least impact on the aquatic resources of the Tennessee Valley system and substantially increase recreational opportunities.
- Develop an alternative designed to protect aquatic habitat and species.
- Consider alternatives that would decrease flooding potential for Pickwick and Kentucky Reservoirs.

### *Optimize Individual Reservoir*

- Maximize each reservoir for residents/users of it, provided it does not substantially and negatively affect other users or other systems.

## **APPENDIX F2 : Response to General Comments, Issues, and Concerns**

- Use Reservoir Recreation Alternative A for Cherokee Reservoir and differing alternatives for other reservoirs to produce best overall system-wide results.
- Manage each reservoir for its own unique situation rather than a standard procedure for the whole reservoir system.
- Consider the highest and best use of each lake in the system. For some, it may be flood control, but navigation shouldn't be as high as it is now.
- Reservoirs such as Fontana, Nottely, and Watauga could be managed to optimize recreation, tourism, and/or water supply, while downstream reservoirs could be managed under other more profitable guidelines.
- Try a softer approach on a per-reservoir basis.

### **Pilot Test**

- Try a more conservative approach for a season or two before implementing a more aggressive alternative.
- Suggest a "trial" or "pilot program" for one of the alternatives outlined in the study; could extend study now in progress.

### **Fill and Drawdown**

- Use a more balanced approach for raising and lowering tributary reservoirs.
- Address additional winter pool drawdown options.
- Reduce period of draining and filling reservoirs.
- Average the drawdown between reservoirs, so that they are all taken down the same amount.
- Keep all reservoirs at relatively the same pool levels for the same duration, as nature and flood control allow. Do not have certain lakes absorb all fluctuation while preferred lakes are kept stable.
- Lower pool levels consistently and on the same time frame across reservoirs. One of the biggest areas of concern over the past has been the varying degrees of draws between the surrounding tributaries. Nottely has had a lower level much earlier than Lake Chatuge and Lake Blue Ridge.
- Appears study was written to justify Base Case.
- As an alternative, study how following FERC rules would affect the system.

### **Commenters**

*April Hall, Alabama Rivers Alliance,  
Birmingham, AL*

*Austin Carroll, Hopkinsville, KY*

*Barbara A. Walton, Oak Ridge, TN*

*Bob Russum, Piney Flats, TN*

*Brian E. Eeister, Bethalto, IL*

*Brian Geisel, Golden Pond, KY*

*Crystal Brown, Decatur, AL*

*Dale Whitman, Bristol, TN*

*Dana J. Mullins, Hillsboro, AL*

*Dave Cooper, Morristown, TN*

*Dennis Mack, Huntsville, AL*

*Don Waldon, Columbus, MS*

*Doug Triestram, Blairsville, GA*

*Forrest Liles, New Concord, KY*

*Kerry Grissett, Decatur, AL*

*Kevin M. McCarthy, Peachtree City, GA*

*K. Pritchard, Decatur, AL*

*Lamar Paris, Sole Commissioner, Union County,  
GA*

*Larry Mancini, Blairsville, GA*

*Lynn Fowler, Mayor, City of Decatur, Decatur,  
AL*

*Malcolm P. Cotton, Dandridge, TN*

*Marti Steffen, Dandridge, TN*

*Margaret H. Schramke, Blairsville, TN*

*Mary Pat*

*Norman K. Owen, Murphy, NC*

*Peter Low*

*Ray Murphy, Dandridge, TN*

*Richard Simms, Chattanooga, TN*

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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*Frank McGinley, Savannah, TN*  
*Gloria Dahlberg, Dandridge, TN*  
*Greg Batts, Cadiz, KY*  
*Guy Larry Osborne, Jefferson City, TN*  
*Harold Andrews, Hiawassee, GA*  
*H. B. McCowan, Clinch River Chapter, Trout Unlimited, Lake City, TN*  
*J. C. Goodwin, Tuscaloosa, AL*  
*Jim Wood, Hiawassee, GA*  
*Joe Brang, Dandridge, TN*  
*John Honey, Dandridge, TN*  
*John S. McClellan, Dandridge, TN*  
*Karen Adamson, Blairsville, GA*  
*William H. Dyer, Paducah, KY*

*Richard Wagner, Blairsville, GA*  
*Roger Gant, Corinth, Ms*  
*Ron Krammes, Dandridge, TN*  
*Stefan Prada, Morristown, TN*  
*Gunnar F. Wilson*

*Richard C. "Dick" Crawford, President & CEO, TVPPA, Chattanooga, TN*  
*Sarah A. Francisco and Richard A. Parrish, Southern Environmental Law Center, Charlottesville, VA*  
*Stefan A. Prada, Morristown, TN*  
*Wayne and Sigrid Burge, Athens, AL*  
*William Gazda, Bryson City, NC*

### **RESPONSE TO COMMENTS**

Comment noted. TVA appreciates the suggestions of how alternatives could be modified or combined to increase their value and reduce adverse impacts. Those individuals who suggested TVA combine one or more of the recreation alternatives with commercial navigation to reduce adverse environmental consequence overlooked the issue that most of the adverse impacts of the recreation alternatives result primarily from higher and extended pool levels. The Preferred Alternative is a hybrid or blended alternative that was formulated to accomplish many of the changes suggested in these comments.

In response to the suggestion that TVA consider FERC rules, both FERC and TVA rely on the basic elements of the National Environmental Policy Act, specifically consideration of environmental impacts and public participation to incorporate stewardship considerations into their decision-making processes. Section 4(e) of the Federal Power Act requires FERC to give recreation, environment, fish and wildlife, and non-power values the same or "equal" consideration as it does to power and development objectives. By contrast, the TVA Act requires TVA to regulate stream flows primarily for certain non-power objectives: navigation and flood control and, consistent with those purposes, power generation. In addition, TVA must carry out its responsibilities for achieving these three system benefits in the context of its overall regional development mission and the demands of good stewardship, including water quality, water supply, and recreation.

TVA evaluated holding pool levels higher over a range of possible dates as it formulated the alternatives analyzed in detail in the EIS. Dates extending higher pool levels beyond Labor Day into fall resulted in unacceptable levels of increased flood damage and significant impacts on water quality.

In reference to the suggestions to run pilot tests, TVA has long employed an adaptive management approach to the operation of its reservoir system and intends to continue to do this, regardless of which alternative is selected. This involves extensive monitoring of a number of different reservoir and ecological parameters, and flexible application of reservoir operating guidelines that takes into account monitoring results. See Section 3.4 and Chapter 7.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### **Proposed Project Modifications**

#### Summary of Comments

Most individuals who made comments that recommended modifications to projects mentioned specific summer or winter pool elevations. A few individuals proposed alternatives to the rate and amount to which certain reservoirs are drawn down. These and other proposed changes are listed below. Several of the agencies acknowledged that this EIS is programmatic in nature, but asked that TVA consider as part of the EIS or in subsequent studies various reservoir-specific issues or needs.

#### *Blue Ridge*

- Hold summer pool levels at elevation 1,690.

#### *Boone*

- Modify Reservoir Recreation Alternative A to provide some improvement on Boone Reservoir.
- Hold reservoir up longer.

#### *Chatuge*

- Maintain minimum pool no less than elevation 1,920 beginning in 2003.

#### *Cherokee*

- Maintain full summer pool at elevation 1,073.

#### *Douglas*

- Maintain minimum winter pool at elevation 960 (2).
- Maintain winter level at 970 to 980.
- Maintain minimum winter pool from elevation 955 to 958.
- Leave winter pool 10 to 30 feet higher (3); drawdown of 40 to 50 feet is excessive; 30 feet should allow for enough flood control.
- Increase winter pool about 10 feet higher than under Reservoir Recreation Alternative B.
- Maintain summer pool levels at least at elevation 990 or above between Memorial Day and Labor Day.
- Limit drawdown to elevation 985 August 1 to September 1, then a minimum of 975 until October 1.
- Limit drawdown to 980 feet from August 1 until Labor Day, then 970 feet until October 1.
- Maintain two-thirds full or less for duck hunting.

#### *Great Falls*

- Maintain summer pool at elevation 800 from May 30 through Labor Day.
- Increase winter pool elevation to 795.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### *Kentucky Reservoir*

- Increase winter pool a few inches and more gradually fill and draw down the reservoir, starting when it is normally started, so that reservoir is filled later in spring and reaches winter pool later in fall.
- Begin drawdown from summer pool earlier than the existing Base Case and operate Pickwick and Kentucky Dams in tandem to maximize Kentucky Reservoir's riverine character and maintain biological health of this highly important resource.
- Hold winter level at elevation 356; elevations below 354 create hazards for reservoir users.
- Hold winter pool higher than elevation 354.3.
- Hold winter pool at elevation 356.
- Hold winter pool at least at 357.
- Hold summer pool of 359 and extend it past Labor Day.
- Raise winter pool a few inches; fill to summer pool more gradually, reach summer pool a little later in spring; maintain summer pool about same time; and draw it down gradually to reach slightly higher winter pool. No drastic changes.
- Maintain pool level in January and February at 354; from March to April 1 increase to 356; from April 1 to May 1 increase to 359; stay at that level until Labor Day; from Labor Day until November 1, go down to 356; then from November 1 through December go down to the 354; and back to January and February at 354.

### *Melton Hill*

- Maintain water levels at 794 during the day for boater access.

### *Norris*

- Don't go above elevation 1,020 during boating season because of bank erosion.

### *Nottely*

- Leave at or near full pool (elevation 1,777 to 1,779) until Labor Day.
- Maintain summer levels above elevation 1,775.
- Maintain above 1,775 through Labor Day.
- Extend pool levels at least 6 weeks.

### *South Holston*

- Increase winter pool to 1,702 or higher.
- Keep winter pool level at 1,713 (4).
- Do not drop winter pool level below elevation 1,716.
- Raise summer pool from 1,721 to 1,729.
- Increase summer pool between elevations 1,725 and 1,728.
- Keep pool elevations at 1,720 until Labor Day.
- Limit volume discharged to what is coming in.

### *Watauga*

- Keep Labor Day pool level above elevation 1,949.

## **APPENDIX F2 : Response to General Comments, Issues, and Concerns**

### *Wheeler*

- Raise minimum flood guide level to elevation 552.
- Maintain pool levels above elevation 553 for water quality.

### *Wilson*

- Provide additional 3 feet of water at winter pool below Wilson Dam.
- Provide minimum flows.

### Commenters

*Al Caudell, Marietta, GA*

*Anonymous*

*Bill Beutjer, Athens, AL*

*Bill Faber (Sportsmans Marina), Abingdon, VA*

*Bob Garrison, Blairsville, GA*

*Carole Kovich, Benton, KY*

*Colman B. Woodhall, Johnson City, TN*

*Dale Hartsell, Newport, TN*

*Dennis Yates, Baneberry, TN*

*Garland Wyatt, Benton, KY*

*Gary Connaughty, Hiwassee, GA*

*George A. Gantte, Dandridge, TN*

*George Chaney, Knoxville, TN*

*George Cherry, Hiwassee, GA*

*Gloria Dahlberg, Dandridge, TN*

*Gordon B. Livingston, Clinton, TN*

*Greg Robinson, Abingdon, VA*

*J. Cavagnini, Dandridge, TN*

*Jackie F and Brenda Sise, Dandridge, TN*

*Jay and Libby Wise, Johnson City, TN*

*Jerry Stephens, Bluff City, TN*

*John Harper, Sikeston, MO*

*Larry and Karen Clevinger, Dandridge, TN*

*Mark Fredrick, Murray, KY*

*Michael Guffey, Seymour, TN.*

*Michael R. Adamson, Blairsville, GA*

*Michael Sylva, Del Rio, TN*

*Michael Sylva Sledjeski, Del Rio, TN*

*Paul Morris, Benton, KY*

*Peter Brunson, Killen, AL*

*Ralph Sheets, Abingdon, VA*

*Rex Mallory, Bristol, VA*

*Richard N. Douglas, Benton, KY*

*Roger Helton, Honaker, VA*

*Steven L Grubb, Knoxville, TN*

*Thomas Hodge, Dandridge, TN*

*Ulf Rheborg, Marietta, GA*

*Wayne Goodwin, Bristol, TN*

*Wilbur Neil, Gilbertsville, KY*

*William E. Hixson, Newport, TN*

*William T. Moon, White Pine, TN*

### **RESPONSE TO COMMENTS**

Although the focus of this programmatic EIS was to conduct detailed analysis on system-wide issues, reservoir specific recommendations that were received from scoping through the DEIS were considered in constructing all of the policy alternatives evaluated in this EIS, including the Preferred Alternative. Due to the infinite number of policy alternatives that could be developed from combinations of these recommendations, not all of the suggestions could be specifically included in the detailed analysis, but the nature of the suggestions was addressed within the context of broader programmatic issues. For example, under the Preferred Alternative, winter flood guides would be raised on Boone, Chatuge, Cherokee, Douglas, Norris, Nottely, South Holston, and Watauga Reservoirs. Also, the duration of the restricted summer drawdown would be extended on Blue Ridge, Chatuge, Cherokee, Douglas, Great Falls, Norris, Nottely, South Holston, Watauga, and Wheeler Reservoirs.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### **F2.3 Resource Areas**

#### **Water Levels for Fish Spawning**

##### Summary of Comments

Most individuals who commented on fish spawning were concerned about the effect of water level fluctuations on fish reproductive success. Most people were critical of TVA's existing reservoir operations, particularly how water levels are drawn down during the spring spawning season. In addition to individual comments, TVA received a petition signed by 4,602 fishermen on Cherokee Reservoir, requesting that TVA stabilize reservoir levels during spring spawn to increase fish populations in all reservoirs in east Tennessee. Several individuals recommended that TVA cooperate with state fisheries agencies to improve fish spawning success. Major issues identified by those commenting on water levels for fish spawning are listed below:

- Stable water levels are critical during spring for fish to spawn.
- A substantial reduction in fish populations is due primarily to drawdown during spawning.
- Water level fluctuations have hurt fish reproduction; the generations of bass, crappie, and other species are lost year after year when water levels are dropped either during or just after spawn.
- Filling reservoirs early and holding them steady would enhance crappie and bass sport fisheries and benefit the overall fish community.
- Tax revenue would be lost because of no fish to catch.
- Decreasing standing stocks of sport fish, such as white and black crappie and largemouth bass, hurts the local economy; visitation of fishermen to the area during the months of March through May and September through November can make or break a resort's business for the year.
- Reduction of shoreline scrub/shrub wetland habitat or buttonbush habitat because of longer periods of full pool levels on Kentucky Reservoir, as well as other mainstem reservoirs, would substantially affect spawning success of white and black crappie and largemouth bass (7).
- Cooperate with the state agencies (e.g., Virginia Department of Game and Inland Fisheries and Tennessee Wildlife Resources Agency) on improving fish spawn (6).
- Petition signed by 4,602 fishermen on Cherokee Lake indicates that changing water levels during spawning time may be destroying eggs and requests stable water levels during fish spawn to increase fish populations in all reservoirs in east Tennessee.
- Request that water levels not be lowered on South Holston during fish spawn (8).
- Ecology of Cherokee and Douglas Reservoirs is suffering as evidenced by a substantial reduction of fish populations.

##### Commenters

*Al Westlake, Athens, AL  
Alan Mitchell, Abingdon, VA  
Angela Yates, Abingdon, VA  
Ann R. Warner, Memphis, TN  
Anonymous (2)*

*Lorraine Nobes, Murfreesboro, TN  
Larry Akers, Abingdon, VA  
Larry Whaley, Dandridge, TN  
Lowell Smith, Raven, VA  
Martha Atkins, Morristown TN*

## APPENDIX F2 Response to General Comments, Issues, and Concerns

Ben Sharrett, Abingdon, VA  
Bernard Johnson, Dandridge, TN  
Bill Coward, New Market, TN  
Chris Perkins, Florence, AL  
Christine M. Robinson, Abingdon, VA  
Don A. Brown, Greeneville, TN  
Doug Triestram, Blairsville, GA  
Edward Stricklin, Murfreesboro, TN  
G. L. and Billie Bowman, Dandridge, TN  
Gary D. Jenkins, Buchanan, TN  
George A. Gantte, Dandridge, TN  
Gilbert Moebes, Decatur, AL  
H. R. Nicholson, Cherokee, AL  
James Blankenship, Cedar Bluff, VA  
James E. Barker, Kodak, TN  
James W. McCabe, Dandridge, TN  
J. D. Smith, Doran, VA  
Jeff Blankenship, Cedar Bluff, VA  
Jerri Mitchell, Abingdon, VA  
Jimmy and Amy Owens, Dandridge, TN  
John Ashe, Hayesville, NC  
John Taylor, Springville, TN  
Kerry Grissett, Decatur, AL

Mike Harriss, Knoxville, TN  
Martha L. Atkins, Morristown, TN  
Norman Owen, Murphy, NC  
Paul Howell, Selmer, TN  
Petition signed by 4,602 concerned fisherman  
Ralph Duff, Saltville, VA  
Richard L. King, Dandridge, TN  
Richard Simms, Chattanooga, TN  
Robert Browning, Hayesville, NC  
Roger Dixon, Greeneville, TN  
Roger Gant, Corinth, MS  
Ron Witkowski  
S. Dean Yates, Abingdon, VA  
Sandy Robinson, Abingdon, VA  
Sharon L. McCabe, Dandridge, TN  
Steve McAdams, Paris, TN  
Sue King, Dandridge, TN  
Theresa Toney, Cedar Bluff, VA  
Tom A. Yates, Bristol, VA  
Vincent L. and June D. Greaves, Blairsville, GA  
Wayne K. King, Dandridge, TN  
William McIntosh, Blairsville, GA

### RESPONSE TO COMMENTS

As discussed in Section 4.7.2, TVA has a program to stabilize water levels as the water temperature at a depth of 5 feet reaches 65 °F. Attempts are made to minimize water level fluctuations (maintain level within 1 foot per week, either higher or lower) for a 2-week period. TVA proposes to adjust this routine, beginning in 2004, to stabilize levels at 60 °F in order to better include spawning for crappie, smallmouth bass, and early largemouth and spotted bass. Minimizing water level fluctuations is only one part of the fish spawning issue. Other environmental characteristics are also important in determining the numbers of larvae and juvenile fish produced. Factors after spawning, such as the amount of food and cover available for much of the initial growing season, are also critical to determining the number of catchable fish. TVA cannot limit fluctuations during the entire spawning season because of unacceptable impacts on flood risk and achieving other operating objectives for the TVA system.

### **Migratory Shorebirds**

#### Summary of Comments

Most individuals whose comments related to migratory shorebirds expressed concern about changes in TVA's drawdown policy to reduce or eliminate flats and other critical habitats for migratory shorebirds, as well as herons, egrets, bald eagles, peregrine falcons, waterfowl, and other species. Accordingly, most were opposed to any changes in TVA's existing policy, (i.e., they supported the Base Case). They recommended that if the existing policy is changed, TVA should conduct additional evaluations of baseline conditions and potential impacts of alternatives, document the results in the FEIS, and mitigate any loss by providing a comparable

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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or greater amount of habitat elsewhere across the reservoir system. The primary concerns of these commenters are listed below:

- Flats on Douglas (Rankin Wildlife Management Area), Chickamauga (Hiwassee Wildlife Refuge) Wheeler (Wheeler National Wildlife Refuge) and Kentucky (Tennessee National Wildlife Refuge) Reservoirs are important stopovers for wading birds, shorebirds, and waterfowl during migration.
- Changes in the existing policy to extend water levels through Labor Day will greatly reduce or potentially eliminate flats and other critical feeding and resting habitats for migratory species during peak migration.
- Late summer shallows are important for juvenile and adult wading birds that breed in the area.
- TVA does not have comprehensive survey or inventory data. If an alternative other than the Base Case is selected and implemented, TVA should compile all known data on species occurrence, numbers, alternative sites, and alternative site utilization for the project area, and also assess the potential for reservoir habitat loss and shorebird use for each alternative.
- TVA should evaluate the potential to avoid impacts on certain high-quality areas and nominate these areas as Important Bird Areas.
- Mitigate loss through creation of other suitable habitat; there should be no net loss of these areas in any modified river system operations plan.
- Evaluate (research if necessary) the use of areas and impact of habitat loss to shorebird energetics during migration.
- Consider the economic benefits from birders.

### Commenters

#### *Anonymous*

*Barabara G. McMahan, Chattanooga, TN*  
*Benny Thatcher, Knoxville, TN*  
*Bettie Mason, Knoxville, TN*  
*Charles Musde, Maryville, TN*  
*Charlotte E. Lackey, for WNC Group, NC*  
*Chapter, Sierra Club, Asheville, NC*  
*Christine Liberto,*  
*Clayton Ferrell, New Johnsonville, TN*  
*Dan Feathers, Nashville, TN*  
*David A. Aborn, Ph.D, Chattanooga, TN*  
*David Vogt, Chattanooga, TN*  
*Dr. K. Dean Edwards, Knoxville, TN*  
*Dwight Cooley, Athens, TN*  
*Elizabeth Wilkinson-Singley, Kingston, TN*  
*Gary D. Jenkins, Buchanan, TN*  
*Gaynell Thomas, Del Rio, TN*  
*James K. Luce, M.D., Amarillo, TX*  
*Jay Desgrosellier, Nashville, TN*  
*J. Don Burgess, Killen, AL*  
*Charles Muise*

*Jerry Hadder, Oak Ridge, TN*  
*Jim Garner, Madison, MS*  
*Kelly, Knoxville, TN*  
*Kevin Calhoon, Chattanooga, TN*  
*John Taylor, Springville, TN*  
*Leslie J. Gibbens, Del Rio, TN*  
*Linda Wright, Cosby, TN*  
*Marian Fitzgerald, Maryville, TN*  
*Mary Stevens, Jackson Audubon Society,*  
*Jackson, MS*  
*Michael A. McMahan, Chattanooga, TN*  
*Michael Smith, Gallatin, TN*  
*Michael Sylva Sledjeski, Del Rio, TN*  
*Michael Todd, McKenzie, TN*  
*Robert Wheat, Paris, TN*  
*Ruth Pullen*  
*Shirley Cunningham*  
*Steve McCadams, Paris, TN*  
*Thomas and Marian Fitzgerald*  
*Wayne Patterson, Shannon, MS*  
*Noreen Kenny*

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### **RESPONSE TO COMMENTS**

As noted in Section 5.10, most of the identified alternatives would affect flats and other habitats used by migratory shorebirds and other wildlife. Concerns for impacts on migratory species were considered in developing the Preferred Alternative. The Preferred Alternative would eliminate most of the proposed increases in winter pool levels on mainstem reservoirs, including Kentucky Reservoir. Accordingly, the Preferred Alternative would result in fewer impacts on flats and other critical habitats of migratory shorebirds. The FEIS includes additional analysis and information to address the issue. Issues regarding surveys and data gatherings are addressed in the Terrestrial Ecology section in Appendix F3.

#### **Shoreline Erosion**

##### Summary of Comments

Most individuals who expressed general concern about soil erosion indicated that higher and more constant water levels could reduce erosion, especially during the peak of the boating season. Their concerns included loss of land, loss of shoreline vegetation, bank slumping, and sedimentation that could occur due to wind- and boat-generated waves, fluctuating reservoir levels, and exposure of soil in winter months under TVA's existing operations policy. These and other concerns are listed below:

- Reservoirs should be maintained at constant level to prevent erosion.
- Shoreline is lost every year as lakes are lowered; shoreline erosion goes unabated.
- Change in water levels during boating season subjects the entire shoreline to erosion.
- Trees and other native vegetation are being lost due to bank slumping from undercutting of the banks.
- When water levels are held high during the boating seasons, erosion occurs mostly at a single point with little if any "undercutting."
- Higher lake levels in winter covers flats and reduces erosion and sedimentation.
- On Douglas Reservoir, banks are eroding at a very fast rate due to extreme drawdown.
- Boat traffic is a major contributor to shoreline erosion on Lake Nottely; it appears that there is more erosion when the lake levels are below full pool, than at full pool.
- High water is ruining the shoreline on Lake Blue Ridge; shoreline is eroding and trees are collapsing into the water.
- As a lakefront homeowner, I am very concerned about the amount of erosion we have experienced in the past several years.
- If the levels were left at more consistent levels or at full pool, property owners could better control the erosion of their individual properties.
- TVA should provide information and assistance to residents on how to stop erosion.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### Commenters

*Anonymous (2)*  
*Bill Dearing, Ooltewah, TN*  
*Charles Butler, Powder Springs, GA*  
*Chuck Kinard, Morristown, TN*  
*Colman B. Woodhall, Johnson City, TN*  
*David and Marilyn Miles, Dandridge, TN*  
*Doug Triestram, Blairsville, GA*  
*Freda Wycoff, Abingdon, VA*  
*Howard Lowden, Rome, GA*  
*Jack Miller, Hiawassee, GA*  
*James F. Smith, Ringgold, GA*  
*Jane Chinnici, Hiawassee, GA*  
*John Taylor, Springville, TN*  
*Joe Depew, Kodak, TN*  
*Larry Mancini, Blairsville, GA*  
*George Latham*

*Lee S. Horne, Lebanon, VA*  
*Mark Patterson, Brentwood, TN*  
*Michael A. O'Brien, Kennesaw, GA*  
*Mr. and Mrs. D. C. Wenberg, Blairsville, GA*  
*Robert Taylor, Dandridge, TN*  
*Susan Goodman, Dandridge, TN*  
*Patti Grubb, Knoxville, TN*  
*Paul Howell, Selmer, TN*  
*Roger W. Hill, Jr., Blairsville, GA*  
*Sally Bobo, Hiawassee, GA*  
*Sharon L McCabe, Dandridge, TN*  
*Steve McCadams, Paris, TN*  
*Thomas G. Sandvick, Morganton, GA*  
*Thomas L. Parker, Murphy, NC*  
*Tony E. Branan, Hiawassee, GA*

### **RESPONSE TO COMMENTS**

Comment noted. Shoreline erosion is an unavoidable consequence of changing water elevations, wind- and boat-generated waves, and freezing and thawing of exposed shore lands. Although there is a slight water quality impact from this erosion, it is small compared to the sediment contributions from the watershed. Because TVA's Preferred Alternative would result in higher winter flood guides, erosion is likely to decrease in the most sensitive, low-lying areas because less area would be exposed. The text in Section 5.16 has been changed to clarify this.

Additionally, TVA has an ongoing program to assess, prioritize, and repair eroding TVA-owned shoreline. TVA Watershed Teams work with local communities and property owners to address problem areas on tailwater banks. Watershed Teams provide technical support and help with obtaining funding. In addition to traditional riprap, TVA supports the use of bioengineering and natural channel design techniques to enhance habitat and aesthetics, while stabilizing shoreline and channels. These efforts are ongoing and might be expanded if the alternative chosen is shown to increase erosion rates.

### **Economic Analysis and Adverse Effects on Jobs and Local Economy**

#### Summary of Comments

A number of individuals questioned the credibility of the economic analysis. They rejected the determination that increasing recreational opportunities by extending summer pool levels would result in negative impacts on the economy and a net loss of jobs. On the contrary, most indicated that higher and longer reservoir levels would expand tourism and development in their local communities and, as a result, create additional jobs and increase revenue for the local economy. Typical comments provided by those critical of the economic analysis are listed below:

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

- I disagree with the adverse effects on jobs.
- Can't imagine how an economist would conclude that jobs would be less with longer recreational periods.
- The economic analysis showing a net economic loss under plan A or B is not credible.
- I don't understand the negative impact on jobs that are indicated in the study.
- I think you have vastly underestimated the effects of jobs, as I think it would create a very positive job market, not negative.
- Leaving lake levels up for longer periods of time would not have a negative economic impact.
- Contrary to your study, the greater number of users on and around the lake shorelines, the greater number of jobs would be created for the people in these rural areas.
- Contrary to what your economists have stated, the retaining of more consistent lake levels would be an economic boon to the area.

### Commenters

#### *Anonymous*

*Charles Butler, Powder Springs, GA*

*Chuck Kinard, Morristown, TN*

*Colman B. Woodhall, Johnson City, TN*

*David and Marilyn Miles, Dandridge, TN*

*Doug Triestram, Blairsville, GA*

*Freda Wycoff, Abingdon, VA*

*Howard Lowden, Rome, GA*

*Jack Miller, Hiawassee, GA*

*James F. Smith, Ringgold, GA*

*Jane Chinnici, Hiawassee, GA*

*John Taylor, Springville, TN*

*Joe Depew, Kodak, TN*

*Larry Mancini, Blairsville, GA*

*Lee S. Horne, Lebanon, VA*

*Mark Patterson, Brentwood, TN*

*Michael A. O'Brien, Kennesaw, GA*

*Mr. and Mrs. D. C. Wenberg, Blairsville, GA*

*Robert Taylor, Dandridge, TN*

*Susan Goodman, Dandridge, TN*

*Patti Grubb, Knoxville, TN*

*Paul Howell, Selmer, TN*

*Roger W. Hill, Jr., Blairsville, GA*

*Sally Bobo, Hiawassee, GA*

*Sharon L McCabe, Dandridge, TN*

*Steve McCadams, Paris, TN*

*Thomas G. Sandvick, Morganton, GA*

*Thomas L. Parker, Murphy, NC*

*Tony E. Branan, Hiawassee, GA*

### **RESPONSE TO COMMENTS**

There is no doubt that an extended recreation season on tributary reservoirs would result in job creation in the areas around those reservoirs, particularly in the recreation and tourism industry and retail sales. However, the TVA region as a whole would be negatively affected by Reservoir Recreation Alternatives A and B, because a loss of hydropower generation would increase power costs. These increased costs drive up the cost of doing business in the Tennessee Valley, the result of which would be jobs lost, either through plant relocation, job reduction, or slower job growth (as compared to the Base Case).

While coal-fired and nuclear plants provide the base load of TVA's power production capabilities, hydropower is used to meet peak demands. The water that turns turbines at tributary dams continues to generate electricity at each location downstream. If that hydropower capability is reduced as a result of holding tributary pool levels up longer, TVA must replace that power by either generating it using other means (typically gas turbines) or buying it off the

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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national grid at market rates. Either proposition is more expensive than hydropower generation, especially in August when annual demand is at its greatest. TVA costs are paid for by its power consumers. Increased power costs are passed along to customers.

Although the percentage is small, the actual change in the cost of doing business for industrial customers purchasing hundreds of thousands of dollars of electricity every day could be millions annually. These industries compete with others outside the region, so they might, in turn reduce their workforce, add fewer jobs than would occur under the Base Case, or relocate in order to remain competitive. Consequently, extending summer pool levels would increase the number of lower-wage, seasonal jobs in areas around the tributary reservoirs but decrease the number of higher-wage, permanent manufacturing jobs elsewhere in the TVA region. From a regional perspective, the economic losses would outweigh the economic benefits.

### **F2.4 Out of Scope**

#### **Logs and Debris**

##### Summary of Comments

Several individuals expressed concerns regarding the large amounts of floating logs and debris when pool levels are raised and their accumulation along shorelines when pool levels are lowered. They commented on how the amount of trash and debris continues to grow, creating increasing hazards for boaters and night fishermen. Several indicated that the problem was too large for a few concerned citizen groups and property owners, and suggested that TVA and other agencies should address the problem. Suggestions to address the problem are listed below:

- Provide revenue to address the problem.
- Create jobs so that someone is constantly working on the problem.
- Use prison inmates to cleanup the shoreline.
- Work with other agencies, such as the Corps, to remove logs and debris, especially big logs and large objects in the water, which are dangerous to boaters.

##### Commenters

###### *Anonymous (2)*

*Clarence R. Bailey, Dandridge, TN  
Jeff Cabe, Robbinsville, NC  
Sharon Chilson, Bryson City, NC  
Don Cross, Bluff City, TN  
Laurie Danko, Dandridge, TN  
Louis Duval, Dandridge, TN  
Fred Frazier, Bluff City, TN  
Mike Harriss, Knoxville, TN*

*Alice Jane Jesseel, Abingdon, VA  
Jerri Mitchell, Abingdon, VA  
Dianna Mullins, Bristol, TN  
Karen Niehaus, Cadiz, KY  
Norman Owen, Murphy, NC  
Jean Prater, Athens, AL  
Mrs. Jean Roberts, Morristown, TN  
Mark Wiggins, Cordova, TN  
Jay Wise, Johnson City, TN*

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

### **RESPONSE TO COMMENTS**

TVA agrees that the presence of floating logs, trash, and debris on TVA reservoirs and shorelines is a serious problem, particularly after heavy rains and sudden increases in water levels. Most of the debris originates on land and enters the rivers and streams due to erosion, rainfall runoff, and improper disposal practices. Effective combative measures require a concerted effort by the general public, reservoir users, TVA, and other organizations to conduct cleanup projects and public education campaigns, and to enforce laws related to littering and dumping trash. To help address this problem, TVA actively works in partnership with reservoir users, other citizen groups, and local agencies to plan and implement cleanup of shorelines before the reservoir level rises each spring. It is commendable when property owners take the time and effort to clean up the shoreline in front of their lots. Reservoirs by nature contain hazards that may not be visible to all users. While TVA tries to identify and mark permanent hazards that could affect a large number of users, use of TVA reservoirs by the public is at the risk of individual boaters.

#### **Boater Safety**

##### Summary of Comments

Three individuals expressed concern regarding snags, stumps, and other submerged objects posing safety hazards for boaters if pool levels are changed, especially in small inlets and backwater areas. They noted that adding 2 feet of water to winter levels will have serious consequences to boaters, as stumps that normally are out of the water in winter pool, or deeper in summer pool, become just out of site, but within the draft of a boat. They recommended that backwater areas laced with stumps be marked in some way, or that the stumps be physically removed to protect recreational boaters from the hazards associated with travel in those areas. One individual suggested that TVA come out in favor of age restrictions for boats and other powered watercraft.

##### Commenters

*Mark Cole, Athens, AL*  
*Candy Cox Ellis, Bristol, VA*  
*H. Lee Fleshood, Nashville, TN*  
*John Gustafson, Decatur, AL*

*Chip Miller, Hixson, TN*  
*Lorraine Nobes, Murfreesboro, TN*  
*James D. Wheeler, M.D., Dandridge, TN*

### **RESPONSE TO COMMENTS**

TVA recognizes that when the reservoir levels are raised or drawn down on certain reservoirs, submerged hazards may become more problematic to boating safety. This occurs at a time when the majority of the recreating public has reduced their use. There are inherent risks in recreation activity. TVA makes an effort to mark particularly hazardous underwater obstructions; however, use of TVA reservoirs by the public is at the risk of individual boaters. State agencies are primarily responsible for regulating usage and safety of watercraft and should be contacted about setting age restrictions on watercraft use.

## **APPENDIX F2 Response to General Comments, Issues, and Concerns**

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### **Jet Skis**

#### Summary of Comments

Several individuals expressed concern and frustration regarding jet ski operators. Concerns focused on operators having no regard for property owners who live on the lake, shoreline damage and safety hazards they cause, possibly restricting them to certain areas on lakes, and operators being under age.

#### Commenters

*Tony E. Branan, Hiawassee, GA  
Barbara Phillips, Lexington, KY  
Frank Stahlkuppe, Hiawassee, TN  
Earl L. Card*

*D. C. Wenberg, Blairsville, GA  
Joanne Wenberg, Blairsville, GA  
Roger W. Dixon, Young Harris, GA*

### **RESPONSE TO COMMENTS**

Comment noted. State agencies, not TVA, regulate watercraft operations on TVA reservoirs.

### **Water Pollution**

#### Summary of Comments

Water pollution concerns were raised by several individuals around Boone, South Holston, Hiwassee, and Chatuge Reservoirs, and elsewhere. Sewer outfalls and runoff from hog and cattle farms were mentioned as particular problems. A few commenters asked whether TVA has a role in addressing these issues; others requested that TVA take a more active role in monitoring and policing lakes for violators.

#### Commenters

*Anonymous  
Angela Boyda, Abingdon, VA  
Louis Duval, Dandridge, TN  
H. Lee Fleshood, Nashville, TN  
Fred Frazier, Bluff City, TN  
Jeff Garner, Florence, AL  
Barbara Garrow, Dandridge, TN*

*Brian Mazzei, Abingdon, VA  
Steven J. Milcheck, Mooresburg, TN  
Lorraine Nobes, Murfreesboro, TN  
Jean Prater, Athens, AL  
K. Pindzola, Johnson City, TN  
Alice Russell, Hayesville, NC  
[I] Tolly G. Shelton, Decatur, AL*

### **RESPONSE TO COMMENTS**

This EIS focuses on the reservoir system operations policy, not issues of the type identified by those commenting on water pollution. However, TVA is aware that both failing septic systems and runoff from cattle operations can adversely affect water quality. Through its Clean Water Initiative, TVA is developing partnerships with regulatory agencies, the general public, local officials, industries, and other others to enhance water quality in the Tennessee Valley.

## **Appendix F3**

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### **Response to Specific Public Comments**



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### **List of Acronyms**

cfs	cubic feet per second
Corps/USACE	U.S. Army Corps of Engineers
DEIS	Draft Environmental Impact Statement
DO	dissolved oxygen
USEPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
ROS	Reservoir Operations Study
SMI	Shoreline Management Initiative
TVA	Tennessee Valley Authority
TWRA	State of Tennessee Wildlife Resources Agency
USFWS	U.S. Fish and Wildlife Service

### F3 Response to Specific Public Comments

This section contains specific individual comments followed by TVA's response. Comments are arranged by alternatives and study areas. Each comment identifies the author and original comment by number. TVA staff has provided a response related to every substantive comment, either individually or by clusters of clearly related comments.

#### F3.1 Alternatives

##### Base Case

1. The Base Case presented does not provide enough info to tell us what the current operating policies are. "Target dates and target elevations" don't tell us anything. I do not see how anyone can make an intelligent comment when the Base Case is not presented. The Alternatives can not be properly evaluated unless we know what the current operating policies are. **Bill Beutjer, 2554**

**Response to Comment 1:** The Base Case operations policy is described in Chapter 2 of the DEIS, and Appendix C contains detailed tabular and box plot data that show probable elevations for the Base Case and each alternative. In response to public comments, flood guide curves that show probable elevations for the Base Case and TVA's Preferred Alternative have been added to Appendix C.8.

2. It was difficult, indeed impossible, to select an alternative, or even two or three alternatives. Choosing an alternative to enhance one area of the environment almost always adversely affected another when straying from the Base Case. The most logical solution would be Adaptive Management. We don't know the outcome in some of the cases. Let us try for a period of time to see what works best. I hope you will take these comments seriously. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3108**

**Response to Comment 2:** TVA has long used an adaptive management approach to the operation of its reservoir system and intends to continue to do this, regardless of which alternative is selected. This involves extensive monitoring of a number of different reservoir and ecological parameters, and flexible application of reservoir operating guidelines that takes into account monitoring results. See Section 3.4 and Chapter 7.

3. My overall observation is that none of the 8 alternatives evaluated in detail stand out as a definite enhancement over how TVA operates the system currently. If that is the case, i.e., if the current policy cannot be improved upon and there is consensus that it was a fair and balanced assessment, as I believe it is, will TVA's critics and the TVA board be willing to accept "no action" as the preferred alternative for the FEIS? **Gary Hauser, 68**

**Response to Comment 3:** All eight alternatives identified in the DEIS and the Preferred Alternative identified in the FEIS were evaluated in detail to determine whether they met the criterion of increasing the overall public value.

## **Appendix F3 Response to Specific Public Comments**

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4. This [Base] Case calls for a very low drawdown of the tributary lakes (November - December) when flood risk is negligible and peak power production is the least needed. Summer levels are acceptable to reduce electrical rates, as long as drawdowns are somewhat limited prior to Labor Day. **Greg Worley, 1346**

**Response to Comment 4:** TVA's Preferred Alternative strives to increase recreational opportunities on a number of reservoirs by restricting drawdowns through Labor Day and allowing higher winter flood guide elevations, as determined by the flood risk analysis.

### **Reservoir Recreation Alternative A**

1. This comment is submitted on behalf of The United Company, a privately held corporation located in Bristol, Virginia, which owns Camp Sequoya, a girl's camp located on 50 acres of lakefront property at South Fork Holston River Mile 64. Camp Sequoya was established more than 75 years ago by Sullins College as a private camp where young girls and young women would be allowed to flourish in a safe, nurturing environment.

Throughout its history, Camp Sequoya has attracted generations of campers from across the United States, and many foreign countries. One of the strengths of the camp is the diversity of the backgrounds of its campers, each of whom returns to their respective homes at the end of each summer as an ambassador for the beauty of South Holston Lake and the surrounding area. The camp is the only facility of its kind on South Holston, and to our knowledge, is unique in its proximity and access to the TVA waterways.

Throughout the years, Camp Sequoya has managed its operations in relative harmony with the TVA's operations of its South Holston Reservoir. Much of the Camp lies within the TVA easement below the 1747 foot elevation mark, which accommodation was reached when the TVA approved the construction of certain camp facilities in its easement.

The camp, which is in the peak of its operations during the summer season when schools are out of session, is affected dramatically when the elevation of South Holston approaches the 1729 level. At this elevation, the camp's swimming pool is rendered nearly unusable, as the pump equipment is at this elevation. At 1732 elevation, the camp pool, which is one of its primary attractions, is underwater. At this higher lake level, access to the isthmus portion of the camp property is also cut off as the access road is likewise underwater. Consistently higher pool levels in the summer season will threaten the economic viability of the camp.

For these reasons, The United Company and Camp Sequoya are concerned about the ROS alternatives that project higher levels for the summer pool in South Holston. For example, Recreation Alternative A would increase the number of days that the camp pool would be underwater during June, July and August. Under the Base Case, the South Holston summer pool level peaks in late May and early June, which generally has minimal impact on camp operations.

We certainly recognize that by virtue of the easement agreement between the TVA and the Camp, complaining about the impact of reservoir levels on camp operations may not be compelling. However, we wished for the TVA to understand that Camp Sequoya campers and their families who visit the area to drop off campers and pick them up, are just the type of visitors that this area needs -- people who appreciate the natural beauty of the lakes and

## Appendix F3 Response to Specific Public Comments

mountains, and choose this area over scores of others, to send their daughters to learn about teamwork, fellowship, nature, self-sufficiency, self-image and themselves.

In concluding, we believe that the Base Case Alternative, which has been the manner in which the South Holston Reservoir has been managed very well for more than a decade, is the best alternative to pursue. We therefore wish to add our voice to those who oppose raising the summer pool levels in the manner contemplated by Reservoir Recreation Alternatives A & B, the tailwater recreation and habitat alternatives, and the Equalized Risk alternative. **Brian Sullivan, 3120**

**Response to Comment 1:** Under the Preferred Alternative, the flood guide for South Holston Reservoir in late spring and summer has not been modified from the existing operation.

2. I do not fully understand the differences between the Reservoir Recreation Alternatives A and B. I would like to communicate that as a homeowner, small business owner, and permanent resident of Towns County, I would like to see Lake Chatuge stay at the highest water level possible throughout the year. This would benefit the businesses of Towns County in many ways, make the lake recreational year round, and increase the look of the area. I would tend to think that Plan B would accomplish these things, but as I stated earlier, I do not understand the report enough to draw that conclusion. I want the plan that would keep the lake level up year round. Please take my comments into consideration when making a decision about Lake Chatuge. **Denise N. Gladfelter, 518**

**Response to Comment 2:** The major difference between Reservoir Recreation Alternatives A and B regarding summer pool levels on Chatuge is that Reservoir Recreation Alternative B would provide a higher median pool elevation on Labor Day than Reservoir Recreation Alternative A. TVA did evaluate holding reservoir levels higher year-round; however, this would result in unacceptable flood risks.

3. Allowing the TVA lake and river levels to remain high in summer and winter would greatly increase their recreational value and use. Property values and development would increase around them as a result. This would help the economies of the surrounding areas.

I work for Georgia Power and Southern Company. I have seen what the Georgia Power lakes such as Burton and Rabun have meant to the economies of the counties around them. I can only assume that this would happen for TVA's lakes if recreation is made a primary purpose also

I realize that when the dams and lakes that make up the TVA system were created, flood control, navigation and power generation were the primary purposes for the system.

It is my opinion that due to the tremendous population growth the south has seen in the past 50 years, recreation will have a much higher priority than in the past. The mountains and lakes of Appalachia are where the people of the South choose to play.

The political pressure to make recreation a primary purpose for the TVA lakes and rivers will only increase in the future.

## Appendix F3 Response to Specific Public Comments

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I call upon you - the leaders of TVA to be proactive and make that change today!

**Michael P. Van Winkle, 680**

**Response to Comment 3:** TVA developed its Preferred Alternative in an effort to enhance recreational opportunities on its reservoirs and the associated economic benefits, while lessening the potential impacts on other important values and benefits associated with alternatives in the DEIS—such as water quality and flood risk reduction. The primary purposes for which the TVA reservoir system is operated were established by the TVA Act.

4. Under my study of 2002 that I sent to TVA, this plan would fall with in my predictions for Douglas Reservoir. I live on Douglas at river mile 61 left. **Philip Davis, 716**

**Response to Comment 4:** Comment noted.

5. The possibility of Alternative A is the best news we in the navigation business have gotten from TVA in over 40 years. There are innumerable reasons for an additional 2 feet of water at minimum winter pool levels and no apparent reasons not to change the minimum levels. Some of the advantages to navigation, and the river's other users as well, are:

The 2 feet additional depth would eliminate all the choke points on the main river, i.e., below Pickwick Dam, Florence cut and the canal below Wilson Dam, the rock reach below Guntersville Dam, problems below Nickajack, and all the low water problems between Chattanooga and Knoxville. The choke points limit an otherwise 10' plus useable channel. It seems wasteful to let choke points adding up to less than 50 miles of river dictate the usability of the remaining 600 miles of the Tennessee River. Actually, the load draft is limited all the way from origin.

The 2 feet additional depth will mean that barges will not have to "lite load" for the Tennessee River, thereby putting Tennessee River users at an automatic rate disadvantage. (TVA coal will probably be the single biggest benefactor).

The 2 feet additional depth will enable more tonnage to transit our congested locks in the same number of lockages, i.e., a 15-barge tow that is held to 9' draft rather than 10' draft is sacrificing 17 ½ feet of cargo handling capability or over 1 ¾ extra barge loads equaling over 12%. This would mean an automatic 12% decrease in lockages required to move the same tonnage, saving our equipment time, wear and tear on old locks and dams, saving wasted lockage water, etc.

The 2 feet additional depth would make the Tennessee River much safer. The Tennessee River is a major hazardous liquid material artery. More water would vastly increase the safety factor in handling these hazardous barges.

## Appendix F3 Response to Specific Public Comments

The 2 feet additional depth would be a significant safety factor for our towboats themselves. Since there are no midstream fuelers on the Tennessee River, the towboats going to the Tennessee must take on at least 10 days of fuel prior to entering the river. This means that for the first few days of a trip during "winter low pools" our towboats are drafting deeper than their tow of barges. This is certainly not desirable now "best practices." It is usually much more serious when the towboat is disabled or holed than when a barge(s) is grounded.

The additional 2 feet of water at minimum pool would be a great help to all of our river dock customers and would greatly lessen the need for dredging, thereby appealing to environmental concerns.

The fact that the Tennessee River is known as a "lite load river" undoubtedly has cost the area some industry. If everything else is equal, a plant on the Ohio or Illinois rivers has an advantage of heavier draft and thereby lower transportation costs. There is no appreciable difference in our boats costs shoving a 9' draft tow and a 10' draft tow if there is enough water. **Tennessee Valley Towing, Inc., Bill Dyer, 3717**

**Response to Comment 5:** The purpose of increasing channel depth in the winter pool time frame was to provide added benefits to navigation on the Tennessee River. However, detailed flood risk analyses indicated that raising the mainstem reservoirs by 2 feet in winter would result in an unacceptable flood risk. The Preferred Alternative provides for a 1-foot increase in channel depth at Kentucky Tailwater to elevation 301 feet by controlling releases at Kentucky Dam and raising the minimum winter pool depth at Wheeler by 6 inches.

### **Reservoir Recreation Alternative B**

1. The actual resulting Water Level Elevations would be a very important clarification when presenting the alternatives. I.e. - Great Falls Dam Reservoir Summer Pool Level of 800 ft. would be extended to June 1 through Labor Day of each year ... and the winter pool MINIMUM water elevation would be increased from 785 ft. to 795 ft. ... suggest this be applied throughout the Alternatives discussing the TVA Great Falls Dam Reservoir at least. You folks have been doing an excellent job in this "Milestone" Project. Would accept Reservoir Recreation Alternative B with these discussed changes. **Dan Fairfax, Representative of Rock Island Shores Property Owners, 1982**

**Response to Comment 1:** Under the Preferred Alternative presented in the FEIS, Great Falls would have a planned operating level of 800 feet from Memorial Day through the end of September, and the winter minimums would be set at elevation 785. Due to hydrologic characteristics of the reservoir and contributing watershed area, however, much of the time the reservoir levels would be substantially higher than 785 feet. Allowing the pool to be lowered to 785 feet by hydroelectric generation as often as possible during this period provides additional benefits to TVA power consumers during a time of the year when recreation is less critical.

## **Appendix F3: Response to Specific Public Comments**

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2. The lake elevations are very important to my family. The extended summer elevations through labor day will add value to my property and allow me to use my lake front property for a longer period. I would like to have the following charts shown during one of the presentations for Wheeler lake:

- Flow chart for options A & B base
- Elevation charts for options A& B& Base
- Generation capacity for option A & B & Base

I would like to get the above charts for the main stem lakes combined also **Gail Spurgeon, 2305**

**Response to Comment 2:** Probability elevation plots along the flood guide curves for the tributary reservoirs and the operating guide curves for the mainstem reservoirs have been included in Appendix C for both the Base Case and the Preferred Alternative.

### **Equalized Summer/Winter Flood Risk Alternative**

1. Was the original intent and origination of TVA to control waters to prevent flooding along with the opportunities of commercial navigation and power supply? If this is true, and the original goal of TVA, there is only one alternative that reduces the risk of flooding, (Equalized winter/summer flood risk), with minimal increase or decrease for optional benefits. **Lane Marte, 2354**

**Response to Comment 1:** Section 9a of the TVA Act establishes the priorities for operation of the TVA reservoir system. The primary priorities are navigation, flood control, and the generation of power. Consistent with meeting those priorities, TVA also operates the system to meet other goals, such as water quality and recreation. Under the Preferred Alternative, potential damages from flood events with less than a 500-year frequency are lower than under the other action alternatives, and essentially the same as under the Base Case.

2. When did TVA go to a 500-year inflow? What is the variance when comparing the 500-year inflow, and the 100 year inflow? Since Blue Ridge lake is only 73 years old, where did tva get statistics from 500 years ago. To me it sounds like TVA did this, to have as large a "cushion" as possible for justification when it decides on lake levels.

The description of "lower summer pools" and "higher winter pools" is totally vague. I believe all users of Blue Ridge lake as well as the other TVA lakes would welcome fairly stable lake levels as long as those levels would not make land owners and public-use areas non-navigable to recreation boats and docks. **Thomas G. Sandvick, 2655**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 2:** TVA selected the 500-year flood level as an objective means of comparing the flood damages associated with large flood events. A 100-year continuous period flow record was established from historical stream gage data, and then analyzed using standard hydrologic statistical techniques to estimate flood inflow volumes. Using the 500-year flood inflow is appropriate, in light of the direction in the TVA Act to operate the reservoir system primarily for flood control (as well as for navigation and power generation). Reservoir levels vary for many reasons such as heavy rainfall and runoff, power demands, and meeting downstream minimum flow targets and navigation needs.

### Commercial Navigation Alternative

1. Do the numbers in the EIS include navigation levels for Kentucky? Very difficult to determine from text. Assume Corps did not allow Kentucky to be included. Would make report more straight forward to say 2 feet increase Ft. Loudoun through Pickwick. **Arland Whitlock, 565**

**Response to Comment 1:** Seasonal levels for all projects, including Kentucky, for all alternatives are shown in Appendix C. Several agencies, including the Corps and other individuals, objected to changing levels on Kentucky Reservoir. TVA's Preferred Alternative would not change operating guide curves on Kentucky.

2. It is extremely disturbing to discover the fact that TVA did not broaden the scope of their study, which they are currently performing, for other adverse affects downstream of Savannah. Increased water flow into the Tennessee River, which in turns increases water flow on the Ohio River which in turns increases water flow on the Lower Mississippi River. During high water months, navigation on the Lower Mississippi River becomes extremely difficult due to increased water flows. Towing companies are unable to efficiently move barges up and down stream on the Mississippi River during high water conditions. During normal water conditions, a 20 barge tow can be pushed with a 4,000 horsepower towboat (approximately 200 horsepower/barge). However in high water conditions, the same 20 barge tow can only be pushed with a 5,000 horsepower towboat (approximately 250 horsepower/barge). Many towing companies are unable to offer such an option of increased horsepower so they have to limit the size of their tows or they will add a helper boat to the tow in order to gain the needed horsepower to move the 20 barge tow. The increased water flows also greatly escalates the risk for a tow to collide with bridge piers on the Ohio and Lower Mississippi Rivers. **Eddie Adams, 3033**

**Response to Comment 2:** As explained in Section 5.22, TVA's analysis did extend downstream of Savannah, Tennessee. The Corps expressed concerns about changing operations on Kentucky Reservoir because of the potential effect on the lower Ohio and Mississippi Rivers. Its position is that any proposed changes that would involve reduction in flood storage capacity would need to be evaluated within the context of the entire lower Ohio/Mississippi River system. Flow changes, if any, from Kentucky Reservoir and/or Barkley during high-flow periods are expected to be minor and should not impede navigation. TVA did not include changes to the operating guide curve for Kentucky Reservoir as an element of its Preferred Alternative.

## **Appendix F3 Response to Specific Public Comments**

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3. Commercial benefits seem somewhat obsolete despite all of the supporting information. We do not believe river commercial navigation is either economical or practical considering the impending scarcity of water. Wasting water on navigation is somewhat scurrilous. **George Pisciotta, 1871**

**Response to Comment 3:** See Section 4.21 for a discussion of commercial navigation benefits. Water used to support navigation serves a number of different objectives, including maintaining water quality.

4. The way that I understand this Alternative, Kentucky Lake reservoir elevation would be 356' during the winter months and the drawdown from summer pool would be much later than the base case. If that is the case, I would be in favor of this Alternative. **John De Freitas, 3082**

**Response to Comment 4:** TVA's Preferred Alternative does not include changes to the operating guide curve for Kentucky Reservoir.

5. If the pool level could be maintained at a higher level, barge traffic in the Guntersville pool would be improved. My company, USG, Bridgeport, Al. is adversely affected when low water pool levels are experienced. We receive 100 % of our raw material, synthetic gypsum by barge. We experience difficulties in maintaining barge deliveries when the water pool level falls below 594 MSL. In addition during power generation peak periods, we experience rather severe water level fluctuations on an hourly basis. This not only interferes with barge delivery schedules but also creates safety issues for barge handling personnel. **Larry Pawlosky, 2197**

**Response to Comment 5:** None of the alternatives analyzed in detail, including the Preferred Alternative, would change elevations for Guntersville Reservoir headwater because of the limited flood storage available. Steady water releases, such as those that would occur under the Tailwater Habitat Alternative, were found to result in an unacceptable cost to power and power system reliability. Dredging at the dock to ensure adequate depth and provision of adequate and safe mooring facilities are the responsibilities of the dock owner.

6. 1) One of the things that is causing this [shoreline erosion] to come up is barge traffic. Barges don't operate in the sloughs even in the summer, and the channel stays at a relatively fixed level. Increasing water levels in the reservoir will only fix the problem for a short time - until the channel fills again. It is likely that the increased washing on the shore will advance the rate of sedimentation or silting. The channel should be deepened by dredging, not by changing the ecology of the river. **Mark Cole, 2077**

**Response to Comment 6:** Wave action from barges does contribute to shoreline erosion. However, barges produce a smaller wake than large V-hulled recreational boats because they have a flat bottom and travel at slower speeds. Other factors contributing to erosion and sedimentation are addressed in Sections 4.16 and 5.16. The Corps dredges the channels periodically, but resource limitations preclude the use of dredging throughout the reservoir system with sufficient frequency to "fix the problem." Dredging also results in a number of adverse environmental impacts, including re-suspension of sediments and disruption of channel bottom ecosystems.

## Appendix F3: Response to Specific Public Comments

7. As an employee with Marine Terminals of Alabama, I am very concerned that lower water levels will adversely affect our company. One of our main sources of income derives from unloading steel scrap from barges off the river. A lower water level will inhibit the ability for scrap to arrive at our port and therefore not provide the revenue to sustain our current job level and limit the potential for growth. Increased cost would also adversely affect the ability of NUCOR Steel to make a profit and again negatively impact the employment situation of our facility. **Ray Hancock, 2333**

**Response to Comment 7:** Comment noted.

8. We need an additional 2 feet of water at "winter pool." The Tennessee River is being severely affected by a 9' restriction when the whole US River System is at their higher winter pools with "at least" 10' loadings. **William H. Dyer, 3506**

**Response to Comment 8:** The Preferred Alternative would allow 1 foot of additional channel depth through controlled releases below Kentucky Dam. Increasing winter pool elevations resulted in an unacceptable increase in flood risk; therefore, it was not included in the Preferred Alternative.

9. My main concern is operation of the gates at Normandy Dam during flooding. I think there needs to be a study on when to open them and close them in order to release -- in releasing the water to help in the flooding downstream. The big question -- I know when the lake gets full, it has to be released, but maybe a study that it could start releasing -- when you see the radar that the weather is coming, maybe the lake could be lowered prior to all the rain when it gets here, then be cut back. That is my main concern. Operating it by computer from Knoxville, I think that's the way it's operated, it's questionable whether you could open the gates properly or know when to open and close them. That's basically it. I mean, that's my main concern is the flood. You know, I know there's concern with fishermen and boaters, but Normandy Dam was built for flood control and not for boating and recreation; that's as only a second. And this flooding here this time has cost me somewhere around probably 18 to 20,000 dollars. Even though I have flood insurance, you still lose the deductibles and things. Then last January, I was also flooded in my shop due to two gates being opened after the river had already crested, and it brought 26 inches in my shop; didn't quite reach my home. And this is my main concern, the opening and closing the gates. There needs to be more study done on them to maybe help us downstream. **Donald R. Carpenter, 2324**

**Response to Comment 9:** No changes are proposed in the operations policy for Normandy Reservoir as part of the ROS. To address some of the specific concerns you have regarding the existing operations policy at Normandy, we offer the following comments:

Normandy Reservoir is operated as part of the TVA integrated water control system. Releases from Normandy Dam are scheduled and implemented from TVA's River Forecast Center in Knoxville, Tennessee. Normandy is monitored 24 hours a day in the Forecast Center for observed rainfall, predicted rainfall, downstream flows, and the existing and projected reservoir pool elevations. When heavy rainfall occurs in the Normandy and Shelbyville area, if adequate pool storage is available at Normandy, Normandy releases are generally reduced to low amounts until the flooding that occurs due to natural runoff

## **Appendix F3 Response to Specific Public Comments**

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below Normandy Dam has crested. Releases are then increased at Normandy, but not to the extent that flooding is increased beyond that which occurred due to the local runoff downstream of the dam. Because Normandy Dam has limited flood storage, if the reservoir fills to the top before downstream flooding has crested, TVA must begin releasing water earlier than desired.

Although weather radar is a valuable tool in helping plan and monitor the system, the advance warning provided by radar is not sufficient to lower the reservoir in order to gain any substantial additional flood storage. In fact, in many events, lowering the pool level while heavy rainfall is occurring downstream would increase flooding.

10. I would be interested in knowing how much increase in navigation tonnage would be realized by the extra 2ft of water. I would like to know if there is a preferred plan at this time. **Rick Saucer, 1296**

**Response to Comment 10:** The ROS project looked at the increased efficiency to existing Tennessee Valley shippers with the extra 2 feet of year-round navigable channel. No measurement of induced tonnage was made; however, a traffic forecast growth factor was included for the existing shippers. During the comment period for the DEIS, TVA had not selected a preferred alternative. After review of comments on the draft and further analyses, TVA formulated a Preferred Alternative, which is addressed in Chapter 3 of the FEIS.

### **Tailwater Recreation Alternative**

1. Please continue to provide regular releases on from Ocoee #2 and #3 and also from the Apalachia Dam. I am pleased that Ocoee #3's releases will augment from 20 in 2003 to 54 in 2004. River releases are critical to the economy and in essence to the survival of Polk County and its neighbors. Thanks for reclassifying the Upper Ocoee into the bracket (community/economic development rather than power generation) in which it belongs. **Anonymous, 2100**

**Response to Comment 1:** TVA's Preferred Alternative includes increased flows through the Apalachia Dam and scheduled releases at a number of locations for which this has not been previously done. This should enhance opportunities for tailwater recreation, including rafting and boating. As stated in the EIS, recreational releases from Ocoee #2 and #3 are not within the scope of this EIS. In addition, the Upper Ocoee has not been reclassified; TVA still requires full-cost recovery for lost power revenues that result from Upper Ocoee recreational releases.

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2. As a whitewater paddler, I request that reservoir releases be planned in advance whenever possible and that current release data be available online or by telephone for as many navigable waterways as possible. I request that fall draw-down releases be conducted during daylight hours and with flows suitable for recreational uses. I appreciate the variation of these releases as this creates a more natural river environment than one sustained level at all times. Please consider the importance of recreational information and releases on the Ocoee, Nantahala, Tallulah, Pigeon and Dries, Great Falls Hydrostation, and other popular whitewater streams that make the Southeast such a great place for paddlers to live, work, and play. **Cay Wright, 666**

**Response to Comment 2:** To respond to this and similar comments, TVA's Preferred Alternative includes a number of scheduled releases from dams. TVA will continue to provide a daily water release schedule on its web site and toll-free public lake information telephone line.

3. The Ocoee is a world-class whitewater paddling resource, as emphasized by the construction of the 1996 Olympic Whitewater facilities. Nothing in the ROS should be done to interfere with the 74 release days recommended for the Upper Ocoee in the earlier NEPA document pertaining to that issue; nor should the ROS adversely affect the whitewater releases on the Middle Ocoee. **David M. Ashley, 2098**

**Response to Comment 3:** TVA's Preferred Alternative would not adversely affect scheduled releases on the Ocoee.

4. I'm with Edge of the World Rafting Company in Banner Elk, North Carolina, and we are concerned with the release of the water from Watauga Lake out of Wilbur Dam back into the Watauga River because that's where we raft.

And what we would like to see ideally happen for our rafting business and the other rafting businesses over there is to begin scheduled releases Memorial weekend and to end the scheduled releases Labor Day weekend, plus have Saturdays through September, plus add Sunday of Memorial weekend and Sunday of Labor Day weekend. And the amount of water we would find ideal to release would be one unit from 11:00 to 12:00, two units from 12:00 to 4:00 and one unit from 4:00 to 5:00 Monday through Saturday; no release on Sundays. **Greg Barrow, 4355**

**Response to Comment 4:** TVA has developed a Preferred Alternative that includes a release schedule for Watauga operations for recreation flows below Wilbur Dam. See Appendix B for details.

5. Two generators daily Memorial Day through Labor Day 9:00 am to 7 pm minimum and two generators 11:00 am-3:00 pm every Saturday of year at Apalachia --Hiwassee River. **J. Harold Webb, 2196**

**Response to Comment 5:** TVA's Preferred Alternative includes an expanded release schedule for below Apalachia Dam. See Appendix B for schedule and timing of recreation flows below Apalachia Dam.

6. I think the Ocoee #2 and #3 tailwaters should be considered in the recreation and economic and environmental studies also. And consider same for all other significant (i.e.,

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where is a significant user base of desire for more tailwater flow) tailwaters upstream of the tailwaters you did study. Even though Ocoee #2 has a contract for water, it will be up for negotiation in the near future, about 5 to 7 years from now. So considering it now in your ROS would be helpful. The economic benefits of Ocoee #2 are great now to the region. Helping improve use of Ocoee #3 would further help the region economically, especially since so much money was invested in the Olympic section. **John Hubbard, 2255**

**Response to Comment 6:** Recreational flows for Ocoee #2 and Ocoee #3 were the subject of two separate EISs that included decisions concerning recreational releases to the Ocoee River. See Response to Comment 2.

7. An unrestricted drawdown would seemingly be beneficial for tailwater recreation on dams like Apalachia where water release coincides with power generation. However the statement that "no tailwater releases would be made for recreation" seems to imply that TVA would release the water whenever demand spiked. According to TVA's statements issued to Ocoee outfitters, power demand remains level on weekends as compared to weekdays, making the release of water into the Ocoee riverbed on weekends detrimental to the price of hydropower. However, TVA often cites lower weekend power demands as the reason for a lack of water on Saturdays and Sundays in the Hiwassee riverbed. Since Apalachia Powerhouse produces more electricity than Ocoees #2 and #3 combined, it seems that this alternative could work for that region if TVA opted to generate from Apalachia at the same times that they release water into the Ocoee for recreation. This would also produce a guaranteed release schedule for Hiwassee recreation, and the amount of cold water in the Hiwassee tailwater during the summer months would effectively protect the coldwater fishery habitat found there. **Mary Shirley, 42**

**Response to Comment 7:** TVA's Preferred Alternative includes scheduled releases from Apalachia Dam. See Appendix B for the schedule. Regardless of whether power demand is high or low, when water is spilled at Ocoee, revenues are lost.

8. Great job pitting lake interests against those downstream. I am CERTAIN that there is a balance that can provide adequate water for both of these groups, but the language employed in the summary of this plan should make for great fireworks at the Blairsville meeting.

I'm not sure that I understand this alternative correctly, but it seems that TVA would maintain lake levels until Labor Day -- delaying the fall drawdown by about a month. Would lake levels be maintained at lower levels than in the Base Case? I don't understand how a lengthened summer pool season can provide priority to downstream recreation over lake recreation -- at first glance it seems like a good compromise for both groups. **Mary Shirley, 45**

**Response to Comment 8:** Appendix C shows a comparison of reservoir levels at various times of the year for all alternatives. TVA's Preferred Alternative attempts to balance many competing demands, such as reservoir and tailwater recreation. Under this alternative, tailwater releases would have a higher priority at selected locations. See Appendix B for details.

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9. Why does tailwater recreation have a higher priority over reservoir water level and recreation??? Is this because a group of Tennessee politicians forced the TVA to supply water to the Ocoee River for rafting?? **Thomas G. Sandvick, 2667**

**Response to Comment 9:** The Tailwater Recreation Alternative placed a higher priority on tailwater recreation compared to reservoir recreation, just as other alternatives placed higher priorities on other operating objectives. See Response to Comment 8.

10. I am concerned about this alternative, because I disagree with the notion that tailwater recreation at South Holston is more valuable (higher priority) than reservoir recreation. I would like to see more information regarding how this decision was made. The graph of model simulations for this alternative suggested that reservoir elevation would be higher under this alternative than in the Base Case scenario. Under median conditions, can flow be increased while maintaining the lake at higher elevations? **Tom Hampton, 262**

**Response to Comment 10:** Under median conditions both reservoir and tailwater recreation would benefit under this alternative. Under the Preferred Alternative, minimum flows at South Holston would be increased from April 1 through October 31 for the downstream fishery. See Response to Comment 9.

11. Tailwater recreation. Has this approach in other parts of the country or world caused any severe consequences? **Richard Wagner, 2101**

**Response to Comment 11:** A number of adverse effects were identified for the Tailwater Recreation Alternative assessed in this EIS. The nature and severity of these effects depend on site-specific factors. Under TVA's Preferred Alternative, releases would be scheduled from a number of TVA dams to support tailwater recreation.

### Tailwater Habitat Alternative

1. This seems to be the best option to mimic the natural flow of the river. The adverse predictions about flood risk appear to be related to the decision to set pool levels at 75% of maximum. A better plan would start with deciding to keep flood risk equal and then set seasonal pool levels accordingly.

This criticism seems to apply to other alternatives as well, such as Reservoir Recreation Alternative A and B. That is, the increased flooding risk is an artifact of deciding to set winter pool levels such that there will be an increased risk of flooding.

A more honest alternative would be to start with a commitment to keep flood levels the same as the Base Case Alternative, and then determine what winter pool levels should be and develop the rest of the alternative from there. **Guy Larry Osborne, 1207**

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**Response to Comment 1:** TVA designed the alternatives to evaluate the broad set of issues and suggested operational changes identified during the scoping phase of the study. TVA performed the flood risk analysis to determine which of the changes evaluated could be made without unacceptably increasing flood risk at any critical location. TVA developed its Preferred Alternative to maintain flood risk at acceptable levels while preserving desirable characteristics that were associated with the alternatives that were evaluated in detail.

2. This option would not appear to help the Apalachia tailwater habitat at all. The best way to maintain the coldwater fishery habitat in the Apalachia tailwater corresponds to practices for maximum tailwater recreation there and the installation of a continuous low-flow alternative to average the "one-hour-on/three-hours-off" amount of discharge currently practiced. **Mary Shirley, 54**

**Response to Comment 2:** The Tailwater Habitat Alternative was developed to improve biodiversity and aquatic habitat for native warm-water species that live in this cool-to-warm tailwater. TVA's Preferred Alternative contains increased recreational flows from the Apalachia powerhouse. See Appendix B for details.

3. Contrary to its stated purpose, the Tailwater Habitat Alternative does not always improve overall aquatic habitat in tailwaters. In fact, the DEIS characterizes this alternative, one of the two worst alternatives for water quality because it would reduce instream flow during the summer. DEIS at 3-26. We are puzzled by this. Could you please explain why mean Summer and August-September flow will decrease in almost all tributary tailwaters under the Tailwater Habitat alternative, when this alternative was intended to improve water quality and aquatic habitat by increasing and stabilizing instream flow? DEIS at 3- 18; DEIS at Table 5.7-04, Table 5.7-05. **Southern Environmental Law Center, 4229**

**Response to Comment 3:** The Tailwater Habitat Alternative was developed in response to requests to better mimic natural seasonal variation of flows—high flow during winter and early spring, and low flow during late summer and early fall. This was accomplished by reducing hydro peaking and releasing a portion of the natural inflow on a continuous basis. Reducing hydropower peaking stabilizes the flow on a weekly basis. These lower flows would adversely affect water quality. The benefits provided by the reservoir system to augment lower flows in late summer with water held in storage would not be realized under this alternative.

4. I raise the question of state prejudice when the TN located Ocoee River has priority over the Georgia located Blue Ridge Lake **Thomas G. Sandvick, 2668**

**Response to Comment 4:** TVA is not proposing to change recreational flows on the Ocoee as part of the ROS and this EIS. Those flows and their associated effects were the subject of two earlier EISs; decisions to provide recreational flows on the Ocoee were made earlier, after those EISs were completed.

5. As stated in Section 5.7.10, the Tailwater Habitat alternative "would increase the weeks at full pool levels and increase winter pool levels." Model results of reservoir levels for five dates through the year (Appendix C) show that the Tailwater Habitat Alternative has either the highest water levels or among the highest water levels of the modeled reservoirs. There are not adequate data presented to determine why this occurs, but it is likely to be

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due to releases of only 25% of inflow or less. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 4182**

**Response to Comment 5:** This is correct. Under the Tailwater Habitat Alternative, reservoir releases are limited to 25 percent of the inflows, or the minimum flows—whichever is greater—and are drawn down only in late fall in order to remain below flood guide levels and maintain flood storage capacity.

### F3.2 Study Areas

#### Air Resources

1. From our property the haze and air pollution is all too pervasive -- there are more days when the park land across Fontana Lake is shrouded in dirty air than there are clear days. The rising incidence of asthma in our young people, the number of days it is unsafe to be outside if one is elderly, young or has respiratory problems is increasing. Plant and animal life in the [Great Smoky Mountains National Park] GSMNP is endangered by pollution and acid rain. TVA's responsibility for much of this pollution is a national shame and recent efforts to clean up the pollution spewing energy plants is way overdue. Continued efforts should be addressed immediately and should be ongoing. **Bonnie Ragland, 2461**

**Response to Comment 1:** As part of continuing efforts to address this problem, TVA has begun a major additional reduction program for air pollutants. The program focuses on reducing sulfur dioxide and nitrogen oxides emissions, which contribute to haze. TVA has spent almost \$4 billion to reduce emissions from its coal-fired power plants, resulting in reductions to sulfur dioxide emissions of over 75 percent and reductions in nitrogen oxide emissions of over 60 percent. TVA is in the process of spending another \$1.8 billion through the end of this decade on additional reductions. By the end of the decade, TVA will have reduced sulfur dioxide emissions by 85 percent and nitrogen oxide emissions by 75 percent during the ozone season. Impacts related to emissions under the Preferred Alternative range from no change to a slight increase compared to the Base Case because of a reduction in hydropower generation and its replacement with fossil-fuel generation.

2. It will cause TVA to burn more coal in a place that already has highly polluted air. This will cause further damage to the most valuable asset in Tennessee - Great Smoky Mountains National Park. **Charles, 2654**

**Response to Comment 2:** While some alternatives would result in slightly more fossil-fuel generation and others less, as described in Section 5.2, TVA does not believe that these relatively small differences would result in meaningful air quality changes. TVA's ongoing emissions control programs for both nitrogen oxides and sulfur dioxide would continue to reduce TVA's contribution to air pollution. See Response to Comment 1.

3. Would like to see improvements in air emissions. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3084**

**Response to Comment 3:** See Responses to Comments 1 and 2.

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4. Do we need more air pollution when the area already ranks nationally as one of the top five in poor air quality? **Drew Danko, 1022**

**Response to Comment 4:** See Response to Comment 1. Contrary to media reports, air quality in the Tennessee Valley region has been steadily improving. The USEPA's decision to make its ozone- and particle-related national standards more stringent will now result in additional emission reductions, ensuring that air quality will continue to improve.

5. As a non-smoking Tennessee resident facing lung surgery for a tumor, I have a strong interest in establishment and enforcement of the most stringent air pollution regulations. Release of small quantities of carcinogens is NOT acceptable. It is better to prevent introduction of hazardous chemicals into our air and water supply than to enact laws to filter them out later. **Lorraine Nobes, 18**

**Response to Comment 5:** TVA has conducted health risk assessments of toxic releases from its coal-fired power plants. Those assessments, which indicate that the releases do not substantially add to the risk of cancer incidences, have been reviewed by an independent third party. See the discussion of hazardous air pollution in Section 4.2.

6. Air quality would suffer if drawdown were to be postponed, as in the recreational alternatives. The loss of hydropower would be compensated by fossil fuel combustion in the worst period for air pollution. TVA should be making every effort to improve air quality. **Michael Sledjeski, 2968**

**Response to Comment 6:** See Responses to Comments 1 and 2.

7. Both recreation alternatives would result in increased fossil-fuel emissions during the period of highest air pollution. TVA power plants are presently the chief cause of air pollution in the area, resulting in conspicuous degradation of plant life, and visibility and a less obvious, but just as real adverse impact on human health. **Michael Sylva, 2124**

**Response to Comment 7:** See Responses to Comments 1 and 5.

8. Maximize all clean air potential for coal plants ASAP, please. **Pr. John Freitag, 983**

**Response to Comment 8:** Comment noted.

### **Climate**

1. Climate is important. Our scientists tell us global warming is real. We know there is a much higher incidence of asthma in children than in the past. This may be related to air quality and climate. For the sake of our children and for the future of the planet, please protect the air resources. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3107**

**Response to Comment 1:** TVA actions to mitigate emissions of carbon dioxide include expansion of green power sources, increased use of generation that emits fewer or no greenhouse gas emissions, and support of carbon emission reduction programs.

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### Water Quality

1. Important to me, but not to such an extreme that other areas are severely affected. **Anonymous, 3072**

**Response to Comment 1:** TVA developed a Preferred Alternative that enhances recreational opportunities on a number of reservoirs and tailwaters, while reducing the potential for adverse water quality effects that was associated with a number of the alternatives identified in the DEIS.

2. Improved navigation and improved water quality seem to go together. **Anonymous, 3074**

**Response to Comment 2:** Comment noted.

3. Water Quality - Only 7 out of the 35 reservoirs were modeled for changes in water quality. The water quality parameters should have been modeled for all reservoirs considered in the EIS so that impacts could be analyzed for each reservoir. The proposed changes in TVA's operations should not be based on only a small portion of the system.

Although the change in reservoir retention time and change in volume of low DO water is presented for the reservoirs modeled, the number of days of low DO water is not presented in the same tables (Appendix D). An increase in low DO volume may only include lower elevations, which typically may not even impact aquatic habitat or compliance with water quality standards. The significance of the increase or decrease in the volume of low DO water is not described in the water quality sections. **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3735**

**Response to Comment 3:** This is a programmatic EIS and use of representative reservoirs is an appropriate approach for a Valley-wide evaluation. A total of 26 reservoirs and 10 tailwaters were modeled and model outputs were examined during preparation of the EIS. Representative reservoirs were chosen from these results for more in-depth analysis. Based on comments on the DEIS and the operations policy of the Preferred Alternative described in the FEIS, model results from two additional representative reservoirs were included in the final evaluation and presentation of water quality information.

4. Reports on water quality for Lake Chatugee reflect fair to good and medical people in the area state that to swim in the lake can have adverse effects, involving ear infections and skin eruptions. As recent residents to the area, we hear about homes along the tributaries and on the lake frontage that have sewage flowing directly into the water system. Is this a Clay County in North Carolina and Towns County in Georgia issue or does TVA have any clout in cleaning up problem areas? **Alice Russell, 642**

**Response to Comment 4:** Other federal and state agencies have primary regulatory authority over water quality and sewage disposal facilities. However, TVA is concerned about water quality in its reservoirs and works cooperatively with other agencies, businesses, and landowners to encourage actions to improve water quality.

5. There have been septic systems that have been allowed to be put into flowage easement areas, and my concern is that the septic is going to be entering into the water. And this

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high water has not been a consideration to land management in the past, and how are they going to handle the roads and the septic systems that have been allowed to put in the easement areas when they do hold the water up higher? **Angela Boyda, 4368**

**Response to Comment 5:** See Response to Comment 4. The June 1 flood guide levels would not be higher than they were in the past under the Preferred Alternative. Some roads and septic systems located in flowage easements would be subject to more—but still infrequent—inundation under the Preferred Alternative.

6. Please try some how to try and clean up South Holston lake. It is filthy and am ashamed of it. **Anonymous, 139**

**Response to Comment 6:** See Response to Comment 4.

7. I'm concerned that this objective only considered water quality of reservoirs, not those in tail waters. Could these two objectives be split into 2? **Anonymous, 20**

**Response to Comment 7:** Water quality in 10 tailwaters was modeled for the Base Case and alternatives identified in the EIS. Tailwater quality was an important metric in the threatened and endangered species analysis. Temperature, dissolved oxygen (DO), and water surface elevation were evaluated for the tailwaters.

Additionally, some of the reservoir metrics were chosen due to their potential impact on tailwater quality. For example, the Base Case and alternatives were compared for their potential to form anoxic (very low DO) conditions at the bottom of the reservoir. Under these conditions, manganese and iron in the bottom sediments may dissolve into the water. When this water is discharged into the tailwater, brown stains may appear on the rocks and shoreline downstream. Therefore, an alternative with better DO in the reservoir would result in better conditions in the tailwater.

Regardless of the alternative chosen, TVA is committed to maintaining the existing DO targets in the tailwaters. This may lead to adding aeration capacity at some sites. TVA's cost of additional aeration was included in the cost analysis.

8. I am seriously concerned that no alternative was included that optimized water quality on the reservoir system. The Navigation alternative helps water quality the most, but I'm concerned about the by products effects on water supply and purity. **Anthony Morris, 2715**

**Response to Comment 8:** Water quality improvement was an important consideration in the formulation of all of the alternatives. Because the alternatives considered span a reasonable range of alternative operations policy, water quality effects or consequences varied. There are many demands placed on the Tennessee River system, all of which TVA considers and integrates when making decisions about use of available water. Water quality is one of those considerations. For example, TVA operates the river system to provide minimum flows at numerous locations specifically for water quality. Water quality played a very important role in the development of the Preferred Alternative. One of the fundamental changes proposed in the Preferred Alternative is to manage reservoir operations to achieve certain flows, rather than certain levels in summer, June 1 through Labor Day. This is expected to improve water quality in low-flow years in the latter part of summer.

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9. How is DO effected by alternatives in mg/ltr. No graphs or tables to indicate how close or how much deviation from TVA's commitments in base case. **Arland Whitlock, 566**

**Response to Comment 9:** Section 5.4 provides a variety of data and graphics relating to DO. More detailed information is contained in the Water Quality Technical Report. This report is in TVA's administrative files.

10. Water quality and water supply are my next biggest concerns and should be managed as the second highest priorities. **Betty M. Fulwood, 2292**

**Response to Comment 10:** Protecting water quality and managing to ensure adequate water supply are also goals of TVA. Chapter 3 of the FEIS includes a description and the reasoning behind the formulation of TVA's Preferred Alternative and indicates the roles of water quality and water supply in this alternative.

11. Water quality and water supply with higher lake levels, how can that be adversely affected also, I'm asking, for the fact that water is there, and not a dwindling supply of it, away from the tributary lakes. **Carroll and Gail Johnson, 4403**

**Response to Comment 11:** There are two components to water supply: (1) the cost of extracting water from reservoirs, which is decreased (a beneficial impact) by higher reservoir levels and (2) the quality aspect of the raw water in the reservoir. When reservoir levels are held up, flows through the system are generally decreased, water can stagnate, and water quality in the reservoir can deteriorate, which leaves the water more difficult to treat (an adverse impact). See Sections 4.4, 4.5, 5.4, and 5.5.

12. That is one of the first things I look for. I'm afraid we have way too much runoff in our rivers. This ends up in our reservoirs (such as TVA) and sits there with its load of pollutants. Nasty stuff. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3105**

**Response to Comment 12:** See Sections 4.5, 4.16, 5.5, and 5.16 and Response to Comment 4.

13. Continuation of the liquid oxygen injection system currently in use is encouraged. This is important to support the fishing opportunities in the tailwaters. This also assists in the aquatic insect population to insure adequate food production for the species in the river. We suggest that there be continued research in this area. As new technology and techniques become available it would be advantageous to implement them to insure the water quality of the lake at Blue Ridge and the Toccoa River. **Jacquelyn O'Connell, 3801**

**Response to Comment 13:** TVA is committed to maintaining these DO targets, regardless of any changes that may result from this review of TVA's reservoir system operations policy. To ensure effective and efficient operation, TVA continually researches products and techniques as they become available. When innovations appear promising, TVA conducts either bench-scale or pilot tests to evaluate potential application within the Tennessee Valley region.

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14. There are significant water quality issues in the Elk River. There is ample evidence to suggest that there is untreated sewage—including some very obvious above-ground septic systems that are right on the river bank that have not been dealt with. **Jean Prater, 1373**

**Response to Comment 14:** Other federal and state agencies have primary regulatory authority over water quality and sewage disposal facilities. However, TVA is concerned about water quality in its reservoirs and works cooperatively with other agencies, businesses, and landowners to encourage actions to improve water quality.

15. There are many natural lakes without a drawdown that have better water quality than the TVA reservoirs. I don't believe that keeping the water up through the 1<sup>st</sup> of November would create a problem. **Joe Brang, 863**

**Response to Comment 15:** Reservoirs differ from natural lakes in many ways. Some of the more important differences are:

- *Water temperature.* TVA's reservoirs are warmer than most natural lakes. The warmer water helps more algae grow, which can deplete DO that aquatic life need.
- *Drainage basin.* The land area draining into a natural lake is usually small in comparison to the lake area. The land area draining into a reservoir is usually large compared to the reservoir area. This means there is more opportunity for nutrients and pollutants to rinse into the reservoir.
- *Inflow.* Runoff usually flows into natural lakes via small streams and often through wetlands before reaching the lake. These wetlands reduce the nutrient and pollutant load to the lake. Most inflow to reservoirs enters via high flow streams, directed along old riverbed valleys, where there is less opportunity for the nutrients to be reduced. Increased nutrient loads contribute to more algal growth.
- *Outflow.* Outflow is relatively constant from natural lakes and water flows out from the surface of the lake. Reservoir outflows are irregular, and withdrawals are typically from the bottom of the reservoir.
- Many reservoirs have been built to promote economic development.

Maintaining reservoir levels longer in fall requires releasing letting less water from the reservoir. Data and model results indicate that these lower flows affect water quality. Maintaining constant levels through November 1 would also result in unacceptable impacts on flood risk.

16. [Under the Tailwater Alternative] with levels remaining constant, I think that TVA could look at alternatives when discussing Water Quality and Aquatic Resources. Many of our northern neighbors have taken drastic steps in their older still water lakes. They have actually flown in large aerators to draw oxygen depleted bottom waters and thrust it into the air somewhat improving the quality. This would serve in much the same way as weir dams do in the tailwaters of rivers below dams. This also would allow natural regeneration of aquatic plant life to return thus renewing the process of replenishing the natural nutrients needed for healthy macroinvertebra. **Joe Payne, 60**

**Response to Comment 16:** TVA uses a wide range of methods to improve DO concentrations in tailwaters. As the commenter indicated, one way is through aerating

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weirs (small dams designed to add oxygen to the water as it plunges over the top of the weir walls). Another method is turbine venting. TVA has developed a technique for this method using hub baffles and bypass piping to draw air into hydroturbines and mix it with water as power is generated. Air compressors and blowers are used at other sites to force air into the water flowing through the turbine.

Two other methods are used by TVA to improve tailwater conditions, each of which add oxygen to the reservoir immediately upstream of the dam. Hydroturbine intakes typically draw water from deep levels in the reservoir, creating low-oxygen conditions downstream of the dam. One of these methods is the use of surface-water pumps, which resemble large ceiling fans. These pumps push warm, oxygen-rich surface water downward, where it is mixed with low-oxygen bottom water and then drawn in by the turbines during generation. The other method TVA uses in the reservoirs is the use of oxygen injection systems. The system consists of an oxygen tank and evaporators on the bank that are connected to diffusers, perforated hoses suspended above the reservoir bottom upstream of the dam. All these methods are used to improve conditions in the tailwaters.

Theoretically, the oxygen injection system could be used to aerate an entire reservoir. However, due to the volume of TVA's large reservoirs, this would be infeasible, both in terms of cost and the ability to obtain and diffuse the volume of oxygen needed. The method of drawing bottom water and thrusting it into the air, as the commenter suggested, is frequently used at wastewater treatment plants to aerate sewage. On a large scale, such as on the reservoirs, pollution prevention and reservoir operation are much more effective and practical than treatment.

17. In the video presentation, a somewhat negative impact on . . . water quality was indicated, however this was based on computer modeling, which, while an approximation of reality, is subject to question. I am interested in how the data was gathered, and whether the current TVA baseline is really a true median for all the factors at stake. So many things are affected by any change in the system, but I have to assume the overall benefit to the public is the eventual goal. **Margaret H. Schramke, 1436**

**Response to Comment 17:** The baseline, or existing conditions, as described in Section 4.4, was based on TVA's extensive Vital Signs Monitoring Program, which examines biological, chemical, and physical conditions in most TVA reservoirs. The program is in its 14<sup>th</sup> year and provides a very good representation of existing conditions. Water quality models were successfully calibrated against existing baseline conditions in order to ensure the validity of predicted results, and used to predict conditions that do not yet exist and for which there is no available data. TVA's objective in the ROS is to identify changes to TVA's reservoir system operations policy that will improve the overall public value of the system.

18. We also are concerned about water quality and would agree with exceptions to this plan in years when water quality is significantly affected by low inflow or other factors. **Michael and Evelyn Fink, 430**

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**Response to Comment 18:** During drought conditions, TVA strives to continue to meet water quality and water supply commitments, and uses the flexibility in its reservoir operations policy to maintain other minimum levels of benefits to the extent possible. As discussed in Section 3.4, TVA is considering developing a formal drought management plan that would supplement its reservoir system operations policy.

19. I would like to see water quality monitored more than it is at this time. **Mrs. Jean Roberts, 1919**

**Response to Comment 19:** TVA has an extensive monitoring program, Vital Signs Monitoring, which provides extensive amounts of data from locations throughout the Tennessee Valley region. This program was started in 1990 and is expected to continue into the future. Other federal and state agencies also monitor water quality conditions.

20. Water needs to be tested regular and be enforced to keep clean water for fishing and over wildlife, also people health. **Paul Howell, 4024**

**Response to Comment 20:** See Response to Comment 19.

21. In addition to concerns about flood control, I would also like to minimize any adverse effects on the water quality of the system. This puts a double whammy on alternatives 3C, 5A, 7C, and 8A. **Robert A. Lamm, 2920**

**Response to Comment 21:** Comment noted.

22. With the standards in Virginia getting tougher every year our health department is protecting our water quality in an upgrade on a yearly basis. This quality is elevated on a yearly basis. Development in our area is strict. Of the highest standards and tradesmanship ability we protect our water quality to send it to the Tenn. River System in the highest quality that they can get the most benefits from it. **Taulbee Lester, 2987**

**Response to Comment 22:** Comment noted.

23. I would like to see this a top priority of concern in conjunction with affiliated agencies who oversee and enforce industrial waste and farmland waste. My school students think the green color of the water is the natural color and have no idea how beautiful clean water can be. **Terry Sisk, 577**

**Response to Comment 23:** Other federal and state agencies have primary regulatory authority over water quality and sewage disposal facilities. However, TVA is concerned about water quality in its reservoirs and works cooperatively with other agencies, businesses, and landowners to encourage actions to improve water quality.

24. TVPPA supports environmental stewardship in the Tennessee Valley. We believe that its citizens have a basic right to clean water. Thus, TVPPA supports a balanced sensitivity that incorporates environmental quality improvements in the overall reservoir operations policy decisions. **TVPPA, Richard C. "Dick" Crawford, President & CEO, 4237**

**Response to Comment 24:** Protecting water quality was an important consideration in the formulation of TVA's Preferred Alternative. Although there could be some negative impact

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on water quality if the Preferred Alternative is implemented, compared to other alternatives that would enhance recreation, the expected effects would be less.

25. My house is on South Holston Lake and we have to have a septic system, sewer lines are not available for hookup. I don't believe this situation provides for optimal water quality. Are there any plans concerning this situation? Brian Mazzei, 134

**Response to Comment 25:** While it is true from the perspective of water quality that septic systems are less desirable than a sewer system connected to a wastewater treatment plant, a well-designed, properly installed, and periodically maintained septic system can effectively treat household wastewater. This EIS examines issues associated with possible changes to TVA's reservoir system operations policy. The resolution of site-specific problems, such as those identified in this comment, is addressed in other forums.

26. I think the winter water level should be maintained through the months of March, April and May because we have experienced our severest floods during those months in Decatur. When the pool is kept close to 553 heavy rains in those months cause the drainage system of Decatur to become slack water and our sewerage system seems to back up. ITolly G. Shelton, 2428

**Response to Comment 26:** Wheeler Reservoir is commonly filled during the period from March 15 to April 15 to full pool at elevation 555.75 feet. While holding Wheeler Reservoir levels low might relieve some of the backup on the sewage system, this comment suggests that the sewage system suffers from excessive infiltration and inflow or cross connections from the storm drain system. This is a design or operating problem. The sewage system should function without backup when Wheeler Reservoir is at full pool. After an extensive flood risk analysis, TVA is not proposing to change the spring fill period on Wheeler Reservoir under its Preferred Alternative.

### Water Supply

1. It would be wonderful and helpful, and even critical if the data information in your publications contained easily readable 'x-y graphs' covering the '30 year water and population projection period' this study suppose to be covering within the Tennessee River Watershed. These graphs would contain on the 'y' axis the population increase over 30 years. The 30 years would be on the 'x-axis.' Also there would be similar separate or overlay graphs showing the increase of water consumption with increasing population over the 30 year projection. Separate increased water uses over the 30 year period would be on either separate graphs or overlays. The water uses would include as your report indicates: drinking (residential), industrial, recreation, and etc. The water quantity would be related to satisfy the water quality needed for the uses. The water uses would take into account the water quantity needed to maintain the water quality for human/aquatic/biological/ecology criteria. The average water quantity and related quality would also include 'drought' and 'global warming' variables over the 30 year projection. The drought variable (based on historical water history) would decrease total available water. The 'global warming' variable will either increase or decrease the water quantity in this geographical region over the next 30 years. I assume the impact of 'global warming' and the 'drought variables' would be

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averaged into the total water quantity over the 30 year projection. Your 'Summary of Policy Alternative' tables are technically very wonderful, but visually for the ordinary citizens I do not believe are very readable for understanding the related impacts.

All of the above would indicate the decreasing amount of available water for inter-basin transfer from the Tennessee River Watershed to other regions over the next 30 years.  
**Frank DePinto, 3965**

**Response to Comment 1:** TVA's FEIS uses a variety of similar techniques to provide data in tabular formats. Among other things, summary material provided in the text of the EIS is typically expanded on in the appendices of the EIS, where readers can find more detailed information.

### **2. I. General**

**A. Yearly Projected Percentages of Growth for: Population/Business/ Industry/Commercial/Recreation and related water volume demands.**

1. What is the yearly percentage increase (10%, 12% population growth) TVA will be using for the six state area for the 30 year projected period?
  - a. also the yearly projected percentage growth for Business, Industrial and Commercial sectors?
2. What is the coinciding yearly increase of water increase for each of the above sectors?

**B. The average inches per yearly rainfall statistic which will be used for the study? (80 inches/year, etc)**

1. Does this include a global warming factor?

**C. Drought occurrences.**

1. The number drought occurrences within a 30 year time frame which will be used?
  2. What are the parameters of these drought occurrences?
    - a. Number of days, months, years of drought?
    - b. The yearly reduction of water availability due to projected drought conditions.
- Frank DePinto, 3968**

**Response to Comment 2:** Population is forecasted to increase from less than 10 percent in some parts of the watershed to more than 100 percent in other areas over the 30-year period. Likewise, business, industrial and commercial growth is expected to be slight in some areas of the watershed and extensive in others. Overall, population is expected to grow by about 31 percent over the watershed. Other growth factors in the next 30 years include:

- Public supply and commercial water use – 31 percent;
- Industrial use – 25 percent;
- Irrigation – about 37 percent;
- Cooling water for coal and nuclear power generation – about 11 percent; and,
- Total water use – about 14 percent.

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Average rainfall in the Tennessee River Watershed is presented in Section 4.3.3.

Potential global warming was not considered in the detailed modeling analysis of water quality and water supply effects because there are no reliable projections specific for the Tennessee River Watershed. In the water quality analysis, 8 years of varying meteorological conditions were considered. This included a record drought year, a very wet year, and a very warm year. The climate variability likely to occur in global climate change would be within the range of the variability illustrated during the 8-year simulation. Climate change and global warming are discussed in Sections 4.3 and 5.3.

The Base Case and each alternative were analyzed for the last 99 years of hydrologic record—the entire hydrologic record for the Tennessee River Watershed. This record includes both wet and drought conditions. Mean annual rainfall during this period varied from 35 to 65 inches per year, as explained in Chapter 2.

### 3. II. Priority/Allocation

A. Will each state know how much 'projected water' they will be getting for each of the 30 projected years so that they can plan growth/no growth?

B. Will there be any stipulations for water conservation programs in each state, and states where there is interbasin water transfer (a stipulation for inter-basin transfer)?

C. How will each state be allocation the quantity of volume of water per year? Will this be determined by the amount/percentage of area each state has in the watershed/waterstudy area? Or will it be determined by population number in the watershed/waterstudy area?

1. An example: say the State of Tennessee occupies 35% of the waterstudy area, so it will be able to obtain 35% of the water. Or: there are 1 million Tennesseans in the watershed/water study area so Tennessee will be able to obtain that amount of water for drinking, business, commercial and recreation uses. If Mississippi is only 6% of watershed/water study they will get 6% of the water flow.

a. Scenario: Would Georgia (say 5% of the watershed/water study area) be able to siphon off as much water from Tennessee as they want and transfer it to Atlanta?

b. Scenario: Will north Alabama which is in the watershed/waterstudy area be able to siphon off as much water as they want to send to South Alabama which is not in the watershed/waterstudy area?

3. Who/What type of committee/authorities will make the above decisions i.e. TVA, state agencies, federal agencies, etc. **Frank DePinto, 3969**

**Response to Comment 3:** Sections 4.5 and 5.5 address water supply issues. TVA's final reservoir operations policy and the analyses of it in this EIS will provide a framework for making the types of decisions identified in this comment. TVA has had over several years of dialogue with Valley states about water supply issues and the management of water supplies in order to meet the needs of the region now, and in the future, and that dialogue is ongoing. TVA is not, as part of the ROS or possible changes to its reservoir operations policy, proposing to establish a water allocation policy for the region. There are important and complex economic, environmental, and political considerations associated with developing such a policy that extend well beyond TVA's role as manager and steward of the water resources of the Tennessee River system.

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### **4. III. Contractual- Inter-Basin Water Transfer-Droughts**

A. Will there be stipulations that during droughts the amount of water originally contracted for Interbasin water transfers will be proportionally reduced during drought periods. **Frank DePinto, 3970**

**Response to Comment 4:** Net inter-basin transfers into and out of the Tennessee River watershed currently are only about 6 million gallons per day. All the transfers that account for this are the result of utility districts selling water to their neighbors. Some of this water is diverted above TVA reservoirs, where streamflow cannot be augmented in dry conditions by reservoir releases. Therefore, some of these utility districts might not have enough water during dry conditions. Contracts for the sale of such water generally carry provisions for what will happen when the seller has no water to supply the buyer. TVA is not involved in the provision of such contracts, and nothing in the ROS addresses what these utilities would do if flow in their unregulated streams declines.

Appendix D9 provides information about inter-basin transfers. The largest existing inter-basin transfer is 200 million gallons per day through the Tennessee Tombigbee Waterway. It is likely that this amount will not grow more than to about 300–400 million gallons per day over the next 30 years. The ROS, however, has conservatively assumed that the Waterway would operate at its design flow of 800 million gallons per day in 2030. TVA's analysis suggests that TVA's reservoir system could handle a diversion of this amount with limited effects, depending on where the diversions occur. As discussed in Section 3.4, TVA is considering developing a formal drought management plan that would supplement its reservoir system operations policy.

### **5. III. Contractual- Inter-Basin Water Transfer-Droughts**

A. Will there be stipulations that during droughts the amount of water originally contracted for Interbasin water transfers will be proportionally reduced during drought periods. **Frank DePinto, 3971**

**Response to Comment 5:** See Response to Comment 4.

### **6. IV. Legal Strategies to Protect Water Study Area.**

- A. What type of legal strategies have the State of Tennessee and other states within the Waterstudy Area devised to protect its water supply in anticipation of law suits from other states such as Georgia/Atlanta for more water than TVA would allocate?
- B. What legal protections do the citizen/state of Tennessee, etc. have that TVA will not sell its water to another state (outside the watershed/water study area) for greater profit i.e. if Atlanta is willing to pay more for water than the state of Tennessee or other states within the Water study areas?
- C. What legal protection does the state of Tennessee have from the federal government stipulating that water is a southern regional item (Tennessee, Georgia, Alabama, Florida etc.) and not a local watershed/waterstudy (Tennessee, Alabama, Kentucky, Mississippi) item. With such an interpretation and water allocations would be based on a total regional framework and the areas with more population would get the most water. Thus, Georgia and Atlanta would not only get its own water, but would be eligible for water in Tennessee. **Frank DePinto, 3973**

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**Response to Comment 6:** See Response to Comment 4. Tennessee has a law that requires a permit for transfers of water from one river basin to another. Should Georgia seek to divert water from Tennessee to Atlanta, Tennessee would have to agree to this action.

### 7. V. Aesthetic Attractive River Elevations.

#### A. Chattanooga

2. The city of Chattanooga's economy depends on tourism to a large extent. The attraction for tourists in Chattanooga is the Tennessee River. If drought occurs in the waterstudy area, the Tennessee River might be lowered for water transfer to other states thus leaving the water at lower than 'aesthetic attractive' level in Chattanooga, thus effecting tourism.
3. It would be pretty awful during a drought period for Atlanta to be getting Chattanooga's water that is now only 5 ft. above river bed and not a pretty site for tourists, thus demising tourism in Chattanooga. **Frank DePinto, 3981**

**Response to Comment 7:** See Response to Comment 4. None of the ROS alternatives would lower the elevation of Nickajack Reservoir. There are currently no proposals to withdraw water from Nickajack Reservoir for Atlanta. In fact, by Georgia state law, the solution to Atlanta's water problem must be found without considering inter-basin transfers of water. If this law changed in the future and a proposal was made to withdraw a large amount of water from the Tennessee River at Chattanooga, the proposal would be thoroughly evaluated to determine its effect under all hydrologic conditions and would require approval by the State of Tennessee.

### 8. VI. 30 Years of Soil Erosion. (Water Study projection)

A. "Water is like money in the bank. The bigger the bank one has the more money can be put in it."

1. It might be cost effective to dredge lakes, dam areas and rivers so more water can be stored.
2. It might be cost effective along with the Water Study to initiate a 'soil erosion protection plan' for the Water Study area using air and satellite photos. This could be part of a water conservation plan for all states in Study area and inter-basin transfer states. **Frank DePinto, 3985**

**Response to Comment 8:** Reservoir dredging and sediment control for the purposes of increasing reservoir storage were not included in the ROS as elements of an alternative operations policy. TVA has examined reservoir dredging at several locations and found it to be ineffective or too expensive to implement. TVA has implemented extensive soil erosion protection projects in the past (e.g., the reclamation of Copper Basin) and continues to look for opportunities for such projects particularly in cooperation with others. See Sections 4.16 and 5.16, where erosion is addressed.

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9. I live on Lake Chatuge. My property is near the town's county water treatment plant. The area is very flat by mountain lake standards. A draw down of 4-5 feet exposes 15-20 feet of mud and red dirt.

I have wondered just how far out into the lake the supply pipe is that provides the county water. **Harold Andrews, 2423**

**Response to Comment 9:** The Clay County Water Service District—which serves Hayesville—is a groundwater system and is unaffected by Chatuge Reservoir levels. Hiwassee, Georgia, has a surface water intake on Chatuge, which can pull water from as low as 1,895 feet.

10. Flood Control on the Duck was conceived as a two dam river. Columbia didn't get theirs and Shelbyville should not suffer additional flood risk to benefit Columbia's water supply. There are more prudent solutions for Columbia; namely, its ability to provide for drinking water by building a smaller lake on a tributary of the Duck.

To conclude, I would strongly oppose any solution that would increase flow on the Duck. Should Normandy Dam be raised, increased flood control should be one of the benefits.

If the City of Columbia has involved itself in these discussions and that involvement has not made it into the record, I would be disappointed. **Harold Segroves, 3**

**Response to Comment 10:** None of the alternatives considered for the ROS would change the configuration of Normandy Reservoir, the operation of Normandy Dam and Reservoir, or the flow in the Duck River. The Duck River would not be affected by the Preferred Alternative.

11. In regard to Normandy Dam and its management, it is my opinion that nothing should be done that might increase average flows on the Duck River. It is my understanding that one solution the City of Columbia has to combat its own water quality problem would be to have Normandy Dam increase its release into the Duck. I also understand it might be possible to raise the dam at Normandy to help accomplish Columbia's needs.

I am concerned that Columbia's water needs have been a subtext of this TVA study. I can find some verbal proof that this is the case but can find nothing in the study indicating this as an issue. **Harold Segroves, 1**

**Response to Comment 11:** See Response to Comment 10.

12. In the late 1970s, Tupelo was forced to switch from ground aquifers to surface water. The aquifers were being drawn down so far that communities within 25 miles were affected by reduced water levels in their wells. The switch to surface water was essential for human consumption and economic development purposes.

Tupelo, through the Northeast Mississippi Regional Water Supply District, constructed an 18-mile pipeline, water treatment plant and pickup point on the Tombigbee River. A water withdrawal permit was granted for up to 30 million gallons per day. This system is being paid for by a 25-cent sales tax collected in Tupelo.

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The Northeast Mississippi Regional Water Supply District services Tupelo, Baldwyn, Saltillo, Verona, Turner Industrial Park, Tupelo-Lee Industrial Park and North Lee Industrial Park. Fulton has just joined the system and has a main water line under the Tennessee Tombigbee Waterway. The system is truly a regional system at the present time.

Future needs are additional water allocation as the system grows and matures. Current use is in the 60 percent of withdrawal limits. This growth indicates that additional needs for water will be necessary within the next several years.

The future needs will be with the small rural systems that need to connect to a dependable water supply. This is critical for rural systems because of the financial stabilities they face.  
**Mayor Larry Otis, 4348**

**Response to Comment 12:** Sections 4.5 and 5.5 address water supply issues. Appendix D9 presents an analysis of potential effects from inter-basin transfers, including operation of the Tennessee–Tombigbee Waterway.

### **Groundwater Resources**

1. High priority to protecting ground water from depletion and from contamination. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3088**

**Response to Comment 1:** Sections 4.6 and 5.6 address groundwater.

### **Aquatic Resources**

1. In Chapters- 4.7 and 5.7, TV A acknowledges that only the currently existing species and habitats were considered during analysis of the alternatives. However, the EIS should place more importance on native habitat and species, especially those that are rare or imperiled. The Board of Directors should be aware that certain negative impacts on aquatic resources are not as significant as other negative impacts. For instance, a reduction in species or habitat for a non-native, hardy species found in reservoirs may not be considered as significant as the same reduction to a native riverine species. So an overall negative impact to aquatic resources (as illustrated in the Executive Summary) does not necessarily mean a significant change in important native habitat **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3736**

**Response to Comment 1:** We recognize the importance of protecting native species, especially those that are threatened or endangered. However, TVA also realizes that several non-native species are highly managed to provide for sport fisheries. Sections 4.7, 5.7, 4.11, 5.11, 4.13, and 5.13 address aquatic resources, invasive species, and threatened and endangered species, including non-native species. Metrics developed to evaluate aquatic resource impacts included aspects important to native species, such as flow, water temperature, and DO concentrations. A metric was directed at reservoir habitat for cool-water fish species—both native and introduced.

2. The value clean, healthy water and aquatic habitats is not included in the economic model. While we understand that a numerical value would be difficult to determine, the TVA Board

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of Directors should be aware that these values were not considered. We would like to point out however, that the public places a great deal of value on the protection of the environment, as determined, during TVA's scoping process. **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3737**

**Response to Comment 2:** The importance of and potential impacts on these resources are fully addressed in the FEIS. TVA chose not assign monetary values to these resources; rather, to discuss them in terms of natural metrics, such as concentrations of DO as an indicator of water quality.

3. I would like to see the number and status of native flora and fauna improved even if it means that sport fishing opportunities decrease. **Anonymous, 9**

**Response to Comment 3:** Comment noted.

4. The lower levels and early pulls has an adverse effect on the biotic community. Does the TVA really care?? Or is power generation their main goal? **Bill Frisbey, 1445**

**Response to Comment 4:** Power generation is only one of several goals of the operation of the TVA reservoir system. Chapter 2 of the EIS describes in detail the reasons why TVA reservoirs are drawn down each year. Reservoirs are drawn down to maintain flood storage necessary to minimize flood risk, to generate hydropower, to provide minimum flows for aquatic resources, and to meet downstream water requirements, such as providing cooling water for nuclear and coal-fired power plants, processing water for industry, or flow for navigation. See Section 5.7 for a discussion of the potential effects on aquatic resources.

5. Do not want to see the aquatic resources harmed. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3087**

**Response to Comment 5:** See Section 5.7 for a discussion of the potential effects on aquatic resources.

6. Would like to see commercial musselling banned in all TVA reservoirs. **Chris Perkins, 3830**

**Response to Comment 6:** State fisheries agencies are responsible for regulating commercial mussel harvest in TVA reservoirs.

7. I also support maintenance of instream flows below TVA reservoirs to support healthy aquatic ecosystems; however, these measures should be enacted only after site-specific instream flow studies that will accurately quantify habitat needs and therefore minimize the amount of hydropower losses to the reservoir projects. In particular, there is no need for minimum releases on the Ocoee #3 and #2 projects because of the highly impaired nature of the river ecosystems from years of pollution in the Copper Basin upstream and from existing hydropower operations. **David M. Ashley, 2096**

**Response to Comment 7:** While it is true that aquatic resources in the Ocoee River have been devastated by acidic releases from Copper Basin activities for many years, conditions have improved considerably. Tennessee has been successful with acid

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neutralization at one Copper Basin stream and may eventually be able to treat other streams enough to improve conditions for aquatic life in the Ocoee River. Although minimum flows may not be helpful at Ocoee #2 and #3 presently, they could be in the future. Minimum flows are beneficial for the Toccoa/Ocoee River below Blue Ridge Dam and Ocoee #1 Dam.

8. We need to broaden the discussion to take into account the environmental health of the river system. **Guy Larry Osborne, 1267**

**Response to Comment 8:** The purpose of much of the FEIS is to discuss factors potentially influencing the environmental health of the river system. These discussions were broken down into individual aspects of the environment that were most likely to be affected by various policy alternatives. Discussion of some specific aspects have been enhanced. For example, the FEIS contains additional discussion of factors that could influence fish spawning success and determination of year class strength (i.e., numbers of fish that attain sizes large enough for capture by traditional sport fishing techniques). It also describes factors that could influence waterfowl and shorebird numbers, if water levels were held high longer into summer and early fall.

9. I am concerned that the quantity and quality of our aquatic habitat is being compromised and our children's children will not have the option of fishing on our waters. **Lorraine Nobes, 12**

**Response to Comment 9:** Aquatic resources and habitats are addressed in a number of EIS sections including, primarily, Sections 4.7 and 5.7.

10. I own a farm at the head waters of South Holston Lake, the South and Middle Fork rivers. My water level has dropped nearly three feet this week. I have noticed for ten years now at the number of fish that are lost to the water level dropping so rapidly. The farm in mention has over 4,000 feet of water frontage. **Larry Akers, 162**

**Response to Comment 10:** Tributary reservoirs play an important role in flood control; after heavy rainfall and associated runoff, reservoirs must be lowered to regain the flood storage space. Efforts to recover flood storage are made in accordance with prescribed policies that balance the need for recovering flood storage, reducing flood damage downstream, and minimizing environmental impacts in the reservoir. In the specific instance mentioned, the reservoir was lowered to flood guide level within the prescribed policies.

11. Every effort should be made to improve tailwater habitat regardless of which alternative is chosen. **Richard Simms, 2388**

**Response to Comment 11:** Regardless of the alternative, TVA is committed to maintaining existing tailwater conditions first established in the Lake Improvement Plan.

12. Limitations of the "Tailwater Habitat Alternative"

The Nature Conservancy's primary concern with the draft PEIS is that the management alternative intended to benefit these same aquatic habitats, the "Tailwater Habitat

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Alternative," is interpreted as having either adverse or, at best, no effect on either warm-tailwater biodiversity in general or protected species in particular. We believe the problems with this alternative are twofold; the first being the manner in which different species groups were lumped during the impact interpretation, and the second being in the parameters of the alternative itself

In Section 4.7.5, Tailwater biodiversity, cool-water and warm-water tailwater aquatic communities are described separately. However, the discussion of the "Tailwater Habitat Alternative" in Section 5.7.10 lumps these habitat types under one category, "Tailwaters," and concludes that "results suggest no change to biodiversity under this alternative." Native warm- water fauna and introduced cool or cold water species generally have conflicting temperature requirements. Therefore, when these species are combined under the umbrella of "general biodiversity" to interpret effects of the various ROS alternatives, these conflicting requirements may cancel one another out and disguise otherwise beneficial effects for native warm-water species. For example, Section 5.13 - Threatened and Endangered Species, indicates that in warm, free-flowing tailwaters substantial benefits to fauna are seen in many instances under the Tailwater Habitat Alternative. **Scott Davis, Executive Director, Tennessee Chapter of The Nature Conservancy, 3743**

**Response to Comment 12:** Cool-water and warm-water fish species were combined for the purposes of describing potential impacts on biodiversity. This was done because fish species in both of these groups typically are not restricted in warm- to cool-water habitats (except for high water temperatures that could limit cool-water species; however, these conditions would not occur in tailwaters under any policy alternative). Cold-water habitats on the other hand typically have low biodiversity (see Section 5.7.1). Any alternative that would warm tailwater releases was considered to result in beneficial impacts on aquatic biodiversity. As noted in Section 5.7.2, metrics used to evaluate impacts on biodiversity included several directed at changes in water temperature (some comparing water temperatures during the summer and August-September periods, and another addressing hours with a water temperature less than 16 °C). As noted in Table 5.7-06, temperature conditions in warm and cool-to-warm tailwaters would not differ from the Base Case, except for the Cherokee Tailwater, which would have lower temperatures that would adversely affect biodiversity in that particular tailwater.

13. Shoreline habitat is vital to fish spawning and here on Kentucky reservoir we have seen severe shoreline habitat loss due to barge traffic, large pleasure boats, and higher lake levels. **Steve McCadams, 3171**

**Response to Comment 13:** Under the Preferred Alternative, the Kentucky Reservoir operating guide curve would not change from the Base Case.

14. The World Wildlife Fund comments are focused primarily on the aquatic biodiversity aspects of the PEIS.

Section 4.7, Aquatic Resources, [recognizes] "the construction of the TVA reservoir system significantly altered both the water quality and physical environment of the Tennessee River, with little regard at the time for aquatic resources." The reservoir system has indeed created "local extinctions," particularly of native mollusks and fish. However, the compound effect of "local extinctions" in reservoir pools and tailwaters multiplied across the entire Tennessee Valley also resulted in severe habitat fragmentation for our native aquatic

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fauna. In spite of all this, the remnants of the native Tennessee Valley aquatic fauna still rank among the most diverse on the planet. In fact, World Wildlife Fund, the Nature Conservancy and others recognize the aquatic systems of the Tennessee Basin as some of the most significant freshwater systems in the world. As a result, we feel that TVA must place a strong emphasis on protecting and managing specific reaches of free-flowing river habitat in the Valley in order to minimize the risk of further species extinctions. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 3545**

**Response to Comment 14:** As indicated in Section 3.4.1, TVA is aware of the wide diversity and the biological importance of several mainstem and tributary stream reaches within the Tennessee River basin. TVA has evaluated—and will continue to evaluate—project-specific activities that could enhance or improve recovery of endangered and other native aquatic species in these areas. TVA made a commitment in the 1990 Lake Improvement Plan to provide minimum flows below TVA projects. No alternative formulated for the ROS would reduce that commitment.

**15. Limitations of the "Tailwater Habitat Alternative"**

World Wildlife Fund agrees with The Nature Conservancy's primary concern with the draft PEIS which is: that the management alternative intended to benefit these same aquatic habitats, "Tailwater Habitat Alternative," is interpreted as having either adverse, or at best, no effect on either warm-tailwater biodiversity in general or protected species in particular. WE believe the problems with this alternative are twofold: the first being the manner in which different species groups were lumped during the impact interpretation, and the second being the parameters of the alternative itself.

In Section 4.7.5, Tailwater biodiversity, cool-water and warm-water tailwater aquatic communities are described separately. However, the discussion of the "Tailwater Habitat Alternative" in Section 5.7.10 lumps these habitat types under one category, "Tailwaters," and concludes that "results suggest no change to biodiversity under this alternative." Native warm-water fauna and introduced cool or cold-water species generally have conflicting temperature requirements. Therefore, when these species are combined under the umbrella of "general biodiversity" to interpret effects of the various ROS alternatives, these conflicting requirements may cancel one another out and disguise otherwise beneficial effects for native warm-water species. For example, Section 5.13—Threatened and Endangered Species, indicates that in warm, free-flowing tailwaters, substantial benefits to fauna are seen in many instances under the Tailwater Habitat Alternative. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 3546**

**Response to Comment 15:** See Response to Comment 12.

- 16.** The general framework of the Tailwater Habitat Alternative, given the constraints imposed by deep reservoir distributed throughout the system, limits TVA's ability to maintain adequate DO levels in both reservoirs and tailwaters. As evidenced by the success of the Reservoir Release Improvement Program, we believe that TVA can manage reservoir releases to the benefit of the native aquatic fauna. The Tailwater Habitat Alternative as designed does not meet water quality objectives due to reservoir levels that may be

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excessively high. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 4183**

**Response to Comment 16:** See Responses to Comments 12 and 14. Although water depth is a contributing factor to low DO concentrations in many reservoirs, citing it alone as a major contributor without acknowledging the complexities of oxygen depletion in the hypolimnion of reservoirs can be misleading. There are numerous examples in the Tennessee Valley region where deep reservoirs exhibit much less oxygen depletion than shallower reservoirs.

Other preliminary alternatives that passed between 50 and 75 percent of the inflow were evaluated in the screening process but were determined to result in substantial adverse impacts on several other operating objectives:

17. As is clearly described in Section 4.4, deep water is a major contributor to low DO levels. Larger releases from reservoirs would allow for water levels to meet other project objectives, reduce residence time, and improve quality of reservoirs and tailwaters. Better quality water and higher tailwater flows would be beneficial to native aquatic fauna. In addition, lower winter reservoir levels would reduce the adverse impact of this alternative on flood storage. Justification should be given for releases of only 25% of inflows or a new alternative should be designed with higher flows. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 3871**

**Response to Comment 17:** See Response to Comment 16.

### **Fishing**

1. I like fishing **Anonymous, 3174**

**Response to Comment 1:** Comment noted.

2. You can't fish the banks of the reservoir when lake is full for limbs hanging over – especially true on South Holston and Boone Reservoirs. **Alan Mitchell, 705**

**Response to Comment 2:** Comment noted.

3. Would like to do what's possible to enhance and preserve fishing. Critical for preserving wildlife. **Ben Robinson, 3977**

**Response to Comment 3:** State fisheries agencies are responsible for management of the fisheries resources in TVA reservoirs. TVA does work in concert with these agencies when possible to enhance environmental conditions.

4. As a South Holston tailwater fisherman I am concerned about water temperatures stressing trout during the month of August. We have experienced temperatures in excess of 70 degrees Fahrenheit in May when you are releasing (2) one hour pulses a day in an attempt to bring the lake level to full pool by May 31. **Bob Cheers, 269**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 4:** Retention of water in reservoirs such as South Holston enhances tailwater trout fisheries by creating a larger body of cold water. By retaining the water and releasing it at intervals, summer and early-fall water temperatures in the tailwater can actually be decreased (which is better for trout). Section 5.7.11 of the EIS provides additional explanation. In addition, the Preferred Alternative includes increased minimum flow releases from South Holston Reservoir from April 1 through October 31, which would result in colder tailwater temperatures for the downstream fishery.

5. Fishing is a wonderful pastime for many people. Native fish species should be encouraged. Commercial fishing should be monitored and controlled when it threatens to reduce the fish populations. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3104**

**Response to Comment 5:** See Response to Comment 3.

6. The reduction of the shoreline scrub/shrub wetland habitat will have a significant impact on the spawning success of crappie and largemouth bass on Kentucky Reservoir, as well as other mainstem reservoirs. With significantly reduced spawning success, these species could suffer population declines, which would significantly reduce fishing success.

This loss has the very real potential of decreasing standing stocks of sport fish such as white and black crappie and largemouth bass. If indeed this does occur, the economy of this region will suffer significantly. As it stands now, the summer season finds most resorts filled to near capacity with folks who come to the lake for water-related sports such as boating and swimming. However, most resort owners will tell you that these three months are not what is critical to the success of their business. It is the visitation of fishermen to this area in the months of March through May and September through November that make or break the resort's business for the year. If fishing success suffers as a result of reduced fish spawning and nursery habitat from mortality inflicted by longer periods of full pool water levels, visitation to the resorts will suffer significant declines during the "off-season" time frames previously mentioned. **Gary D. Jenkins, 2110**

**Response to Comment 6:** TVA's Preferred Alternative would not change the operating guide curve for Kentucky Reservoir, thereby avoiding potential impacts on fish spawning and nursery habitat.

7. In my opinion, the fishery of TVA's mainstem reservoirs could possibly be severely and significantly affected by any alternative which would cause extension of full pool elevation any longer than currently being implemented. **Gary D. Jenkins, 2105**

**Response to Comment 7:** As discussed in Section 5.7.2, extending the time that reservoirs are kept at full pool would, over a period of successive years, decrease available habitat. Reservoir bottom areas would not be dewatered for sufficient time to allow adequate growing conditions for redeveloping the desirable vegetative growth that provides the nutrient boost, good spawning, and nursery habitat for the fishery.

8. On behalf of Clinch River Chapter of Trout Unlimited. Concerned with summer hydropower alternative could significantly increase number of days of warm water releases that can stress both trout and invertebrates. Concerned that Recreation Alts A and B could lead to increases in deposited sediment due to increase in periods of minimum flow during summer. We recommend that TVA review possibility of special flushing releases during

## **Appendix F3 Response to Specific Public Comments**

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major rain events when extended minimum flows are in effect. We believe these would not be needed often and cost would be minimum. Second, recommend that TVA look for ways to increase minimum flows above 200 cfs on Norris. **H. B. McCowan, 3944**

**Response to Comment 8:** Under TVA's Preferred Alternative, these problems would largely be avoided. TVA considers peaking flows to be flushing flows and does this when water is available. Most of the year, the daily average minimum flow from Norris Reservoir is greater than 200 cubic feet per second (cfs). See Appendix A for these flows. These have been included in the Base Case, as well as in each alternative analyzed.

9. Can you explain why fishing has been so bad in the last few years? **James and Lavada Mansfield, 3823**

**Response to Comment 9:** Numbers of fish typically fluctuate annually, based on numerous environmental conditions and management options. State agencies are responsible for the management of sport fish.

10. More fishing time. **Jerome Alton Connor Jr., 2064**

**Response to Comment 10:** Comment noted.

11. I think that the Ocoee (upper and middle) needs to have consideration of its fish river habitats like you give to the Hiwassee. The waters going into the Ocoee are being cleaned up in the Copperhill area and the river should be able to support for fish life. But the lack of any but absolute bare minimums except for flood control releases and recreational releases seems to me to preclude much life support in the river sections. **John Hubbard, 2389**

**Response to Comment 11:** Aquatic resources and habitats are addressed in a number of EIS sections including, primarily, Sections 4.7 and 5.7.

12. TVA does not do a good job of regulating the lakes for fishing... I feel income in the area is probably decreasing rather than increasing due to water control by TVA. **Karen Niehaus, 3853**

**Response to Comment 12:** See Response to Comment 3.

13. Crappie fishing should get the highest priority in this area. **Kathy Mesmer, 465**

**Response to Comment 13:** Comment noted.

14. No Sea Bass brought in. They have ruined my crappie fishing. **Marlin Seaton, 2735**

**Response to Comment 14:** Comment noted.

15. The way that TVA operates the generators affects our ability to put commercial fishing nets in the water. If the flow is high, we cannot work. It's very important that we continue to be able to get the generation schedule off the computer that TVA now provides on their website. It's also important that we be able to get the daily schedule off of the recorded telephone line at Pickwick Dam. **Mike Kelley, 4524**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 15:** The recorded flow information systems would not be changed under any of the alternatives.

16. One of the recommended alternatives, and I think it was the navigation alternative, where the flow would be continuously an increase flow would severely affect about 400 commercial fishermen and mussel drivers on the Kentucky Reservoir, from Pickwick Dam down to Kentucky Dam. Again I repeat, when the flow is high, we cannot work. To put it in real numbers, when it is in excess of 30,000 CFS. **Mike Kelley, 4525**

**Response to Comment 16:** Under the Preferred Alternative, the flow regime at Pickwick is not expected to change materially on a daily basis.

17. Our fish should be managed in the right way. **Paul Howell, 4027**

**Response to Comment 17:** See Response to Comment 3.

18. Plan A would help fish population along with a TWRA ban on fishing during spawning. **Phillip Davis, 2377**

**Response to Comment 18:** Comment noted.

19. The list below is people who like fishing in South Holston lake. Mr. & Mrs. Johnny Holmes, Mr. & Mrs. Charles Eastridge, Mark Ford, Mr. & Mrs. Lawrence Eastridge, Rev. Dennis Banks, Mr. & Mrs. Jonathan Duff, Mr. & Mrs. Robert Buchanan, Brian & Richard Duff, Troy Terry, Mr. & Mrs. Ralph Duff. We appreciate you keeping the lake at full stages thank you very much. **Ralph Duff, 306**

**Response to Comment 19:** Comment noted.

20. Management efforts should be conducted to enhance and improve fisheries resources. **Richard Simms, 2236**

**Response to Comment 20:** See Response to Comment 3.

21. I will make my comments on fishing here. I have a fishing license, so I fish in addition to boat. I hope that your ultimate operational decisions are not based on lobby from BASS. If fishermen can't catch fish with the electronics that are available to them in today's market, they need to pick another sport. **Suzie Reed, 43**

**Response to Comment 21:** Comment noted.

22. East Lake here in Morgan County just below west of the railroad bridge, normally here we call it the Flat Areas, a stumpy grass area, I would like to present a restocking area of large-mouthed bass because this area hosts the Bassmasters, other tournaments, revenue for this area.

I have an idea for restocking. They are small concrete octagons with holes in them to hold fish, to put a string of large-mouthed bass and other big bass that would draw revenue tournaments here, but they have to grow, be restocked, no fishing for a couple of years to hold in these grassy areas.

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The issue about commercial fishing in the brochure and what I've seen today, I don't believe it was met or nothing was done. Could you look into it and TVA write – give me a letter, call, set up another meeting? **Tim Stewart, 4345**

**Response to Comment 22:** See Response to Comment 3.

23. Issue of a fish attractor, I am going to pursue it, seek a permit and we'll go with that, see how we do on that. That's for areas for the Bass Pro tournaments, environmental or how y'all list it as – this category would be under Aquatic Fishing, I believe. There's a section here under Sports Fishing and Commercial Fishing. That is what these fish attractors would do, bring revenue, and help the environment, fishing in this area. **Tim Stewart, 4346**

**Response to Comment 23:** There are guidelines pertaining to the placement of fish attractors on TVA reservoirs. Those guidelines, as well as permits for attractor placement, can be obtained from the appropriate TVA Watershed Team.

24. Would like to see the level of Douglas lake maintained at 2/3 full OR LESS. Duck hunting and fishing seem to be best when the lake levels are kept lower than they are now. Some really big fish were caught from Douglas Lake during the 60s and 70s. No more. **William E. Hixson, 923**

**Response to Comment 24:** Comment noted.

25. This plan would give the boaters more recreational time in the summer and fall. And also would benefit the fisherman also. **Windel Lester, 125**

**Response to Comment 25:** Comment noted.

### **Wetlands**

1. Protect the wetlands which help water quality. Even the tailwater habitat increases pooling stability and thus doesn't aid water quality. Address a water quality option. **Anthony Morris, 2716**

**Response to Comment 1:** Sections 4.4, 5.4, 4.8, and 5.8 address water quality and wetlands. Water quality improvement was an important consideration in the formulation of all the alternatives. Because the alternatives considered span a reasonable range of operations policy, water quality effects or consequences varied. Many demands are placed on the Tennessee River system, all of which TVA considers and integrates when making decisions about the use of available water. Water quality is one of those considerations. For example, TVA operates the river system to provide minimum flows at numerous locations specifically for water quality. Water quality played a very important role in the development of TVA's Preferred Alternative. One of the fundamental changes proposed in the Preferred Alternative is to manage reservoir operations in such a way to achieve certain flows—rather than certain levels—in summer (June 1 through Labor Day). This is expected to improve water quality in low-flow years during the latter part of summer.

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2. The emphasis on wetlands is absurd. The protection of so called wetlands is often illogical. Like most matters or causes, extremists seem to rule. **Bill Dearing, 2186**

**Response to Comment 2:** Wetlands perform a number of very important water quality and ecological functions. Under the Clean Water Act, certain wetlands are protected. In addition, Executive Order No. 11990 establishes a policy under which federal agencies are to avoid construction activities in wetlands and minimize adverse effects on wetlands. As a federal agency, TVA is committed to protection and stewardship of wetlands. Sections 4.8 and 5.8 address wetlands.

3. Preserve existing wetlands and nurture potential wetlands. Do not destroy existing wetlands. They are one of our greatest natural resources. I won't list all their contributions. Constructed wetlands are nice if they are not replacing a natural wetland which was lost through "development." **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3097**

**Response to Comment 3:** See Response to Comment 2.

4. Wetlands are important to strong ecosystem. **Chris Perkins, 3828**

**Response to Comment 4:** Wetlands are addressed in Sections 4.8 and 5.8.

5. As indicated in the study, scrub/shrub wetlands on Kentucky Lake and other mainstem reservoirs will suffer significant impacts as a result of increased duration of full pool elevations. **Gary D. Jenkins, 2109**

**Response to Comment 5:** Potential effects on scrub/shrub wetlands and other types of wetlands are addressed in Section 5.8. Under TVA's Preferred Alternative, operating guide curves for Kentucky Reservoir would not be changed, and the wetlands and flats on that reservoir would not be affected.

6. On Kentucky Reservoir in particular, the shoreline scrub/shrub wetland vegetation was significantly reduced by the change in dates of beginning drawdown starting in the early 1980's. Prior to that change, water started being drawn from Kentucky Reservoir on June 15. The change was to start the drawdown on July 5. This additional two weeks of high water started increasing mortality of plants such as buttonbush, water willow, and black willow that at one time grew out as deep as the 357 contour on the lower portion of the reservoir. Now, one would be hard-pressed to find any of this vegetation thriving below the 357.5 contour, again on the lower portion of the reservoir. With an increased time of inundation of this vegetation as proposed in the current alternatives, it is highly probable this vegetation will suffer greater devastation. **Gary D. Jenkins, 2106**

**Response to Comment 6:** See Response to Comment 5.

7. I don't like bugs and snakes, but accept them as part of the outdoors. Too many communities are being built at the edge of our lakes and rivers and wiping out the very habitat that made the house on the lake so desirable.

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TVA should consider stronger restrictions for homes and communities that build on or near aquatic areas. **Lorraine Nobes, 22**

**Response to Comment 7:** TVA's Shoreline Management Initiative (SMI) (TVA November 1998) and resulting policy addressed this.

8. If TVA messes up in this area it will be a national disgrace. Many school programs talk about wetland communities and youth today are very aware of the need to preserve these areas. Be very careful to stay on the side of conservation rather than progress in management of wetland areas, because many eyes are watching. **Lorraine Nobes, 32**

**Response to Comment 8:** TVA is committed to stewardship of wetlands on TVA reservoir lands. Potential changes to wetlands and other sensitive ecological resources throughout the region have been evaluated. See Sections 4.8 and 5.8.

9. The Base Case presents the least adverse effect on lowland areas and their plant and animal inhabitants. Migratory birds are at risk because of rampant habitat loss. The TVA water system provides a vital "lifeline" for these birds. Their future may very well depend on the flats that are created in the TVA tributary areas at drawdown. Any choice that raises or maintains higher water levels year round will eliminate the flats. Choices that maintain water levels for longer periods of time, miss the migratory time frame. Any of these choices adversely affect migratory birds. Tree species that currently survive with part of the year spent in the dry, would surely suffer under conditions that would keep them submerged year round. Loss of these species would have an adverse effect not only on the aesthetics of an area but also on animals and other plants that depend on them or relate to them in various ways. **Leslie J. Gibbens, 84**

**Response to Comment 9:** Shorebirds were identified as important resources in the EIS. As noted in Section 5.10, most of the identified alternatives would adversely affect shorebirds, as well as some species dependent on forested wetlands—mostly from the extension of summer pool levels on various reservoirs. TVA considered these impacts when developing the Preferred Alternative and has made changes where appropriate to accommodate this important resource.

10. Wetlands improvement is almost certain to result. **Mark Patterson, 2898**

**Response to Comment 10:** The wetland analyses conducted for this EIS indicate that holding reservoir levels higher longer would increase the period of inundation of wetlands and flats, and result in some adverse effects. See Sections 5.8 and 5.10.

11. A potential compromise: limit drawdown in Douglas Lake to 980 feet from Aug. 1 until Labor Day, then, say, 970 feet until Oct. 1. This would allow plenty of lake surface for recreation and esthetics, and permit power generation during the late summer period of high demand. Most importantly, the established wetland cycle would be preserved and the dependent wildlife species protected. **Michael Sylva Sledjeski, 78**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 11:** TVA formulated a Preferred Alternative in an effort to enhance recreational opportunities on a number of reservoirs and tailwaters, while reducing the impacts associated with the alternatives identified in the DEIS. See Appendix C for elevation probability plots along with flood guide curves for tributary reservoirs, including Douglas, under the Preferred Alternative.

12. Wetland sites should be protected and enhanced in every way possible. TVA should not penalize groups who work to enhance wetland habitat through winter flooding. In other words, don't charge people for holding back water for wildlife development projects.  
**Richard Simms, 2247**

**Response to Comment 12:** Comment noted.

13. Most of the alternative will increase the flood risk to the managed wetlands on Kentucky and Wheeler Reservoirs. These wetlands provide valuable habitat for many species of fish and wildlife. They are also important areas for recreation activities such as hunting. If changes are made that increase the risk of flooding TVA should mitigate the risk.  
**Robert Wheat, 2813**

**Response to Comment 13:** Potential flood risk to managed wetlands and associated infrastructure are discussed in Sections 4.8 and 5.8. Under TVA's Preferred Alternative, operating guide curves for Kentucky Reservoir would not be changed and the important wetlands and flats on that reservoir would not be affected. Wheeler Reservoir minimum winter pool elevations would be raised by 0.5 foot under the Preferred Alternative. See Section 5.14.

### Aquatic Plants (Including Invasive Aquatic Plants)

1. Aquatic Plants - Hooray for past programs to retard hydrilla and other aquatic plants that choked reservoirs! Hooray!  
**Anonymous, 3244**

**Response to Comment 1:** Comment noted.

2. Public should be made more aware of the potential good or bad of plants and trees they may be placing on our shorelines so as not to damage the environment over the long term.  
**Anonymous, 605**

**Response to Comment 2:** TVA has an active program that provides information to landowners about beneficial native vegetation that can be used along shorelines.

3. Invasive aquatic plants are a problem and should be vigorously pursued with a goal toward elimination.  
**Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3086**

**Response to Comment 3:** Invasive aquatic plants such as Eurasian watermilfoil, hydrilla, and spinyleaf naiad—the most abundant invasive species in the TVA reservoir system—are so abundant and widespread that eradication is not feasible. Although these species are exotic, they provide benefits to fish and wildlife, and an eradication effort would likely be opposed by angler and waterfowl organizations, and some state resource agencies. TVA works with stakeholder groups to develop reservoir-specific management plans for

## **Appendix F3 Response to Specific Public Comments**

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controlling invasive and nuisance aquatic plants along areas of developed shoreline, where they hinder recreational use or restrict boating access. See Section 4.9.

4. The City of Guntersville is concerned about the impact of the policy changes and their effect on the aquatic weeds that we are dealing with on the Guntersville Reservoir. We have worked with TVA through the Stakeholders Group to manage and control these invasive aquatic plants. We are satisfied with the progress we have made together with TVA and would not support a policy that would hamper or hinder that process. We feel that the Base Plan is working for us. **City of Guntersville, Alabama, 2332**

**Response to Comment 4:** No reservoir operating guide curve changes are proposed for Guntersville Reservoir under the Preferred Alternative. TVA is appreciative of the support and accomplishments of the Guntersville Stakeholder Group in managing aquatic vegetation in Guntersville Reservoir.

5. I would hope that "Real" science would be used to control the invasive aquatic species of plants, i.e. milfoil and hydrilla. Too many sports fishermen continue to believe that the more plants there are then the more fish there are. Science refutes this and I hope that the TVA is not swayed by emotion put forth by uninformed fishermen. **Harold DeHart, 2132**

**Response to Comment 5:** Aquatic vegetation in moderate amounts is considered beneficial to the reservoir fishery. However, when aquatic plants become overabundant they can adversely affect fish growth and the structure of fish populations, and hinder angler access to "prime" fishing areas. Aquatic plant management plans are developed to promote balanced use of the resource—controlling aquatic plants in some areas and protecting aquatic plants in other areas as fish and wildlife habitat.

6. As I watched the video, I didn't see any discussion of aquatic plants and plant growth. And my property is on Wheeler Lake and I'm very concerned that we do not get aquatic plant growth similar to what they have on Guntersville Lake.

So I'm curious if these alternatives where we keep the water at a higher level throughout the year, in the wintertime particularly would in any way enhance the growth of these undesirable milfoil or other aquatic plants in the lake.

I like the idea of the lake levels being kept at a higher level in the winter as compared to where it is now, but if there's going to be any adverse affect of enhancing the aquatic plant growth, I would be very disappointed. **John Dumbacher, 4331**

**Response to Comment 6:** Higher winter levels on mainstem storage reservoirs, such as Wheeler, could favor the establishment and expansion of species such as Eurasian watermilfoil and hydrilla into the area of the drawdown zone that would no longer be dewatered during late fall and winter months. In many mainstem reservoirs, this portion of the drawdown zone with suitable substrate is already colonized—primarily by spinyleaf naiad and other plants that regrow from seed when flooding occurs during summer months. Therefore, higher winter levels could shift the composition of the plant community in the portion of the drawdown zone flooded by higher winter levels. The extension of summer pool levels could slightly decrease coverage of Eurasian watermilfoil and hydrilla colonies on the deep-water side due to a reduction in light penetration and slightly increase aquatic plant coverage in the drawdown zone. Regardless of the alternative, aquatic plants in

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mainstem reservoirs are expected to fluctuate widely in response to natural climatic and hydrologic events that are beyond the control of TVA. See Sections 4.9 and 5.9.

7. As a fisherman who has been on Kentucky Lake, Barkley, and Priest for several years, I find the lack of aquatic vegetation very disturbing. Years ago, it was possible to see and hear frogs and toads, now they can rarely be seen. I think this may be due to a loss of their habitat and food supply. Consideration needs to be given to bringing back vegetation to support the eco-system needed for reptiles and amphibians. **Lorraine Nobes, 16**

**Response to Comment 7:** TVA recognizes that aquatic plants, including invasive species such as Eurasian watermilfoil and hydrilla, provide benefits to fish and wildlife. TVA also recognizes that an overabundance of aquatic plants impedes many types of recreational activities, restricts access to shoreline areas, and negatively affects the ecological balance within a reservoir. To achieve balanced use of the resource, TVA works with stakeholder groups representing a wide variety of user interests to develop reservoir-specific aquatic plant management plans that allow control in designated areas and protect aquatic plants in other areas for fish and wildlife habitat. Aquatic plants fluctuate widely primarily in response to hydrologic and climatic events that are beyond the control of TVA. Planting of native vegetation is very costly, and expected results are small in comparison to increases that occur during years with optimal growing conditions. See Section 4.9.

8. I am concerned with the growing presence of the aquatic plant Hydrilla that continues to plague Pickwick Lake and the Tennessee River. An aggressive plan to rid this plant of our waterways needs to be developed before it overtakes the regional waters. Last summer there was a sizeable "island" of the plant on the main body of the lake about 1 mile upstream from Pickwick Dam. It caused numerous incidents of damage to boats and PWC but fortunately no loss of life as in other recreational lakes such as Lake Austin in Texas, where uncontrolled neglect of the plant caused an eventual shutdown for a season to recreational boating resulting in major economic impact. **Mark Wiggins, 2275**

**Response to Comment 8:** See Response to Comment 3.

9. All seven policy changes note that they would have an adverse affect on the abundance and spread of aquatic weeds. This, of course, throws up a "red flag" to us on the Guntersville Reservoir. We would not support any policy that would increase the aquatic weed on our reservoir. **Milla M. Sachs, 2331**

**Response to Comment 9:** See Response to Comment 4.

10. I would also like to see if there is anything that can be done about water weed control. At one time it was sprayed for, but we have terrible problems with prop fouling. We know the anglers love it, but it causes tremendous problems for us. **Pat McAlister, 2352**

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**Response to Comment 10:** An overabundance of aquatic plants can affect boating and restrict access to developed shoreline and other areas within reservoirs. All aquatic plant management activities within TVA reservoirs are guided by reservoir-specific plans developed by stakeholder groups that represent a wide variety of user interests. These plans promote a balanced approach to the use of the resource, by allowing control in designated areas while protecting aquatic plants in other areas for the benefit of fish and wildlife. See Section 4.9.

11. Aquatic plants good if keep clean Paul Howell, 4030

**Response to Comment 11:** See Response to Comment 3.

12. There should be recognition that some species once considered "invasive," provide great benefits. Specifically Eurasian milfoil provides great benefits to fish and wildlife, especially waterfowl. Richard Simms, 2239

**Response to Comment 12:** See Response to Comment 3.

13. Management efforts should be conducted to improve and enhance aquatic vegetation in the reservoirs as they provide great benefits for fish and wildlife. Richard Simms, 2235

**Response to Comment 13:** See Response to Comment 3.

14. I would like to see the resource managed to INCREASE the number of aquatic vegetation to provide more habitat for fish and wildlife. Richard Simms, 2219

**Response to Comment 14:** See Response to Comment 3.

15. The plan should recognize that there can be benefits to certain species that some people might consider "invasive." Eurasian milfoil has long been considered "invasive," yet provides great benefit to fisheries and wildlife. There must be an acceptance of the benefits of some of these invasive species. Richard Simms, 2225

**Response to Comment 15:** See Response to Comment 3.

16. Don't make any changes that will allow more millfoil and hydrilla to grow. Rita Dumbacher, 3955

**Response to Comment 16:** Except for the Summer Hydropower Alternative and the Equalized Summer/Winter Flood Risk Alternative, which are expected to decrease coverage of submersed and floating-leaved aquatic plants, climatic and hydrologic events beyond the control of TVA are expected to override any potential changes in coverage associated with the other alternatives during most years (see Section 5.9). Aquatic plants in mainstem reservoirs are expected to continue to fluctuate widely in response to natural climatic and hydrologic events. Hydrilla is expected to continue to expand in TVA mainstem reservoirs under the Base Case or any of the other alternatives.

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17. With respect to invasive aquatic plants, we encourage TVA to consider alternative means of controlling plant growth. Reducing nutrient-laden non-point source runoff and point source discharges of nutrients would retard the growth and spread of invasive plants without using herbicides. **Southern Environmental Law Center, 3615**

**Response to Comment 17:** TVA Watershed Teams currently work with stakeholder groups and local and state agencies throughout the Tennessee Valley region to reduce non-point pollution. TVA also works with stakeholder groups representing a wide variety of user interests to develop reservoir-specific plans for managing aquatic plants. The various options for managing aquatic plants are reviewed prior to development of the plans. Management methods in the plans primarily include the use of herbicides for controlling aquatic plants in near-shore areas of developed shoreline and mechanical harvesters for opening and maintaining boating access lanes.

18. The water levels this summer has reduced the amount of algae and weeds growing in my slough by a considerable amount. **Thomas H. Hollingsworth, 3521**

**Response to Comment 18:** Comment noted.

### Terrestrial Ecology

1. If you chose an alternative plan that does reduce the amount of late summer / fall habitat, I urge you to mitigate this loss by providing a comparable or greater amount of habitat distributed elsewhere across the reservoir system. I would also urge you to commit to managing this replacement habitat in perpetuity. **Benny Thatcher, Graduate Research Assistant, Natural Resources Program, Department of Forestry, Wildlife and Fisheries, University of Tennessee, 2549**

**Response to Comment 1:** As noted in Section 5.10, most of the identified alternatives would affect flats habitats used by shorebirds and waterfowl. This issue ranked highly when TVA developed its Preferred Alternative. TVA considered potential impacts on threatened and endangered species and on resident and migratory wildlife. TVA's Preferred Alternative better addresses these issues than the alternatives identified in the DEIS, which were formulated to improve recreational opportunities by holding levels higher longer. The Preferred Alternative would result in fewer impacts on wildlife resources than the other action alternatives. For example, under the Preferred Alternative, TVA would not change the operating guide curves for Kentucky Reservoir, which has flats that are important to migrating wildfowl. See Sections 4.10 and 5.10. Also see Chapter 7 for a discussion of mitigation.

2. Waiting until later to lower water level will cause an undue burden on a majority of people, so that a small minority of wealthy landowners and boat owners can play, and enjoy raised property value....

It will reduce the number of nature lovers who travel to places such as Rankin Bottoms — who spend money there. **Charles, 2653**

**Response to Comment 2:** Comment noted.

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3. Improve the wildlands to support habitats to support as wide a variety of species as possible. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3093**

**Response to Comment 3:** Comment noted.

4. Particular attention to our R/T/E species habitat which is used year round, breeding habitat, or is an important migratory stop-over for some species. Please be sure that if any of their habitat is lost they will have another place to stop that is as rich as the one they are presently using. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 4181**

**Response to Comment 4:** See Response to Comment 1.

5. It is my understanding that, in the TVA Reservoir Management Study the Base Case (No-Action Alternative: current operating conditions), pool levels begin to drawdown around July 1 each summer by a few inches per day. This results in great habitat for shorebird migration. Regular utilization includes killdeer, plovers, yellowlegs, sandpipers, and dowitchers by the hundreds, perhaps thousands at many sites. However, the TVA does not have comprehensive survey or inventory data. Checking the TNWR bird checklist, 10 waders and bitterns, and over 30 shorebirds could be affected by a change in habitat availability.

If an alternative other than the Base Case is selected and implemented, pool levels will be significantly altered during the peak shorebird migration period, sometimes low, but most times too high to provide the kind of habitat available for them in most normal years. Either way, changes in the current operations will greatly reduce or potentially eliminate this habitat.

TVA should compile all known data on species occurrence, numbers, alternative sites, alternative site utilization, for the project area. Also, assess the potential for reservoir habitat loss and shorebird use with each alternative.

TVA should evaluate potential to avoid impact to certain high quality areas, and nominate these areas as Important Bird Areas. Mitigate loss through creation of other suitable habitat, purchase of other habitats (assuming purchase isn't a high priority habitat for other valuable resources).

Evaluate (research if necessary) use of areas and impact of habitat loss to shorebird energetics during migration. **Christine Liberto, 2434**

**Response to Comment 5:** See Response to Comment 1.

6. Delaying of the drawdown will likely cause continued decline of buttonbush as did the delay that occurred in the 80's. This buttonbush habitat is very important for brood rearing habitat for wood ducks. This could cause decline in the wood duck population. Crappie lay their eggs in buttonbush and this is also important habitat for fish fry. Loss of the buttonbush could be damaging to fisheries on Kentucky Lake as well as others. Loss of this habitat will also speed erosion of islands and the shoreline. This buttonbush habitat is also used by breeding prothonotary warblers as well as migrant warblers. This loss could hurt these populations. Presently flats on the lake are important for fall shorebird migration which begins in early July. Delaying the drawdown will reduce this habitat. Pace Point on the Big

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Sandy Unit of the Tennessee National Wildlife Refuge used to be the most important migration stopover for shorebirds in the state. The delay that occurred in the 80's significantly hurt this area for shorebirds and another delay will be even more detrimental. Another concern is increased flood risk. Hurricanes and tropical storms from the Gulf Coast often dump very heavy rains on this area in late summer. Flooding at this time could ruin the waterfowl foods on the WMA's and Refuges significantly hurting wintering waterfowl populations and hunting. I feel this change will be very detrimental to habitat and wildlife populations in this area. **Clayton Ferrell, 2498**

**Response to Comment 6:** See Response to Comment 1.

7. I am concerned about potential adverse impact on breeding and migrating birdlife (and other aquatic life). It is my sincere hope that TVA place a high value on the ecological results of any changes in reservoir operations. It is my understanding that ANY of the changes being considered will harm waterfowl. If this is the case, I would encourage TVA to reject any of the changes.

I realize that this is a complicated and confusing issue, so I would appreciate any additional information (or sources of information) — if a human reads this and can indeed email me.

**Dan Feather, 2685**

**Response to Comment 7:** Your request for additional information has been forwarded to our Resource Stewardship staff for a response. See Response to Comment 1.

8. Finally, the loss of flats would negatively impact shorebirds. Of the 74 species of shorebirds in North America, over one-third are exhibiting population declines, and 22 are considered conservation priorities. Many shorebirds make extremely long migration, some flying from the Alaskan tundra all the way down to the beaches of Argentina. These flights require a tremendous amount of energy, and all feeding sites along the way are critical to the survival of these species. The loss of flats would reduce the chances of survival for many shorebird species. **David A. Aborn, Ph.D., 2091**

**Response to Comment 8:** See Response to Comment 1.

9. All of your proposed alternatives would increase water levels on the Hiwassee River during the fall and winter, the time when the cranes are here. This would cause the loss of flats and sandbars which the cranes rely on for roosting and feeding. The loss of roosting/feeding sites would result in one of two possible detrimental effects.

The second possibility would be that the cranes stayed in the area, but would begin utilizing off-refuge fields and farm ponds for roosting and feeding. This would result in the cranes being viewed as a nuisance, and could lead to people poaching them or calling for a hunting season on the cranes. **David A. Aborn, Ph.D., 2089**

**Response to Comment 9:** The mouth of the Hiwassee River is an important area for migrating sandhill cranes. Under TVA's Preferred Alternative, the reservoir operating guide curves would be similar to the Base Case during late fall and winter. Consequently, the flats still would be available to the cranes under this alternative, and potential impacts on sandhill cranes should be minimal.

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10. In addition to the sandhill cranes, Hiwassee Wildlife Refuge figures mainly in the efforts to restore endangered Whooping Cranes to the eastern United States. For the past 2 years, ultralight aircraft have been leading flocks of juvenile Whooping Cranes on a migration from Wisconsin to Florida. Hiwassee is one of the places the planes land and the flock spends several days there. The US Fish and Wildlife Service hopes that Hiwassee will be one of the main resting areas for the cranes when they begin migrating on their own. Last year, several of the birds from the previous years' flights did indeed stop at Hiwassee for several days to rest and feed before continuing their migration. The loss of roosting and feeding areas would seriously impair the efforts to restore an endangered species. **David A. Aborn, Ph.D., 2090**

**Response to Comment 10:** See Response to Comment 9.

11. Serious concerns. All your proposed alternatives would increase water levels on Hiwassee during fall and winter, the time when cranes are here. Causing loss of roosting/ feeding sites, resulting in detrimental effects. **David A. Aborn, Ph.D., 4060**

**Response to Comment 11:** See Response to Comment 9.

12. One of the most disturbing things about changing the river operating plan is the effects the various alternatives will have upon Rankin Wildlife Management Area on Douglas Lake in Coker County, I. During the fall, Rankin Bottoms is a crucial migrations stop-over for thousands of shorebirds as well as large waders such as herons and egrets, Bald Eagles, Peregrine Falcons and waterfowl.

Shorebird migration begins in late June and continues until October or even November; however, the peak of this migration occurs from late July through early September. First-year birds (born the previous summer) and non-successful breeders are the first to trickle back through in late June. Early July the males of many species begin to return from the Arctic breeding grounds leaving the females to brood and raise the young. In late July and early August, the females pass through, having left the fledged young to fend for themselves. The juveniles are typically the last to pass through beginning in early August throughout the remainder of the season with peak numbers in late August. The juveniles have a high mortality rate to begin with and depend highly upon reliable migration stop-overs on their long trip south.

In addition to shorebirds, Rankin WMA is important to large wading birds such as Great Blue Heron, Black-crowned Night-Heron, Green Heron, Cattle Egret, Great Egret, Little Blue Heron, Snowy Egret, and White Ibis. The first four species mentioned are known to breed at Rankin; the last four disperse from their breeding colonies further south and come to Rankin specifically to take advantage of the easy feeding opportunities as fish are trapped in ponds as the water level drops. In late August, over 300-400 waders can often be found feeding and roosting at Rankin making the area look more like the Everglades than East I. Local breeding and dispersion into the area are timed to coincide with the lake drawdown.

Bald Eagles also come to Rankin at this time for the easy fishing. Migrating Peregrine Falcons follow the flocks of shorebirds and ducks and can often be seen preying on them at Rankin.

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The current operating plan with drawdown beginning on 1 August provides excellent habitat for shorebirds and waders in late August right at the crucial time, during the peak of shorebird migration and during post-breeding dispersal of the large waders. That is why they have learned to come here. Delaying the drawdown until 1 September would mean that suitable habitat at Rankin would not be exposed until late September or even early October, well past the peak migration period for shorebirds, eagles and Peregrine Falcons and after many of the waders will have headed back south **Dr. K. Dean Edwards, 2726**

**Response to Comment 12:** Most of the proposed alternatives in the DEIS affected waterfowl and shorebirds in varying degrees. Some alternatives reduced the amount of flats habitats by extending summer pool or raising winter pool levels. TVA's Preferred Alternative better addresses these issues than other alternatives that seek to enhance recreational opportunities. See Response to Comment 1.

13. [If you choose to deviate from the Base Case] I urge TVA in the strongest terms to ... to (1) mitigate the loss [of critical habitat for migrating shorebird, herons and egrets] by providing a comparable or greater amount of habitat distributed across the reservoir system, and (2) commit to properly manage this replacement habitat in perpetuity. **Elizabeth Wilkinson-Singley, 2571**

**Response to Comment 13:** See Response to Comment 1.

14. Additionally, several species of wildlife could be adversely affected by such an action. Many species of birds such as Prothonotary warblers, red-winged blackbirds, utilize this habitat for nesting. Wood ducks use these areas for feeding, resting and brood protection. Many species of water snakes and turtles inhabit these habitats. With the loss of this habitat, significant impacts on these species can be expected. **Gary D. Jenkins, 2111**

**Response to Comment 14:** Comment noted.

15. Raising winter level and not exposing river mud bars would completely do away with waterfowl watering at refuges and hunting along the river and at management areas. My lifetime observation show the present policy is working well. **J. Don Burgess, 4164**

**Response to Comment 15:** The proposed changes under the Preferred Alternative would not result in substantial changes that would affect dewatering activities at associated wildlife refuges and management areas.

16. Reservoir Recreation Alternative A would have an adverse impact on migratory shore birds. This would be beneficial to Chatuge since we have too many Canada Geese that have ceased to migrate. **James B. and Elizabeth F. Eppes, 4014**

**Response to Comment 16:** Comment noted.

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17. We (Candace Myers, PhD and I) are writing a guide to birding sites along Interstate 40. One of our best sites is Rankin Bottoms, particularly for wading and shore birds. Delaying the late summer Water drawdown would eliminate critical habitat for shorebirds, herons, egrets, etc for Tennessee. There are a limited number of migrating flats for these birds in Tennessee. While the drawdown delay might benefit waterfowl such as ducks, geese and swan there are plenty of lakes to accommodate these birds. **James K. Luce, MD, 2513**

**Response to Comment 17:** See Response to Comment 5.

18. I strongly object to any plan that destroys or endangers bird and other wildlife habitat. Such plans diminish the quality of life in the Tennessee Valley. If TVA chooses an alternative that destroys important bird habitat, I urge TVA to mitigate the loss by providing a comparable or greater amount of habitat distributed across the reservoir system, and that TVA commit to properly manage this replacement habitat in perpetuity. **Jerry Hadder, 2505**

**Response to Comment 18:** See Response to Comment 1.

19. It is my understanding that there is a proposal to change the time frame the water levels will be increased or decreased. In doing so it endangers the feeding and wading areas of many shorebirds that have built in migratory cycles. I watched a documentary on Yellowstone National Park and how badly it was devastated in the 1920's and through the 1950's all the get the dollars from tourism. Those that use the lakes will not suffer if the boating season is cut short will they? TVA has been an organization that for many years has been trying to balance nature and business and has done a very good job. I hope that you will consider the impact your plan my have on those migratory birds. I will also contact my congressman to let them know what I think as well. **Kelly, 3158**

**Response to Comment 19:** See Response to Comment 1.

20. The shrub/scrub community at the headwaters of Douglas Lake appears to be at the limits of tolerance to prolonged submersion, More black willows and buttonbushes die off during years of prolonged high lake levels. **Michael Sylva, 2126**

**Response to Comment 20:** Under the Preferred Alternative, the fall drawdown would be similar (albeit slightly slower) than the average drawdown observed under the Base Case. The changes for Douglas Reservoir are not expected to result in significant reductions of scrub/shrub plant communities.

21. During the winter months, the flats are very unpleasant to look at. Perhaps migratory birds do like flats somewhere but I have yet to see them here. **Michelle Maloney, 2421**

**Response to Comment 21:** Flats can be an important feeding and resting resource for many birds. See Sections 4.10 and 5.10.

22. The original primary purposes of your dam and reservoir system were power production and flood control. Once in full operation, secondary benefits appeared—some perhaps not anticipated by the planners. As currently operated the system provides excellent fishing year-round, as well as critical habitat for migrating shorebirds, herons, egrets, and other species. In Douglas Lake in particular [where we have for many years enjoyed the fishing and the birdlife], the long months of low water provide time for vegetation growth on the

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exposed flats. When the water level is raised in the spring, these areas become nurseries for many aquatic species, causing Douglas to be one of the most productive lakes around. And the flats at Rankin Bottoms and elsewhere have become important stopovers for migrating shore- and wading birds in August and September. We feel that delaying the late summer drawdown would be a big mistake. The numerous wildlife species that now call our TVA lakes home have adapted to the patterns of high/low in remarkable and delightful ways. Why can't the people who live on the lakes do likewise? **Thomas and Marian Fitzgerald, 3537**

**Response to Comment 22:** Comment noted.

23. I have enjoyed Douglas Lake as a fisherman and wildlife observer for many years. If drawdown schedule is changed, what will be the impact on aquatic species and migrating waterfowl that use the flats as they come through? For over 50 years TVA has maintained the same drawdown schedule and I know for a fact as a fisherman when they draw it down in late August, September, but the time you get to October, there are weeds sprouting and in the spring when it fills back up this provides a great place for baby fish who have been spawned. After all these years, when the aquatic and wildlife have attuned themselves, what is the impact? **Tom Fitzgerald, 3953**

**Response to Comment 23:** Flats must have adequate exposure to air for the annual vegetation to become established. This vegetation provides food for waterfowl, and the exposed flats become feeding areas for migrating shorebirds. See Sections 4.10 and 5.10.

24. It is apparent that many of the alternative reservoir management scenarios outlined in the ROS, would maintain higher water levels during the late summer, fall and winter months. This practice would lead to significant reductions of important habitat for migrating shorebirds, wading birds, and waterfowl, as well as some species of songbirds and raptors. Currently, a large portion of the shorebird foraging habitat available to migrating shorebirds during late summer, and early fall months found in the Tennessee Valley is located within the TVA reservoir system. Unfortunately, this habitat is not quantified. Nor does the study discuss the availability of alternative habitats or the proportion of shorebird, wading birds, and waterfowl in the Tennessee Valley that are dependent on this habitat. This information is critical to the development of measures to mitigate the adverse affect of higher water levels.

We have noted that a few important shore bird areas in mainstream reservoirs, including Pace Point on Kentucky Lake and Savannah Bay on Chickamauga Reservoir, no longer support the late summer/early fall shorebird populations that they did during the 1970s and 1980s (although these areas remain important habitats). This is probably a result of stabilized water levels introduced in the early 1990s, although we cannot determine from the very brief description of previous reservoir policy changes whether this is indeed the case. An explanation of the reduced shore bird numbers at these locations would help in further evaluating the effects of the currently proposed changes.

Among the species that would be adversely affected by increased lake levels are several species included on the US Fish and Wildlife Service 2002 List of Birds of Conservation Concern. These species include Little Blue Heron, Peregrine Falcon, Buff-breasted Sandpiper, Semipalmated Sandpiper, Short-billed Dowitcher, Prothonotary Warbler and Louisiana Waterthrush. Alternative lake management scenarios outlined in the ROS may

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also adversely affect foraging areas used by the Federally Threatened Piping Plover. We are concerned that the DEIS makes no mention of most of these species or the potential impact that increased lake levels may have on their populations.

We believe higher lake levels maintained during fall and winter months will be detrimental to wintering waterfowl population as well as to wintering sandhill cranes. The largest population of wintering sandhill cranes in the Southeastern US north of the Georgia-Florida border is found in the upper Chickamauga Reservoir. These birds require exposed flats for critical evening roosting sites and for foraging grounds.

We find it difficult to evaluate the birds in Appendix Table D6a-01 because there is no accompanying key in the "Reaches" column. This table lists the Swainson's Warbler (which is also on the USFWS 2002 List of Birds of Conservation Concern) as being potentially directly affected in upland habitats. This species also occurs in bottomland forests in the Kentucky Reservoir area (and potentially in similar habitats elsewhere). These populations could be affected by water level changes in the reservoir and are in fact, probably adversely affected by the current practice of periodic overfilling of the reservoir in the late spring. **Virginia B. Reynolds, President, Tennessee Ornithological Society, 3791**

**Response to Comment 24:** See Sections 4.10 and 5.10. More information about waterfowl has been added to these sections to respond to comments. Many of the impacts described in this comment are associated with Kentucky Reservoir. Under the Preferred Alternative, the operating guide curve would not be changed and there would be no impacts on the many biological resources that occur on Kentucky Reservoir. This would include species such as piping plovers and least terns that are discussed specifically in TVA's Biological Assessment submitted to the USFWS. The Preferred Alternative would extend some summer pool levels on select reservoirs. However, many of these reservoirs receive limited use by shorebirds (Guntersville) or are used by them as wintering sites (such as Pickwick) under present operations. TVA recognizes that the Preferred Alternative would delay the development of some flats habitats used by shorebirds by extending pools. We are looking at a variety of ways to mitigate or offset these impacts. Lastly, the sandhill and whooping crane resources at Chickamauga Reservoir are identified as important resources in the EIS. Most flats habitats on Chickamauga Reservoir are not available until mid-October. The weekly scheduling models for the Preferred Alternative indicate that reservoir levels would be similar to those of the Base Case by October 1, and would remain at Base Case levels through April 1. Therefore, TVA does not anticipate impacts on sandhill cranes or their habitat under the Preferred Alternative.

25. I am concerned over the loss of late summer/early fall habitat for shorebirds, herons, egrets, and other species, as well as the loss of winter flat habitat. These birds do not have much habitat left and they need our help. **Wayne Patterson, 2532**

**Response to Comment 25:** See Response to Comment 5.

### **Invasive Terrestrial and Aquatic Animals and Terrestrial Plants**

1. Let's fight the invasives. **Anonymous, 3073**

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**Response to Comment 1:** Sections 4.11 and 5.11 address invasive species.

2. Stop the spread of invasive plants and animals on land and in the water. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3089**

**Response to Comment 2:** Comment noted.

3. Invasives: our animals and fish should be protected from. **Paul Howell, 4031**

**Response to Comment 3:** Comment noted.

### Vector Control (Mosquitoes)

1. Put up boxes for purple martins. **Anonymous, 3245**

**Response to Comment 1:** Comment noted.

2. In the 18 years I have been associated with the use of Lake Hiwassee, this is the first year I have seen mosquitoes to be a problem. Right now, not a severe problem, but this is the first year we have even seen problems. This might be studied as a potential problem keeping the water at full pool for too long, caused by the flooding conditions we have had this year **Anonymous, 624**

**Response to Comment 2:** This was studied as part of the FEIS. See Sections 4.12 and 5.12. Due to unusually heavy rainfall periods, there was an increase in the mosquito population because depressions in the floodplains were continually being filled by rain and high waters. TVA removed the high water as quickly as possible while reducing further flood damage. However, water remained in these pools to produce mosquitoes. The Preferred Alternative does create a potential for increased mosquito breeding habitat.

3. Do whatever it takes to reduce number of mosquitoes. **Bill Dearing, 2187**

**Response to Comment 3:** TVA fluctuates water levels on four mainstem reservoirs—Chickamauga, Guntersville, Wheeler, and Pickwick—for the suppression of mosquitoes and would continue to do so under all of the alternatives identified in the EIS. See Sections 4.12 and 5.12 for a discussion of vector (mosquito) conditions.

4. They used to have it and we would like it back. **Carolyn Ippisch, 3135**

**Response to Comment 4:** TVA no longer uses pesticides for the control of mosquitoes. The TVA mosquito program includes the fluctuations of four mainstem reservoirs for the suppression of mosquito populations. The program also conducts disease surveillance. When TVA has a positive mosquito sample for a virus the state health department is notified. See Sections 4.12 and 5.12 for a discussion of vector issues (mosquitoes) and Sections 4.11 and 5.11 for a discussion of invasive plant issues.

5. Is there habitat for the natural predators of mosquitoes? Bat/other insects eat many mosquitoes. Would like to see natural controls used. Are there particular seasons (such as we are experiencing in WNC) when the mosquitoes are worse? If so, then a flexible

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approach would be best. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3095**

**Response to Comment 5:** There is habitat for natural predators of mosquitoes. It is the same habitat as that for mosquitoes. These predators are small fish and dragonflies. Dragonflies are one of the most efficient predators of mosquitoes. According to many university studies, bats do not eat enough mosquitoes to reduce the abundance of mosquitoes. Spring is typically a worse time for mosquitoes; however, anytime there is an increase in rainfall, there will be an increase in mosquitoes. TVA fluctuates water levels on four mainstem reservoirs for the suppression of mosquitoes.

6. Would like to see mosquito control. **Chris Perkins, 3829**

**Response to Comment 6:** See Response to Comment 4.

7. I'm a resident of Lakeshore Campgrounds where I camp during the summer. The biggest problem we have over there is TVA lowering the lake so much. We get these ponds every time they lower it and mosquitoes are terrible over there because the water doesn't drain. It gets in there somehow but it won't drain until it evaporates. **Danny Matas, 4352**

**Response to Comment 7:** See Response to Comment 4.

8. You need to start spraying for mosquitoes. **David C. Johnigk, 4187**

**Response to Comment 8:** See Response to Comment 4.

9. If the users of Boone Lake can manage this [mosquito] problem with high lake levels in the summer, the users of South Holston Lake can also manage this potential problem with Alternative A. **Greg Robinson, 2976**

**Response to Comment 9:** Comment noted.

10. Obviously, this is an important issue, especially in light of the West Nile Virus. Continued [mosquito] control is of utmost importance. **Harold DeHart, 2134**

**Response to Comment 10:** See Response to Comment 4. West Nile Virus is transmitted by container-breeding mosquitoes (for example, mosquitoes that breed in tires, birdbaths, buckets, and clogged gutters). These types of mosquitoes are not affected by the operation of the reservoirs.

11. If the lake users on Boone Lake can manage this [mosquito] problem with high lake levels in the summer, the users of South Holston Lake can also manage this potential problem with Alternative A. **Joseph A. Robinson, Jr., 2619**

**Response to Comment 11:** Comment noted.

12. The lakes are left very high until mid-June and dropped too low by mid-August. Causes a definite mosquito problem. **Karen Niehaus, 3854**

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**Response to Comment 12:** Comment noted. The drop in August actually decreases mosquito populations. During the summer pool levels in June, mosquito populations typically increase. During this increase, TVA monitors the mosquitoes for viruses.

13. Sanity needs to be part of this area – in the words of Benjamin Franklin, "Moderation in all things." **Lorraine Nobes, 27**

**Response to Comment 13:** Comment noted.

14. Mosquitoes and diseases associated with them is a major issue that should be addressed. It has become a major concern. If any change will cause more stagnant water to pool and cause mosquito populations growth that should be a concern. **Linda Coons, 2309**

**Response to Comment 14:** See Sections 4.12 and 5.12. The TVA mosquito program includes the fluctuations of four mainstem reservoirs for the suppression of mosquito populations. The program also conducts disease surveillance. When TVA has a positive mosquito sample for a virus, the state health department is notified.

15. Need to spray to reduce mosquitoes and milfoil. **Marvin and Lili Scott, 3987**

**Response to Comment 15:** See Response to Comment 4.

16. I think mosquito control should be reinstated. **Mrs. Jean Roberts, 1916**

**Response to Comment 16:** See Responses to Comments 4 and 10.

17. Mosquito Control, yes we need to control mosquitoes **Paul Howell, 4032**

**Response to Comment 17:** Comment noted.

18. The lower and raise policy for vector control should be maintained at all costs... there need to be people to use the resources and aside from health issues, there is a need to encourage recreational use and as such, less bugs=more fun. **Pr. John Freitag, 994**

**Response to Comment 18:** See Response to Comment 14.

19. Once upon a time, TVA had a mosquito control program. They would raise the lake level for a few days, giving the mosquito's time to lay their eggs, then they would drop the lake level abruptly, killing the eggs. I don't remember ever having a mosquito problem in those days. As it stands today, I can't go outside without being eaten alive. This lake level control process did not require any chemicals or spraying and was very effective in controlling the mosquito population. **Suzie Reed, 47**

**Response to Comment 19:** See Response to Comment 4.

20. New viruses are found on mosquitoes. It is very important for TVA to start again spraying for mosquitoes before we all have West Nile. **Thomas Browning, 618**

**Response to Comment 20:** See Response to Comment 10.

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21. The number of mosquitoes in my area has been drastically reduced since early June. Since we have had more rain than usual I can only attribute this drop to higher water levels.  
**Thomas H. Hollingsworth, 3522**

**Response to Comment 21:** The reduction of mosquitoes in the commenter's area is probably the result of two things: (1) mosquito populations naturally drop during summer, and (2) TVA fluctuates water levels on four mainstem reservoirs for the suppression of mosquitoes.

22. Improved efforts to control mosquitoes would be helpful, especially at our site, we now use two (2) LP gas fired Deleto units to control our sites exterior areas and will provide screened porch at addition. **Thomas L. Parker, 3992**

**Response to Comment 22:** See Response to Comment 4.

23. I think mosquito control should be reinstated and be a high priority **Vernon Roberts, 1921**

**Response to Comment 23:** See Response to Comment 4.

### **Threatened and Endangered Species**

1. I would like to suggest that on lands adjacent to TVA holdings that contain cultural resource that TVA advise the local jurisdictions of the significance of these resources and ways they may be protected. The same should be done for other sensitive resources such as Threatened and Endangered Species, etc. **Barbara Garrow, 471**

**Response to Comment 1:** With regard to endangered species, the Tennessee Valley region supports a large number of species that are protected at either the federal or state level. Whenever it is involved with a project, TVA works with local entities to avoid or mitigate adverse effects on protected species in the area. However, identification of specific sites of sensitive resources may not always improve their protection, especially cultural resources.

2. [I am] for protecting T&E species **Ben Robinson, 3978**

**Response to Comment 2:** Sections 4.13 and 5.13 address threatened and endangered species.

3. In the area of threatened/endangered species, it appears extremists are calling the shots. **Bill Dearing, 2188**

**Response to Comment 3:** Comment noted.

4. This is one area that we feel TVA has been largely successful with--we would however, encourage TVA to expand it's programs in this area and encourage it. **Jean Prater, 1381**

**Response to Comment 4:** Comment noted.

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5. The Tennessee River system is home to what is undoubtedly the most important community of freshwater mussels in the world. Protection of this globally valuable resource should be a very high priority, especially in tailwaters of Pickwick, Wheeler and Guntersville dams. One specific situation which should receive consideration is in Wilson Dam tailwaters. There are at least four and probably five federally endangered mussels in the riverine reach downstream of the dam. With no flow from the dam when power is not being generated or water spilled for flood control (which is an almost daily occurrence) treated wastewater from the Florence sewage treatment plant accumulates until the daily start of generation (late morning). Minimum flows from Wilson Dam (enough to keep the wastewater flushed) would likely be very beneficial to that mussel community. Several species in that river reach will likely be lost over the next decade due to very low recruitment. Mitigation of this problem with minimum flows could prevent their loss. **Jeff Garner, 2842**

**Response to Comment 5:** Information provided by the Alabama Division of Wildlife and Freshwater Fisheries has helped TVA stay aware of the importance of the fresh-water mussel stocks in northern Alabama, including the presence of endangered mussel species. TVA has met with state regulatory agencies to discuss possible causes and solutions for the reported stresses to mussel stocks downstream from Wilson Dam. At present, the identification and resolution of those problems appear to be state water quality matters instead of issues that TVA should attempt to identify and address—particularly in the context of evaluating alternative operations policy that are system-wide and not location specific.

6. These practices [?] have not only been very harmful to habitat, but have left the streams almost destitute of freshwater mussels and probably some other aquatic groups as well. An excellent remnant population of freshwater mussels, including two federally endangered and several other sensitive species, is located in the lower reaches of Bear Creek, just above the reach influenced by Pickwick Reservoir. Should the flow regime from the Bear Creek dams be adjusted, and instability problems mitigated, mussels from that population would likely expand upstream to repopulate the system. **Jeff Garner, 2844**

**Response to Comment 6:** As indicated in Section 3.4.1, TVA is not proposing changes in operation of the Bear Creek Projects as a part of the ROS.

7. There appears to be very little justification for this [Tailwater Habitat] plan, except in limited areas such as the Apalachia Bypass. It appears to me that the Apalachia Bypass is unique enough to be an exception to the general plan. **Michael A. McMahan, 2387**

**Response to Comment 7:** As indicated in Section 3.3.8, this alternative was included in the evaluation to specifically look at ways the reservoir system might be managed that would benefit tailwater aquatic habitats. With regard to the flow augmentation through the Apalachia Bypass, as indicated in Section 3.4.1, that proposal would be implemented under any of the identified alternatives.

8. T&E: Should be protected, there are too many people sport fishing and hunting. They kill and leave laying. My daddy told me don't take what you don't use. **Paul Howell, 4033**

**Response to Comment 8:** Comment noted.

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9. Threatened or endangered species didn't matter to TVA as it built Tellico Lake. Why should they now? **Richard Simms, 2233**

**Response to Comment 9:** Comment noted.

10. Project-specific recommendations to protect native aquatic species

While the Nature Conservancy appreciates the system-wide comprehensive nature of the ROS, in order to guard against further extinctions of native mollusk and fish species. TVA must focus financial resources and management efforts on specific free-flowing tailwaters downstream from several tributary and mainstem dams. We are pleased that TVA recognizes that "in some... tailwater reaches, the abundance and diversity of these aquatic communities could be improved through a combination of operational and physical modifications to the dam" (Section 34.1- Biodiversity Considerations). We also are very encouraged that TVA may consider "other project-specific actions to improve biodiversity...on a case-by-case basis as the opportunity for habitat improvement is identified" (Section 34.1- Biodiversity Considerations).

Based on TVA Heritage and other expert-derived data, The Nature Conservancy considers the following five tributary tailwaters to be of extreme significance for the protection of our remnant native fauna: the Duck River downstream from Normandy Dam, the Elk River downstream from Tims Ford Dam, the French Broad River downstream from Douglas Dam, the Holston River downstream from Cherokee Dam, and the Hiwassee River downstream from Apalachia Dam.

Surveys in 2001 and 2002 of the mollusk fauna in the Duck River funded by a grant from the Tennessee Environmental Endowment to The Nature Conservancy and conducted by U.S. Geological Survey and TN Aquarium Research Institute researchers indicate that the Duck River fauna is responding dramatically to improvements made in aeration and minimum flow releases from Normandy. We are pleased that TVA plans to continue these management strategies on the Duck in the future. The Elk River downstream of Tims Ford represents the second longest tailwater in the system and contains potential habitat for a wide range of native aquatic species. We encourage TV A to continue its investment in evaluating operational strategies at Tims Ford to improve native aquatic diversity downstream (Section 3.4.1- Biodiversity Consideration).

In addition to the Duck and Elk project improvements in the central Tennessee Valley, we support TV A's efforts to provide minimum flows on the Hiwassee downstream from Apalachia dam to enhance aquatic diversity (Section 3.4.1- Biodiversity Considerations). The Nature Conservancy requests that TV A consider evaluating management actions to improve water quality conditions for native species on the French Broad River downstream from Douglas Dam and the Holston River downstream from Cherokee.

Available data suggests that on the mainstem of the Tennessee River, the most significant reaches of habitat for native aquatic species are located downstream from Gunterville dam, including the tailwaters of Wheeler, Wilson, and Pickwick dams. TVA should explore potential management actions that would improve DO in releases from these four dams and create a more gradual drawdown from Pickwick. Managing these lower reaches of the Tennessee's mainstem for the enhancement native aquatic species, particularly mussels, is critical because of severe population declines in the upper 350 miles of the mainstem

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due to hydrologic alterations and sediment toxicity issues **Scott Davis, Executive Director, Tennessee Chapter of The Nature Conservancy, 3741**

**Response to Comment 10:** As indicated in Section 3.4.1, TVA is aware of the high diversity and the biological importance of several mainstem and tributary stream reaches within the Tennessee River basin. See Sections 4.13 and 5.13. Under TVA's Preferred Alternative, additional scheduled releases would be provided in several tailwaters. Apart from the ROS, as indicated by this comment, TVA has devoted substantial resources to addressing sensitive populations at a number of locations, including mussels in the Duck River. TVA decided to dismantle Columbia Dam and commit most of the property acquired for that project to natural resource management and recreation. This protected the diverse species that reside in the Duck River watershed, including a number of threatened and endangered mussel species. See Final Environmental Impact Statement, Use of Lands Acquired for the Columbia Dam Component of the Duck River Project (April 1999).

11. In addition to managing the Tennessee River system for navigation, flood control, power production and water supply, TVA must comply with the Clean Water Act and with the Endangered Species Act. In particular, Section 313 of the CWA, 33 U.S.C. 1323, requires TVA to operate its dams in compliance with Tennessee water quality standards, including the narrative standard for aquatic habitat which implicitly requires sufficient instream flow in the mainstem and tributaries to protect aquatic habitat for all native species of fish, mussels and other aquatic organisms. TENN. COMP. R. AND REGS. R. 1200-4-3-.03 (3) (j) (2003). The ESA, in turn, requires special attention be paid to the conservation and recovery of endangered and threatened species. 16 U.S.C. § 1546 (a); 50 C.F.R. § 402.02. The preservation and restoration of natural flow regimes can be important to meeting the requirements of both the CWA and ESA. **Southern Environmental Law Center, 4222**

**Response to Comment 11:** TVA has strategies in place for complying with all applicable environmental requirements, including those established under the Clean Water Act and the Endangered Species Act. Various sections address aquatic resources and habitats and threatened and endangered species. See Sections 4.7, 4.13, 5.7, and 5.13. As indicated in Section 5.13 and the USFWS Biological Opinion concerning this project (Appendix G), TVA has complied with Section 7 of the Endangered Species Act.

12. While both the World Wildlife Fund and The Nature Conservancy appreciate the system-wide comprehensive nature of the ROS, in order to guard against further extinctions of native mollusk and fish species, TVA must focus financial resources and management efforts on specific free-flowing tailwaters downstream from several tributary and mainstem dams. We are pleased that TVA recognizes that "in some...tailwater reaches, the abundance of diversity of these aquatic communities could be improved through a combination of operational and physical modifications to the dam" (Section 3.4.1-Biodiversity Considerations). We also are very encouraged that TVA may consider "other project-specific actions to improve biodiversity...on a case-by-case basis as the opportunity for habitat improvement is identified" (Section 3.4.1-Biodiversity Considerations).

Based on TVA Heritage, The Freshwater Initiative of TNC, WWF's assessments of priority watershed and other expert-derived data, the World Wildlife Fund considers the following tributary tailwaters to be of extreme significance for the protection of our remnant native fauna: the Duck River downstream from Normandy Dam, the Elk River downstream from Tims Ford Dam, the French Broad River downstream from Douglas Dam, the Holston River

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downstream from Cherokee Dam, and the Hiwassee River downstream from Apalachia Dam.

The same data suggests that on the mainstem of the Tennessee River, the most significant reaches of habitat for native aquatic species are located downstream from Guntersville dam, including the tailwaters of Wheeler, Wilson, and Pickwick dams. TVA should explore potential management actions that would improve DO in releases from these four dams and create a more gradual drawdown from Pickwick. **Wendy Smith, Executive Director, World Wildlife Fund, Southeast Rivers and Stream Project, 3548**

**Response to Comment 12:** See Response to Comment 10. As indicated in Section 3.4.1, TVA is aware of the high diversity and the biological importance of several mainstem and tributary stream reaches within the Tennessee River basin. TVA has evaluated, and will continue to evaluate, project-specific activities that could enhance or help recover endangered and other native aquatic species in these areas.

### **Managed Areas and Ecologically Significant Sites**

1. The TVA managed areas are no longer managed or maintained well. Over the years, we have enjoyed these areas for picnics, camping, launching our boat, etc. There are no longer safe places to launch, mowed places to picnic or camp, trash barrels to deposit litter, or easy access to these areas because roads and drives are no longer maintained. It appears to us TVA is trying to restrict access to the waterways for recreational uses. **Jean Prater, 1379**

**Response to Comment 1:** The budgets for most of the governmental entities, including TVA, that have maintained managed areas have been strained. TVA continues to maintain its facilities within the constraints of its available resources.

### **Shoreline Erosion**

1. We are aware that some of the small farmers had to place fences along the creeks and riverbeds to keep the cattle from eroding the edges of the streams and river. But at the same time some LARGE cattle farms are still using the shoreline for cattle watering holes, thereby eroding the edges of the natural river (lake) beds. **Anonymous, 611**

**Response to Comment 1:** Within the limitations of its resources, TVA tries to monitor such activities on its lands licensed for agricultural uses. Other entities, such as the USEPA and state environmental agencies, potentially have regulatory authority over the activities described in this comment.

2. Shoreline Erosion – Encourage USCOE [to provide] permission for riprap. **Anonymous, 3246**

**Response to Comment 2:** TVA recognizes that shoreline erosion can be a problem, and we work with the Corps and others to address the issue by providing technical help and information about preventing and repairing shoreline erosion.

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3. I think that if TVA would help people with the erosion that live on the lake we could clean up the lake. **Anonymous, 141**

**Response to Comment 3:** See Response to Comment 1. TVA does provide technical help and information about preventing and repairing shoreline erosion. Contact the Watershed Team office for your reservoir.

4. Provide information and assistance to residents as to how to stop erosion. **Anonymous, 159**

**Response to Comment 4:** See Response to Comment 2.

5. I am concerned that areas of the lakes are filling with runoff soil and may cause increased chances of injury to users of the lakes and property values to fall over time as once used areas can not be accessed with water. **Beth Carey, 1714**

**Response to Comment 5:** Siltation of reservoirs is more likely caused by sediment from activities in the watershed rather than by shoreline erosion. Erosion issues are addressed in Sections 4.16 and 5.16.

6. Shoreline erosion needs to be addressed. Landowners should be allowed to protect their land from erosion. **Bill Dearing, 2189**

**Response to Comment 6:** Shoreline erosion was addressed as a major issue in this EIS. See Sections 4.16 and 5.16.

7. Shoreline erosion is ugly, pollutes the water. Trees, plants and others are also lost as the shoreline erodes back further and further. The only positive comment I can think of is that some aquatic species might find temporary shelter. But temporary shelter can be provided without the losses caused by shoreline erosion. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3092**

**Response to Comment 7:** TVA recognizes that shoreline erosion can be a problem, which is why it is addressed as a major issue in this EIS. See Sections 4.16 and 5.16.

8. I yield to your experts on this subject [of erosion]. However, 9 years on Watauga Lake (with its substantial Summer-Winter-Summer level changes) lead me to a somewhat different conclusion. The current system usually leads to a 10' water level drop (1959 to 1949) from June 1 to August 1. Thereafter, the level continues to fall, reaching 1940 or sometimes as low as 1935 during the winter. Then, the level rises in the Spring as the lake is refilled. The cycle repeats.

The issue is not the water level change. Rather, it is the level change during moderate to high boating seasons. What this does is subject almost the entire shoreline height to erosion. Specifically, as the level drops during the Summer/early Fall, you can see that boating waves cut a series of small "steps" in the shoreline. Then, when the level rises, these steps become focal points to undercut the shoreline.

In contrast, when levels are held at a high, constant point during the boating seasons, then erosion occurs mostly at that single high level. There is little if any of the "undercutting"

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which I have seen to cause large-scale erosion. Rather, over time the erosion pattern creates a stable, gentle slope. Please consider this. **Colman B. Woodhall, 392**

**Response to Comment 8:** Erosion of the reservoir bank below full pool is an unavoidable consequence of changing water elevations. Although there is a slight water quality impact from this erosion, it is small compared to the sediment contributions from the watershed. Most concern has been for erosion of the full-pool shoreline because usable land is lost when this area erodes. For erosion that occurs within the reservoir pool, no net storage is lost when the eroded material settles elsewhere in the pool. See Sections 4.16 and 5.16.

9. This comment applies specifically to Watauga Lake, and may just be a misunderstanding on my part. Currently Watauga is managed to Jan 1 = 1940', March 15 = 1952', June 1 = 1959', and August 1 = 1949'. Alternative A proposes (if I understand it correctly) to manage Watauga to Jan 1 = 1952', March 15 = '?', June 1 = 1959', and Labor Day no lower than 1949'. It seems then, that the lake level would actually rise from Labor Day (1949') to Jan 1 (1952'). Also, that implies that the majority of lake "pulldown" occurs in the Summer (1959' to 1949'). Somehow, these results do not appear logical. But, logical or not, the Summer pulldown does imply large-scale erosion during that period. Please consider leaving the lake somewhat higher (at least to the Mar 15 level) during the Summer, even if that means a more rapid pulldown after Labor Day.

PS – nowhere could I find specific lake levels corresponding to controlling the 7-day, 500-year flood. Based on the narrative, I presume these would be higher than the stated Alternative A levels. **Colman B. Woodhall, 394**

**Response to Comment 9:** Reservoir Recreation Alternative A would hold Watauga up to about 1,955 feet on Labor Day on average and not decline to 1,949 until mid-October.

All the action alternatives, except the Commercial Navigation Alternative, have higher average winter levels than the Base Case and, therefore, slower drawdown and higher water in late summer and fall. See the box plots in Appendix C.8 for median elevations.

10. In the past eight to ten years we have lost about six to eight feet of our shoreline to erosion. At the present time there's a real serious situation relating to watercraft safety in and out of our cove, located between lake markers 6 and 7. Both types of boats, especially jet skis, are creating a very serious problem relating to boat safety and shoreline erosion. Extreme watercraft speeds are wearing away the shoreline and may eventually cause a future serious accident. We are recommending that a No Wake safety buoy be located at the cove entrance to warn boaters about boat speed. Decreasing boat speed will hopefully decrease shoreline erosion. That's where we are with the situation. **D. C. Wenberg, 4411**

**Response to Comment 10:** Erosion is addressed in Sections 4.16 and 5.16. The state agencies are primarily responsible for regulating boating activity and setting no-wake zones.

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11. In the DEIS it mentioned a negative shoreline erosion condition with Recreation "A" alternative. I can see that at full pool more erosion of shoreline would be possible, but I wondered if you took into account that under the Base Case we get tremendous shoreline erosion during the winter pool levels when we have erosion of the area from the full pool shoreline to the winter shoreline. In some areas this is 50 to 150 feet of bare ground and we get tremendous erosion during the low pool level. **Doug Triestram, 1752**

**Response to Comment 11:** TVA did take this into account when evaluating the potential effects on erosion from identified alternatives. Sections 4.16 and 5.16 summarize TVA's evaluations. Erosion of the reservoir bank below full-pool is an unavoidable consequence of changing water elevations. Although there is a slight water quality impact from this erosion, it is small compared to the sediment contributions from the watershed. Most concern has been for erosion of the full-pool shoreline because usable land is lost when this area erodes. For erosion that occurs within the reservoir pool, no net storage is lost when the eroded material settles elsewhere in the pool.

12. It might be cost effective along with the Water Study to initiate a 'soil erosion protection plan' for the Water Study area using air and satellite photos. This could be part of a water conservation plan for all states in Study area and inter-basin transfer states. **Frank DePinto, 3984**

**Response to Comment 12:** Relating to erosion, reservoir shorelines have all been assessed and catalogued, as have some of the tributary tailwater streambanks. TVA has ongoing programs to address erosion issues on TVA-owned land and to provide technical support on private land.

13. The lake [Kentucky] is so silted in that when you draw down to 354 the lake becomes very dangerous. Holding it to 356 during winter would make it much safer for winter activities. Since the 354 was established many years ago the lake has silted in many feet. The canal dredged behind my property in Jonathan creek, 7 years ago, has silted in over two feet. What considerations have been made on this problem in the last ten years? **Garland Wyatt, 2047**

**Response to Comment 13:** Erosion is addressed in Sections 4.16 and 5.16. Siltation of reservoirs is more likely caused by sediment from the watershed than shoreline erosion. TVA and other agencies have programs that work to reduce erosion and resulting sedimentation from upstream. TVA also provides advice and assistance to private landowners with erosion problems. Under the Preferred Alternative, the operating guide curves on Kentucky Reservoir would not change.

14. I have a home on Lake Chatuge. I'm also chairman of the Sediment and Erosion Overview Counsel for the state of Georgia. We are very concerned about the environmental impact of the erosion in the lakes. And this year, in particular, we have noticed or I have noticed since the lake has been as high as it is, the water quality has been substantially improved. And I believe the reason for that is that because the levels are more consistent instead of eroding the soil when the lake levels are lower than what they are now. And so by having the water level as high as it is, you don't have that constant up and down effect of the lake where it reaches not only the soil but it reaches the silt and allows the silt to come into the lake. **Jack Miller, 4304**

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**Response to Comment 14:** If reservoirs were maintained at a constant level all year, it is likely that shorelines would continue eroding until they reached a stable angle. However, this process would be slower than under existing conditions because vegetation would become better established. Changes in water level contribute to erosion because the changes in the growing environment prevent establishment of stabilizing vegetation. Changes in elevation also make the erosion that occurs at high water visible. Sometimes banks that are undercut during high water collapse when the water goes down; however, these would collapse eventually anyway.

TVA formulated a preliminary alternative that held reservoir levels constant, but this was determined to result in unacceptable flood risk and was not included for further detailed study or as an element in the Preferred Alternative.

15. We suggest that the shorelines of all islands in Lake Chatuge be covered with broken rock to reduce shoreline erosion and improve beauty during periods of low level **James B. and Elizabeth F. Eppes, 4000**

**Response to Comment 15:** This EIS evaluates the potential effects of system-wide operational changes. Site-specific concerns, such as the one identified in this comment, are addressed in other forums. TVA has an ongoing program to assess and address shoreline conditions. This assessment information is used to prioritize the stabilization of TVA-owned areas. If the areas mentioned in this comment are owned by TVA, they are in this assessment. For areas not owned by TVA, we offer technical support. Also see Response to Comment 13.

16. In the winter the water goes down too much. It seems that we should be able to go through the winter so low. Especially on Lake Chatuge. There has also been so much erosion in front of my home ... The Dock seems to be sitting in the mud sooner. Is there any way to slow that down or can the TVA correct this problem. **Jane Chinnici, 1421**

**Response to Comment 16:** Erosion is addressed in Sections 4.16 and 5.16. See Responses to Comments 13 and 15.

17. I think, there's been a lot of erosion of water going back and forth, and it seems to be worse now than it was ever before, and I don't know if they're going to have some kind of correction for the areas that are eroded so poorly. **Jane Chinnici, 4298**

**Response to Comment 17:** See Response to Comment 14.

18. Reaches downstream of the Bear Creek reservoirs have been sites of very bad stream bank erosion and stream bed instability since the dams were constructed. The regime for winter drawdown of those reservoirs appears to be the primary culprit, with water held well into the autumn, then released over a short period prior to the rainy season. **Jeff Garner, 2843**

**Response to Comment 18:** As indicated in Section 3.4.1, TVA is not proposing to change operation of the Bear Creek Projects as a part of the ROS. Erosion is addressed in Sections 4.16 and 5.16.

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19. TVA needs to survey TVA controlled shorelines and develop a plan to minimize shoreline erosion. **Jerry Stephens, 253**

**Response to Comment 19:** TVA does have an active program that does this. See Section 4.16.2 and Responses to Comments 13 and 15.

20. It is a shame that each year we as landowners are losing our land to erosion, for the purpose of TVA profits, not flood control. **Jimmy and Amy Owens, 478**

**Response to Comment 20:** Erosion is addressed in Sections 4.16 and 5.16. Although the generation of electricity is one of the operating priorities of the TVA system and revenue is produced from the TVA power system, TVA does not operate the system to produce profit. TVA's operations are non-profit.

21. Jet skis are eroding the shore line on Lake Nottley. No one is monitoring the damage or concerned with doing anything about speeding jet skis and the destruction and safety hazards they cause **Joanne Wenberg, 2440**

**Response to Comment 21:** Erosion is addressed in Sections 4.16 and 5.16. This takes into account erosion caused by watercraft. State agencies, not TVA, are primarily responsible for the regulation of watercraft on the TVA reservoir system.

22. If the water level was maintained during the summer months it would eliminate some shoreline erosion. I believe more people who live on the lakes would build retaining walls which would further reduce shoreline erosion. **Joe Depew, 1286**

**Response to Comment 22:** See Response to Comment 14.

23. For 35 years I have watched the Decatur area shoreline of Wheeler Basin be destroyed by the action of high water on the bank structure. Over 150 feet on each side of the river in the Decatur area has been taken out through this action. Additionally, almost all islands with trees have been systematically destroyed along with all of their archaeological resources. Your proposal to increase the winter water levels by two feet will accelerate this process and may complicate immeasurably recreation navigation on the river all year long. Let me try to explain.

The erosion process attacks the root system and slow, but sure, exposes enough roots on the river side that the tree weight cannot be supported. The tree eventually falls into the river and is held in that location by the remaining root structure. The tree gradually drowns, dies, and begins the rotting process. At some point in time, sufficient erosion and rot occurs that the tree remains are freed to travel downriver for collection and removal at the dam.

The majority of large trees that have been downed at the shoreline are release during high water periods in the winter months after drying out somewhat during the earlier low water periods. The river at such times is dangerous to travel in recreational boats, but the event occurs over a relatively short time span and is then over.

Your proposal to increase the winter pool levels will accelerate shore bank erosion dropping even more trees into the river where they will hang on the bank until rotted to the point where currents and the actions of large boat waves will tear them loose. Without the

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opportunity to dry out somewhat, I predict that they will become periodic dead-heads or sink entirely to the bottom and tumble their way to the dam where they will be very difficult to recover. Since the higher water will continually do its job of erosion with no intermediate drying period, release of these dangerous masses will be highly unpredictable and most likely occur all year long. You are creating a very dangerous situation for recreational boaters all year long by raising water levels a couple of feet during the winter months. **John Gustafson, 2103**

**Response to Comment 23:** Analysis indicates that the amount of time that the reservoir surface is in the summer operating zone is the main factor in the rate of shoreline erosion on mainstem reservoirs.

The winter minimum pool level would be raised 6 inches in Wheeler Reservoir. On any reservoirs with substantial changes in winter pool levels, the difference in pool elevations should still allow drainage of shoreline soils. Shoreline erosion is addressed in Sections 4.16 and 5.16.

24. If the water were lowered and raised more quickly during a shorter period of time it would seem that less erosion would occur. As it is it is difficult to protect the lakeshore since the water moves so much so slowly. **Larry Mancini, 1605**

**Response to Comment 24:** The rate of drawdown is determined by the design of the reservoir and dam (see Section 4.20.5). The rate of filling is determined by the amount of water available, which can be changed little while maintaining operational commitments. Extremely rapid drawdown is likely to cause increased erosion from mass wasting.

25. Also, I am curious whether keeping the lake level higher would be more environmentally friendly, as silt and debris washing into the lake would be diminished. **Linda Wingo, 1677**

**Response to Comment 25:** It depends. Keeping the lake level higher would allow more residence time and, therefore, more opportunity for suspended material from upstream to settle out in the reservoir pool and for floating material to waterlog. However, high pool elevation also causes more shoreline erosion by delivering wave energy to steep banks for longer periods.

26. I live on the Douglas Lake system and during the recent flooding that took place in May 2003, lost 20+ feet of shore line because of a simple fact: that the level was raised too high too soon. When the Spring rains came as you are aware there was no place for the water to go but on to private property because the lake level was full. Debris and large logs were deposited on my shore and I even lost some trees as a result. If erosion continues because of flooding onto my land, my house will be in jeopardy in a few more floodings. **Mike Harris, 1014**

**Response to Comment 26:** As this comment recognizes, Douglas Reservoir was used to its full capacity in the May 2003 flood to minimize downstream flooding to the extent possible. This is a primary purpose of Douglas Reservoir. At no time during the May 2003 flood did the water level on Douglas Reservoir exceed TVA purchased flowage easements. TVA has an active program to address erosion on its lands as well as programs to assist private landowners with erosion problems. See Response to Comment 1.

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27. Alternating freezing and rewetting of exposed shorelines in winter months generates heavy silt load into reservoirs. Eventually this will have an impact on flood control capability. Has this been considered in the study? **Norman Owen, 639**

**Response to Comment 27:** See Response to Comment 14. Erosion is addressed in Sections 4.16 and 5.16. Most sediment that is deposited in the reservoirs is at low levels and has little impact on the active storage zone. Buildup from siltation is not expected to be substantial in any of TVA's flood control reservoirs within the 30-year time frame of the ROS.

28. A certain level of shoreline erosion should be expected in any aquatic system. Oxbow lakes are great. Erosion control should be allowed where it is occurring at extraordinary levels. However, the cost of that control should be borne directly by those who benefit, not by ratepayers in general. And on that note, the excessive amount of rip rap that has been placed below Chickamauga Dam toward downtown Chattanooga is horrible! We've turned the Tennessee River into a glorified ditch. **Richard Simms, 2242**

**Response to Comment 28:** See Response to Comment 15.

29. The erosion on Douglas needs to be better controlled probably by maintaining higher water levels. At my Marina (Swann's) the bottom of the lake has risen 8 ft in 12 yrs. At this rate my children won't have to worry about water level but will worry about the Lily Pond Stan Veltkamp, 926

**Response to Comment 29:** See Response to Comment 13.

30. Shoreline erosion would increase dramatically if lake levels were left higher in late summer and drawdown was pushed back later, especially here on Kentucky reservoir. **Steve McCadams, 3172**

**Response to Comment 30:** If reservoirs were maintained at a constant level all year, it is likely that shorelines would continue eroding until they reach a stable angle. However, this process would be slower than under existing conditions because vegetation would become better established. Erosion is addressed in Sections 4.16 and 5.16. Under TVA's Preferred Alternative, operating guide curves for Kentucky Reservoir would not be changed.

31. Shoreline erosion, along with the loss of islands adjacent to the main river channel along Kentucky reservoir, would be worse under all the alternatives as keeping water levels up longer would further damage an already fragile area. **Steve McCadams, 2141**

**Response to Comment 31:** Erosion is addressed in Sections 4.16 and 5.16. Under TVA's Preferred Alternative, operating guide curves for Kentucky Reservoir would not be changed.

32. With rising and lowering the levels of the water it has caused enormous erosion on our lot and supposed TVA will not let you build retaining walls to keep that from happening. **Sue King, 1045**

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**Response to Comment 32:** See Response to Comment 13.

33. Reservoirs like Nottely have areas where 90% of the lake bed is exposed during drawdown. The inflow of mud and debris each spring appears to be significantly reducing the available volume of lake after filling the reservoir each year. **Thomas Carey, 1708**

**Response to Comment 33:** See Responses to Comments 13 and 27.

34. You may not want to hear this, but the TVA is the largest source of shoreline erosion!!!! Every time you reduce or raise the lake levels, serious erosion occurs... We all know this, but it seems that the tva being the main source of erosion is not addressable!!!!!! **Thomas G. Sandvick, 2661**

**Response to Comment 34:** See Response to Comment 14.

35. The concerns listed in my March 4, 2003 letter to you noted the primary problems namely excessively high flood plain level and erosion or health hazard caused by the water released from the Nottely Dam into the Nottely River tailwater riverbank area. This water level backflows everyday into the creek that traverses our site. This backflow deposits debris, limbs, etc., or whatever flows downstream. The water level rises five to six feet and causes erosion along the creek and Nottely riverbanks at our site and also at the other sites along the river tailwater release area, especially sites #6, 7, and 8. Who can we contact at TVA to evaluate what can be done to hopefully resolve these health and erosion conditions? **Thomas L. Parker, 4057**

**Response to Comment 35:** See Response to Comment 15.

36. Over 10 feet of shoreline has been lost on our property, primarily due to wave motion. One potential solution might be for TVA to put a barge in Douglas lake for the purpose of installing riprap. We'd pay for the materials and labor if TVA would furnish this. This would stabilize soil, keep silt out of the lake, improve water quality and be an overall benefit to all parties concerned. **William and Velda Clayton, 782**

**Response to Comment 36:** See Response to Comment 15. TVA is also encouraging a contractor to begin serving tributary reservoirs, including Douglas, with a barge capable of installing riprap.

### **Prime Farmland**

1. Yes, prime farmland must be protected. From topsoil runoff, from unnecessary flooding at inappropriate times of the year. We are losing topsoil and prime farmland. High priority. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3091**

**Response to Comment 1:** Although some of the alternatives could potentially increase flooding events and land development, with associated risks of soil erosion, TVA has determined that the impact on prime farmland is not likely to be materially different than under existing conditions. Prime farmland is addressed in Sections 4.17 and 5.17.

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### Cultural Resources (Archaeological & Historic Sites)

1. Cultural Resources will be significantly affected by increased water levels. The only way to reduce this impact is to reduce reservoir levels, even if it is only for a short time.  
**Anonymous, 2840**

**Response to Comment 1:** Although a number of alternative operations polices could adversely affect cultural resources, these impacts would be mitigated pursuant to agreements with the seven Valley State Historic Preservation Officers and other consulting parties prior to implementing any alternative. Under TVA's Preferred Alternative, potential impacts on cultural resources are expected to be only slightly adverse and only on some reservoirs.

2. While cultural resource may receive some protection due to less draw down, thus reducing the possibility for looting of archaeological sites, it is clear that it is not within TVA's authority to give additional protection to historic buildings and structure that are not on TVA lands. I would like to suggest that on lands adjacent to TVA holdings that contain cultural resource that TVA advise the local jurisdictions of the significance of these resources and ways they may be protected. **Barbara Garrow, 468**

**Response to Comment 2:** TVA does coordinate implementation of actions with local officials, as appropriate, as well as with State Historic Preservation Officers. Although cultural resources may not be located on TVA property specifically, TVA does consider impacts on these resources when it evaluates the impacts of its proposed actions. Cultural resources are addressed in Sections 4.18 and 5.18.

- 3 We also need to acknowledge the historical trauma associated with lake property, which once belonged to Native Americans, early settlers, and more recently (prior to the building of the dams) to farmers. The land was forcibly taken from the farmers to construct the reservoirs in the name of the most good for the most number of people

Now a class of wealthy lake property owners have the shoreline property. They seem oblivious to the history of the land they now own and the human suffering behind its current availability to them. **Guy Larry Osborne, 1265**

**Response to Comment 3:** The cultural history of the Tennessee River valley is addressed in Section 4.18.

4. For the sake of archeological sites that have been threatened and damaged for years by your current practices, please maintain your current plans. Raising the winter pool in Wheeler Basin will further erode and destroy what little archaeological treasures that currently exist. The Archaeological Resources Protection Act demands that you do your best to protect those sites from damage. Preservation could best be served by further lowering the basin water levels at all times during the year. The optimum preservation route would be to drain the basin completely back to it's original condition. Obviously, this is impossible and inappropriate to preserve and foster your other goals, but increasing pool levels in the winter will only damage those fragile archaeological sites that remain. **John Gustafson, 2093**

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**Response to Comment 4:** See Response to Comment 1. As indicated in this comment, completely draining the TVA reservoir system—if it were possible—would conflict with uses of the reservoir system and would not increase overall public value of the system.

5. I am very concerned about the increased shoreline erosion associated with water levels kept high in Kentucky Lake for extended periods of time. What about the impacts on arch./historic sites? **John Taylor, 2751**

**Response to Comment 5:** Erosion and cultural resources are addressed in Sections 4.16, 4.18, 5.16, and 5.18. Under TVA's Preferred Alternative, the operating guide curve for Kentucky Reservoir would not be changed; therefore, risks of adverse affects on cultural resources would not change.

6. No problems on South Holston Lake. **Joseph A. Robinson, Jr., 2624**

**Response to Comment 6:** Comment noted.

7. As the water goes down in the winter, the fish go to the dam area. The lake near the hi-way turns to red mud and looks terrible. Property values go down and friend ask why you brought a home near just a big red mud-hole.

It is hard to visit historic sites due to the mud etc. **Marcia, 1652**

**Response to Comment 7:** Comment noted.

8. There are numerous archaeological sites that would be seriously affected or destroyed by the increase in year-round water levels. Some of them are among the most important in this nation. This is a MAJOR ISSUE.

Have the Indian tribes been contacted? Along with these sites, raising water levels will destroy a number of Native American burials in the Tennessee Valley, burials protected by federal law in the Native Americans Graves Protection and Repatriation Act.

Either these burials need to be moved to a safe place, via a complete and thorough archaeological investigation, or other actions need to take place. **Mark Cole, 2081**

**Response to Comment 8:** TVA has invited 17 federally recognized Indian tribes to be consulting parties in the process that addresses potential effects on historic properties, Section 106 of the National Historic Preservation Act. Cultural resource impacts are addressed in Sections 4.18 and 5.18.

### **Visual Resources (Scenic Beauty)**

1. Visual beauty is always important and worth saving. Whenever possible avoid the drawdowns of many feet which expose rock and/or mud walls. Not attractive. Allow natural vegetation around the shorelines to become and remain mature. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3100**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 1:** Many of the alternatives evaluated in the EIS would have beneficial effects on visual resources, including TVA's Preferred Alternative. Visual resources are addressed in Sections 4.19 and 5.19.

2. It is with great hope that TVA will make a change in their policy and give us lake owners, users, visitors and passer bys a much more beautiful site to see. With the mild temperatures we were swimming in October and the bad part was just walking out passed the mud. I appreciate the opportunity to voice my concerns and hope my choice of living on a TVA reservoir will continue to be a great investment with the beauty and recreation it offers. **Gordon, 1149**

**Response to Comment 2:** Comment noted.

3. It means a beautiful govt. provided lake adding more beauty in the winter instead of a wide ugly mud ring around it. **Harold Andrews, 2174**

**Response to Comment 3:** Comment noted.

4. The elimination of unsightly flats would have a favorable impact on our region. **Joe Brang, 881**

**Response to Comment 4:** See Response to Comment 1.

5. I love the beauty of the lake and being able to enjoy it as much possible. To me it is very important for TVA to keep up the good work so people like can continue to enjoy the beauty of our surroundings **Juanita Phillips, 2824**

**Response to Comment 5:** Comment noted.

6. Please take into consideration the families who plan to visit when you drop the water so tremendously, leaving an unsightly gap. **Mary Teaster, 422**

**Response to Comment 6:** See Response to Comment 1.

7. I do not like the lake to look like a mud hole in the winter. I think it hurts business and it is not necessary. **Penny Caudell, 1745**

**Response to Comment 7:** Comment noted.

8. Shoreline development should be discouraged in every way in every viewshed. Recreation is the Number Two priority (or should be) and the recreational experience is dramatically enhanced by scenic beauty. **Richard Simms, 2245**

**Response to Comment 8:** Visual resources are addressed in Sections 4.19 and 5.19. Shoreline development was comprehensively addressed by TVA in its SMI EIS process (November 1998). Section 4.15 discusses the SMI and its resulting policies.

9. The "viewshed" is an integral part of the recreational lake experience and it should be enhanced in every way possible. **Richard Simms, 2227**

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**Response to Comment 9:** See Response to Comment 1.

10. One of the most beautiful times of the year in our area is the fall. Yet many of our reservoirs have levels that do not allow the enjoyment of our environment during that beautiful time.  
**Roger Williams, 2473**

**Response to Comment 10:** See Response to Comment 1.

11. The lake is an ugly sight and potentially dangerous when water levels are dropped low. Fences, pipes and junk are clearly visible. **Thomas Atkinson, 1411**

**Response to Comment 11:** See Response to Comment 1.

### **Dam Safety**

1. Dam safety must always be a top priority. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3103**

**Response to Comment 1:** None of the alternatives identified in the EIS, including TVA's Preferred Alternative, would compromise dam safety. Dam safety is addressed in Sections 4.20 and 5.20.

2. The purpose of the dams in general is for the protection of the people and their livelihood down stream. Historically, the management of the twin lakes has been for flood control. I request that any management plan have this as its number one priority. Those of us who live in the valley are very fortunate to have TVA and its power-producing ability as an added convenience of the dams. We live with the comfort of knowing that operational procedures of the water management plan of the lakes have and need to continue with flood control as the priority for making water level decisions. **Doug Goodman, 3184**

**Response to Comment 2:** TVA developed its Preferred Alternative to reduce flood damages to acceptable levels while preserving increased opportunities for recreation and reducing impacts on other objectives.

3. I understood that there is a federal requirement for dams to be designed to handle the Probable Maximum Flood, at least for dams over a certain size, with potential loss of life downstream from dam failure. So I am curious as to why this option was even considered in the first place, because it raises the winter pool to a level that can only hold the 500-year inflow. But I don't know all the details on how such levels would affect flood control performance in the PMF, so maybe the reservoirs are still capable of passing the PMF. **Gary Hauser, 66**

**Response to Comment 3:** The alternative to which the commenter refers is based on the provision of flood storage sufficient to completely store the inflow volume expected in an event with a 500-year recurrence interval. In the event of inflow volumes larger than the 500-year level, flood control operations at a given project would still allow safe passage of these volumes. TVA would not adopt an alternative that compromises our ability to safely pass the design-basis flood for each project.

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4. Dam safety is of high importance, particularly since the Tennessee Valley is in earthquake and tornado zones. **Lorraine Nobes, 23**

**Response to Comment 4:** See Response to Comment 1.

### Navigation (Commercial Barges)

1. In the discussion of navigation operations in Chapters 4.21 and 5.21, the current condition of navigation is not discussed. For instance, the EIS does not provide an indication of how many days the Tennessee River is not at least 11 feet deep. If there are only a small number of days per year when the river is not fully navigable, then a positive change in navigation operations may not be considered as important as a positive change in the other operational considerations. However, without the discussion of current conditions, it is difficult for an individual to ascertain the impacts of operation alternatives to navigation. **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3738**

**Response to Comment 1:** The Tennessee River navigation system was designed to provide 9-foot draft navigation 365 days per year as mandated by the TVA Act. An 11-foot channel is maintained to provide this 9-foot draft and a 2-foot margin of safety. The navigation industry is able to take advantage of summer conditions to ship at greater than 9-foot draft. The benefits or losses to navigation were computed for each alternative based on the number of months the alternative would change the existing navigation draft depth condition. TVA receives a number of complaints every year about insufficient depths for navigation at various locations on the waterway. The number of these complaints fluctuates annually. Partly in response to these complaints, the Preferred Alternative provides for a 1-foot increase in channel depth at Kentucky tailwater to elevation 301, by controlling releases at Kentucky Dam and raising the minimum winter pool depth at Wheeler Reservoir by 6 inches.

2. It is imperative that barge navigation receive serious consideration in this study. This one area has dramatic economic impact along the river. In Northeast Alabama, industries are closing their doors due to not being competitive. The industries on the river, especially the gypsum industry is growing, but if the river management increases the cost, this industry will be impaired. **Anonymous, 2198**

**Response to Comment 2:** Commercial navigation is important to the region's economy and is a primary objective for operating the reservoir system. Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would commit to discharging a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would benefit the navigation industry.

3. We at Marine Terminals of Alabama would like to see the water level at the river to stay the same or raise. The impact of lowering the river would cause definite problems with barge traffic. We are already facing problems as is with the water levels with barge traffic. Please take that into consideration. Thanks **Anonymous, 2299**

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**Response to Comment 3:** Under TVA's Preferred Alternative, minimum winter water level on Wheeler Reservoir would be raised by 6 inches in order to address navigation problems on that reservoir, and tailwater releases would be increased as necessary to allow deeper draft barges to move on the Tennessee River.

4. Inexpensive and environmentally-friendly means of transportation (barges) are also important to me. **Betty M. Fulwood, 2293**

**Response to Comment 4:** Water transportation is an important component of the nation's transportation infrastructure. This mode of transportation generates savings for industries that utilize it and it also produces a water-compelled rate effect in the region that benefits industries that use rail as a means of transportation. Transportation data indicate that, because water transportation is available in the region, rail rates are lower due to competitive factors and the need of railroads to maximize utility.

5. We have been penalized by limited draft on our barges for 40 years and it is time to raise minimum winter pools at least a foot and a half. It is foolish to limit the Tennessee River efficiency because of shallow draft in tow percent of the river. **Bill Dyer, 2770**

**Response to Comment 5:** Analysis of the alternatives evaluated in the DEIS indicated that raising winter flood guides 2 feet on the mainstem reservoirs would result in unacceptable increases in flood risk. Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would commit to discharging a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would benefit the navigation industry.

6. All navigation channels need to be clearly marked. **David C. Johnigk, 4186**

**Response to Comment 6:** The U.S. Coast Guard marks the main channel of the Tennessee River; TVA maintains about 2,000 markers on the secondary channels and tributary reservoirs used primarily for recreation. Observed problems can be reported to TVA on its Info-line or at (865) 632 2906.

7. Navigation was a primary concern in bringing jobs into the Valley. **Dean and Mary Jane Heavener, 2214**

**Response to Comment 7:** Commercial navigation is important to the region's economy and is a primary objective for operating the reservoir system. Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would discharge a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would improve navigation conditions.

8. In regard to the barge industry, your economic analysis there also rests on some unknown assumptions. If there is job loss due to increased shipper costs they too could pass on the costs. If the issue is shipping more tonnage by creating deeper channels that comes at the expense of the home owners and lake users of Douglas and other tributary lakes. I

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seriously doubt anyone other than the barge owners and their stockholders would benefit from the increased revenues generated by the increased tonnage shipped. At the same time, they would be creating more safety hazards and contributing to more pollution by continuing to support coaled fired power plants. Do we need more air pollution when the area already ranks nationally as one of the top five in poor air quality? **Drew Danko, 1023**

**Response to Comment 8:** Navigation on the Tennessee River supports industries in East Tennessee such as zinc mining, road paving, corn processing, aluminum production, agricultural inputs, and steel fabrication. It also produces a water-compelled rate effect in the region that benefits industries that use rail as a means of transportation.

Transportation data indicate that, because water transportation is available in the region, rail rates are lower due to competitive factors and the need of railroads to maximize utility. Reducing the cost of transportation to these industries allows for more investment in jobs in the region. The ability to ship coal by barge helps TVA keep its power costs low, which is good for the entire region. As part of continuing efforts to address emissions at its coal plants, TVA has begun a major additional reduction program for air pollutants. The program focuses on reducing sulfur dioxide and nitrogen oxides emissions, which contribute to haze. TVA has spent almost \$4 billion to reduce emissions from its coal-fired power plants, resulting in reductions to sulfur dioxide emissions of over 75 percent and reductions in nitrogen oxide emissions of over 60 percent. TVA is in the process of spending another \$1.8 billion through the end of this decade on additional reductions. By the end of the decade, TVA will have reduced sulfur dioxide emissions by 85 percent

9. During high water conditions, some loading/unloading docks are unable to accept barges at their docks because they are unable to load/unload them with any degree of safety or the water is above their dock. That in turn creates an economic downturn in the local economy if the loading/unloading facilities are unable to load/unload barges. If that happens, freight owners will turn to the trucking and/or rail industry in order to move their product at drastically higher rate, which creates higher prices for raw materials and finished goods alike. **Eddie Adams, 3035**

**Response to Comment 9:** TVA operates the reservoir system to achieve multiple objectives, including navigation, flood control, and power supply. During periods of high flow, TVA stores water in the tributary reservoirs and controls releases at the dams, if possible, to reduce navigation disruptions.

10. I would like to encourage further exploration and support to the efforts concerning increased barge traffic. It continues to be the safest and most efficient means of transporting large amounts of goods. It is also a primary reason to eliminate the need of interstate truck traffic. **Harold DeHart, 2131**

**Response to Comment 10:** Navigation is an important element in the transportation of bulk commodities. Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would discharge a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would improve navigation conditions and enhance the continued use of this safe and efficient mode of transportation.

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11. Looks good, need to keep the navigation access available for economic development. The new automotive industry growth will need this. **Jeff Braun, 2335**

**Response to Comment 11:** See Response to Comment 7.

12. Understood from the video presentation that this alternative might decrease the depth of the channel for commercial navigation. I represent a large chemical plant in Decatur. We receive a billion lbs of chemicals at our site each year plus up to 1000 tons per day of coal shipments. We also ship some finished products out of the plant by barge. Barge draft is already a limiting factor on our shipments in the Base Case, and this case apparently might reduce that.

You can probably recite the plight of US chemical companies competing in a global marketplace - we cannot pass on these additional costs, and it is more and more difficult to absorb them ourselves. Commercial navigation is a responsibility that is somewhat subtle - I'm not sure the public appreciates the impact of barge transportation, or more importantly, the impact of losing some of that ability. We encourage you to retain at least the current commercial navigation capabilities of the river system. **Jim L. Collins, 2350**

**Response to Comment 12:** See Response to Comment 7.

13. On the decision of either lowering the river or raising the river please take into consideration the barge terminals on the river. We really could use the higher river waters for barge traffic for our terminal. We would really appreciate the consideration for this. Thanks! **Joe Huzar, 2342**

**Response to Comment 13:** See Response to Comment 7.

14. My comment commends TVA for recently installing blinking lights on the electric towers that cross the water ways, this has helped us greatly in navigating the river after dark. But now I am disappointed to find that the lights are no longer in use on the towers in the area where we live. Big Sandy arm and the Tennessee River toward Leatherwood. Please reconsider turning them back on. This was a great safety measure that you had put in place. **Kelly Brawner Chadwick, 2591**

**Response to Comment 14:** Recent tower construction required de-activation of the blinking lights. TVA staff has asked the construction superintendent to look at re-activating the lights on the tower.

15. I work for Marine Terminals & I would like to see the water table stay as it is. It is very important to me, my fellow co-workers, & several other people & industry in the area that rely on the river for their income. I also feel that if the water table was lowered it would present navigational problems for the boats & barges coming down river. **Kevin Sellars, 2336**

**Response to Comment 15:** See Response to Comment 7.

16. The nature of Chickamauga reservoir (including the Hiwassee branch) is that in most locations the primary deep water river channel is surrounded by large but very shallow flats. My experience is that with near full pool elevations (>682'), these areas can be

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navigated safely. However, when the elevation is decreased to the current August 1 guide (681' nominal), the shallow flats become hazardous. This tends to squeeze recreational boaters into the deeper main channel regions and, due to congestion in areas where the channel is narrow, increases the danger of accidents. Another negative aspect of the current operational guide for the late summer period is that access into and out of shallow bays and sloughs, where most private residences and docks are located, becomes difficult. In early August of 2002, my personal dock and boat lift become essentially unusable for the remainder of the season due the effects of silting and low water (nominally less than 681' during daylight hours). **Larry Rinaca, 1895**

**Response to Comment 16:** To achieve the multiple objectives for operating the system, reservoirs are drawn down to regain flood storage capacity, to generate hydropower to meet peak demands, and to meet downstream requirements such as providing cooling water for nuclear and coal plants. Under the Preferred Alternative, the summer operating zone on Chickamauga would be extended through Labor Day.

17. The Ohio and Mississippi Rivers have sufficient water levels to accommodate 10 and 11 foot draft barges. Most of the new barge construction today is 13 and 14 foot hull barges. These barges can be loaded to a draft of 10 to 12 feet. However the Tennessee River cannot currently these heavy draft barges. This results in additional cost to shippers in the Tennessee Valley and leaves our region at a competitive disadvantage as compared to other areas along the mainstream rivers. **Mark Hommrich, 2230**

**Response to Comment 17:** The Tennessee River is a multi-purpose system designed for a navigation draft of 9 feet, with a 2-foot under clearance for safety. Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would discharge a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would improve navigation conditions.

18. We are concerned about water resources that supply the Tennessee Tombigbee Waterway and water supply for Tupelo and other communities. It is essential that water resources of the connected basins continue to be available for continuous transportation of barges and ports along the Tennessee Tombigbee Waterway. This vital link in Northeast Mississippi is critical in retention of jobs and creation of jobs in this needy area. The waterway is maturing at a measured rate as the economy firms up. The waterway also provides through passage of materials in the states of Kentucky, Tennessee, Missouri, Illinois and other northeastern states. Many natural products flow from this area in to coastal markets and global markets. **Mayor Larry Otis, 4347**

**Response to Comment 18:** All of the policy alternatives considered as part of this study included full design capacity use of the locks at Jamie Whitten Dam, offering maximum utilization of the Tennessee-Tombigbee Waterway and flows downstream of the project. See Appendix A, Table A-06 for additional water withdrawal assumptions for the Tennessee-Tombigbee Waterway.

19. My name is Mike McDonald. I am VP of Muscle Shoals Marine Service, Inc. in Florence, AL. We operate harbor and fleet services at Florence mile 257 and Yellow Creek mile 215 (TTWW mile 448) on Pickwick Lake. Our primary concern of course is the safe and

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efficient operation of our vessels in accomplishing their work. To that end our specific concerns are pool and discharge levels on Pickwick Lake. Our major area of concern is low pool levels at Florence during winter pool and periods of low water. Pickwick levels below 410 at Florence cause unsafe conditions for our tugs and customer barges. Customer barges have been damaged on several occasions with lake levels below 410 costing the company thousands of dollars in insurance deductibles and contributing to increased insurance premiums. Low lake levels also cause problems with fleeted barges causing groundings which can potential damage barges and also inability to spot barges at docks. Also of great concern are dramatic fluctuations (we have witnessed 4 to 5 foot fluctuations overnight) in lake levels over a relatively short period of time. Fleeted barges in both fleets can suddenly be hard on ground after these rapid fluctuations and we must then "pull the barge off ground" to prevent sinking which can damage or hole the barge. This is of particular concern at Yellow Creek where our fleeting area is adjacent to limestone bluffs with many rock ledges the barges can "sit down on" when water levels are lowered rapidly. Also of concern are Lock discharge levels which can make it very difficult to shove barges upstream. **Mike McDonald, 2509**

**Response to Comment 19:** Under the Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches to address navigation problems on that reservoir. Also, TVA would discharge a minimum instantaneous flow up to 25,000 cfs as necessary to maintain a tailwater elevation of 301 feet at Kentucky Dam, thereby aiding navigation on the reach downstream of Kentucky Dam. These changes would improve navigation conditions.

20. In conjunction with this I would hope that the lock can be replaced soon at Chickamauga in order to allow the transfer of such products as asphalt to Knoxville by barge rather than by highway or rail which increases costs, air pollution and accident risks on interstate highways and local roads. **Pete Barile, 1192**

**Response to Comment 20:** A 600- by 110-foot lock has been authorized at Chickamauga. Funding has been provided in Fiscal Year 2004 for pre-construction and design work.

21. As an employee with Marine Terminals of Alabama, I am very concerned that lower water levels will adversely affect our company. One of our main sources of income derives from unloading steel scrap from barges off the river. A lower water level will inhibit the ability for scrap to arrive at our port and therefore not provide the revenue to sustain our current job level and limit the potential for growth. Increased cost would also adversely affect the ability of NUCOR Steel to make a profit and again negatively impact the employment situation of our facility. **Ray Hancock, 2334**

**Response to Comment 21:** See Response to Comment 7.

22. We would like for you to take into consideration to keep the water levels at the same level or raise them. We are already facing problems with water levels as it is. With the barge traffic coming as it is we are going to have definite problems with lower river waters. Please take this into consideration. **Stanaley L. McClellan, 2341**

**Response to Comment 22:** See Response to Comment 19.

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23. As an employee of marine terminals of Ala. I think this could cost jobs and a loss of profit to the company that I work for. We unload scrap steel from barges and load processed coils back onto barges for NUCOR Steel. If water tables are too low we can not get the product in to load or out with full loads. In turn this will cost more to ship causing a loss of productivity which will cause labor to go up and profit to go down this is where jobs will be lost. **Tim Bass, 2300**

**Response to Comment 23:** See Response to Comment 19.

24. I was here last time, I addressed about dredging the river from Guntersville to the dam. I would like to know where we're at and what has happened up until now. TVA has raised our power rates or are trying to. You cannot generate energy from silt or mud, so, you know, I would like to know why we're not doing any dredging to get more water flow, more capacity in the river. **Tim Stewart, 4344**

**Response to Comment 24:** The primary influences on improved hydropower generation are improving turbine efficiency or increasing the height of the water column that feeds the turbine. Dredging the main channel would have little influence on the production of hydropower. Subject to the availability of resources, the USACE performs dredging operations on the inland river system to support navigation and flood control objectives.

### Flood Control

1. TVA raises lake levels too fast. Keep water 10ft. low till May 1st. Then finish filling lake so it is full on Memorial Day. This will help with flood control and fishing. Then everyone can enjoy a full lake until Labor Day or thereabouts. Specifically South Holston and Boone and maybe others - everyone wins. You can't fish the banks of the reservoir when lake is full for limbs hanging over - especially true on South Holston and Boone Reservoirs.

TVA started as flood control and that should be the main concern. People who moved in and around lake should know this before they moved there. All I'm saying is why won't this work. Keep lakes 10ft from full till May 1st, then fill by Memorial Day. You would have your flood control, people could fish better along banks, and then you could have full pool for the rest of the summer. Why won't this work. **Alan Mitchell, 706**

**Response to Comment 1:** In general, the potential for increased flood risk is greater for any alternative operations policy that specifies higher pool levels for any reservoir during any time of the year. The reduction in flood storage associated with increases in pool levels necessarily implies a reduction in TVA's ability to regulate large floods. A goal of the ROS is to determine what kinds of operational changes could be made without resulting in an unacceptable increase in potential flood risk.

2. Flood control is not directly affected by TVA. Other impacts are causes of floods. We should, as a society, concentrate on correcting these imperfections, such as permeable surfaces in our parking lots. Creating greenroofs to help aid in the prevention of flooding. **Anonymous, 1809**

**Response to Comment 2:** Flood control is addressed in Sections 4.22 and 5.22.

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3. Only one alternative was even slightly beneficial for flood control, Equalized Winter/Summer Flood Risk. **Anonymous, 2839**

**Response to Comment 3:** For the Equalized Winter/Summer Flood Risk Alternative, the increase in potential flood risk (relative to the Base Case) associated with the higher winter reservoir pool levels would be, at some locations, offset by the decrease in potential flood risk associated with the lower summer pool levels.

TVA developed its Preferred Alternative to maintain flood risk at acceptable levels while preserving increased opportunities for recreation and reducing impacts on other objectives.

4. It seems that the tributary lakes carry an unfair share of the burden of providing flood control to some mystery person or city out on the Tennessee River. Surely a small increase in flood storage capacity on non-tributary lakes would allow us to have winter lake levels that would allow boat ramps to remain useable. **Bob Garrison, 1773**

**Response to Comment 4:** The TVA flood control system was designed and built to take maximum advantage of locations whose physiographic characteristics allowed the construction of dams and benefits justified the required costs. The tributary dams were located where they could provide the aggregated flood storage necessary for TVA's integrated reservoir system and flood control purpose. The flood risk analysis indicated that TVA could not replace flood storage lost on tributary reservoirs on the mainstem river without adversely affecting navigation.

5. Melton Hill Lake, downstream of Clinton, has had two serious floods in the last eight years, washing away boats and docks. About four years ago, the flood from local precipitation washed away several boats, and nearly lifted my floating dock off of its pilings. At that time, Norris dam appeared to be releasing water through the turbines at maximum flow. I extended my pilings about a foot after that. This year, the flood would have removed my dock if the pilings had not been extended. The dock and pilings are more than thirty years old, so this problem must be recent. With Norris and Melton Hill dams to control the water level, this situation should not occur. **Bob Olson, 3012**

**Response to Comment 5:** Flood control is addressed in Sections 4.22 and 5.22. A primary purpose of Norris Dam is flood control. However, some downstream flooding can, and does, occur. To prevent unacceptable increases in reservoir flood elevations during a flood control operation, TVA will release water through the turbines to generate electricity, instead of spilling water to lower the level upstream of Norris Dam.

6. Alternative A does not make sense to me by saying that flood control would be an adverse effect, when flood control is not even a subject here or a problem to begin with, in the Douglas area or any of the tributary lakes. But as Chattanooga is flooded every year, how can TVA blow their own whistle and say they've saved us millions of dollars in flood dams in Chattanooga, when we have plenty of water space in Douglas and other tributary lakes also. **Carroll and Gail Johnson, 4401**

**Response to Comment 6:** TVA's detailed flood risk assessment shows that the loss of available flood storage associated with Reservoir Recreation Alternative A would lead to an unacceptable increase in the flood risk at many damage centers, including Copperhill-McCaysville, Elizabethton, Knoxville, Lenoir City, Chattanooga, Decatur, Florence, and

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Savannah. At several of these locations, increases in flood risk would be expected for all five of the seasons included in the assessment. Flood control is addressed in Sections 4.22 and 5.22. Chattanooga is not flooded every year. Douglas is one of many multi-purpose reservoirs that are used to reduce flood risk but have insufficient capacity to completely eliminate flood risk.

7. Being downstream of the dams of Kentucky Lake and Lake Barkley, flood control is critical and has an impact on navigation, economic development, agriculture and recreation. Many jobs, family farms and billions of dollars of economic activity depend on reliable flood control. In times of serious flooding, your alternatives would have an adverse effect on flood control and significantly increase the flood risk of people downstream. **Delila Sayre, Vice President, Caruthersville Marine Service, Inc, 3083**

**Response to Comment 7:** Flood control is addressed in Sections 4.22 and 5.22. Under TVA's Preferred Alternative, operating guide curves on Kentucky Reservoir would not be modified and it is expected that downstream flooding would not be noticeably affected.

8. Flood control was one of TVA's primary goals, and TVA has succeeded in meeting it. It should remain an important goal. As such, those alternates which have "substantially adverse" impacts upon flood control should be considered only with great reluctance. That said, it is very difficult to comprehend how the relatively small water level flood control changes (mainly shifting to the 7-day, 500-year flood) produce such large adverse impacts. **Colman B. Woodhall, 385**

**Response to Comment 8:** TVA remains committed to reducing the risk of flooding throughout the Tennessee River system. The adoption of the 7-day, 500-year inflow volume as a criterion for flood control storage would result in reservoir levels being substantially higher during the winter months at a large number of projects (relative to the existing operations policy). TVA's analysis demonstrates that such a reduction in total available flood storage would be accompanied by increased discharges at some points in the system during some times of the year. Flood control is addressed in Sections 4.22 and 5.22.

9. While I was unable to find the exact winter lake level (for Watauga) under the 7-day, 500-year storm criterion, the narrative leads me to believe it would be higher than the March 15 level. However, the March 15 level is such a substantial improvement over the Base Case Jan 1 level (1952 vs 1940 for Watauga) that any further increase would appear marginal -- particularly considering the stated increased flood risks. **Colman B. Woodhall, 332**

**Response to Comment 9:** The Watauga winter lake level required to satisfy the 7-day, 500-year inflow volume criterion is about elevation 1,957 feet. The commenter is correct in the assumption that higher reservoir levels could lead to additional increases in flood risk.

10. Would be interested in separation of Kentucky and Barkley Lakes from other mainstream reservoirs regarding flood control as holding water from Base Case in July until Labor Day has minimal impact of flood in these lakes. This is by far our driest time. **Dave Baxter, 2803**

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**Response to Comment 10:** Flood control is addressed in Sections 4.22 and 5.22. Under TVA's Preferred Alternative, the operating guide curve for Kentucky Reservoir would not be adjusted.

11. No alternative looked at the environmental impact of taking the reservoirs so low in the winter. In the case of Cherokee Lake, 15,000 acres are turned into a habitat that is similar to a strip mine. No amount of flood control can justify the damage to our environment the TVA is doing. **Dave Cooper, 1140**

**Response to Comment 11:** All the alternatives were evaluated in order to determine the potential environmental consequences of increasing or lowering water levels over different periods of time. The benefits of flood control are discussed in Sections 4.22 and 5.22.

12. Once again those of us living on the tributaries need real numbers to make a informed decision. We all know that the 500-yr. storm inflow is only a subjective number since there have only been lake level history since the 1940's and weather keeping records only for less than 100 years so there is no real data to base a 500 yr level on. So what level does Douglas Lake need to be to hold this 500 inflow? **David and Marylin Miles, 383**

**Response to Comment 12:** The estimated volumes are based on real data. However, uncertainty is associated with using the 99 years of available data to estimate an event with a recurrence interval substantially larger. This is a common situation in hydrologic design and analysis. TVA's estimates of the 500-year inflow volume were based on a rigorous statistical analysis of both estimated and observed inflows spanning the continuous 99-year period between 1903 and 2001. The analysis is based on techniques that were adopted by all federal agencies over 20 years ago.

The Douglas Reservoir level required to store the 500-year inflow depends on a number of factors: the duration of the storm event in question (for example, the 1-day, 500-year inflow volume is substantially smaller than the 3-day, 500-year inflow volume), the assumed operation of the project (which would dictate how much of the inflow volume could be discharged during the flood event), and the time or season of the year. The target winter flood guides for Reservoir Recreation Alternative B are based on the ability to store all of the volume from the 7-day, 500-year inflow.

13. Public comments were sought from within the Tennessee River watershed and the TVA service area but not from those outside this region. However, it is precisely those residents of communities downstream in the Ohio and Mississippi River basins whose lives, livings, and property are currently protected by the prudent and historically proven operation of the Tennessee River reservoirs.

In citing the benefits of reservoir operations, the documents on your website mention navigation, clean water supply, sustainable economic development, recreation, environmental enhancement, and flood control. For those of us downstream from the dams of Kentucky Lake and Lake Barkley, flood control is more than merely another benefit, more than an afterthought. Flood control has critical impacts on navigation, clean water supply, sustainable economic development, agriculture, and recreation. Indeed, flood control makes these benefits possible! Tens of thousands of jobs and billions of dollars of economic activity depend on reliable flood control.

## Appendix F3 Response to Specific Public Comments

All but one of your considered alternatives have an adverse effect on flood control, and that one, Equalized Summer/Winter Flood Risk, affords only a slight decrease in flood risk. Similarly, only two alternatives have a positive effect on commercial navigation, and those effects are negligible.

When TVA studies policy changes that have impacts which reach far beyond its service area, those who are affected by proposed changes should be equal participants in the decision process. **David P. Madison, Executive Director, Pemiscot County Port Authority, 3282**

**Response to Comment 13:** Notice of the availability of the ROS and EIS was widely provided, including in the Federal Register. Flood control, navigation, and power production are the three primary purposes for operating the TVA water control system. Under TVA's Preferred Alternative, operating guide curves on Kentucky Reservoir would not be modified; and analysis indicates that downstream flooding would not be noticeably affected.

14. We do have a couple suggestions for improving river management. When the threat of heavy rain in the eastern part of the state occurs, start lowering the reservoirs downstream to help control water levels. For our immediate area, the property on the west side of interstate 75 from the 24-75 split to exit 1 could be used as a catch basin for Chickamauga Creek back water. **Dean and Mary Jane Heavener, 2205**

**Response to Comment 14:** This comment describes typical flood control actions on the TVA system. Under any alternative, TVA would prepare for expected flood events by recovering flood storage capacity in appropriate reservoirs to assist in managing flood waters.

15. I also think the current flood control levels on tributary lake are excessive. Last year at Nottely we had higher than normal lake levels well into November because of work on the dam. Even with higher than normal rain fall level over the winter we were never in danger of flooding at our lake or downstream. **Doug Triestram, 1786**

**Response to Comment 15:** However, flood risk studies indicate that the risk of a major flood event during this time is high. The fact that no flood occurred in that particular year is not a valid indicator of the likelihood of future flood events.

16. Flood control with the Kentucky Lake and Barkley Lake dams greatly affects the Ohio and Lower Mississippi Rivers navigation, economic development, agriculture, and our clean water supply. Only one of your considered alternatives has an adverse effect on flood control, and that one only affords a slight decrease in flood risk. Similarly, only two of your alternatives provide a positive effect, but negligible, on commercial navigation. **Eddie Adams, 3036**

**Response to Comment 16:** TVA formulated its Preferred Alternative with the objective of trying to reduce the adverse effect on flood risk associated with the alternatives identified in the DEIS. Under TVA's Preferred Alternative, operating guide curves on Kentucky Reservoir would not be modified; and analysis indicates that downstream flooding would not be noticeably affected.

## **Appendix F3 Response to Specific Public Comments**

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17. Why does TVA seem to be considering flooding some of our lands below Pickwick Dam and at the same time helping other people upstream with recreational activities, et cetera?

What effect will these have specifically with given elevation changes with the present 1991 operating system? By this, what would the alternatives that have been mentioned in the EIS do to storm events of the past and their relation to these easement levels?

With a given easement of elevation 372 and with a flooding of 385, what effect would each of these alternatives have -- back it up just a second. With a past rainfall event that crested at elevation 385, what would each of these alternatives do to this?

Also, what would be the duration of the flooding and the effect on this duration with these various alternatives? **Frank McGinley, 4475**

**Response to Comment 17:** The downstream limit of TVA's detailed flood risk simulation model is Savannah. At that location, the model computes total discharges only. No data are available to demonstrate flood-crest elevations and durations for the various alternatives at Savannah. However, the analysis at Savannah is very comprehensive, and includes both period-of-record flow-frequency curves and analysis of a very large number of hypothetical design storms.

The intent of the flood risk study is to define the range of operations policy modifications that can be made without substantially increasing the potential for flood damage at any critical location, including Savannah. TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives.

18. What economic effect on Agriculture below Pickwick Dam would each of these alternatives have had for each flood occurring from May through November from 1991-2002 which exceeded 372 feet in elevation? A comparison with the 1972-1990 period would also be helpful since, I've been told, different operating conditions were used in the earlier period. How much would each of these changes cost farmers in the flood plane below Pickwick Dam? Ag related records are available from Farm Service Agency, USDA and UT Extension Service Offices. Flood information should be readily available from the stream models developed as part of this EIS. Consideration of maximum elevation and duration should be made a part of this exercise. **Frank McGinley Jr., 3024**

**Response to Comment 18:** The hydrologic model used by TVA to assess potential changes in flood risk at critical locations across the Tennessee Valley region does not compute elevations at Savannah. Therefore, it was not possible to conduct the specific analysis requested in your comment. Assessment of potential change in flood risk at Savannah was based on computations of total discharge. TVA has computed annual and seasonal flow-frequency curves at Savannah for all the alternatives based on a simulation of 99 continuous years. In addition, TVA has analyzed the impact of 138 hypothetical design storms at Savannah.

TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives.

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19. I've lived on Douglas Lake for over 27 years and most of the 27 years the drawdown has started around the 1st of July. When I try to find out I'm told it's for flood control. If it's for flood control why so early, since the rainy season doesn't start till the end of the year and I know doesn't take that long to let the lake down. If you started to let it down after Labor Day you would still be ahead of the rainy season. **Fred Schaffer, 889**

**Response to Comment 19:** Since the implementation of the alternative operations policy recommended in the Lake Improvement Plan in 1991, TVA typically begins unrestricted drawdown on eastern tributary flood storage projects on August 1. In terms of monthly average rainfall, rainfall in the Tennessee Valley region is fairly uniform throughout the year. While the volume of runoff associated with that rainfall shows a strong seasonal variation—with maximum amounts in the winter seasons when most vegetation is dormant—the observed hydrologic history of the Tennessee Valley region clearly indicates that large floods can and do occur any time of the year. Restricted drawdowns during June and July, and unrestricted drawdowns afford other benefits to constituents in the region, including power consumers. Flood control issues are discussed in Sections 4.22 and 5.22.

20. We have not seen any potential flood hazard during the winter months more so than summer months since we have lived around the Douglas lake area. We do not understand the reason for lowering the lake levels so low that homeowners and boaters cannot enjoy the benefits of the lake year round. **Frederick L Steel, 404**

**Response to Comment 20:** TVA's system of integrated multi-purpose dams was designed and built primarily to provide a navigation benefit and to reduce the risk of flooding in communities that had been built in the floodplains of the Tennessee River and its tributaries. That flood risk varies seasonally. Because the probability of large inflow volumes is highest in winter months, the reservoir pool levels are lowest then.

The inherent difficulty in demonstrating the value of flood control is the relative rarity of the flood events for which the system was designed. The TVA system was designed to provide protection for floods larger than those that can be expected every 500 years on the average. There is only about an 18-percent chance that one or more 500-year floods could occur within any given 100-year period. Therefore, the fact that large floods have not been observed within recent history does not necessarily mean that the potential for these large floods does not pose a significant risk. Flood control issues are discussed in Sections 4.22 and 5.22.

21. There seems to be concern about flooding downstream, Chattanooga. Chattanooga was supposed to build levees years ago. I don't see why our lake has to be drawn down because Chattanooga didn't build their levees. **Glen and Janice Boland, 4448**

**Response to Comment 21:** Flood control issues are discussed in Sections 4.22 and 5.22. Chattanooga's failure to construct levees, except on South Chickamauga Creek, was addressed in TVA's 1990 Lake Improvement Plan EIS, Tennessee River and Reservoir System Operation and Planning Review (December 1990). As discussed in the 1990 EIS, the likelihood that Chattanooga could now construct levees is remote. The consequence of this failure, however, is not increased lowering of tributary reservoir levels, but a higher risk of flooding in the Chattanooga area. The total Chattanooga flood protection plan included seasonal flood control afforded by the TVA system, as well as the planned levee system.

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22. A better plan would start with deciding to keep flood risk equal and then set seasonal pool levels accordingly. This criticism seems to apply to other alternatives as well, such as Reservoir Recreation Alternatives A and B. That is, the increased flooding risk is an artifact of deciding to set winter pool levels such that there will be an increased risk of flooding.

A more honest alternative would be to start with a commitment to keep flood levels the same as the base alternative, then determine what winter pool levels should be and develop the rest of the alternative from there. **Guy Larry Osborne, 1206**

**Response to Comment 22:** TVA designed the alternatives to evaluate the broad set of issues and suggested operational changes identified during the scoping phase of the study. TVA performed the flood risk analysis to determine which of the changes evaluated could be made without unacceptably increasing flood risk at any critical location. TVA developed the Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving desirable characteristics that were associated with the alternatives that were evaluated in detail.

23. The higher flood risk associated with Recreation Alternative B is an artifact of your decision to keep winter pool levels higher. This would be a stronger alternative if TVA committed to holding flood risk levels constant and then developed a plan for later draw down from that starting point. TVA has fudged in constructing alternatives from the Base Case by building in a higher flood risk. Who will vote for that? This is a rigged process to insure we stick with the Base Case which is what TVA wants to do anyway. **Guy Larry Osborne, 1271**

**Response to Comment 23:** Our analysis of Reservoir Recreation Alternative B has indicated an unacceptable increase in flood risk in all seasons of the year at critical locations in the Valley, including Knoxville. The increase in flood risk is not limited to the winter months. The alternatives analyzed as part of the ROS were based on extensive input received from the public, governmental agencies, and non-governmental organizations. TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives.

24. We have weather systems today that tell us weeks in advance of major storms. Why do we have to pull the lakes down in preparation of a 100 year flood when we know it is not going to happen 99 of those years. As a worst case, we know well in advance of any rains that cause floods. **Harold Andrews, 2168**

**Response to Comment 24:** While the science of meteorological forecasting has improved over the years, there is still far too much uncertainty to allow effective operation of the reservoir system based on weather forecasts. In order to release water "as needed" to provide effective flood-risk reduction, reservoir pool levels would need to be drawn down days or weeks before the initiation of flood-producing rainfall (the rate at which pools can be lowered is constrained by downstream channel capacities and, in some cases, dam safety considerations).

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A "release-as-needed" operation would frequently dictate the need to lower pool levels quickly based on rainfall forecasts. If the rainfall did not develop as predicted (or fell in an area outside the predicted area), the effective operation of the entire reservoir system would be compromised. Under this operating scenario, reservoir levels would likely fluctuate much more widely and often.

25. As you know the 99 year study excludes the three highest regulated floods of record at Chattanooga. This includes the 1867 flood (44.0 gauge), which is above the 500 year regulated flood at Chattanooga (42.48), and the 1875 flood (40.6) and the 1886 flood (39.1), which are both above the 100 year regulated flood (35.88). The 1867 and the 1875 floods were both between the January 1 and March 15 period which Alternative A does not provide any extra flood storage. The scaling factors of 1.5 and 2.0 attempt to compensate for these larger floods outside of the 99 year study, and if storage is provided for these scaling factors, all floods of record would be accounted for in the study. **Jack C. Marcellis, 2862**

**Response to Comment 25:** The design of the flood risk study includes both a continuous simulation over the 99-year period between 1903 and 2001, driven by observed (historical inflows), and the discrete simulation of a large series of hypothetical floods, some of which are larger than the 1867 flood.

26. As for flood control. It is time Chattanooga built the dike. **Janice Boland, 1619**

**Response to Comment 26:** See Response to Comment 21.

27. The problem of flooding does concern me though in that less retention of water in the upper reservoirs does reduce the ability to hold back excessive runoff from rain. An alternative to this may be the possibility of check dams along some of the larger inlet streams into the main channel rivers. An example of this was discussed about 12 years ago when TVA conducted a feasibility study in Claiborne County to see if damming the Big Sycamore Creek would benefit the economy of the region. At that time it was decided that it wouldn't. The dam would not be a hydroelectric but more to control the water flow of several large streams into the main channel. **Joe Payne, 2102**

**Response to Comment 27:** Flood control is discussed in Sections 4.22 and 5.22. In light of the environmental issues associated with constructing new dams and reservoirs, as a general matter it would be difficult to justify the construction of check dams at most locations in the Tennessee Valley region from a flood storage viewpoint alone. The objective of this EIS is to identify how TVA's existing reservoir system could be operated to improve overall public value of the system. TVA is not proposing to construct additional dams and reservoirs. If such a proposal was made, additional environmental review would be required.

28. Does this EIS consider the silt buildup that all dams have? How will this be addressed? From my readings, at some point in the life of a dam, it ought to have greatly reduced water holding capacity as the silt builds up. **John Hubbard, 2257**

**Response to Comment 28:** While the buildup of silt is problematic at some dams, this buildup and continued silt deposition in TVA reservoirs is generally below the range of elevations important for flood control pool operations. It is not expected to be substantial in

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any of TVA's flood control reservoirs within the 30-year time frame of the study. Erosion and its effects are addressed in Sections 4.16 and 5.16.

**29. 500-year inflow?????? Julia Householder, 3285**

**Response to Comment 29:** The 500-year inflow, for any given reservoir, is the volume of water flowing into the reservoir that, on average, would be expected to be equaled or exceeded every 500 years. This does not mean that the period between events of this magnitude is 500 years. It is more accurate to state that the probability of an event of this magnitude is about 1 in 500, or 0.2 percent, in any given year. Therefore, it is possible, although highly unlikely, that 500-year events could occur in successive years.

The 500-year inflow volume is usually understood to occur over a specified duration. The 7-day, 500-year inflow volume is the inflow volume over a 7-day period that is expected to be equaled or exceeded once every 500 years.

**30. I'm from Savannah, Tennessee, and I'm a farmer. I farm approximately 1500 acres below Pickwick Dam, between Pickwick Dam and Savannah. I am concerned about the adverse effects on the flood control on the Tennessee River that were proposed in basically all the alternatives that are proposed except for the flood control or the flood risk alternative. I am very much opposed to any increase in flood control below Pickwick Dam especially.**

I want to increase awareness that below Pickwick Dam TVA has several thousand acres that they use to flood or for flood control where there were no easements purchased back in the '40s. My concern is that if any of these alternatives are going to be selected and imposed on us, has TVA any kind of idea how to approach the easement issue below Pickwick Dam. I make my living 100 percent from farming and I am very much opposed, again, for increased floods that can be prevented with the system as it is now. **Karl Forsbach, 4438**

**Response to Comment 30:** TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts to other objectives. TVA is aware of the potential flooding impacts on farming in the Savannah area and will continue to operate the system to minimize these impacts on the extent possible.

- 31. 1. I would like to see data showing the duration and crest elevation of the flood at Mile Marker 190 (Savannah) for each alternative using the April/May 2003 storm pattern as an example.**
- 2. I would like to see data showing the duration and crest elevation of the flood at Mile Marker 190 without any dams (flood control) using the April /May 2003 storm pattern as an example.**

Let me point out at this time that every foot of additional flood water above 372' will dramatically increase the flooding of our farm land. In addition to that, the duration of a flood adds drastically to the damage of our crops and shorelines.

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Furthermore, I would like to question why the analysis for flood risk did not consider areas downstream from Savannah? How can a study like the ROS be complete if it fails to neglect the lower part of the Tennessee River and Kentucky Dam?

It is my understanding that the Corps of Engineers only interfere with the discharge of Kentucky Dam when the Ohio River is at a certain flood stage, I believe measured at Cairo, Illinois. The result of that particular situation is well known here in Savannah. TVA blames the Corps of Engineers for holding water on our farmland, at our expense. Does your study suggest that the above described situations will get worse? **Karl Forsbach Farms, Inc., Karl Forsbach, Jr., 3731**

**Response to Comment 31:** The downstream limit of TVA's detailed flood risk simulation model is Savannah. At that location, the model computes total discharges only. No data are available to demonstrate flood crest elevations and durations for the various alternatives at Savannah. However, the analysis at Savannah is very comprehensive, and includes both period-of-record flow frequency curves and analysis of a very large number of hypothetical design storms. Separate from its modeling of flood risks, TVA did consider flooding effects downstream from Savannah.

For Kentucky Reservoir, TVA conducted a detailed investigation of the effect of different operations alternatives on the volume of water discharged from Pickwick Landing Dam. This investigation included the identification of the 10 largest annual and seasonal volumes discharged over 1-, 3-, 7-, 10-, 15-, and 30-day durations in the 99-year simulated period of record and, for each of these events, a comparison of the incremental volumes discharged into Kentucky Reservoir with respect to the No-Action Alternative or Base Case. This analysis shows that it is reasonable to expect that the differences in discharge at Pickwick in these large storms can be temporarily stored in the Kentucky pool.

TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives.

32. Are you seriously looking at alternatives that would turn our privately owned land, free of easements, into a "holding pond" for the benefit of some developers on certain lakes, which were originally designed to ease the flooding of the Tennessee River and consequently the lower Mississippi River?

I would like to state adopting any one of your alternatives would be devastating to our farm operations in and around Savannah. Crop Insurance would become unaffordable for us, the Shoreline Erosion would drastically increase and our property values (farmland) would collapse. All these facts combined would be devastating to any family farm operation. **Karl Forsbach Farms, Inc., Karl Forsbach, Jr., 4172**

**Response to Comment 32:** TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving increased opportunities for recreation and reducing impacts on other objectives. Flood control is addressed in Sections 4.22 and 5.22.

33. TVA owns flood easements along most of the Tennessee River and prohibits building permanent structures below the 500 year flood elevation to minimize high water damage.

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They have no easements from Chickamauga Dam downstream thru Chattanooga because House Document 91, 76th Congress, 1st Session, 1939 planned the main Tennessee River reservoirs with limited flood storage, 4,000,000 acre-feet of tributary storage and a levee at Chattanooga to hold back water to Walnut Street gage height of 60 feet or thirty feet above flood stage. TVA constructed the Tennessee River dams and 9,000,000 acre-feet for flood control in the tributaries. Chattanooga refused to build the levee. After the March 1973 flood, TVA Chairman Aubrey Wagner made numerous proclamations making one think completing Tellico Dam would solve Chattanooga's flood problems. But former TVA Chairman Herbert D. Vogel, who worked at the Corps of Engineers river hydraulic lab at Vicksburg before his TVA appointment, warned of continued extensive flood hazard because the levee was not in place in a March 25, 1973 letter to The Chattanooga Times.

The May 2003 flood shows General Vogel was right and extensive rains can fall any time of the year. Tributary communities are requesting TVA to hold reservoirs high into the fall for recreation. But TVA really needs to lower upland lake levels in warm weather so five inches of runoff can be stored like the Corps of Engineers does in their reservoir operation instead of the approximate one inch TVA keeps. Chattanooga also needs to help itself by limiting development below the 500 year flood plain. When an early season hurricane stalls over the eastern Tennessee Valley and the river washes out the foundations of the 21st Century Waterfront Development, FEMA and Chattanooga officials will wonder what happened. Anyone who has studied the situation will remember General Vogel's warning. Minimum drawdown levels of navigable channel reservoirs should not be raised two feet during winter to accommodate heavier barges. These lakes have quite marginal flood storage under the current plan. **Kirk Johnson, 3794**

**Response to Comment 33:** Flood control is addressed in Sections 4.22 and 5.22. See Response to Comment 21.

34. All other options are either adversely or substantially adverse for the risk for flooding, with most other options being effected slightly plus or minus. It is great to look at alternatives for better recreation, power, or navigation and do what can be done to improve these by reservoir, tributary or by area, but do it scientifically and not err on the risk side of massive flooding, thereby defeating the purpose of TVA. **Lane Marte, 2395**

**Response to Comment 34:** See Response to Comment 32.

35. After reviewing the TVA document called "Weighing the Alternatives," I really don't understand why or how improving late summer recreational opportunities (particularly on mainstream reservoirs) has any significant adverse impact on flood control. Historically, it appears that the major flood risk is in the winter through spring time frame (i.e., the normal rainy season where the ground is usually saturated), particularly after the reservoir filling process has started or completed. Although it is obvious that raising winter reservoir levels would be adverse to flood control, it is not clear why increased mid-winter levels are necessarily tied to increased late summer levels. **Larry Rinaca, 1894**

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**Response to Comment 35:** The flood risk analysis indicates that extending summer pool levels leads to an increase in flood risk in those months. The location and the extent of increased flood risk varies from alternative to alternative, but the notion that late summer is a period free from flood risk is not supported by the results of the analysis. See Sections 4.22 and 5.22.

36. In the video presentation, a somewhat negative impact on flood control . . . was indicated [for Alternative A], however this was based on computer modeling, which, while an approximation of reality, is subject to question. I am interested in how the data was gathered, and whether the current TVA baseline is really a true median for all the factors at stake. So many things are affected by any change in the system, but I have to assume the overall benefit to the public is the eventual goal.

A more balanced approach to raising and lowering the local lakes would be desirable. The tributary lakes should be dropped evenly, instead of drastic differences (for example, Lake Chatuge is only dropped 10 feet while Nottely is dropped 30. This is not fair to the homeowners and recreational industries on Lake Nottely.)

The tributary lakes seem to be a "red-headed -step child" of sorts. We are responsible for flood control and navigation, with resulting dramatic and detrimental changes in our lake levels. The main system realizes very few elevation changes, perhaps levees could be put in place to help regulate shipping needs. **Margaret H. Schramke, 1437**

**Response to Comment 36:** A computer model is only an approximation of reality and should not be interpreted as reality itself. However, a computer model that captures all of the important physical phenomena associated with the modeled process, and is driven by valid data, can be a very useful tool in predicting possible outcomes or in comparing the potential impacts of changes in the modeled system.

TVA's flood risk analysis was performed using a complex reservoir simulation model called RiverWare. The RiverWare model has been thoroughly tested and used routinely by TVA for several years. It accurately represents all of the physical characteristics of the TVA reservoir system that would affect the magnitude and the timing of floodflows.

The model was driven by an extensive database of both observed and estimated hydrologic inflows. The Tennessee Valley region was conceptually subdivided into 55 sub-basins, and a continuous record of flows in those subbasins over the 99-year period from 1903 through 2001 was developed. Observed inflow data included stream gage records maintained by the U.S. Geological Survey and TVA's reservoir operations data. Standard hydrologic techniques were used to fill in "gaps" in the available flow record where required.

The computer model makes decisions about how much water to release from each simulated project every 6 hours for the entire 99-year period. Those decisions are driven by rules incorporated into the RiverWare model that were developed and tested by TVA to represent the existing operations policy. Because TVA's operations policy has evolved since the inception of the agency in the 1930s, the model is not intended to "reproduce" historical flow and elevation data but rather to operate as if the 99-year historical pattern were to recur under the existing operations policy. Each time an alternative was analyzed,

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the RiverWare model operations policy rules were revised as required in order to reflect that new policy and the entire simulation repeated.

Based on extensive analysis, the computer model adequately represents both the Base Case and all of the simulated alternatives; therefore, any differences between the Base Case and a given alternative are meaningful. See Response to Comment 21.

37. I am surprised TVA would consider options that increase the risk of flooding. Unfathomable to me that TVA would manipulate the water levels in such manner to increase the risk of flood damage. Recreation for some is not worth the risk of flooding damage. Recreation for some is not worth the risk of flooding to the many of us downstream. Primarily TVA is to provide cheap electricity and control flooding. Providing water recreation should be of secondary importance. **Marianne T. Helton, 4058**

**Response to Comment 37:** Although navigation, flood control, and the generation of electricity are the primary objectives for operating the TVA reservoir system, TVA also operates the system to improve water quality and water supply, and to provide recreation opportunities. TVA designed the alternatives that were evaluated in detail in the DEIS to reflect the broad range of issues and recommendations that were identified during scoping. This enabled a determination of the full range of associated potential impacts. Results of the analyses were then used to determine which elements of the alternatives would and would not meet evaluation criteria that were established for the primary system operating objectives, such as reducing the risk of floods. TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving desirable characteristics that were associated with the other alternatives.

38. As a landowner in the upper bottom area in Fulton county on the Mississippi, (an area unprotected by levee) I am interested in seeing lake levels and flows managed to reduce flooding of our farmland at critical growing periods in our crop year. This may mean Alternative ES 7.5, or the Equalized Summer/Winter Flood Risk would be the best alternative for us but it is hard for me to understand how maintaining higher winter levels could reduce flood risk downstream. I can see how reducing pool levels in summer somewhat would give more storage to reduce downstream flooding in the event of growing season flooding conditions, however. I believe flood control continues to be a primary reason for flow management. This alternative seems to have few negative effects compared to some others. The overall change in area GDP is very slight and probably within the estimation margin of error. One thing is for sure, when the river takes your crop in June and July, it is gone, with no replanting recourse, and along with it comes the large negative economic impact in our farming economy counties. **Max Wilson, 2002**

**Response to Comment 38:** The Equalized Summer/Winter Flood Risk Alternative attempts to equalize flood risk for the two seasons of summer and winter, relative to each other. In fact, the higher winter pool levels specified in this alternative lead to an increase in winter flood risk over the Base Case condition. The lower summer pool levels specified in this alternative, conversely, lead to a decrease in summer flood risk over the Base Case condition. Flood control is addressed in Sections 4.22 and 5.22.

39. And the other comment would be the flexibility, flood control being probably the most important thing. And I find it's pretty hard to write a formula for flood control when there's too many variables that are uncontrolled and try to interject them the best you can. So, if

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probably a more flexible system were developed, that if flood is the problem, then do what you have to do to eliminate it, whether it's lowering the lake or letting it up here and lowering it someplace else. **Michael Kovich, 4469**

**Response to Comment 39:** See Response to Comment 32.

40. We've had very heavy rainfall in the watershed of the French Broad, Nolichucky, and Pigeon Rivers in August of 2001 and 2003. If drawdown had not commenced on August 1, there likely would have been flooding in the river system. I don't think a tradeoff of flood risk and recreational opportunities is fair. Even if the positive and negative economic impacts are balanced, recreation is fleeting and easily rearranged; flood damage is long-lasting and emotionally and financially burdensome. **Michael Sledjeski, 3221**

**Response to Comment 40:** Comment noted.

41. There was serious downriver flooding in 2003 despite the extensive system of TVA flood control dams. My impression is that the impoundments were allowed to build up too soon. In view of this failure, TVA should reconsider allowing summer pool levels to be reached too early. Likewise, TVA should make every effort to maintain early drawdown dates, i.e., August 1, for all lakes. Rainfall during August of this year, was quite heavy. There should be no margin of error when it comes to flood control. Failures by TVA in this area are inexcusable. **Michael Sledjeski, 2969**

**Response to Comment 41:** The Base Case, or No-Action Alternative, shows the flood consequences of an August 1 drawdown. The Summer Hydropower Alternative shows the flood consequences of a June 1 drawdown.

42. Flood control is the original reason for constructing the TVA dam system, but is being relegated to a secondary position by the demands of recreational users and tributary lakeshoreline property owners, TVA must not slack off on its responsibility to protect downstream communities from flooding. Lake levels were allowed to rise too high, too soon in Spring 2003, and considerable damage resulted from the inability to hold back floodwaters. Delaying drawdown will increase the likelihood of flood damage; in 2001, flooding was avoided in August because drawdown commenced an August 1. Comparing economic impact of recreational use and flood damage is unfair and egregious. Recreation advantages are trivial relative to the tragic effects of flooding. Property owners should have known about drawdown schedules before they bought; they should have to live with it, rather than ignore the risk to downriver property owners. **Michael Sylva, 2128**

**Response to Comment 42:** See Response to Comment 41. Table 3.5-02 shows changes in the percentage change (plus or minus) in annual flood damage and other economic effects, including recreation spending.

43. If the extra 2 months of full pool create a flood hazard due to excessive rain (which is very unusual for July and August), why can't the water be released as needed. **Mrs. Jean Roberts, 1913**

**Response to Comment 43:** See Response to Comment 24.

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44. I do not know the number of rivers feeding into the 10 reservoirs addressed in Alternative A. Regarding Nottley, because it is only fed by one river, it has little impact on flood control to the overall TVA system. This spring exemplifies this. The highest level was 1777, 8 feet below the allowed level of 1785, as stated on the plats. How were the 10 reservoirs chosen for the study? Would the elimination of one or two reservoirs from having the levels maintained greatly impacting the "substantially adverse" flood control results?

I compliment the TVA system on its control when compared to the other reservoir systems in region, i.e., Lake Lanier. **Nanette M. McCarthy, 1494**

**Response to Comment 44:** The reservoir simulation model used to perform the flood risk analysis includes 36 dams. While several very small dams with little or no impact on flood control operations were not included in the study, all of TVA's major dams were included in an effort to conduct a comprehensive and physically realistic analysis. TVA's understanding is that the 10 reservoirs referred to are the eastern tributary projects with some flood control storage. These include Norris, South Holston, Watauga, Cherokee, Douglas, Fontana, Chatuge, Nottely, Hiwassee, and Blue Ridge.

The flood risk analysis of Reservoir Recreation Alternative A was based on the assumption that the operations policy of all of these reservoirs would be modified in a similar fashion. Separating operation of the system and operating reservoirs on an individual basis could be done, but this would be inconsistent with how the system was designed to be operated and would result in substantially adverse impacts on flood control and other important system operating objectives, such as navigation. TVA did consider excluding individual reservoirs from its system-wide operations policy, when it last comprehensively evaluated system operations for the 1990 Tennessee River and Reservoir System Operation and Planning Review (Lake Improvement Plan). TVA concluded that, while this may be feasible, it would raise serious equity issues because of the disparate treatment of reservoirs within the system. For example, if TVA substantially reduced levels on Nottely and other reservoirs in that basin, TVA might be able to maintain levels somewhat higher longer on Cherokee or Douglas Reservoirs (ignoring the increased risk of local flooding) without unacceptably affecting downstream locations. However, such preferential treatment would likely be objectionable to users of Nottely. For clarity, the Top-of-Gates at Nottely Dam is elevation 1,780. The 1,785 elevation referenced includes flowage easements.

45. [Recreation B] is a viable alternative; however once again those of us living on the tributaries need real numbers to make an informed decision. We all know that the 500-yr. storm inflow is only a subjective number since there have only been lake level history since the 1940's and weather keeping records only for less than 100 years so there is no real data to base a 500 yr level on. So what level does Douglas Lake need to be to hold this 500 inflow? **Anonymous, 4190**

**Response to Comment 45:** See Response to Comment 12.

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46. Because of flood water in the last 3 years, I have lost about \$20,000. They hold water in the lake to take care of these rich people. If you're going to flood us, then pay us for what we lose. There is no cause for this flooding. You could control the flooding if it is managed right. Instead of letting water raise in the lake, you could take care of the water without flooding. We are just as important as the lake side. I don't like to try to tell people how to do their job, but something got to be done. Our money running out. **Paul Howell, 4021**

**Response to Comment 46:** See Response to Comment 36.

47. I believe that the concern for flood control is overstated and is controlling the lake in an adverse manner not beneficial to all concerned, especially residents of the areas concerned. Anytime you raise water levels you will have an increase of flood concerns, however, look at recent flood situations, not 100 years, and you will find the concerns are not substantiated. Is a loss of power sales or a real concern of flood risks? Let the voice of the people be heard and respected as many who are involved have as much knowledge if not more than the elected officials involved. **Richard Rodriguez, 1338**

**Response to Comment 47:** It is correct that any time reservoir levels are raised, there is an increased risk of flooding. See Response to Comment 36.

TVA's flood risk analysis was based on extensive evaluation of the entire period for which good hydrologic data are available. Weather patterns are often cyclic, with both wet and dry conditions occurring in multiples of 2 or more consecutive years. Conditions over any period limited to several years are most likely representative of only a very small sample of the range of possibilities. If the last several years had been wetter than normal, the commenter's argument would suggest that pool levels should be reduced throughout the system. TVA's position is that the flood potential of any watershed is best understood by observation over a long period.

The flood risk analysis was conducted independently of the analysis of power costs. See Sections 4.22 and 5.22, where flood control and flood risks are addressed.

48. Flood control is critical; however the public in general places too much responsibility on government agencies, including TVA, for flood control. No matter what alternative is chosen, or what action's TVA takes, there will always be risk to those whose choose to live within the flood plain. There should be an education effort to help the public understand that. Mother Nature has the last word... NOT TVA! **Richard Simms, 2223**

**Response to Comment 48:** TVA and other agencies such as FEMA do try to educate the public about the risks of living in the floodplain. This EIS should contribute to that effort.

49. 7-Day 500-year inflow--what does that mean? Re: water levels? **Richard Smith, 4042**

**Response to Comment 49:** See Response to Comment 29.

50. Would like to see Kentucky and Barkley Lakes looked at separately concerning summer flooding impacts. **Roberta Baxter, 2046**

**Response to Comment 50:** Because Kentucky and Barkley Reservoirs are directly connected by a canal, any changes in pool level in one of the reservoirs necessarily causes

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an equal change in the pool level of the other. It is unrealistic to conceptually separate these two projects.

51. It seems that this spring and summer have been a prime example of how to deal with high water levels due to all of the rain that we have had. We keep a boat on South Holston and would like to see the water level stay higher until labor day. According to your study it seems that this would cause a lot of adversity, but like I said earlier, with all the rain that we have had, I believe TVA could handle it. **Sherri Hinkle, 189**

**Response to Comment 51:** Flood control and flood risks are addressed in Sections 4.22 and 5.22.

52. I don't think the risk of flooding is any higher up to this point than it is throughout the summer. The real risk of flooding is not until water- absorbing grass, crops, trees and shrubs have gone dormant for the winter, especially from November on. **Steven L. Cook, 327**

**Response to Comment 52 :** Comment noted.

53. The TVA ROS will have a widespread impact across the Tennessee River Valley. The critical balance between electricity production, flood control, economic development and recreational opportunities all contribute to our excellent quality of life in this region. TVA's initial mission to control flooding is critical and should remain an extremely high priority--the protection of human life is paramount. **The Honorable Zach Wamp, U.S. House of Representatives, 3896**

**Response to Comment 53:** See Response to Comment 36.

54. When TVA went to a 500 year flood level basis, it was done for one reason..... An additional excuse for justification of lower lake levels. This ploy is too similar to the insurance companies new revised hurricane forecast table for the gulf of Mexico, for the sole purpose of justification of insurance rate increases. **Thomas G. Sandvick, 2659**

**Response to Comment 54:** The TVA flood control system was designed to provide effective reduction in flood risk for events much larger than the 500-year flood. The primary flood risk evaluation criterion used in the ROS specifies that substantial increases in flood risk associated with events smaller than the 500-year level are not acceptable. Using the 500-year event as a primary criterion to judge flood risk acceptability could be viewed as being less conservative than the flood risk criteria originally used by TVA to design the system.

55. This is our primary concern since the floodplain level indicated by Cherokee County (NFI) flood damage prevention ordinance adopted 2/2/89 was based on TVA/ONRED/AWR 85/25 dated August 1985. We can find no basis for raising the flood plain level as shown on elevation certificate #6558 issued at 1/23/95 was to be raised from 1577.00 to 1585.00 at 7/2/95. TVA has no record of any changes in 1995 or after. **Thomas L. Parker, 3995**

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**Response to Comment 55:** As discussed in the September 3, 2003 meeting where this comment was made, there has been no change in the 100-year flood elevation on the Nottely River since the publication of the 1985 flood study.

56. I am primarily interested only in the Nottely River area near bridge #74 at Cook Bridge Road (NCSR 1596) in particular our lot No. 1 and the seventeen (17) lots along the Nottely river in The Preserve subdivision. Our biggest problem is to confirm that the base flood elevation data is realistic and correct, since TVA closely monitors the release waters on a daily basis. Our observations at our site indicate that the daily flood level is maintained about 13' to 15' lower than the EIS info. **Thomas L. Parker, 4056**

**Response to Comment 56:** The pertinent TVA Watershed Team will be asked to contact the commenter about this.

57. I have never seen a rain in winter raise the level anywhere near full pool and am certain that the winter low draw-down could be raised about 25 feet with no adverse flooding. Most of the volume of the lake is in the top part of the lake any way. The lake would fill up sooner in the spring if the winter draw down was not so severe. **Tom Murphy, 1537**

**Response to Comment 57:** TVA has considered several alternative operating guidelines for Nottely Reservoir that specify higher winter flood guide levels than those for the Base Case. Under TVA's Preferred Alternative, higher winter flood guide levels would be established for 11 tributary reservoirs, including Nottely.

58. What I'm concerned about is a lot of times this lake as of right now is a foot higher than it should be. It's a foot higher than normal. This is our rainy season. Right now it's coming up on our rainy season. I just feel like that this could be controlled a lot better. They know this water is coming, so why not pull it down a foot? Why do they have to leave it up to as high as it is right now? Especially, what is the reason, do you know, that it's a foot higher?

....I just feel like that TVA handled their end of this last flood very poorly. I feel like that a lot of that could have been prevented to a certain extent by controlling the reservoir. The reservoir -- that's what a reservoir is for is to control the water. They didn't do it. They didn't control their end of it. **Tommy Epperson, 4529**

**Response to Comment 58:** Due to the multi-purpose nature of TVA's system of reservoirs and the unpredictability of weather, pool levels in TVA reservoirs can ordinarily be expected to fluctuate 1 or more feet over short periods. When reservoir levels increase above flood guides, TVA acts to lower them as expeditiously as practicable—consistent with the protection of downstream areas from increased flooding and using available water to generate electricity.

59. Another thing that concerns me is why the Tom Bigbee Waterway down here is running at a 35 percent capacity when they could route some of that water down the Tom Bigbee Waterway. I understand that the Corp of Engineers and the TVA is two different forms -- I understand that the Corp of Engineers is a form of the government, but TVA is a different form. I can't see why that two big organizations like that can't work together enough in an emergency situation to dump that other 65 percent of water down that Tom Bigbee Waterway. **Tommy Epperson, 4532**

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**Response to Comment 59:** The amount of flow released on the Tennessee-Tombigbee Waterway is determined by the amount of traffic that moves through the locks at Jamie Whitten Dam. Current use is well below the maximum utilization level. Also, the waterway does not have sufficient flow capacity to be used effectively in a flood control operation. USACE and TVA closely coordinate operations during flood events.

60. The other thing that I see in water releasing is below Nottely Dam there are about 30 to 40 properties that it may be in the best interest of TVA to buy those so that they wouldn't have to worry about flooding in this particular area. **Vincent L. and June D. Greaves, 4295**

**Response to Comment 60:** Those properties are located in the floodplain and are subject to flooding. However, operation of the TVA system does not exacerbate this situation and, in fact, provides them substantial protection.

61. Many times we hear about the water reservoirs protecting Chattanooga from flooding. Approximately two months ago, Chattanooga flooded. Well, what happened? What happened was the entire area received so much rain that you couldn't stop it from flooding. If you'd had ten more lakes up here, it wouldn't have made any difference.

Putting that in context, there are many times when those lakes would prevent that, but there's also many times when Chattanooga is going to get flooded because they did not put in flood prevention walls down there in the city. When this act went into effect back in the '30s, I believe they were directed to do that. And they assumed that Douglas and Cherokee and Norris lakes would prevent them from getting flooded, but they have found out since that's not necessarily so. **W. G. Cahoon, 4383**

**Response to Comment 61:** See Response to Comment 21.

62. Douglas Reservoir - We need clarification on what depth change occurs to provide for a seven-day, 500 year storm inflow. Was the 8 inches of rain in 36 hours this spring a 500 year storm? If so, the level change of 10 feet or so in spring had little effect, and less effect than the quick drawdown following the next week. **Wayne Gallik, 2915**

**Response to Comment 62:** The depth change associated with the storage of a given inflow volume depends on the initial reservoir pool level. For Douglas Reservoir, our analysis shows that the annual 7-day, 500-year inflow volume is about 475,000 day-second-feet, or about 940,000 acre feet. This is a volume equivalent to 3.9 inches of runoff (not rainfall) distributed uniformly over the entire 4,541-square-mile drainage basin above Douglas.

Most of the watershed above Douglas received between 2 and 4 inches of rainfall (not runoff) in 72 hours on May 5-7, 2003. Based on a review of our rainfall data, this was the most intense rain over the watershed this spring (and was not particularly unusual). It is possible that the event you describe occurred over a small area, but we have no data that show rainfall of that amount.

## **Appendix F3 Response to Specific Public Comments**

### **Power**

1. Reservoir operations policy should not be changed to increase power prices for Valley residents so that a few wealthy property owners around reservoirs can increase their property values and have better views of the lake. They bought their lake property knowing that reservoir levels would drop in August and the price they paid for that property reflected it. I should not have to pay any more for my power so they can get a windfall when they sell their property. **Anonymous, 2678**

**Response to Comment 1:** One of the objectives in the formulation of TVA's Preferred Alternative was to reduce the potential cost impact on the TVA power system that occurred under the recreation-based alternatives in the DEIS.

2. Power - Learn more nuclear! When coal is gone, nuclei will still be around. **Anonymous, 3248**

**Response to Comment 2:** Comment noted.

3. Keep power rates low **Ben Robinson, 3982**

**Response to Comment 3:** See Response to Comment 1.

4. Restrictions on when TVA can pass water through it's hydro-turbines would result in the use of fossil fired power for peak power demands instead of the hydro-turbines! This ultimately comes back to the consumer as higher utility bills. **Clifford J Rabalais, 2287**

**Response to Comment 4:** Potential effects on the TVA power system are addressed in Sections 4.23 and 5.23.

5. I am not in favor of any option that would increase my power costs. I am not in favor of increased recreation that would increase noise, increased pollution, increased boat traffic. **David R Cook, 1522**

**Response to Comment 5:** Potential effects on the TVA power system are addressed in Sections 4.23 and 5.23.

6. TVA was created to create affordable power for the Valley. **Dean and Mary Jane Heavener, 2213**

**Response to Comment 6:** Comment noted.

7. When the TVA originated low cost energy to stimulate growth in the Valley was very important. Today the energy out of tributary dams is but a small part of the power used by our area according to my contacts at Blue Ridge Mountain EMC. **Doug Triestram, 1787**

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**Response to Comment 7:** Although hydropower generating plants provide less than 15 percent of TVA's annual power generation in the average year, the water released from the reservoirs is also necessary to assure adequate cooling water for the TVA coal and nuclear power plants that provide the majority of TVA's generation. Reservoir releases for cooling water and other purposes are dispatched through hydropower units when it is most valuable, reducing reliance on higher-cost fuels during high demand periods.

Also, the operational flexibility afforded by the hydropower units for adjusting the system generation to changes in demand is critical in order to maintain the stability of the power system at a low cost.

8. Do not hold it up past Sept 1. I do not want my power bill to go up. We like to go boat riding and my husband likes to fish when he gets the opportunity. **Glenda Wade, 234**

**Response to Comment 8:** Comment noted.

9. My suggestion to TVA is on Cherokee Lake that they build a coffer dam at the bottom of the big dam; and the water they're spilling to make electric power, that they catch it at the bottom and recycle it, pump it right back up into the lake and use it over again. That way they don't have to lower the level of the lake as much as they do. Now, they tell me that they're doing this at other dams currently. So, they do have the program working elsewhere. I guess that will do it. **Gordy and Helen Reed, 4369**

**Response to Comment 9:** The type of plant that you are describing is known as pumped storage. The concept of pumped storage is that two adjacent reservoirs are connected by piping and a combination pump-turbine. Electricity is used to pump water from the lower to the upper reservoir, and electricity is generated when the water in the upper reservoir is released to the lower reservoir.

Due to friction in the piping, mechanical equipment, etc, energy losses occur during both generation and pump-back; and the electricity required to pump exceeds the energy produced during the generation cycle, making the process a net energy user. Because pumped storage is a net energy user, it is not a viable stand-alone source of electricity and is only beneficial in limited applications. Pump storage applications can be beneficial if, for example, the difference between the value of peak- and off-peak electricity is greater than the cost of the energy lost during the generation/pump-back cycle. The plant operator would pump during off-peak periods and generate during peak periods.

TVA has one such facility, the Raccoon Mountain Pumped Storage project, and one pump unit located at Hiwassee Dam. Cherokee Dam is not being considered for modification for a pumped storage project.

10. The benefit of hydropower to maintaining low rates can not be under stated. **H. Ray Threlkeld, 2252**

**Response to Comment 10:** Comment noted.

11. Our utilities are government regulated, yet we have a government agency competing with them. TVA contracts and provides electricity when it wants to. The private companies do it because they have to by government regulations. GA Power has a power lake within 20

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miles of TVA Power Lake Chatuge. It is never pulled down anywhere near the levels of the TVA lake while generating power.

If TVA elects to stay in the power generation business, competing with the private sector, then it should study that sector's method of returning the water from the generators back to the lake. This prevents all water used for generating power from being lost down stream. Rather, it is pumped back over the dam and used again and again without affecting the lake level. **Harold Andrews, 2176**

**Response to Comment 11:** Chatuge Reservoir is a multi-purpose project. As such, its uses include a critical flood risk reduction role. Annual drawdowns in Chatuge Reservoir are driven in part by the need to provide the seasonal allocation of flood storage necessary for this purpose. The Georgia Power lake near Chatuge Reservoir is not used for flood control purposes. In addition, as described in Response to Comment 9, pumped storage is not suitable for all locations. Chatuge Dam is not being considered for modification for a pumped storage project.

12. It seems strange to me that when fall comes and power demands drop because we are between cooling and heating seasons and our power consumption falls at the lowest is when the TVA drops the water levels with much pretty weather wasted for recreation use. Boat docks and other related businesses suffer. **Jay Wise, 224**

**Response to Comment 12:** Fall drawdown of the reservoir system is driven by many factors, including flood control. The water is used economically for power generation while evacuating water to regain flood storage space.

13. Power is a great resource from the TVA dams but I would like to know why we sell power to the north and if that is the reason TVA drains the lakes down so early in the fall is to supply the north with power, without regard to what it does to the recreation and beauty of the lakes, **Jay Wise, 239**

**Response to Comment 13:** See Response to Comment 12. Currently, TVA is a net importer of power. Interchange of power at favorable rates with neighboring utilities is performed to help maintain a reliable and affordable power supply for TVA consumers. TVA balances its reservoir system operating objectives to provide multiple benefits. These include year-round commercial navigation, reduced flood risk, reliable and low-cost power, improved water quality and water supply, and recreational opportunities.

14. Power generation should be a byproduct of flood control and recreation, not the driving force. I believe that a higher lake levels would have a much more beneficial impact on the region. **Joe Brang, 877**

**Response to Comment 14:** See Response to Comment 12.

15. But if it requires that we lose some the privileges of being in a low rate electric area as a tradeoff for a little bit more water in the lake, I don't mind paying the extra bill. **LARRY SAMPLE, 4414**

**Response to Comment 15:** Comment noted.

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16. Cooling Brown's Ferry reactor is not an issue [for higher winter levels]. My father was an engineer there for many years and the cooling line draws from the channel, which makes raising water levels for Brown's Ferry a non-issue. **Mark Cole, 2080**

**Response to Comment 16:** The reason that this ROS has proposed alternative operations that include higher winter levels on the mainstem reservoirs is to increase the depth of the navigation channel. The increased depth influences the navigability, size of barges that can be used, barge travel times, and a number of factors that could reduce the cost of shipping goods on the commercial waterway of the TVA system. Higher winter reservoir levels are neither a hindrance nor aid to withdrawal of water for cooling the Browns Ferry Nuclear Plant.

17. Raising rates without FIRST or, CONCOMITANTLY, creating new jobs to sustain the population's ability to afford it would be unconscionable. **Pr. John Freitag, 985**

**Response to Comment 17:** The potential socioeconomic consequences of alternative operations policy are addressed in Sections 4.25 and 5.25.

18. Please increase your use nuclear power. **Ronald Huffaker, 933**

**Response to Comment 18:** Comment noted.

19. As a ratepayer in the TN Valley, I am especially opposed to any alternative that might increase my cost of electricity. **Stephen L. Keever, 1967**

**Response to Comment 19:** See Response to Comment 1.

20. Relatively inexpensive power rates have been one of TVA's most important goals. Any reduction in the ability to generate inexpensive power penalizes all TVA customers. Cost of generation must still be tempered by water and air quality. **Terry C Smith, 2961**

**Response to Comment 20:** See Response to Comment 1.

21. Labor Day would be a good start for maintaining summer pool, but why just to labor day? Why not until November 30th or after Thanksgiving? The potential for floods in the fall is minimal. Once the water level goes below full pool by 14 feet, the efficiencies of generating power is significantly reduced. In other words, you have to use more water to generate power when the lake levels are down. Also, with current power outages in the northeast, shouldn't we consider higher lake levels as an alternative power source in the event of power outages in the south? **Thomas G. Sandvick, 2665**

**Response to Comment 21:** While hydropower generation is more efficient at higher levels, some of the water must be released to generate power, which lowers water levels. TVA evaluated a range of dates for unrestricted drawdown of reservoirs, including through November 1, as well as holding reservoir levels constant year-round. TVA conducted a comprehensive flood risk evaluation, based on hydrologic data for the 99-year continuous period between 1903 and 2001, and supplemented by consideration of a large number of hypothetical design floods. This evaluation is described in detail in Section 5.22. The evaluation allowed TVA to rigorously investigate the potential changes in seasonal and annual flood risk at a large number of critical locations in the Tennessee Valley that were

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associated with any given operations policy alternative. The Preferred Alternative satisfies the flood risk evaluation criteria established for this study. The results of the flood risk evaluation indicated that it is not possible to extend reservoir levels beyond Labor Day without increasing flood risk at some locations.

22. The delivery of low-cost reliable power to electric customers in the Tennessee Valley remains the primary interest of TVPPA and its members. Attainment of this critical priority requires using our region's natural resources, none of which are more important than the Tennessee River. Maximizing the value of Tennessee River system of reservoirs requires TVA policies that effectively integrate a robust, economical generation and transmission infrastructure with other beneficial river uses, including recreation. Considering TVA's critical role as the power supplier in the Tennessee Valley, TVPPA supports operating alternatives that maintain TVA's ability to provide low-cost, reliable power. **TVPPA, Richard C. "Dick" Crawford, President & CEO, 4233**

**Response to Comment 22:** TVA formulated a Preferred Alternative in an effort to achieve what this comment suggests.

23. I want Tennessee Valley Authority to meet the rates of Kentucky Utility. I think they should be able to compete. TVA has 6.40 cents per kilowatt hour. Kentucky Utility has 4.29 cents per kilowatt hour. And that's from the source Tennessee Valley Authority, out of the News Sentinel. **Winona and Hilton Tunnell, 4373**

**Response to Comment 23:** TVA has evaluated the potential effect of alternative operations policy on the TVA power system. See Sections 4.23 and 5.23. For a number of reasons, average rates on the Kentucky Utility system are lower than TVA's, including proximity to low-cost coal supplies and reduced transportation costs. Apart from the ROS, TVA is developing a strategic plan that will help maintain TVA's competitiveness in the electric utility industry.

### Recreation

1. Lake Chatuge--Your recent allowing launching from Hwy.64 is Dangerous, unnecessary, and loads up heavy boat traffic which erodes private and TVA shoreline. Waters are flooded with loud jet ski boats racing back and forth in a small lake channel. BESIDES, there is an EXCELLENT dual concrete launching ramp about a mile away on Ledford Chapel Rd. where parking area, safe wide lake waters, etc. has been present for 30 years. On NC lakes, your present early drawdown reduces fishing & recreational use--mainly to help the barge navigation up to Knoxville--not fair! **Andrew J. Dickerson, 2394**

**Response to Comment 1:** TVA manages water to achieve a variety of purposes, including flood control, navigation, and power generation, as well as for recreation and water quality. The primary reason that TVA seasonally adjusts reservoir levels is for flood control, not navigation. See Sections 4.22 and 5.22, which address flood control issues. The commenter's concern about boat launching from Highway 64 has been referred to the pertinent TVA Watershed Team for an answer. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions—including Chatuge.

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2. We are in favor of limited population growth on the shorelines of Hiwassee River/Lake, but USFS has a neglected campground on/near the lake that should be analyzed for possible contamination of the lake. Restrooms are simply port a pottys that overflow, smell bad, and are basically unkept. Private enterprise might be suggested to USFS on TVA Lake protection of the waterway. **Anonymous, 623**

**Response to Comment 2:** We will pass them on to our Murphy Watershed Team, which works with other agencies on this type of problem.

3. I realize there are a lot of issues to consider, however recreation is very important to a great many people and financial gains are not always the answer **Barbara Cavagnini, 542**

**Response to Comment 3:** One of the driving issues that prompted the ROS was stakeholder concerns about the decrease in reservoir levels between August 1 and Labor Day, and the effect this has on recreation use and property values. Recreation issues are addressed in Sections 4.24 and 5.24. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions.

4. Another thing I would like, I would like to see the recreation vehicles kept out of the closed-in coves because they are tearing up my land. I moved here 15 years ago and I have lost over two foot of land **Bart Dastolfo, 4488**

**Response to Comment 4:** The State of Tennessee's Wildlife Resources Agency (TWRA) is responsible for managing watercraft on Tennessee's water. TWRA has a regional office in Morristown (1-800-890-8366).

5. All other issues are "nice to have's" but incidental in my opinion. Recreation, especially is questionable to me. The emphasis on recreation may be affecting our environment negatively through large boats on our waterways, personal water craft and water pollution. **Betty M. Fulwood, 2294**

**Response to Comment 5:** Comment noted.

6. Congress has considered legislation to encourage TVA to consider recreation more prominently in it's operation, but I would hope that the Board would choose to move aggressively, rather than being forced by Congress. As home owners on Blue Ridge, we have mixed feelings about more recreation as that means more pleasure boats on the lake. However the consideration to keep levels higher at least thru Labor Day would greatly benefit the economics of the Blue Ridge area. **Bob Harrell, 1687**

**Response to Comment 6:** See Response to Comment 3. Blue Ridge is one of the reservoirs that would benefit under the Preferred Alternative.

7. Lake level fluctuations make operating a marina way too difficult, unpredictable and unprofitable. **Carl Lakes, 965**

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**Response to Comment 7:** TVA fluctuates reservoir levels seasonally and weekly for a number of reasons, including flood and mosquito control, as well as power generation. See Sections 4.24 and 5.24 for a discussion of recreation issues.

8. The recreation survey gives a biased view of reservoir-based recreation, as it fails to address wildlife-oriented recreation such as hunting and wildlife viewing. These recreation activities occur at public, commercial, and private sites, on reservoir waters and shoreline lands, and on mainstem reservoirs, tributary reservoirs, and on tailwaters. These activities have a growing economic impact, and both participation rates and expenditures likely exceed several of the recreation activities included in the survey. The recreation analysis fails to address the full spectrum of potentially affected recreation activities. **Charles P. Nicholson, 2889**

**Response to Comment 8:** The ROS was a system-wide analysis of 35 reservoirs. The recreation evaluation of that system was an effort to evaluate total water-based recreation use of 35 reservoirs. Over 4,500 interviews were conducted at public boat ramps and beaches, over 2,000 households on the shoreline were surveyed, and approximately 200 commercial recreation providers were surveyed to determine the most important recreation activity for any given trip to the reservoir. These interviews took place on reservoirs from Watauga, Tennessee; to Nottely, Georgia; to Guntersville Alabama; to Kentucky Reservoir. The results of those interviews, and the subsequent models developed from the interviews, were used to estimate recreation use and the potential effects of alternative operations policy on recreation use.

Because it was a system-wide evaluation, the models are not specific to specific reservoirs or recreation activities. It is possible that waterfowl hunting and late-fall bird watchers were underrepresented in the sample because interviewing and recreation counts were completed by mid-October. These data provide the most accurate water-based recreation picture of the TVA system. However, the potential for underestimating recreation use has been considered qualitatively.

9. Human paddle sport is becoming more and more common. Pay attention to this sector. Would like to see TVA cooperate in constructing portage routes around dams such as Fontana to enable multi-day trips by paddlers. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3098**

**Response to Comment 9:** Comment noted.

10. TVA and Tapoco lakes are being used by paddlers more. Constructed routes around the dams, making portage possible, and multi-day trips is highly desirable. APGI has consented to construct portage routes around Lakes Cheoah, Calderwood and Chilhowee. A portage route around Lake Fontana would make a wonderful multi-night trip available beginning somewhere around Bryson City on the Tuckaseegee River or even the Little TN River at its confluence with Lake Fontana. **Charlotte E. Lackey for WNC Group, NC Chapter, Sierra Club, 3106**

**Response to Comment 10:** The objective of this EIS is to determine whether changes could be made in TVA's system-wide operations policy in order to provide overall greater public value.

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We are working with the Regional Resource Stewardship Council to examine TVA's recreation strategy. Because we have limited funds to invest in capital improvements, such as portage routes for paddlers, we currently give highest priority to investments with partners who have committed to fund part of the capital cost and assume responsibility for long-term maintenance. Groups interested in presenting partnership proposals to TVA should contact the local TVA Watershed Team. More information about these teams can be found on TVA's website at [www.tva.gov/river/landandshore/index.htm](http://www.tva.gov/river/landandshore/index.htm).

11. There is also a safety concern. Many people who are weekend boaters do not see the change in the water level. They are not aware that last week there was 6' of water, and now there is less than 2'. The small inlets are fun places for people to play, but when the water goes down early, they become hazards. **Chip Miller, 1393**

**Response to Comment 11:** TVA recognizes that, on certain reservoirs and in areas of certain reservoirs, submerged hazards may become more problematic to boating safety when the reservoir is drawn down. Typically, this situation occurs at a time when the majority of the recreating public has reduced their use or stopped using the reservoir. No recreation activity is 100 percent safe. TVA makes an effort to mark particularly hazardous underwater obstructions; in the final analysis, however, it is the responsibility of individuals to be aware of the conditions under which they participate in recreation activities.

12. I believe that the stakeholders should embrace recreation as much higher valuable factor in future system management. **Chris Offen, 2328**

**Response to Comment 12:** Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions.

13. As a whitewater paddler, I request that reservoir releases be **PLANNED** in advance whenever possible and that current release data be available online or by telephone for as many navigable waterways as possible. I request that fall draw-down releases be conducted during daylight hours and with flows suitable for recreational uses. I appreciate the variation of these releases as this creates a more natural river environment than one sustained level at all times.

Please consider the importance of recreational information and releases on the Ocoee, Nantahala, Tallulah, Pigeon and Dries, Great Falls Hydrostation, and other popular whitewater streams that make the Southeast such a great place for paddlers to live, work, and play. **Clay Wright, 665**

**Response to Comment 13:** Under TVA's Preferred Alternative, TVA would schedule releases from a number of dams in order to enhance tailwater recreation. Call 1-800-238-2264 to obtain information about scheduled or planned releases.

14. The use of the lakes by fishermen and other persons who enjoy being on the water is a wonderful thing. In reality, the use by the majority of the users has nothing to do with the lake levels. I live in a Marina. The lakes are nearly empty after Labor Day every year and before Memorial day every May. There will be a big surge of folks coming to the lake when the weather first gets warm. Then immediately after school lets out, and the kids are free,

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between Memorial Day and the end of June there is a lot of recreational activity on the lake. By late June a lot of folks have gotten tired of "going to the lake" and the crowds diminish greatly. There will be a surge of folks for the week of July 4th, then the activity drops off again. August is generally considered "too hot" so there are not a lot of folks coming to the lake. The last week of August before school starts, a lot of people come to the lake for the "last week of summer". There will be a surge again for Labor Day, but by early September the lakes are nearly empty again.

This cycle has repeated itself every year. Rain and cold have a lot more to do with the number of folks who use the lakes for recreation than anything else. **Clifford J Rabalais, 2288**

**Response to Comment 14:** This pattern is generally close to many reservoir recreation use patterns. The ROS was an effort to quantify that pattern and the contributions that reservoir levels have in creating that pattern. When asked why people stopped coming to the reservoirs, the most common answer was the air temperature was either too hot or too cold.

15. At the present time there's a real serious situation relating to watercraft safety in and out of our cove, located between lake markers 6 and 7. Both types of boats, especially jet skis, are creating a very serious problem relating to boat safety and shoreline erosion. Extreme watercraft speeds are wearing away the shoreline and may eventually cause a future serious accident. We are recommending that a No Wake safety bouy be located at the cove entrance to warn boaters about boat speed. Decreasing boat speed will hopefully decrease shoreline erosion. That's where we are with the situation. **D. C. Wenberg, 4410**

**Response to Comment 15:** TVA employees from the Hiwassee Watershed Team in Murphy, NC, can help the commenter to assess the shoreline erosion problem. However, it is the Georgia Department of Natural Resources' responsibility to establish no-wake zones and regulate boating use.

16. Also during high water months, there is an increased risk for recreational boating along the Lower Mississippi River due to the fact that recreational boaters are unaware of the swift water conditions and are simply unable to or do not know how to react in certain situations. **Eddie Adams, 3034**

**Response to Comment 16:** Comment noted.

17. I live in view of South Holston Lake. I enjoy fishing all year long. During the winter months it is impossible for me to launch my boat from any boat ramp near by. Avons mill, Washington County, Observation Knob are boat ramps that are useless during the winter months on South Holston Lake. **Edward J. O'Neill, 683**

**Response to Comment 17:** If the commenter has similar problems in the future, it is recommended to use the TWRA ramps on Highway 421. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions—including South Holston.

18. However, many of the complaints from residents about water levels are actually about water access during recreational seasons (April 1 through October 31). Other than higher

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water levels increasing property values, most residents do not utilize the reservoir for recreation after the above mentioned date **Edwin D. Breland, Jr., 2451**

**Response to Comment 18:** Comment noted.

19. I am a whitewater enthusiast. and while I am not very versed on many of the particulars of land and river management, I do know that I love to paddle. It is my favorite thing in the world!! I first learned on the Ocoee river and I thought that was the only place people kayaked in the world, back in the '90's. Since then, my eyes have been opened, all from my experiences on the river! I have traveled the country, I follow politics so that I may not lose this privilege. I have become VERY aware of water quality and have interest in its improvement. I have made a decent living at recreation on TN rivers, and I have gotten to see some of the most remote and beautiful places in our state. Please take people like me into consideration when you make your decisions regarding recreation and water. recreating on water has changed my life for the better! I believe it improves the economies and lives of many others as well. **Amy Elizabeth Walters, Asheville, NC, 2095**

**Response to Comment 19:** TVA is concerned about both reservoir and tailwater quality. Eleven tailwaters were modeled to evaluate the Base Case and action alternatives. Tailwater quality was an important metric in the threatened and endangered species analysis. Temperature, DO, and water surface elevation were evaluated for the tailwaters.

Additionally, some of the reservoir metrics were chosen due to their potential impact on tailwater quality. For example, the Base Case and alternatives were compared for their potential to form anoxic (very low DO) conditions at the bottom of the reservoir. Under these conditions, manganese and iron in the bottom sediments may dissolve into the water. When this water is discharged into the tailwater, brown stains may appear on the rocks and shoreline downstream. Therefore, an alternative with better DO in the reservoir would result in better conditions in the tailwater.

Regardless of the alternative chosen, TVA is committed to maintaining the existing DO targets in the tailwaters. This may lead to adding aeration capacity at some sites. TVA's cost of additional aeration was included in the cost analysis. Under TVA's Preferred Alternative, it would schedule releases into a number of tailwaters to help enhance recreational use, including paddling.

20. In essence, the reason for increased duration of full pool is not valid! The recreational boaters and swimmers essentially start their season on Memorial Day weekend and vacate this reservoir after Labor Day. Fishermen make up the bulk of water recreationists at other times of the year, with several waterfowl hunters coming into the picture during September, November and December. The proposed alternatives that suggest full pool for a longer time frame have the potential to severely impact these users of the reservoir. **Gary D. Jenkins, Buchanan, TN, 2108**

**Response to Comment 20:** The reservoir system is used by people with different, and sometimes competing, objectives. The EIS presents a range of alternatives. TVA's challenge and goal is to select an alternative that improves overall public value of the reservoir system.

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21. How is it not one alternative has a beneficial, yet a substantially beneficial advantage to recreation, according to your study? **Greg Batts, 2738**

**Response to Comment 21:** When evaluating the increase or decrease in recreation use associated with the various alternatives, TVA focused on the changes in recreation use that were estimated for August, September, and October. Reservoir Recreation Alternative B and the Tailwater Recreation Alternative showed an estimated increase in recreation use of over 23 percent for this period. When compared to recreation use for a 12-month period, however, the increase is only 7.4 percent.

22. There are lots or unmarked, very dangerous stakes and rebar that have been placed in the water. These objects could cause serious damage to water craft and injury to boaters and others using the water for recreation. What are the laws/policies about placing such dangerous objects in the water? Is anything being done to remove these objects? And if nothing is being done, why not? **H. Lee Fleshood, 2864**

**Response to Comment 22:** Under Section 26a of the TVA Act, TVA approval is required before obstructions can be placed in a reservoir. Our permits require that structures be kept in a safe condition. Unauthorized structures, such as fish attractors or duck blinds, that are built can pose a hazard. As resources are available, TVA does remove derelict facilities and mark hazards. Other federal and state agencies are also involved in boating safety.

23. We realize the need to continue the current cooperation between TVA and the rafting organizations in our area. Having appropriate water levels for the fishermen and rafters alike are an important aspect of the tourism and recreational opportunities that support our local economy.

The need for cooperation and support between Fannin County, State and Federal Governments are necessary for the quality of the growth in our area. We need to continue to build on the collaboration between TVA, US & GA Fish & Wildlife, USDA (Chattahoochee/Oconee) National Forests, GA Dept of Natural Resources and the GA Dept of Transportation. It is imperative that we continue and enhance the cooperative efforts on projects through the research, funding, design, and implementation stages. Working together with all of these organizations will insure the enhancement of the tourism and recreational opportunities around the Blue Ridge Reservoir and the entire Fannin County area.

We are respectfully asking for your consideration of all these alternatives. The additional revenues realized would provide an economic stimulus to our local municipalities, our county and the TVA region. We hope you will examine these options in the final adoption of policies for your Reservoir Operations as it pertains to Fannin County. **Jacquelyn O'Connell, 3802**

**Response to Comment 23:** TVA works closely with county and state governments, as well as federal agencies to promote recreation and economic development. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions—including Blue Ridge—in order to enhance recreational opportunities.

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24. We need more parks bike paths, recreation areas and similar high touch areas to attract tourism. TVA also has property on these area lakes that will also be more useful. **Jerry Huskey, 2488**

**Response to Comment 24:** We addressed the impact of the various alternatives on water-based recreation on 35 projects (reservoirs).

TVA is working with the Regional Resource Stewardship Council to examine TVA's recreation strategy. As part of this effort, we are examining recreation trends. Our evaluation thus far shows that walking for pleasure is attracting a growing number of participants. The recreation strategic assessment will help us better determine the most beneficial role for TVA in meeting future recreation demands.

25. There seem to be two competing areas of recreation: Whitewater rafting, and lake boating. I feel the revenue benefit of increased rafting would only benefit the limited number of tour operators. Lake boating would benefit more of the general public. **Jim Mootrey, 1995**

**Response to Comment 25:** Recreation and recreation-based economic effects are addressed in Sections 4.24, 4.25, 5.24, and 5.25.

26. I also want to see the ramps improved so that they can be used when the lake is less than 5 ft. from full. **Jim Wood, 2317**

**Response to Comment 26:** The ramps at Clay County Park, Chatuge Woods, Towns County Park, and TVA's Dam Reservation should all be usable in the range of elevation the commenter mentioned. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions—including Chatuge.

27. There has been no analysis of the impacts on waterfowl hunters and birders associated with increased water levels adversely affecting flat habitat. There will also be adverse impacts on crappie fishermen due to a loss of button ball brush habitat used for spawning. **John Taylor, 2746**

**Response to Comment 27:** Additional information about potential impacts on these resources has been added to the FEIS. See Sections 4.10 and 5.10.

28. I live locally to South Holston and use the lake quite often. After the first of August we usually quiet using the lake due to so much mud around the shore line. This is very hard on a boat and has almost ruined mine. **Kevin Abel, 294**

**Response to Comment 28:** One of the driving issues that prompted the ROS study was stakeholder concerns about the decrease in reservoir levels between August 1 and Labor Day. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions, including on South Holston.

29. Whatever changes TVA considers, please realize the vital importance of BASS tournaments to the Columbus region. This year we've hosted 5 major tournaments this year. Each one brings over 250 boats, pumping \$1.5 million PER Tournament. Tournament

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hosting is a growing area for B.A.S.S./ Bassmasters/ESPN. Others host smaller tournaments that also contribute. This is a significant shot in the arm to the local economy. At a 3x multiplier this represents a MAJOR contribution to our economy. 7% of this is sales tax. Next year in Columbus we will host 7 MAJOR fishing tournaments with additional sponsors looking. Recreation is a serious, significant component of the picture in the Columbus area. Please be certain that any considered changes recognize this. **Larry Turman, 3425**

**Response to Comment 29:** Comment noted.

30. Many fishermen think that they will be able to motor through the sloughs at will in the winter if this takes effect, but soon the number of just submerged boats hung on stumps will become an issue. Adding two feet of water will have serious consequences to boaters, as stumps that normally are out of the water in winter pool, or deeper in summer pool, become just out of site, but within the draft of a boat. It is an invitation for disaster. **Mark Cole, 2079**

**Response to Comment 30:** See Response to Comment 11.

31. This category is given too much significance in the evaluation. Recreational "needs" are frivolous and should be regarded as secondary to the primary functions of the TVA system. The greater community served by TVA shouldn't have to bear any extra cost or risk to satisfy the demands of recreational users of the system. Let them adapt to the schedule determined by the primary functions of TVA. **Michael Sledjeski, 2967**

**Response to Comment 31:** Comment noted.

32. Any increase in water level during Winter Pool would be very much appreciated for the LAUNCH areas of Ditto Landing and Whitesburg Boat and Yacht Club (WBYC) which is at mile marker 334. The rationale is that both harbors are in need (especially WBYC) of dredging. In fact WBYC cannot launch boats during the current winter pool. WBYC is teaming with DITTO for dredging needs; however, neither marina will have the proper funds to perform such a task this - year 2003. I will close for now with more to come and I appreciate your time and energy towards a worthy cause. **Mike Jankowski, Fleet Captain (WBYC), 2430**

**Response to Comment 32:** Thank you for the comments. Changes in winter elevations on mainstem reservoirs have been evaluated as a part of this study. Under TVA's Preferred Alternative, the minimum winter elevation on Wheeler Reservoir would be raised 6 inches. Unfortunately, unacceptable impacts on flood risk precluded raising winter levels on other mainstem reservoirs as part of TVA's Preferred Alternative.

33. At this time I am requesting an answer from you on one of your studies concerning recreation and the levels and drawdown of the lake. In particular from your study, Recreation 4.24.1, the last paragraph and the footnote: You state that you made your study on 19 recreation areas and usage out of a total of 70 properties, representing public, commercial, and private recreation areas. Using that small a number of areas is bad enough as a representation, but your footnote is even worse. You state that a user day is equivalent to a recreation day as a visit by one person for recreation purposes in a 24 hour period. That is a total of nineteen people, am I right? You refer to that as a study? How many people go swimming, boating, etc., alone? How about boating? Usually one person

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in a boat? Fishing? The fishing business certainly would not be able to stay in business if they rented only one boat, etc., a day. This is just a few questions on one category. **Mr. and Mrs. Schaffer, 4054**

**Response to Comment 33:** TVA organized the 35 projects (reservoirs) under review in ROS by type of reservoir, character of reservoir, and level of recreation use. TVA then conducted recreation surveys on 13 entire reservoirs and tailwater areas, and field interviews and recreation user counts at 121 recreation areas on the 13 reservoirs and 6 tailwater areas, for a total of 490 person days spent in the field collecting data.

TVA input the survey results from 4,587 different groups of people to generate results from the "trip response" model and the economic model. In addition, TVA sent questionnaires to approximately 200 commercial recreation operators on the reservoirs and tailwaters. Finally, TVA used the results of 2,200 questionnaires from private homeowners to estimate recreation use and behavior of private recreation users. TVA retained national recreation experts with experience in designing and carrying out recreation studies to lead this effort. The analysis of recreation issues done for this EIS was comprehensive and state-of-the-art.

34. I am surprised by the findings that Alternative A and Alternative B would only be "slightly beneficial to recreation. After seeing the growth along the TVA system over the last 16 years, I would think the benefits of recreation to the reservoirs would be greatly beneficial to the counties housing these reservoirs. **Nanette M. McCarthy, 2207**

**Response to Comment 34:** The growth you are describing is occurring without extending summer reservoir levels and is driven by population, increased incomes, and the desire to be on the reservoir—even one with fluctuating water levels. The majority of recreation use occurs during the May through July 4 period, and holding reservoir levels higher into Labor Day or longer would have a limited effect. From a regional economic standpoint, the more important recreational expenditures are those that come into the region from the outside and this is what TVA's economic analyses captured. The regional economy benefits regardless of whether a regional resident elects to spend money on recreation at a TVA reservoir or on shopping at the local mall. See Sections 4.25 and 5.25.

35. I'm a member of the lake watch at Pickwick and we've been working with TVA now to organize a lake watch on Pickwick and we're putting it together. We have about 100 signed up on it now. We plan to have one of the best lake watches on the entire system. I just wanted to make some comments about TVA, things they've done in the past and maybe about some changes that they may be going to make to it. **Roger Gant, 4533**

**Response to Comment 35:** Comment noted.

36. The other thing that I question is on your numbers. On your Recreation A, for improving recreation on reservoirs and tailwaters, you have a number here of 1.34 million user days. As I see it that's an increase of 20 percent. It would read better if it was added onto the base of 6.57, giving us a total of, a real number, of 7.9 million user days. And the same goes with reservoir or Recreation B. That 1.54 should really read 8.1 million user days. **Ted Bollman, 4378**

**Response to Comment 36:** Because there is no specific reference, it is unclear whether the commenter is referring to one of our visual presentations or the EIS document.

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However, Table 5.24-01 lists the specific numbers the commenter identified and Section 5.24.4 includes a verbal description of the percent change of the various alternatives. In addition, Table D8-07 in Appendix D8 has the specific numbers and percents listed together.

37. We are also concerned and surprised that wildlife-dependent recreation activities including hunting and non-consumptive wildlife viewing are generally ignored in your recreation analyses, even though they are often directly dependent on reservoir waters. Based on results of the 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation, these activities are likely more popular than several activities your survey did address. Therefore, we question the results of your survey and the dependent recreation impact analyses. **Virginia B. Reynolds, President, Tennessee Ornithological Society, 3793**

**Response to Comment 37:** See Response to Comment 8.

### Social and Economic Resources

1. The reasons being, Marshall County's #2 industry that contributes to our economy is "tourism". It would be of great economic impact to our community to have the water levels lowered at a later date at less drastic levels than it is currently operating under, which in turn would expand our tourism season thereby contributing more to our community and providing more dollars to our community. If used wisely these dollars will contribute to a better way of life for all citizens. **Anonymous, 2801**

**Response to Comment 1:** USACE expressed concerns about changing operations on Kentucky Reservoir because of the potential effect on the lower Ohio and Mississippi Rivers. Its position is that any proposed changes that would involve reduction in flood storage capacity would need to be evaluated within the context of the entire lower Ohio/Mississippi River system. In addition, USFWS, other agencies, and individuals voiced concerns about changing operations on Kentucky Reservoir. TVA did not include changes to the operating guide curve for Kentucky Reservoir as an element of its Preferred Alternative.

2. The need for revenue, which I believe is the reason you are using the water, can no longer be a rationalization for doing so. As more and more expensive homes are built on the Douglas reservoir there will most decidedly be a bigger tax base for the counties. Since the county affords little to these homes TVA should look into the trade off of less taxes to the counties and more water to the owners. Simplistic to be sure but a half century of doing things one way could certainly be modified if people got their heads together. **Anonymous, 554**

**Response to Comment 2:** This study analyzes whether it is possible to increase the overall public value of the TVA reservoir system by making changes in reservoir operations. TVA operates its reservoir system to achieve a number of goals including, primarily, navigation, flood control, and power generation. The first two priorities are not related to producing revenue. Socioeconomic issues are addressed in Sections 4.25 and 5.25.

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Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Douglas.

3. TVA is a business, in your study you do not address the impact on TVA operating costs of any of the alternatives. My understanding is that you as an entity have been running at a substantial deficit for many years. Your baseline does not appear to address that problem and the new alternatives do not factor that in as beneficial or adverse. I think that if study participants knew what the cost advantages/disadvantages are they may have a different viewpoint on the best approach.

As a note; AMTRAK has been a federally funded operation for years that Congress is now seriously considering selling off because it has accumulated such huge cost overruns. I would think that prudence would dictate that a healthy operating business model should also be a operating goal for TVA and that it should be included in this EIS. **Anonymous, 2441**

**Response to Comment 3:** The economic analysis for each alternative is the net effect of economic drivers and includes an estimate of the gain or loss as a result of generating power. This is presented in Section 5.3. All these alternatives increase the cost of generating power—some more than others. TVA formulated its Preferred Alternative, in part to reduce the potential cost impact on TVA's power system compared to other alternatives that enhanced recreation opportunities.

4. I also believe that benefits assigned to recreation have been severely undervalued by the study team **Anonymous, 2013**

**Response to Comment 4:** TVA retained nationally recognized experts with experience in designing and carrying out recreation studies. Economic analysis regarding recreation was based on expenditure data provided by survey data of recreationists at various locations around the region participating in water-based recreational opportunities. A separate mailed survey to lakeshore property owners provided increased expenditures for those who would live in the area longer if the lake levels were held up longer. Surveys included restaurant, hotels, automobile rentals, and other related consumer spending. The analysis did not include expenditures from regional residents, only those coming from outside the region. Although local effects might be higher, TVA is looking at the regional economy for a determination of whether changes could benefit the overall public value of its regionwide reservoir system.

5. Most of the homes located on Douglas Lake only have lake access 3 months out of each year these homes are taxed as lakefront but 9 months of the year we don't even have lake view. **Bernard Johnson, 297**

**Response to Comment 5:** TVA does not set the rates at which property is taxed. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day,

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resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Douglas.

6. I attended your workshop at Gilbertsville recently. I understood that your economists came up with about 65 million dollars for the value of recreation on all TVA reservoirs. That strikes me as incredibly low. We discussed some of the things that were not deemed to be an economic impact and these economists surely don't think the way most of us do!! I would have expected the economic impact to be one or two orders of magnitude larger than the value given. Just an example, they didn't consider money spent playing golf or other recreation to be an impact even though the people were attracted to the area by the lake. And people who live here have no economic impact even though the lake may have attracted them and keeps them here? I could go on with other examples! **Bob Holdman, 2589**

**Response to Comment 6:** Recreational economic benefits were estimated based on survey data of customers at facilities located on reservoirs (recreationists at locations where water-based recreation is the primary activity), marina operator customers, and reservoir property owners. The survey provided the estimate of changes in water-based recreation spending but not what is spent in the Tennessee Valley region for all types of recreation.

The property owner survey sampled residents to determine whether they would spend additional time and funds in excess of what they do now (Base Case), if reservoir levels were maintained at summer pool longer. Their response provided information on expenditures for consumer goods, gasoline, groceries, and other items related to property owners. Therefore, property owners responses were included in the recreation spending gathered through the study.

Also, note that the estimate for recreation spending is the net increase, not the total spent on recreation. See Section 4.25.

7. It seems like in the economic analysis that they didn't really address how lake levels on Kentucky Lake negatively impact the economy by people who live here or people who have bought a second home here deciding to leave because of their frustration with lake levels being lowered so quickly in the fall. And so the economic impact doesn't address the economic loss if I go elsewhere.

Also, when I participated in the survey. It addressed me and my family, but it didn't address that the last two weekends I've had 20 people each weekend down here with me, eating out at restaurants and spending money on the lake, and those people won't be coming down if I leave because I'm so frustrated with lake levels **Brian Keister, 4522**

**Response to Comment 7:** See Response to Comment 6.

8. I do not understand the "slightly adverse" label that has been placed on the job category. The video stated that jobs would be slightly effected but it failed to mention what types of

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jobs, how many jobs, and what exactly "slightly adverse" means. **Charles and Kristie Wallis, 1171**

**Response to Comment 8:** A "slightly adverse" effect on jobs means that the number of jobs in the region would be slightly less than under the Base Case in the year 2010. For a region with 6 million jobs in 2010, the loss for Reservoir Recreation Alternative A would be 43 jobs, a very slightly negative number. The impact of any alternative with a job loss of less than 1,000 was considered slightly adverse. The impact of any alternative with a job loss of more than 1,000 was considered adverse. Types of jobs vary across the economy and include industrial, business, retail, and agricultural.

9. Attended Blairsville meeting - interested in new paradigm for evaluation economic value. **Chris Offen, 3867**

**Response to Comment 9:** Comment noted.

10. As I understand the econometric model it seems to me that the economic benefit of higher lake levels and therefore better recreation has a negative bias from the beginning. The benefit coming from recreation is highly fragmented and impacts many sectors of the local economy which is hard to quantify. This challenges the TVA decision making in wondering whether the recreational value is underestimated. If this is so then alternatives may be favored where the driver is something other than recreation i.e. navigation and/or power. I would ask TVA decision makers to favor recreation more intensely than seen in recent years. **Chris Offen, 2326**

**Response to Comment 10:** The economic modeling for the ROS analysis was conducted with REMI, the regional economic impact analysis model most widely used in the United States and Canada. The economic relations designed in the model are well documented and the result of considerable research over many years. The REMI model was programmed for TVA by its creators, Regional Economic Modeling, Inc., using methodologies and assumptions consistent with existing economic thought and conditions. The economic outcomes of the various alternatives were derived by comparing the Base Case (existing conditions) with the changes to the economic drivers that result from changes in operations. The economic drivers were recreational spending, consumer spending resulting from changes in property values, shipper savings from commercial navigation, the cost of hydropower, and the cost of water supply. The model calculates the indirect, as well as direct, effects of the inputs; therefore, spin-off effects are captured in the analysis.

There is a description of the REMI model in Appendix C of the DEIS, and Section 4.25 contains descriptions of the economic drivers. Under TVA's Preferred Alternative, recreation opportunities would be enhanced by a longer duration of higher pool levels under median conditions on a number of reservoirs.

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11. I have lived and worked along the lower Mississippi River, and in Houston, Texas along the ship channel. These areas are full of industrial facilities. While they may not be pretty, they provide the good paying jobs for a LOT of people. The Tennessee Valley area has some areas of economic growth, because of the access to water, and water borne commercial traffic. The ability to maintain commercial barge traffic is essential for the economic health of this area of the US. **Clifford J Rabalais, 2286**

**Response to Comment 11:** Comment noted.

12. Most of the people who come to the lakes, spend money on the recreational equipment, spend money on coming to the lake, and people who spend money to buy property on the lake all have jobs. Jobs that are supported in some form or fashion by the industrial base in the US, and particularly in this region.

Restrictions on TVA lake levels based on recreational activities is not only ludicrous, it is self defeating! **Clifford J Rabalais, 2289**

**Response to Comment 12:** Effects on jobs in the region is one of the key factors to be considered. The economic analysis showed that, under Reservoir Recreation Alternatives A and B, and the Tailwater Recreation Alternative, power costs and its effect on industrial, commercial, and residential customers—as well as shipping costs to businesses—would have more effect on the economy through loss of jobs than jobs created, due to increased recreational opportunities on a regionwide basis.

13. It is difficult to grasp that Summer Hydropower would actually increase the cost of electricity generation (albeit a tiny amount), while Commercial Navigation would actually decrease it. It is also difficult to grasp why Tailwater Habitat would cause such a large increase. **Colman B. Woodhall, 333**

**Response to Comment 13:** The Summer Hydropower Alternative would decrease navigation channel depth, which would increase the cost of shipping coal to TVA plants. System operations for the Navigation Alternative would be similar to the Base Case but would reduce TVA's shipping costs because of increased navigation channel depths. The Base Case already uses available water to achieve as much value as possible from hydropower generation, consistent with the constraints on the use of that water. Under the Summer Hydropower Alternative, TVA would change the start date for unrestricted drawdowns from August 1 to June 1, the date that existed before the changes made following TVA's 1990 Lake Improvement Plan study. This would make more water available for generation during summer months but would decrease hydropower generation in fall. Power costs would increase for this alternative due to additional coal derates, additional aeration costs, and higher coal shipping costs. Maintenance of tailwater habitat prohibits the use of the hydropower units for peak power production, thereby resulting in large power purchases.

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14. Look to the western NC mountains or Lake Burton in NE Georgia as documentation of what happens. **Colman B. Woodhall, 349**

**Response to Comment 14:** The mountain areas in western North Carolina in the Tennessee River Watershed were considered in the economic analysis, including Watauga, Mitchell, Madison, Yancey, Buncombe, Haywood, Swain, Graham, Macon, Jackson, Transylvania, and Henderson Counties. In Georgia, Union, Towns, Fannin, and Gilmer Counties, and other counties in the watershed were included. The economic analysis used population, industry, and other economic data from those counties.

15. This comment combines Recreation, Social and Economic Resources, and Visual Resources. The comment is specific to Watauga Lake and its surrounding communities.

The DEIS states that the impact of any alternative is relatively minor upon the regional area. However, the combined impact of improved Visual Resources and Recreation would most likely have substantial positive impact upon the Johnson and Carter county communities surrounding Watauga Lake.

Johnson County (and to a lesser extent, Carter County) is poor. It in no way matches the Tri-Cities economic data the DEIS presents. In the past, Johnson County has tried to rely upon textile-oriented plants for non-agricultural employment. While these individually offer 100-300 jobs, unfortunately they quickly leave when wages become lower abroad.

In contrast, improved recreation, vacation, and retirement opportunities tend to build support businesses and jobs only a few at a time – but, once created, these types of businesses and jobs almost never leave (see the area around Lake Burton in NE GA and the NC mountains in general as documentation).

This would be very important for Johnson County. Watauga Lake, with the surrounding mountains, could become a major resource to develop these jobs – and several of the alternatives appear to greatly improve the Recreation and Visual Resources of the lake. As such, these alternatives should be strongly considered. **Colman B. Woodhall, 389**

**Response to Comment 15:** TVA used a regional economic analysis because it is considering changes to its regionwide reservoir system. This can mask benefits that specific locations might receive from changes. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Watauga.

TVA has programs such as its Special Opportunities Counties and Cities that specifically address the furthering of economic development and improving the standard of living in such areas.

16. Secondary comments on economic impact of delayed draw down. Based on three (3) years of financial data, please note following: Labor Day drawdown would extend our season by

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at least 30 days and possibly longer. Typical monthly income drops approximately \$20,000.00 in August compared to July and another \$20,000.00 in September compared to August. Fall in East Tennessee is some of the best weather to enjoy our lake, however, under current policy, levels are such that no one is interested utilizing our beautiful resources. **Dan Meek, 1313**

**Response to Comment 16:** See Response to Comment 2.

17. It appears that a very large economic impact has been overlooked, TVA should look at new commercial development that would come to our lake because the longer season now justifies the investment. It appears that TVA only considered the increase in recreation for the couple of months that the lake levels are extended. **Dave Cooper, 1138**

**Response to Comment 17:** See Response to Comment 10.

18. It appears that TVA only considered the increase in recreation for the couple of months that the lake levels are extended. The "quality of life" has not been taken into consideration. **Dave Cooper, 1139**

**Response to Comment 18:** Quality of life is a difficult concept to define and quantify. This EIS analyzes the impact of various alternative operations scenarios on visual resources (scenic beauty), cultural resources, property values, and recreation—in addition to environmental resources. The change in these resources should suggest whether "quality of life" would be improved or harmed.

19. First, the cranes might leave the area. The cranes are a significant source of revenue for the area. Hiwassee is the second largest concentration of cranes in the eastern United States. People have come from as far away as Indiana and New York to see them. The Sandhill Crane celebration that is held every year in Birchwood draws up to 10,000 people, spending \$25,000 to \$50,000 in Hamilton, Meigs, and Bradley counties JUST FOR THAT SINGLE WEEKEND! The loss of the cranes would mean a huge economic loss for the region. **David A. Aborn, Ph.D., 2088**

**Response to Comment 19:** Comment noted.

20. I am a resident of Fannin County. The county has traditionally lost jobs in the past due to plant closings. The region in general would benefit economically using Lake Blue Ridge as a recreation lake. More dollars would stream into the local economy thru increased spending. Property taxes, school taxes and sales tax would also increase not to mention the additional construction boom to the county. **Don Leonard, 2935**

**Response to Comment 20:** Comment noted.

21. This would also bring more birders to the area to see the birds, bringing in more revenue to Cocks Co. I personally have met birders at Rankin WMA who have come from Memphis,

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Chattanooga, Alabama, Kentucky, and North Carolina... all to see the birds. **Dr. K. Dean Edwards, 2728**

**Response to Comment 21:** TVA surveyed recreationists at reservoir access locations and property owners across the region. This effort should have captured comments from some birders.

22. I am concerned about the assumptions you made when building your models for the impact analysis. First, I wish you had made the assumptions more public. In fairness I can understand this may have been difficult, but to fully understand and TRUST your impact conclusions I would like to know what assumptions you made in order to do the analyses. For example, under Alt. A there is a slightly negative impact for employment. Further investigation revealed that this comes about because of the assumption made that Alt. A would increase power generating costs which could force certain employers to not hire or to lay off employees. But use of that assumption seems biased in favor of the base case. Why not assume some other equally or more plausible assumptions such as--1. the employer will pass on the increased costs to the consumer as has been done historically. 2. TVA could charge residential customers the small amount it would take to cover their losses. Would TVA not be able to further offset its increased costs by generating more power than it is doing now if the lake levels were up longer?

In regard to the barge industry your economic analysis there also rests on some unknown assumptions. If there is job loss due to increased shipper costs they too could pass on the costs. If the issue is shipping more tonnage by creating deeper channels that comes at the expense of the home owners and lake users of Douglas and other tributary lakes. I seriously doubt anyone other than the barge owners and their stockholders would benefit from the increased revenues generated by the increased tonnage shipped. At the same time, they would be creating more safety hazards and contributing to more pollution by continuing to support coaled fired power plants. Do we need more air pollution when the area already ranks nationally as one of the top five in poor air quality? **Drew Danko, 1025**

**Response to Comment 22:** See Response to Comment 10. There is no doubt that an extended recreation season on tributary reservoirs would result in job creation in the areas around those reservoirs, particularly in the recreation and tourism industry and in retail sales. However, the TVA region as a whole would be negatively affected by these alternatives because a loss of hydropower generation would increase power costs. These increased costs would drive up the cost of doing business in the region, the result of which would be the loss of jobs either through job reduction or plant relocation.

While coal and nuclear plants provide the base load of TVA's power production capabilities, hydropower is used to meet peak demands. The water that turns turbines at tributary dams continues to generate electricity at each location downstream. If that hydropower generation capability is reduced as a result of holding tributary pool levels up longer, TVA must replace that power by either generating it by other means (typically gas turbines) or buying it off the national grid at market rates. Either proposition is more expensive than

hydropower generation, especially in July and August, when annual demand is at its greatest.

TVA costs are paid for by its power consumers. While the change in TVA costs may be relatively small, the change in the cost of doing business for industrial customers purchasing hundreds of thousands of dollars of electricity every day could be millions annually. These industries compete with others outside the region, and they can either reduce their workforce or relocate to remain competitive. Although extending summer pool levels would at least extend seasonal employment in areas around the tributary reservoirs, the resulting employment increases would be offset by decreases elsewhere in the TVA region, and would tend to outweigh those benefits from a regional perspective. The same may be said for increases in barge transportation costs.

23. What was the rationale for placing the three Georgia Counties in the Chattanooga Region as opposed to North Carolina? **Frank Maloney, 1760**

**Response to Comment 23:** The three Georgia counties: Fannin, Union, and Towns, are close to Chattanooga, as are two North Carolina counties, Cherokee and Clay, and are in the TVA Power Service Area. All these counties are in the Chattanooga region. The other counties in the North Carolina subregion are not in the TVA Power Service Area, but are in the watershed of the Tennessee River.

24. You will be guaranteed increased tourism dollars and weekend second home and rental dollars by allowing water to remain in Nottley lake throughout the year. Today everyone knows the lake goes dry in many areas, so they are buying homes at lake Chatuge and other lakes. Blairsville is not getting that added revenue. keep up the water and watch your revenue grow **Jeanne Sheahan, 2701**

**Response to Comment 24:** Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Nottely.

25. There is minimal information on the assumptions used for the economic analysis. It would be helpful to have some information on the inflation rate, interest rates assumed and other factors. Also there is no indication of the discount rate used, the assumed economic life of the projects, or any justification of any of the figures used. How were the values for fish, wildlife, value of lakefront land, etc established? All this seems very subjective. Changes in these numbers could have a significant impact on the answers. The final solution will likely have a mix of projects and which ones are viable and finally selected could be affected by all the assumptions above **Jim Mills, 3479**

**Response to Comment 25:** See Response to Comment 10. TVA did not try to monetize natural resources such as fish and wildlife. Rather, potential effects on these resources are reported in their natural metrics (e.g., changes in DO concentration for water quality).

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26. Table ES-02 indicates that for all alternatives except for Commercial Navigation the impact on personal income and Gross regional product is slightly adverse. Is this correct?

Table ES-03 indicates that for all except the Commercial Navigation alternative the net effect of any changes is not beneficial (slightly). It seems that this would include several intangibles and other factors which would be very hard to evaluate and would be very subjective. How were these factors evaluated and included in the final result? It is true that the net loss is very small, but the region is so far behind that any loss at all may not be desirable. **Jim Mills, 3483**

**Response to Comment 26:** It is correct that all alternatives except the Commercial Navigation Alternative would negatively affect (however slightly) the region's economy because they would involve a loss of hydropower generation, which would increase power costs. These increased costs drive up the cost of doing business in the Tennessee Valley, the result of which would be jobs lost, either through plant relocation, job reduction, or slower job growth (as compared to the Base Case).

While coal-fired and nuclear plants provide the base load of TVA's power production capabilities, hydropower is used to meet peak demands. The water that turns turbines at tributary dams continues to generate electricity at each location downstream. If that hydropower capability is reduced as a result of holding tributary pool levels up longer, TVA must replace that power by either generating it using other means (typically gas turbines) or buying it off the national grid at market rates. Either proposition is more expensive than hydropower generation, especially in August when annual demand is at its greatest. TVA costs are paid for by its power consumers. Increased power costs are passed along to customers.

Although the percentage is small, the actual change in the cost of doing business for industrial customers purchasing hundreds of thousands of dollars of electricity every day could be millions annually. These industries compete with others outside the region, so they might, in turn reduce their workforce, add fewer jobs than would occur under the Base Case, or relocate in order to remain competitive.

27. Table ES-01—increasing revenue from recreation. Note 2 says this is the change in recreational expenditures from outside the TVA region. Please explain. **Jim Mills, 4168**

**Response to Comment 27:** See Response to Comment 10. For each alternative, we estimated the effects from five areas that affect the economy: power costs, navigation or shipping costs to industries and users of water-borne transportation, increased spending by consumers in categories related to recreation, increased spending in durable goods related to the wealth effect of increased property values, and water supply costs for municipalities or industries that rely on minimum elevations or flows. The economic analysis measures the net effect on the regional economy for each alternative. Because the analysis is for the entire region, shifting expenditures from one section of the Valley to another (i.e., recreationists choosing Chickamauga Reservoir rather than Kentucky Reservoir) are not

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counted, but transfers into the valley (recreationists choosing Chickamauga Reservoir rather than Lake Michigan) would constitute a net gain to the region.

28. There is minimal information on assumptions used for economic analysis. Some of the data is referenced to TVA revenue in 2010 but no indication of how this figure was arrived at. Some of economic data appears smoothed over a lengthy period. Has recent blackout of 2003 caused the evaluation of risks, etc., to be reevaluated? Questions on tables ES-02, ES-03. You are asking us to take nearly all your figures on faith. **Jim Mills, 3961**

**Response to Comment 28:** See Response to Comment 10.

29. There is a lot of revenue to be generated from use of TVA lakes for the economy of surrounding counties. **Jimmy and Amy Owens, 486**

**Response to Comment 29:** Sections 4.25 and 5.25 provide data on economic conditions and impacts.

30. Douglas Lake in 2003 has many more lakeshore land owners and users and is still growing by leaps and bounds and is an asset to the communities that surround it. **Jimmy and Amy Owens, 480**

**Response to Comment 30:** Comment noted.

31. The notion that increased power costs to the public would be detrimental is absurd when you're talking about 30 cents or so per hundred dollar electric bills. **John Honey, 2037**

**Response to Comment 31:** Applying the increased cost of power due to the loss of hydropower production across residential, commercial, and industrial customers is a method of showing the magnitude of the effects on customers. While the effect on an individual customer basis might be small, the effect when accumulated over the region might be in the \$10s and \$100s of millions annually, depending on the alternative. For some customers, any increase would be meaningful.

32. I feel income in the area is probably decreasing rather than increasing due to water control by TVA. **Karen Niehaus, 3856**

**Response to Comment 32:** On the contrary, U. S. Department of Commerce data indicate that personal income on the national average in per capita terms has been increasing. The Base Case economic forecast projects this trend to continue in the Tennessee Valley region, with personal income expected to increase yearly at a rate of 2–3 percent per year.

33. TVA concludes Alternative 2A would result in job loss. The explanation I read is based on a series of extrapolated assumptions. If that is accepted as valid, I offer this equally reasonable scenario with an opposite projection:

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A lake season throughout summer would encourage commercial and retail development in our community. This growth would ADD jobs. It would also increase real estate value, both commercial and residential, adding to area financial health.

An additional comment about your job loss conclusion. If there were any increased downstream cost as the result of Alternative 2A, most businesses pass those costs along to consumers before resorting to job lay-off. You did not include that reality in your assumption base.

Honestly – with the exponential increase in recreational use of TVA reservoirs since its charter in the 30's and accompanying commercial and residential growth, can trade-offs for allowing high pool to more fully mirror a full summer season really be that bad???

Thank you for all your hard work!! We await the December decision (with crossed fingers)!  
**Laurie Danko, 2732**

**Response to Comment 33:** See Responses to Comments 10 and 22.

34. I work at the public library here in Morristown, which is between Cherokee and Douglas Lake. We get a lot of people in who are looking for a place to move from out of state. In the summer they are real happy about the idea of living here on the lakes, but in the winter all they do is talk about mud holes and flats and they are not so encouraged to come and move into this area, which I think is detrimental to TVA's image and East Tennessee's image. **Marti Steffen, 4497**

**Response to Comment 34:** Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Cherokee and Douglas Reservoirs.

35. I believe TVA may be underestimating the scenic beauty and long run recreational values of some of our local feeder lakes. The natural beauty of S. Holston and Watauga rival some of the most beautiful water systems on our continent such as the inland passages from Vancouver to Alaska. I recently kayaked parts of this passage and when I returned I realized how similar those lakes with their adjacent mountains were to that inland passage. The August pull downs and resulting mud banks severely reduce that natural beauty.

I do not have enough information or expertise to know if those increased aesthetic and recreational benefits would outweigh the increased flood risks. However, I think, as a professional economist, TVA needs to weigh those benefits more heavily. **Mike Everett, 272**

**Response to Comment 35:** TVA did evaluate all of the issues identified in this comment. See Sections 4.19, 4.24, 5.19, and 5.24. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including South Holston and Watauga.

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36. I think this section is just a guess. The best that can be done is to look at trends . A major event like 9/11 can have more impact than anything. I think it can not be a heavily weighted factor on the overall study. **Richard Wagner, 1635**

**Response to Comment 36:** TVA used the REMI model which was customized to industries, population data, and demographics, or the economic structure of the Valley. The model has been verified and results compared favorably to actual historical records. The forecasting model processes thousands of data points in order to formulate trends, and calculates variations from those trends related to changes in water management.

These variations are certainly smaller than the effect of 9/11 but are based on the same concept because an event like 9/11 was not predicted. The impact of that event over time is not only calculated in the Base Case forecast but also in all the action alternatives. As with all major events, it affects the Base Case and the action alternatives. What is being compared in this study is the net difference between the Base Case and each alternative. Comparing various river management effects against their economic impacts is a standard and reasonable way of evaluating change.

37. The economic study by the U of T seemed to consider the entire country rather than just the local TVA area in value of Higher lake levels for a longer time period. The presentor made a statement to the effect that if the recreation activity were to and the result was a wash. The reason for higher lake levels longer is to bring "recreationists" to this area. If recreationists that come here because the season is longer are new, great. If they come from other areas because the season is longer, that too is great. Bottom line is more will come here if the season is longer. That adds to the economy.

Another area that will be affected is dining on the lake. There is only one eating establishment left on the lake between mile marker 9 and 29. The other one closed because the season was too short and they could not make a go of it.

The economic study also indicated that the increase in value of the average home would be about \$13,000. Ask a real estate agent about that erroneous information. **Robert J. Reynolds, 898**

**Response to Comment 37:** The comments seem to focus on the University of Tennessee report on recreation and tourism in 13 counties in East Tennessee. The report is available on the University of Tennessee Center for Business and Economic Research web site: <http://cber.bus.utk.edu/lakeres.htm>.

TVA's study is much broader in scope than that study—encompassing 201 counties in the Tennessee River watershed and TVA Power Service Area. The commenter is correct that an extended recreation season on tributary reservoirs would result in job creation in the areas around those reservoirs, particularly in the recreation and tourism industry and in retail sales. From a regional analysis perspective, however, those local gains would be offset by losses elsewhere in the region from increased costs in power production—due to

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the loss of the availability of hydropower to meet peak demands during the period of highest annual demand in August. Increased power costs would drive up the cost of doing business in the region, resulting in the loss of jobs through job reduction or relocation of production. The outcome of holding tributary reservoir levels up longer into fall is a net loss in jobs for the TVA region as a whole.

The reference to property value impacts seems to be specific to the University of Tennessee report. See Sections 4.25 and 5.25 for a discussion of how property value changes were evaluated for the ROS.

38. I am not sure what jobs are included or the economic impact on the communities surrounding the lake. I would assume that a more consistent lake level during the summer would make North Georgia a more attractive vacation area and stimulate the local economy creating more jobs. At this point, any jobs projection would be speculative at best. **Roger W. Hill, Jr., 2417**

**Response to Comment 38:** See Response to Comment 10. Recreation surveys around the reservoirs yielded increases in consumer spending, as a result of an extended recreation season. Additional jobs around the tributaries would be expected from the additional spending in the area (for example, at marinas and restaurants).

39. In your studies of economic impact do you look at retail sales, tax dollars, local jobs, hotel and cabin rentals and incomes, or any economic impact other than commercial navigation affects? The language does not indicate this. The only economic impact to the region TVA indicates in any of their studies is the impact on mass industry and shipping costs based on river navigation. Take Polk County for example. If you study the local economy of such counties that depend almost entirely on tailwater recreation for their economy, you will find that economic impacts are far more reaching than mass industry. **Stephen Smith, 48**

**Response to Comment 39:** See Response to Comment 10.

40. One item that I have not seen discussed is the benefit of increased tourism that the later summer pools and slower draw downs would encourage. **Teddy Murrell, 1248**

**Response to Comment 40:** The benefits of increased tourism were specifically addressed in the study as part of the recreation-related benefits. See Sections 4.25 and 5.25. There is no doubt that an extended recreation season on tributary reservoirs would result in job creation in the areas around those reservoirs, particularly in the recreation and tourism industry and in retail sales. The study looks at the economic impact of recreation, power costs, navigation and shipping costs, water supply, and property values simultaneously. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs, which would enhance recreation.

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41. So what I would like to see is TVA to work with our local county executives, Johnson County, Carter County and the counties surrounding the Bristol area to help recruit industry as far as lakes are concerned. I know one industry in Mountain City, Tennessee, came here primarily because of Watauga Lake and they were trying to recruit some more people to come in that area because of the lake. **Terry Peters, 4359**

**Response to Comment 41:** TVA works cooperatively with the Northeast Tennessee Valley Regional Industrial Development Association and is represented on its board. More information about this organization, including contact information for representatives in your area, may be found on the internet at <http://www.netvaly.org>. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Watauga.

42. The growth in Fannin County over the past ten years is without doubt tied to the recreational and tourist opportunities provided by the region. Given recent industry shutdowns (Levi Strauss, etc.), recreation will be a key industry for the county into the future and Blue Ridge Lake is a critical component of this direction. **Thomas C. Roberts, 2908**

**Response to Comment 42:** Recreation and economic effects are addressed in Sections 4.24, 4.25, 5.24, and 5.25. The analysis did not look at economic impacts on specific counties but rather regionwide, where the economic outcomes of the various alternatives were derived by comparing the Base Case (existing conditions) with the alternatives.

Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Blue Ridge.

43. The initial purposes of the TVA projects of the 1930's were to control flooding, bring electricity to these underdeveloped areas and promote economic growth.....

Now, 73 years later, the fluctuating lake levels are restricting economic growth by forcing potential consumers to chose alternative locations for recreation, such as many of the lakes in Tennessee that do not fluctuate lake levels. **Thomas G. Sandvick, 2663**

**Response to Comment 43:** See Responses to Comments 10 and 17.

44. I challenge your economic assumptions regarding recreation revenue. While your figures may reflect the total universe of direct recreation revenue, I wonder if you have also fully captured the indirect effects of increased spending at local restaurants and businesses and the resultant multiplier effect on the regional economy. It hardly seems possible to me that the total economic benefit of 1.34 million user days of recreation would only generate an \$11 million incremental contribution to local economies. While I'm sure you've captured direct revenue to TVA, I urge you to also consider the significant effect on the local economy as visitors spend in local shops and businesses, generating an economic engine

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in the region more than capable of offsetting the potential increase to electricity costs.  
**Thomas Still, 353**

**Response to Comment 44:** See Response to Comment 10.

45. Although the commercial navigation alternative seems to yield the greatest positive economic benefit, I urge the TVA and relevant parties to consider not only the impact on Gross Regional Product but also the potential impact on adjacent property owners of dramatic changes to reservoir levels in terms of adverse impact on property values. Literally thousands of property owners like myself have invested hundreds of millions of dollars in properties for purposes of enjoying the recreational opportunities and aesthetic beauty of TVA reservoirs. While this option may seem to have a positive impact on economic income, the potential impact on property values and the real estate market, especially surrounding tributary reservoirs, would likely be devastating. On the other hand, I believe that longer term positive benefits to the economy would result from the recreational opportunities, in terms of longer term attractiveness of the area to investors and retirees, ultimately providing a sustainable (versus cyclical) lift to the economy while preserving the aesthetic beauty of the Tennessee Valley watershed versus the Commercial Navigation alternative. **Thomas Still, 345**

**Response to Comment 45:** Changes in property values were included in the overall economic analysis; one measure of this is gross regional product. TVA has assessed the impact of changes in property value (a measure of wealth) on the regional economy in terms of consumer spending (a contribution to the economy) for each of the alternatives. This is discussed in Sections 4.25 and 5.25. Further information about property value modeling and the regional economic modeling process is available in Appendices C6 and C7.

Aesthetic impacts, while not quantified in the economic analysis, have also been considered for each alternative. More about aesthetics can be found in Sections 4.19 and 5.19. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs.

46. Recreational use of lake Nottely is vital to the economical and financial welfare of Union County. Presently, the amount of funds that the county and school system receives from TVA is not a fraction of the taxes that would be obtained if the property was private. Given this arrangement, TVA should allow the lake to be maintained at full pool at least until the tourist season has waned (late October). **Tommy Stephens, 1996**

**Response to Comment 46:** The 2002 in-lieu-of-tax payment to Union County was about \$476,000, and payment to Blairsville was about \$15,000. The existing value of the block group properties around Nottely was \$237 million. Property taxes were considered in the Base Case. See Response to Comment 45.

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47. I completely disagree with the information provided by TVA as to how jobs would be lost with Alternatives A and B. Jobs would have to develop around the tributary reservoirs due to increased usage of the lakes. There would be opportunities that would be attractive to land developers of many different types. I can only imagine how the housing would increase for not only vacation and second home purposes, but permanent residences, as well. Obviously, with more people in the area the potential for jobs would be much greater than currently exists. New businesses would start up immediately, with the greater number of users on and around the lakes. Please look at the tourist destination areas of Sevierville, Pigeon Forge and Gatlinburg and all of the jobs that have been created because of the millions of visitors in these areas, yearly! Surely, the real estate located on the banks of the Reservoir of Douglas Lake would see a significant increase in values, as well. Undoubtedly, the demand for these properties would significantly increase. With over 550 miles of shoreline, on Douglas Lake alone, the possibilities would continue past our lifetimes and into future generations. **Vicky Murrell, 1260**

**Response to Comment 47:** See Responses to Comments 10, 33, and 45.

48. At the review meeting in Bryson City it appeared as if the management is too committed to a computer model that is inflexible. Furthermore an economic projection that goes out 20 years is a joke. No economic model can work for anything but short term and as exhibited by today's economic conditions, models generally don't work well even in the short term. They are no substitute for common sense and good management practices! **William Gazda, 3193**

**Response to Comment 48:** See Responses to Comments 10 and 36.

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### **F3.3 Other Areas**

#### **Water Levels**

1. Why is it necessary to drawdown Douglas Lake before Labor Day of each year? This year with all the rain and bad weather proved that an early drawdown is not necessary.  
**Anonymous, 2407**

**Response to Comment 1:** The reasons why TVA reservoirs are drawn down each year are described in detail in Chapter 2 of the EIS. Reservoirs are drawn down to maintain flood storage availability in order to minimize flood risk, generate hydropower, and meet downstream water requirements (such as providing cooling water for nuclear and coal-fired power plants, processing water for industry, and flow for navigation). A single year, or small subset of years, does not provide an adequate basis for establishing or modifying reservoir management policy.

2. TVA officials have told us for years that tributary lakes must be started down by August 1 in order to get all the water through a single outlet downstream from Nottely. This really seems unjustified since we are drawn down way below any possible flood storage requirements that are ours. It seems our shores are exposed for months ahead of any real flood storage need. **Bob Garrison, 1799**

**Response to Comment 2:** See Response to Comment 1.

3. With the info from weather satellites, and accessibility to all types of weather patterns, are they being used to the fullest to perhaps move water in a more efficient way in the year 2003? **Carolyn R Clarkson, 1849**

**Response to Comment 3:** TVA uses a variety of weather information for guidance with our daily reservoir operations. However, as the commenter may know from following the local weather forecasters: weather forecasting, even in the short term, is not completely accurate.

4. I would like the water to be kept up until September. Every year half way into the summer season we lose use of our boat because the water level is so low. I think it would be nice to at least be able to go boating all summer. Instead all we are looking at is brown dirt, flats. At one time TVA said they would leave the lake up until August 1. THAT has never happened. TVA takes the lake down starting the middle of July. I don't think TVA is being fair. TVA has even lowered the full pool number. I would like to know why? **Catherine Kelly, 1500**

**Response to Comment 4:** The full summer pool of 1,777 feet on Nottely has been in effect since 1991. The existing operating plan restricts the drawdown to elevation 1,770 until August 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs.

5. I have never understood the need to start pulling the lake level down beginning in July which is still the middle of the summer. **Charles Butler, 1838**

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**Response to Comment 5:** See Response to Comment 1: Under TVA's existing operations policy, unrestricted drawdown typically starts on August 1, not July 1, for most reservoirs.

6. When discussing summer pool as it relates to Cherokee Lake, a specific level should be clarified. 1060 or min. recreation level should not be used. 1073 is full pool and full pool is what level all other lakes are measured by. Please treat Cherokee as the other lakes are treated, so we don't see a 13 foot drawdown in July. **Dave Cooper, 1131**

**Response to Comment 6:** Full summer pool at Cherokee is 1,071 feet. Under TVA's Preferred Alternative, equitable treatment of the reservoirs that comprise the TVA system was a consideration. Under the Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Cherokee.

7. The only problem I have with your proposal is that those of us who live on the tributaries are use to dealing with specific lake level numbers while main reservoir users pay little attention to lake level numbers as the level fluctuates very little from summer to winter. I have lived on both for years and know this is true.

The reason I mention this is that it would be nice to know what the March 15 levels are in real numbers mentioned under the winter pool? We know full pool is 992-995. We know the winter pool level is usually pulled down to 940-942 level, but most of us are not sure what the level is supposed to be at March 15. Is it 965?

Also there is no mention of time schedule to raise tributary level from winter pool to summer pool. Would full pool levels be reached earlier since winter pool is kept higher or still be same as today? **David and Marylin Miles, 379**

**Response to Comment 7:** Full summer pool on Douglas is elevation 994. Flood guide elevation on March 15 is 958 feet. The fill schedule depends on which alternative is being discussed. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Douglas. In addition, winter flood guide levels would be raised. See Appendix C.8 for elevation probability plots and flood guides.

8. I question TVA as to their policy. This year for example the lake was within 1 foot of full pool. Then TVA "dumped" 4 ft in the June/July period as contrary to the policy of not "dumping" water until August 1st. Will the acceptance of plan A change TVA from doing what they want at any time.

Another comment is that I have lived on the lake for 13 years. Up until last year "full pool" was 1779 ft. Last year TVA announced that "full pool" was now 1773 ft. **Debra Jensen, 1478**

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**Response to Comment 8:** Full summer pool at Nottely, established by the Lake Improvement Plan in 1990, is elevation 1,777. The existing operations policy restricts the drawdown to elevation 1,770 through August 1, then allows unrestricted drawdown to winter elevations starting on August 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Nottely.

9. What is different about your management system that results in much lower water levels than what the Corps of Engineers is able to accomplish on other reservoirs? **Douglas Dean, 2903**

**Response to Comment 9:** Operation policies vary between organizations, but also depend on the objective of individual projects. It would be difficult to compare different reservoirs without knowing which specific reservoirs to compare. For example, some Corps projects in Tennessee operate with a larger fluctuation than similar TVA projects.

10. My first concern is that you may be taking too much water out of Nottely Reservoir compared to the other reservoirs. How can you justify the 30 foot drop in the winter water level? It makes no sense to comment on policy if Nottely is not treated fairly. **Gerald Langer, 3535**

**Response to Comment 10:** The drop in water elevation that occurs as water is withdrawn depends largely on the design of the reservoir. See Response to Comment 1.

11. Why not go ahead and lower the water levels to the 354 level on our lakes by Jan/Feb for Spring floods? Recreational needs would not be affected; flood control would then be positively affected. Power would still be available. Navigation would be affected over a drastically lower period than the base level.

Is it a fast rule that the drop must occur in a steady pattern? Why not stair-step it down? **Greg Batts, 2741**

**Response to Comment 11:** See Response to Comment 1. The stair-step pattern suggested was tested in the early to mid-1990s; however, the USACE and USFWS identified unacceptable flood risk and environmental consequences with this type of operation at Kentucky and Barkley Reservoirs.

12. Negotiated settlement of the Tapoco FERC relicensing is nearly complete. As proposed, the general relicensing changes to the Tapoco operations include: The Santeetlah reservoir will be operated at higher levels with an extended recreation season and significantly less drawdown **Greg Ott, Operations Manager, Alcoa Power Generating Inc. Tapoco Division, 3749**

**Response to Comment 12:** Comment noted.

13. The EIS does not contain sufficient detailed information to allow for an evaluation of the impact of the alternatives on the Tapoco facilities. To better understand the effect of alternative Fontana operations on the Tapoco facilities we need to have access to the model that was used to evaluate ... flood operations and the results from that model. In addition, the model should be modified to account for future changes in the operation of the

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Tapoco facilities. **Greg Ott, Operations Manager, Alcoa Power Generating Inc. Tapoco Division, 3750**

**Response to Comment 13:** TVA continues to work with Tapoco to provide them with detailed data for their evaluations.

14. Why is it necessary to keep water levels so low in July, August, September and October?  
**H. Lee Fleshood, 3297**

**Response to Comment 14:** See Response to Comment 1.

15. Since we are virtually at the headwaters of Douglas Lake, we have absolutely no lake for 2/3 of the year. I believe a balance can be reached between the needs of TVA and the needs of those of us who use the system. Unfortunately, none of the alternatives will substantially increase the winter pool for our County. The lakebed will continue to be an unattractive, unusable mudbog for much of the year. **James Finchum, 1299**

**Response to Comment 15:** Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Douglas.

16. I guess I want the plan that is best all around. That's pretty much it. **Jane Chinnici, 4299**

**Response to Comment 16:** Comment noted.

17. Why is Lake Chatuge level still as high as it is when every other lake is not. **Joanne Wenberg, 2415**

**Response to Comment 17:** See Response to Comment 1. Chatuge has less planned annual fluctuation due to characteristics of the watershed and the reservoir shape.

18. Can you please tell me why TVA lets so much water down, in lake Chatuge, you are killing the fish, and causing more erosion, breaking up docks. i see no reason for such a let down, and yes i have heard all the stories, to which i find very hard to believe, can we find a happy middle point. **John S. Petraskiewchz, 2512**

**Response to Comment 18:** See Response to Comment 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Chatuge.

19. What factors dictate the dropping of water levels in August? Why must it be done before summer is over? **Judy Kirchner, 4558**

**Response to Comment 19:** See Response to Comment 1.

20. The lake has not been this high for 5 years and even with the high water this year the TVA has managed the water flow. Since we've had 5 lean years it appears it would in the best interest of TVA to maintain some water level in Lake Nottely so that there would be standardization. **June Hewett, 1830**

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**Response to Comment 20:** Inflow fluctuates substantially on an annual basis and will result in varying water levels that TVA must manage, regardless of the policy alternative selected.

21. One of the biggest areas of concern over the past has been the varying degrees of draws between the surrounding tributaries. Nottely has had a lower level much earlier than Lake Chatuge and Lake Blue Ridge. A main concern is that all the surrounding lake levels be lowered consistently and that all are done on the same time frame. **Karen Adamson, 1666**

**Response to Comment 21:** Equitable treatment among the reservoirs that comprise TVA's reservoir system was a consideration in the formulation of TVA's Preferred Alternative. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Nottley.

22. "Why was not the month of October included in the study"; since that is what anyone and everyone, plus Loud, was asking for; that the winter draw down would not take place until the 1st of October, which would be the time that the reservoir usage would start to really drop off and the summer usage would be coming to an end, so to speak?

WHY wouldn't it be feasible to OPTIMIZE each dam on its own, just like you have four tires on your automobile and two wheels are balanced and two are not. If that were the case, you would then balance one of the other wheels and then balance to last wheel and A MAXIMUM OPTIMIZATION would be the final result. **Malcolm P. Cotton, 441**

**Response to Comment 22:** October was included in some of the preliminary alternatives but not included for the detailed study in the EIS due to adverse impacts on many operating objectives.

TVA is responsible for managing the entire Tennessee River system watershed for the purposes of navigation, flood control, power generation, water quality, water supply, and recreation. The high and low dams were designed to work together as a system to reduce the impacts of damaging floods and to ensure that a navigable waterway could be maintained year-round. In order to achieve the greatest overall level of benefits for the region, TVA operates the reservoir system as an integrated unit rather than a set of individual projects. This approach allows each of the projects to contribute to the operating objectives for the system. Because the water that is released from each of the reservoirs is used repeatedly by projects downstream and because there are varying amounts of storage space available in each reservoir, a careful balancing and scheduling of reservoir releases is required each day to ensure that enough water is released to meet system needs while preventing a surplus of water that could result in flooding under high inflow conditions. If each reservoir were optimized independently, just for its own immediate region, system needs at downstream locations would be negatively affected and the overall level of benefits provided for the region would be diminished.

23. Minimizing fluctuations in water levels to provide a stable environment. **Mark Wiggins, 2278**

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**Response to Comment 23:** TVA fluctuates water levels weekly and seasonally for a number of reasons including, but not limited, to flood and mosquito control and power generation.

24. As property owners at Lake Blue Ridge, (611 Magnolia Drive, Blue Ridge), my wife and I would like to ask a question ...Why is it not possible for the lake level to remain at or near full until much later in the year? Keeping it at a higher level until at least Labor Day would make a very great improvement in the quality of life at Lake Blue Ridge.

**Mr. And Mrs. John R. Scott, 3718**

**Response to Comment 24:** See Response to Comment 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Blue Ridge.

25. I confess to being uneducated with respect to broad requirements of coping with TVA's mission—flood control, navigation, water quality, power supply, recreation, etc. And I confess to having a personal interest in lake levels, I have problems understanding the rigid adherence to reducing lake levels as early as late July and not allowing those levels to return to recreational levels until late spring. Would it make a significant difference if three or four weeks were added at each end? There already is a sizeable population along the lakeshores—and even more who commute to take advantage of water sports. Several residential developments are in planning—and actual construction—stages.

Yours is a challenging task requiring the balancing of many conflicting interests. I hope there may be room for modifying the present scheduling of lake level adjustments—providing more "lake" and less "Gobi."! **Norman J. Knights, 810**

**Response to Comment 25:** See Response to Comment 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs.

26. I guess my specific comment is that I strongly recommend some combination of these alternatives, a blend, if you will, because as I see this, the benefits of Reservoir Recreation Alternative A and/or Alternative B are not in mutual exclusive to an alternative such as commercial navigation, which was economically beneficial. So it seems that in the process of evaluating comments and then trying to assign value to those comments that it would be advantageous to look across some combination of alternatives, and I'm sure you're doing that.

The major impact on our property owners has to do with the extreme fluctuation of the water levels and the fact that the low water in midsummer seems to be unnecessary from our perspective even when you look at the study data, and that is -- Alternative B in our specific case would be the most advantageous, yet, I do not understand the specific impact on hydro production in that the same amount of water would eventually flow through the reservoir and the hydro plant under alternative Base Case.

It's a question of timing, and the timing issue is not clear to me other than the fact that summertime, August, is the prime peak season for power needs. However, I also know at that point in time that you are very unlikely to lower the gas- and coal-fired plant production

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because of the cost of the fluctuations of those plants as opposed to the ease of regulating a hydro plant off and on, if you will, in terms of generation.

So I'm here to speak in behalf of Alternative B and some combination of that alternative with any of the others, specifically, the commercial that seems to be the most economically advantageous. **Norman K. Owen, 4324**

**Response to Comment 26:** The commenter is correct that the adverse impact on power system costs is a question of timing. Generation from TVA's hydropower plants is used for and is most valuable during peak demands on the TVA system. Our coal-fired and nuclear plants are typically operated in a baseload manner (around the clock as necessary in order to meet demands). While the same amount of water may be available in most reservoirs to generate power at different times, that generation would likely be less economically valuable. The annual impact on the TVA power system from Reservoir Recreation Alternative B was estimated to be \$67 million. In part to address these adverse cost impacts, TVA developed its Preferred Alternative. The Preferred Alternative has an estimated cost to the power system of approximately \$14 million annually.

27. First let me identify my vested interest. I am a property owner on Boone Lake. As a result of this, TVA has a flowage easement for Boone Lake on my property and I interface with the lake every day. Therefore, I was most interested in the Reservoir Operations Study and attended the workshop you had in Blountville, TN in the spring of 2002 to collect input from concerned people about TVA operations and the impact on Boone Lake and others in the TVA System. I had great hopes for some improvement in the lake level that could be obtained by (1) raising the January 1 lake level target to reduce the unsightly nature of the uncovered lake bed in the winter and (2) extending the targeted summer level to obtain more use of the lake in the favorable months of September and October.

I obtained and read the DEIS and was extremely disappointed to see that after all the effort spent by a lot of people there was no change made to Boone Lake. This does not address my hopes or those of many others interested in this lake. I found it to be curious why this lake received no redress on these issues when clearly so many of the people who attended the input meeting in Blountville in the spring of 2002 were desiring an improvement. I spent some time researching the background of the changes that TVA has made on lake levels over the years and I have concluded that TVA has made no changes to Boone Lake in the last 35 + years in spite of at least three significant studies where numerous lakes have received improvements in TVA operations policy. I base that conclusion on the DEIS and GAO/RCED-99-154 GAO Report on Lake Levels to the Honorable Van Hilleary, House of Representatives dated May 1999.

It seems clear that Boone Lake is one of 14 TVA lakes that falls into a category of TVA lake called a multi-purpose tributary project (MPTP) and as such has much more significant changes in lake levels than main river lakes. I quote the GAO report:

Chapter 2, Page 25 and 26: "While all 54 projects were built or acquired as part of TV A's integrated system of projects and all of the projects contribute to maximize the value of the available water in the Tennessee River, the multi-purpose tributary projects generally have more significant changes in lake levels during the year. For example, the target lake level for Douglas - a multi-purpose tributary project - decreases 50 feet from 990 feet on August 1 to 940 feet above sea level on January 1. On the other hand, the target lake level for Fort

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Loudoun - a multi-purpose main river project - only decreases 6 feet from 813 feet on August 1 to 807 feet above sea level on January 1. Table 2.1 shows the differences between the August 1 and January 1 target lake levels at the multi-purpose tributary projects.

Table 2.1: August 1 and January 1 Target Lake Levels for TVA's Multipurpose Tributary Projects. Of the 14 MPTP lakes, ten have a significant variation during the year in their lake level of greater than 10 feet. They are Blue Ridge, Boone, Chatuge, Cherokee, Douglas, Fontana, Hiwassee, Norris, Nottely and South Holston. Of these 10, all but Boone and Fontana received an apparent recommended increase in the January 1 target Level. I quote the DEIS: "Under Reservoir Recreation Alternative A, the winter flood guide levels would be increased on 10 tributary reservoirs (South Holston, Watauga, Cherokee, Douglas, Chatuge, Nottely, Hiwassee, Blue Ridge, Norris, and Tims Ford) to the pool level targeted to be reached by March 15 under the Base Case."

Fontana has received increases before so that leaves Boone as the only Lake of these 10 with significant lake level variation to never receive an increase in the winter lake level in the last 35+ years. I quote the GAO report: Chapter 3 page 39 "Over the past 3 decades, TVA has instituted two sets of significant changes in the way the multi-purpose tributary projects are operated. --- In 1971, TVA conducted a study to modify, if possible, some portions of its operations to improve recreational uses of TVA's multi-purpose tributary projects within the framework of the statutory requirements for flood control, navigation, and hydropower generation. As a result of this study, TVA concluded that raising the January 1 target levels and the normal minimum levels of nine of its multi-purpose tributary projects should provide higher lake levels during the winter in most years. -Table 3.1 highlights the changes TVA implemented in 1971. Table 3.1: Changes Made in 1971 to Multipurpose Tributary Lake Levels SEE ORIGINAL FOR TABLE.

Executive Summary Page 5 "According to TVA, while large storms can occur throughout the year, the major regional floods on the Tennessee River normally occur between December and April." -- "A key change resulting from its December 1990 review of project operations was TVA's delaying the annual lake drawdown at the multi-purpose tributary projects from Memorial Day to August 1. (The multi-purpose tributary projects were defined as Boone, Chatuge, Cherokee, Douglas, Fontana, Hiwassee, Melton Hill, Norris, Nottely, South Holston, Tellico, Tims Ford, and Watauga plus Blue Ridge)"

Executive Summary Page 6 "Since the 1990 review, little has changed in how TVA operates its multi-purpose tributary projects. Because it had been receiving an increasing number of requests to analyze changes in the lake levels for individual lakes, TVA determined that a piecemeal approach raised questions of fairness in how each lake would be treated within TVA's system. --- Therefore in March 1997, TVA established a 4-year moratorium on making any changes in lake levels."

Chapter 3 Page 41 & 42 "In December 1990, TVA released the results of its work examining lake management policies in a report entitled, "Tennessee River and Reservoir System Operation and Planning Review."-- Referred to by TVA as its "Lake Improvement Plan," this review evaluated (1) three alternatives to provide additional minimum flows from TVA dams to improve reservoir releases downstream and (2) seven alternatives to stabilize lake levels by delaying the drawdown of lake levels until August 1 or later. As a result of TVA's analyses, the 1990 review recommended that (1) TVA increase minimum flow

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requirements from mainstream and tributary projects and increase DO levels in the releases from 16 of its dams and (2) maintain summer target levels in 10 multi-purpose tributary projects until August 1st."

The 10 projects were: Blue Ridge, Chatuge, Cherokee, Douglas, Fontana, Hiwassee, Norris, Nottely, South Holston, and Watauga. "The remaining four multi-purpose projects - Boone, Melton Hill, Tellico and Tims Ford - not included in the review were excluded for various reasons. Boone was excluded because its original design included its operation at prescribed seasonal elevations that result in a constant lake elevation from Memorial Day through Labor Day. Melton Hill does not have an annual drawdown; it is operated in a fixed range of about 793 to 795 feet. Tellico, which is connected by an ungated canal to Fort Loudon Lake, has a lake elevation essentially the same as Fort Loudon - a multi-purpose main river project. Because Fort Loudon is targeted to reach its summer lake level by April 15 and its drawdown does not begin until November 1, Tellico has a flat summer lake level until November 1. Tims Ford, by design and original project allocation, has always been operated with a minimum summer lake elevation of 883 feet, which extends until October 15."

Chapter 3 page 44 and 45 "Table 3.3 shows the effects of the changes on the August 1 lake levels of the 10 multi-purpose tributary projects considered in the 1990 review. SEE ORIGINAL FOR TABLE

What makes this situation even stranger is the fact that TVA recognizes the fact that minimizing exposed reservoir bottoms, debris, trash and underwater structures and shoreline ring effects resulting from low winter pool levels is important and discusses it in Chapter 4 and 5 of the DEIS. Table 4.19-02 Existing Scenic Conditions for Representative Reservoirs specifically discusses Boone Lake and describes the negatives of the current situation under Landscape Visibility as: "High Concern Level," "High opportunity for viewing," "Recreational Use," "Substantial residential Development," and under the Existing Scenic Integrity as: "Low water levels create ring effect and expose flats." "High amount of shoreline residential development and related facilities are evident" The DEIS, Chapter 4.19.5 Exposure of Reservoir Bottoms and Flats goes even further and depicts the situation on Boone Lake in Figure 4.19-02 The Effects of Lower Pool Levels on Exposing Reservoir Bottom and Flats-Boone Reservoir Observed from a Rural Road Adjacent to a Residential Area, Figure 4.19-03 The Effects of Lower Pool Levels - Upper Boone Reservoir Observed from Highway IIE near Bluff City and Figure 4.19-04 Effects of Floating Structures Sitting on Exposed Reservoir Bottom and Other Exposed Structures Resulting in Lowered Scenic Integrity.

Yet the ROS did nothing to specifically address this problem on Boone Lake. Why? Why after all these years and studies has Boone Lake never received an adjustment in the winter pool level? The recommendations of this study would have been a great opportunity to address this problem on Boone Lake. I don't think this issue is going to go away.

On the second issue of extending the targeted summer level to obtain more use of the lake in the favorable months of September and October there was apparently no study done.

The only two references to this I could find in the DEIS were in the Executive Summary ES.8 Other Actions Considered where the following was found:

"TVA considered but did not include a number of other actions. They included --- filling tributary reservoirs by March 1, and delaying drawdown until after October." and Chapter

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3.4.2 Actions Not Included in Any Policy Alternative where the following was found: "During the formulation of the initial 25 alternatives, the practice of raising tributary reservoirs to summer pool levels by March 1 and delaying drawdown until October 1 was evaluated but not carried forward. Because filling reservoirs before the end of the flood season would compromise TVA's ability to control runoff in spring, filling reservoirs to summer pool by March 1 was not considered for detailed analysis. Delaying drawdown until November 1 would reduce flows from the Tennessee and Cumberland Rivers during September and October when water levels on the lower Ohio and Mississippi Rivers already are likely to be low."

In my opinion, these statements seem like a broadbrush approach to basically staying with the status quo. The dates of March 1 and November 1 push the envelope and "likely" doesn't seem very definitive. There are 61 days between 1 March and 1 June and I don't understand why some interim points were not analyzed to consider bringing the summer levels earlier in the year by at least a few weeks. I do recognize that the spring months are flood sensitive. The same can't be said for the fall which is typically much drier than the spring and has excellent weather for recreational use of the lake. There are also 61 days between 1 September and 1 November and I don't understand why some interim points were not analyzed to consider keeping the summer pool levels into September or early October. I recognize that DEIS Reservoir Recreation Alternative A recommends extending the summer pool period until Labor Day on 10 of the 14 MPTP's (South Holston, Watauga, Cherokee, Douglas, Fontana, Chatuge, Nottely, Hiwassee, Blue Ridge, and Norris) but since Boone Lake already had the summer pool extended until that date, this lake got no improvement. Why? It's difficult to believe that holding Boone Lake at summer level for another month would have much impact on the Ohio and Mississippi River water levels. Earlier studies had shown that the impact was apparently not significant. I quote the GAO report: Chapter 4 Page 52 and 53, "Despite the changes made to its policies impacting lake levels earlier this decade, TVA has continued to receive a number of requests to make further changes. TVA ultimately decided in March 1997 to implement a 4-year moratorium on making further changes to these policies." -- "After the 1991 Lake Improvement Plan was implemented, requests for changes to TVA's lake-level policies slowed for a year or two but began again in 1993. According to TVA, constituents were no longer satisfied with the changes made in 1991, or new constituents were not aware of the changes that had been made." By March of 1997, several requests for changes to policies impacting lake levels had been submitted to TVA. For example, (1) TVA had completed a preliminary study that examined the power and flood control aspects of extending Boone Lake's level later into the fall:"-- (In addition, TVA has commented on two studies discussing the potential economic benefits resulting from higher lake levels later in the year (Oct 1) at Cherokee and Douglas Lakes in Tennessee and Blue Ridge, Chatuge, and Nottely Lakes located in northern Georgia and users at South Holston and Watauga Lakes requested changes in policies at those lakes)

"TVA staff had performed analyses for Boone Lake, which indicated that the impacts on TVA's system-wide cost of supplying electric power associated with the requested changes were relatively small, with a net present value of less than \$1 million. TVA estimated that increased cost of supplying electric power associated with the requested changes at Boone Lake was much less than for other TVA lakes analyzed in the past, primarily because the changes in lake levels during the year at Boone were smaller in comparison to other lakes, and TVA had already extended the summer target lake level at Boone Lake until Labor Day. As a result, TVA would not need to shift power production at Boone Lake from the

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peak summer months to the fall. In addition, the flood impact analyses indicated that based on historic data, flood control at Boone Lake would not be affected. However, TVA indicated that potential storms would have an impact on the frequency of floods downstream from Boone Lake. TVA became concerned that more and more users were requesting studies for the lakes they used, resulting in an analysis of the system on a piecemeal basis. To TVA, this raised a "fairness" issue of treating these lakes differently in the TVA system. Of particular concern to TVA was the relatively low impact that the requested changes at Boone Lake would have on TVA's system-wide cost of supplying electric power. TVA believed that the implementation of these changes would give even more favoritism to a lake that already had high lake levels envied by users at other tributary lakes, while also promoting a "first come/first served" attitude to the lake users."

Why was the earlier study that had shown the feasibility of extending the summer pool level on Boone Lake later into the fall and had been placed on hold because of the moratorium on changes to lake levels, not now implemented in the ROS? Of the 14 MPTP Lakes, 4 received no benefit from the DEIS recommendation to extend the summer pool period. They are Boone, Melton Hill, Tellico and Tims Ford. Of these only Boone would receive some benefit from a summer pool extension into September or early October. Melton Hill has an operating range of 793 to 795 feet year-round so this is a non issue there. Tellico's level is determined by Ft. Loudoun's level which does not start drawdown until 1 November. Tims Ford already has the summer pool level extended until 15 October. So why not give Boone some benefit by extending the summer pool level-into the fall for some amount? Is it TVA's view about Boone Lake, as I found in Table 4.19- 02 of the DEIS, that "compared to other reservoirs, high water level is held longer (Mid-May to early September)" and therefore they don't need a benefit from this Reservoir Operations Study? I would point out that both the "run of the river" projects such as Ft. Patrick Henry and "mainstream" projects such as Guntersville all have high water levels longer as well as Melton Hill, and Tellico of the "tributary projects."

I hope you and your team have an opportunity to reflect on my comments and make some favorable adjustment in your recommendations concerning Boone Lake and the issues I have discussed in this letter. There are many other constituents in East Tennessee that are affected by TV A's operations policy on Boone Lake and they may be happy with continuing to get the status quo, but I doubt that the majority is. I write this letter hoping to achieve a positive benefit for both you and I. **Richard F. Odum**

**Response to Comment 27** As stated in your comments, Boone Reservoir typically has high, stable reservoir levels through Labor Day. For several reasons, this duration of summer levels would not be extended under TVA's Preferred Alternative. Providing a longer duration of higher pool levels at Boone would negatively affect reservoir levels upstream, including Watauga and South Holston; increase residence time of water in the reservoir, which would likely lead to decreased water quality in the reservoir; and raise questions of equitable treatment among TVA reservoirs. Regarding your desire for higher winter levels on Boone, the winter flood guide level would be raised under the Preferred Alternative, which would likely result in higher winter water levels.

28. We can't see any valid reason to drop them [lake levels] before October. **Pete and Diane Heinen, 981**

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**Response to Comment 28:** See Response to Comment 1. TVA considered extending reservoir levels to October but determined that this would result in unacceptable impacts on flood risk, as well as adverse impacts on many other operating objectives.

29. Would like Watts Bar held at normal pool from April to November for maximum power generation. Gradually lower by 6 ft before 1/1 for max power generation and held there during January for pier maintenance, filled 2 ft. in Feb. to increase turbine pressure and decrease ice formation by flow rate, then filled normal pool in April. All lakes lowered up to 2.5 ft. below normal pool to prevent flooding. Initiate lowering prior to rain. This year even piers installed by USACE destroyed. **Peter Low, 3956**

**Response to Comment 29:** Changing the operating guidelines for Tennessee River mainstem projects was included in all action alternatives. However, results of the flood risk analysis indicated that raising the winter operating guide levels would result in unacceptable increases in the potential for flood damage. These analyses led TVA to propose under the Preferred Alternative to delay the complete filling of upper mainstem river projects—including Watts Bar—until May 15, in order to reduce potential flood damage. Existing meteorological tools do not allow TVA to adjust reservoir levels quickly enough to respond to all possible flood events. Also see response to Comment 3.

30. If the water is drawn down after Labor Day rather than August 1, I fail to understand why the winter level has to be maintained at a higher level. Why can't the water be brought back down to the same level in September that it is in August, effectively leaving the winter level the same and avoiding the potential flood control danger? **Phyllis Miller, 287**

**Response to Comment 30:** This would eliminate some of the flood control concerns, and TVA considered this in the formulation of its Preferred Alternative. The analysis of flood risk impacts was conducted on a seasonal basis; therefore, data for each location and season were analyzed. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs.

31. No one cares so much in the winter so draw it down more then if needed. Power can still be created and everyone will be a lot more happy. **Regina Frisbey, 1453**

**Response to Comment 31:** TVA has also received a number of comments from people who care very strongly about reservoir levels in winter. While electricity can be and is generated during the winter months from TVA's hydroelectric units, natural inflow usually provides adequate water to maintain high use of the units.

32. The March 15 elevation on Nottely (1755' base line) was found to be 5+ feet lower than necessary by the TVA's 3R group in 1989. The increase to 1762 should solve your perpetual problem of not being able to fill Nottely. I guess 15 years later isn't very bad, assuming something is actually going to happen. **Richard Bell, 2025**

**Response to Comment 32:** TVA's Preferred Alternative would raise the winter flood guide levels at Nottely, as shown in elevation probability plots in Appendix C.8.

33. I have found no reasonable reason for the extreme drawdowns. **Stan Veltkamp, 930**

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**Response to Comment 33:** See Response to Comment 1.

34. I am disappointed that the most important water level issue that is of significant concern to the users of Melton Hill is the pool level that is being maintained, mostly in the summer and more importantly, on weekends. Since Melton Hill is a pass thru only with a minimum capacity for storage, we have asked that levels be maintained at higher levels. As an example, we have requested that the day start off (AM) at 794 or higher so as you generate thru out the day, you have more flexibility without leaving many recreational boaters stranded at the end of the day. Many of the lake users have come down to their docks on a Saturday or Sunday, only to find that they cannot take their boat out due to the low lake level. Many complaints also are that they do go out in the morning, only to find out that the water level has dropped so much that they cannot get all the way home. We respectfully request that TVA consider working with higher levels on weekends during the summer so the users of Melton Hill Lake who live on some of the more shallow areas can have access to their docks. **Steve Lewis, 3281**

**Response to Comment 34:** As noted, Melton Hill has very little usable storage between the normal operating range of 792 to 795 feet. Therefore, it has no planned seasonal fluctuation: this is an advantage for year-round reservoir users, when compared to many other tributary reservoirs that seasonally fluctuate an average of 30 to 35 feet and, in some cases, more. Operations at Norris Dam and Melton Hill Dam support hydroelectric production and provide adequate water supply for the efficient and reliable operation of TVA Bull Run Steam Plant. The available usable storage space in Melton Hill is used on a daily basis to allow the hydroelectric units at Melton Hill and Norris Reservoir to generate during high-demand peak power hours in summer—typically from mid-day through early evening. Because the units at Norris generate at a flow rate of about 9,000 cfs, the units at Melton Hill generate at a flow rate of about 21,000 cfs, and travel time is required for the water released from Norris to arrive at Melton Hill; the stored water in Melton Hill Reservoir is used to supply water to the units at Melton Hill during the peak hours. Reducing the pool level fluctuation at Melton Hill would severely diminish TVA's ability to shape hydropower generation to cover the highest-cost peak hours.

35. I'd like to preface my comments with a disclaimer saying that, of course, I only have knowledge of what the TVA does with the lake levels from a purely personal point of view (and probably a selfish one too.) BUT, I would like to understand the timetable you folks work on a little better. thus enabling me to justify why a recreational lake, that provides much economic growth to this area i.e. BLUE RIDGE, cannot be used for recreation and the enjoyment in the splendid months of September, October, and in some instances, even as early as August. I understand you must maintain flood control, provide water for upstream usage, generate power elsewhere,, and maintain the dam...and probably many other projects that I have no clue about...., but why do we have such a full pool in March and no water in September? I'm sure I am being rather simplistic in my views, and I apologize for that, but I know that I am not alone in wishing with all of my heart, that we could change the timetable of events to rotate the drawing of the water level , delaying it for one month. I feel sure that the trade off for less water in March, would be met with great happiness from many of us who love our lake. Thank you for having this forum for our communication with you, who make such important decisions in our lives. **Susan Carruth, 3197**

## Appendix F3 Response to Specific Public Comments

**Response to Comment 35:** See Response to Comment 1. Blue Ridge Reservoir is actually a single-purpose power storage reservoir, not a recreation reservoir. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Blue Ridge.

36. So, what I want to find out is why they say the base is supposed to be August 1st, when we know they were drawing down early in July. That's really my only complaint. **Sydney Y. Cole, 4412**

**Response to Comment 36:** The existing operations policy (Base Case) allows for a restricted drawdown on the tributary storage reservoirs from June 1 to August 1. This means that TVA can draw down reservoirs a certain amount, while remaining above the minimum summer pool levels that were established in the 1990 Lake Improvement Plan. Unrestricted drawdown to winter elevations begins on August 1.

37. The late drawdown of the upper reservoirs during the month of August reduces the amount of water available for power generation during the peak months of TVA's generating scheme. The extended recreational requests of the small number of property owners in the upper reservoirs should not be able to cause increasing power production costs due to less available water flow when it is most needed. Additional coal must be purchased and burned to generate power. Landowners in the upper reservoirs (with few exceptions) knew the drawdown schedules when their property was purchased and the entire TVA customer base should not be penalized by higher generating costs and additional pollution created by lack of water flow. **Terry C Smith, 2965**

**Response to Comment 37:** Comment noted.

38. Am I correct in assuming that the total volume of water in Lake Nottely is decreasing over time? If yes, then increasing winter pool levels would help reduce the rate of change occurring. **Thomas Carey, 1707**

**Response to Comment 38:** There is no indication that the total volume of water is substantially decreasing over time.

39. When water levels are reduced below the maximum efficiency levels for the production of electricity, what is the justification????

It is not flood control on Blue Ridge Lake except during certain months. Who and why does TVA pick August 1 as the date to start reduction of water levels??

I believe that the TVA does not want to change or change as little as possible its water level policies, because once the people who use the lakes see how great it is to have a higher water level in months other than May, June, and July, they will protest future water level reductions vehemently. **Thomas G. Sandvick, 2664**

**Response to Comment 39:** See Response to Comment 1. Unrestricted drawdown begins on August 1 as a result of the 1990 Lake Improvement Plan that was adopted by TVA in 1991.

## **Appendix F3 Response to Specific Public Comments**

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40. As far as I know TVA has never given any logical or believable reason for the low lake levels. Lake levels need to be higher in the winter. I do not believe a need has been shown for lowering the levels to the point at which they are now lowered. Also, levels should be reduced later. There is no documentation proving that the lake levels must be reduced as much as they are now reduced. Cherokee is dropped much more than appears necessary in the winter. For some reason TVA has not been open to this. **Vonda M. Laughlin, 2406**

**Response to Comment 40:** See Response to Comment 1.

41. I think things are operated reasonably well. I'm a little surprised this summer that Blue Ridge and Nottely are not full with all the rain we've had. **W. H. Cross, 4362**

**Response to Comment 41:** Comment noted.

42. I am voting to express my concern for the varying lake levels seen throughout the year for Lake Blue Ridge in Blue Ridge, GA. Aside from depriving lakefront property owners with year-around recreational opportunities, lowering the lake level too far below full pool, negatively affects property values and depresses economic development efforts of the surrounding municipalities. By depressing assessed property values, you are in fact robbing the City of Blue Ridge of additional tax dollars that are imminently important to improve and construct new economic and physical infrastructure necessary to support the growing popularity of North Georgia cities. I do not profess to be a hydrologist, water scientist or civil engineer, however, I can deduce that there are other ways to satisfy all necessary water and power obligations throughout the Toccoa/Ocoee River Basin without draining Lake Blue Ridge to such low levels. There are lake models, which serve as precedent outside of the TVA system. Lake Keowee in South Carolina, which is controlled by Duke Power, is able to maintain high lake levels, while still meeting necessary water and power obligations. As a result, housing developers and residents of the lake are very cognizant of their part in maintaining the natural characteristics of the shoreline to promote real estate value and tax dollars for the community. I hope that I have made a somewhat compelling argument for consistently high lake levels for Lake Blue Ridge, as I feel that this is the correct action to take. Everyone will have a role in this effort to promote economic development, and the TVA has the privilege of starting the process. **Wes Hardy, 3031**

**Response to Comment 42:** See Response to Comment 1. Under TVA's Preferred Alternative, flows would be adjusted from June 1 through Labor Day, resulting in a longer duration of higher pool levels under median conditions on a number of reservoirs—including Blue Ridge.

43. I just can't understand why the water level [on Kentucky] can't be up to at least 357 all winter. That's about it. **Wilbur Neil, 4367**

## **Appendix F3 Response to Specific Public Comments**

**Response to Comment 43:** USACE expressed concerns about changing operations on Kentucky Reservoir because of the potential effect on the lower Ohio and Mississippi Rivers. Its position is that any proposed changes that would involve reduction in flood storage capacity would need to be evaluated within the context of the entire lower Ohio/Mississippi River system. In addition, USFWS, other agencies, and some individuals voiced concerns about changing operations on Kentucky Reservoir. TVA did not include changes to the operating guide curve for Kentucky Reservoir as an element of its Preferred Alternative.

44. I manage Cancun on Boone. My concern is -- I asked a TVA representative here about 20 minutes ago, about the lake levels and why can't they leave the lake summer level until the end of October, and his comment was they didn't make that study on Boone Lake.

And October and November, to me, is a really dry month, and for us and economics of Boone Lake, it would be advantageous for TVA to maintain the lake level, at least to October. Then they could begin to drop. If a storm surge comes in, like a tornado, sure they could drop it, but, you know, we would take that chance. **Wynn Beidleman, 4310**

**Response to Comment 44:** See Response to Comment 27.

45. I am disappointed that the most important water level issue that is of significant concern to the users of Melton Hill is the pool level that is being maintained, mostly in the summer and more importantly, on weekends. Since Melton Hill is a pass thru only with a minimum capacity for storage, we have asked that levels be maintained at higher levels. As an example, we have requested that the day start off (AM) at 794 or higher so as you generate thru out the day, you have more flexibility without leaving many recreational boaters stranded at the end of the day. Many of the lake users have come down to their docks on a Saturday or Sunday, only to find that they cannot take their boat out due to the low lake level. Many complaints also are that they do go out in the morning, only to find out that the water level has dropped so much that they cannot get all the way home. We respectfully request that TVA consider working with higher levels on weekends during the summer so the users of Melton Hill Lake who live on some of the more shallow areas can have access to their docks. We do not think that this will have any impact on TVA other than how they schedule power generation at Norris and Melton Hill. By running Norris Dam power generation for a set period longer than Melton Hill, and starting it sooner than Melton Hill, you should be able to accommodate these people. Melton Hill power generation usually draws the lake down much faster than Norris Dam power generation can replenish it. Our request is simple-Can TVA balance the power production at these two dams to maintain higher lake levels with special consideration to the weekend operations. With a little creativity in the scheduling of power production, you can produce the same power, provide the Melton Hill Lake user more ability to use the lake due to higher levels, and have no negative impacts on Norris, Melton Hill or Watts Bar Lakes. **John Croes, President, Milton Hill Lake Users Associations, 1374**

**Response to Comment 45:** See Response to Comment 34.

## **Appendix F3 Response to Specific Public Comments**

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### **Minimum Flow**

1. Why was 25K [at Chickamauga] chosen for August for this alternative? Average since LIP is 31K for August. The change only results in an increase of about 3 feet in tribs on Labor Day. 20K would have added about 6. What were the impacts for 20 that excluded it's consideration. **Arland Whitlock, 2171**

**Response to Comment 1:** A range of flows was considered for the August minimum flow requirement. Higher flow rates would have provided little increase in reservoir recreation levels compared to the Base Case; lower flow rates would result in greater negative impacts on water quality and power costs.

2. Release only minimum flows between June 1 and Labor Day. Douglas is my main concern. **Louise Murray, 688**

**Response to Comment 2:** Under TVA's Preferred Alternative, only minimum flows would be released from a number of tributary reservoirs, including Douglas, from June 1 through Labor Day. See Appendix B for details about summer minimum flow releases under the Preferred Alternative.

### **NEPA Process**

1. I have reviewed the June 2003 Draft Environmental Impact Statement (EIS) prepared by TVA for the operation of 35 reservoirs in the Tennessee River Basin and am pleased to submit the following comments on behalf of the Alabama Rivers Alliance (the Alliance). The Alliance is a nonprofit conservation organization committed to the conservation, restoration, and preservation of waters in the state of Alabama. We would like to thank TVA for inviting the Alliance to participate as a member of the Public Review Group during the development of the EIS. We hope that these comments will be helpful in the development of the final operations policy. **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3733**

**Response to Comment 1:** We are very grateful for all the time contributed by the participants of the Public Review Group established for the ROS.

2. Although we understand that several factors including recreation, environment, navigation, and power generation were considered in the development of operations alternatives, we consider the protection and enhancement of the natural aquatic environment to be the most important priority in the management of a natural resource such as the Tennessee River. The environmental impacts of TVA's reservoir system were not fully considered. When the first dams were constructed in the early 1900's because the system was constructed solely for navigation and power production and the many environmental protection laws that exist today were not in effect at the time of dam construction; Therefore, steps should be taken by TVA to protect the existing native habitat and to operate the system in a manner that will halt or reverse —the adverse impacts on the environment already created by the dams.

The results of the public scoping process indicate that 20 to 30 percent of individuals polled feel that protection of the environment should be the top priority of TV A's operation. However, the proposed operations alternatives do not provide a "balance" to many TVA

## **Appendix F3 Response to Specific Public Comments**

objectives. It is obvious that improved environmental quality and recreation may likely come at the expense of other objectives such as power generation. We suggest that the information gathered during this lengthy and complicated EIS process be used to develop additional operations alternatives that actually reflect the opinions of the public. As presented in the draft EIS, alternatives were developed based on public input, but the results of the alternatives do not actually achieve an acceptable balance. Therefore, some of the proposed alternatives should be revised to achieve the results desired by the public. **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3734**

**Response to Comment 2:** TVA was aware of the wide support for environmental protections when it formulated the identified alternatives. As recognized in this comment, the public identified a range of values and objectives for operation of the reservoir system and many of those are in tension with one another. Except for the alternatives that were formulated to be primarily single purpose (e.g., the Summer Hydropower or Tailwater Habitat Alternative), the identified alternatives were designed to achieve or enhance a number of different values. We are not surprised that the "balances" struck by these alternatives fail to satisfy all of those commenting on the EIS. As suggested, TVA did use this and other comments to help fashion the Preferred Alternative that is identified in the FEIS. TVA hopes that this alternative, and the balance it strikes, will be more acceptable to those who opposed earlier alternatives.

3. We acknowledge the Complexity of the ROS process conducted by TVA and appreciate the efforts put forth to compile and model the available data for the betterment of the TVA system. We urge TVA to consider the alternative best suited to provide improvements to the natural environment and prevent further damage. Since the alternatives discussed in the draft EIS do not provide a great deal of environmental quality improvements, modified alternatives should be developed and studied to optimize environmental improvements through TVA operations **Alabama Rivers Alliance, April Hall, Watershed Restoration Specialist, 3739**

**Response to Comment 3:** From scoping through the FEIS, TVA considered a large number of alternatives. Sections 1.6 and 3.2 discuss how TVA developed the range of alternatives that were evaluated in detail in the EIS. All of these alternatives would produce varying effects on the environment. Many of the alternatives would result in substantially adverse impacts on one or more environmental resources. Some alternatives would enhance a number of environmental resources but with substantial impacts on other objectives that are valued highly by the public. These results provide both TVA decision makers and the public a solid basis for judging the consequences of increasing or decreasing environmental protection.

4. For the people in communication that monitor the emails — I have asked for info twice, no reply

Have followed the study closely and know staff and consultants have done a tremendous amount of work. There must be a lot of technical data somewhere. Is it available to an old retiree like me? **Arland Whitlock, 1927**

**Response to Comment 4:** Technical data are in TVA's administrative files, which are available on request.

## **Appendix F3 Response to Specific Public Comments**

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5. Another issue is that it seems like it's a system-wide analysis, but it doesn't seem to address just Kentucky's needs; that if Kentucky Lake was held at winter pool currently the way it is but held at a foot higher until October and then drawn down more quickly, the flood control problems with that are probably less severe, just when you look at Kentucky, than if you look at that on a system-wide basis.

And so I think that there's not enough information that looks at what happens to recreation on Kentucky and what impact does it have if all we do is hold the summer pool at where it's at for two more months. I think you'll find substantial recreational benefits, rather than tying it all to all the other systems. That's what I wanted to say. **Brian Keister, 4523**

**Response to Comment 5:** USACE expressed concerns about changing operations on Kentucky Reservoir because of the potential effect on the lower Ohio and Mississippi Rivers. Its position is that any proposed changes that would involve reduction in flood storage capacity would need to be evaluated within the context of the entire lower Ohio/Mississippi River system. In addition, USFWS, other agencies, and individuals voiced concerns about changing operations on Kentucky Reservoir. TVA did not include changes to the operating guide curve for Kentucky Reservoir as an element of its Preferred Alternative.

6. How many people attended Blairsville workshop? **C.G. Boland, 3958**

**Response to Comment 6:** Table F1-01 identifies the number of attendees at the TVA workshops. The attendance for the Blairsville workshop was 407 people.

7. I have been to these meetings at least two or three times. You waste your money by asking people what they want, because you do not listen. **Carolyn Lakes, 4388**

**Response to Comment 7:** TVA's Preferred Alternative was formulated largely in response to public comments.

8. I have a number of questions about this telephone survey:

Question # 1 is why wasn't the telephone survey made known up front when the information about the ROS was published?

Question # 2 is what questions were asked of those people surveyed?

Question #3 is what area codes and telephone exchanges were called in the survey? **Cecil G. Boland, President Lake Nottely Improvement Association, Inc., 4163**

**Response to Comment 8:** One of the first ROS documents released, TVA's Scoping Document, did provide information about the referenced telephone survey. This was a random survey and included telephone exchanges (and locations) throughout TVA's 201-county Power Service Area. Approximately 3,600 registered voters were contacted. An independent opinion research firm developed the questions that were asked. Both the EIS and the Scoping Document refer to the results of this survey.

## Appendix F3 Response to Specific Public Comments

- 9 First, determine which alternatives have large numbers of "substantially adverse" or "substantially beneficial" impacts. If so, these alternatives should be either strongly considered for elimination or for acceptance.

Summer Hydropower = 6 substantially adverse (SA), 1 substantially beneficial (SB)  
Reservoir Rec B and Tailwater Rec each = 4 SA, 1 SB  
Tailwater Hab = 3 SA, 1 SB  
Equal Summer/Winter = 3 SA, 0 SB  
Res Rec A and Comm Nav each = 0 SA, 0 SB

On that basis (and also noting the specific SA's), I would consider eliminating Summer Hydropower, Res Rec B, and Tailwater Rec. Equal Summer/Winter and Tailwater Hab would be considered poorly. Res Rec A and Comm Nav, although neither has strong benefits or negatives, should be considered as the best candidates. Of these, I would recommend Res Rec A as the preferred alternative. The basic reason is that it would provide benefits to a wider range or region residents than Comm Nav.

Finally, congratulations on an excellent, detailed DEIS. As a resident, thank you! **Colman B. Woodhall, 399**

**Response to Comment 9:** The general approach described in this comment is the one TVA used to produce a set of alternatives that covered a reasonable range of possible operations policy changes. As described in Chapter 3, TVA began by eliminating alternatives that clearly produced unacceptable results that did not achieve TVA's objective of greater public value. This task was conducted in an iterative fashion to reformulate and reduce the number of possible alternatives. The eight alternatives identified and discussed in detail in the DEIS (including the Base Case) were the result of this process. Finally, after considering the environmental and economic analyses conducted for the ROS and the comments from the public and interested federal and state agencies, TVA formulated its Preferred Alternative, which appears in the FEIS.

10. I favor the use of scientific data in the determination of which alternative to use to better make use of the water resources of the Tennessee River and the many tributaries to the River. The proper decision needs to be made with the entire system in mind. I would favor the decision that maintains a "high" summer pool level in as many lakes as possible; but, keep "flood control" in mind. **David Slagle, 490-**

**Response to Comment 10:** Comment noted.

11. It is my sincere hope that you will take the time to just use some of your God given common sense and not let someone inundate you with so many "facts" that you can't see the forest for the trees.

This is not meant in any way as an antagonistic approach and I hope that you will give this and the many other comments I am sure you have received serious consideration. **David Trotter D.D.S., 541**

**Response to Comment 11:** TVA has reviewed and considered each comment received.

## **Appendix F3 Response to Specific Public Comments**

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12. I thank you so much for considering changing policy to better serve our lake region as it has changed over the years, requiring a different approach to water management, realizing the huge importance recreation and property values have become to our region. **Diane Layton, 2490**

**Response to Comment 12:** Comment noted.

13. During the course of TVA's study, they should have broadened their scope to include a larger population, not just their service area, that would be affected by the proposed changes and involved them in the decision making process. **Eddie Adams, 3037**

**Response to Comment 13:** Notice of the availability of the DEIS was published in the Federal Register, a publication that is distributed nationally. TVA received a number of comments from persons outside the TVA region. TVA also coordinated preparation of the EIS and ROS analyses with other agencies that have responsibilities beyond the TVA region, such as USACE.

14. I would also like to say that so far this year TVA has done a good job with lake levels. That is as of July 24<sup>th</sup>. Thank you for hearing my opinion. **Franklin D Brown, 117**

**Response to Comment 14:** Comment noted.

15. I am using this area to enter a general comment. Obviously an enormous amount of good work went into these evaluations, and TVA is to be commended on this study. I certainly admire the tenacity and skill of the technical folks who took on this enormous task. I hope the results will carry the day against political pressure that I know TVA faces day in and out which can work against a balanced operations policy. **Gary Hauser, 1899**

**Response to Comment 15:** Comment noted.

16. Based on the Executive Summary tables, I am struck by the fact that Res Rec A and B appear to focus on extending summer pool levels, which according to the tables have negative impacts pretty much across the range of reservoir objectives. So why do we continue to look so hard at extended summer lake levels when only benefits seem to accrue to a few? **Gary Hauser, 65**

**Response to Comment 16:** Comment noted.

17. And I hope, after \$12 million, that TVA comes up with something more than "This is the way we've always done it and so we're going to continue to do it this way." **Glen And Janice Boland, 4449**

**Response to Comment 17:** Comment noted.

18. I am a little disappointed with the alternative options. I feel that they were somewhat limited in scope and did not include enough options in the area of winter pool draw down levels. **Gloria Dahlberg, 2040**

**Response to Comment 18:** TVA considered a wide range of alternatives, as described in Section 3.2.

## Appendix F3 Response to Specific Public Comments

19. TVA has fudged in constructing alternatives from the Base Case by building in a higher flood risk. Who will vote for that? This is a rigged process to insure we stick with the Base Case which is what TVA wants to do anyway. **Guy Larry Osborne, 1273**

**Response to Comment 19:** Chapter 3 describes the process TVA used to formulate alternatives. A substantial number of those commenting during the EIS scoping process asked TVA to change its operations policy in ways that would maintain reservoir levels higher for longer periods or that would fill reservoirs sooner after fall drawdowns. Most of the resulting alternatives were formulated in response to these commenters. In almost all instances, however, holding reservoirs higher for longer periods or filling them sooner would negatively affect flood management control. More water in reservoirs translates to higher flood risks because it corresponds to decreased flood storage capacity. Eliminating unacceptable effects on flood risk was one of the primary drivers in TVA's effort to formulate its Preferred Alternative.

20. I do not think TVA has adequately communicated to the non-lake user the potential impact of this study on them. The potential for higher electric rates due to efforts to maintain higher reservoir levels and increased water quality problems have not been communicated to the public. I agree the cost is not significant on the valley economy, but I don't think the non-lake user is really aware of the potential for a rate increase. **H. Ray Threlkeld, 2254**

**Response to Comment 20:** The DEIS; materials available at the 12 workshops that TVA held throughout the TVA region, including a short video that summarized results; and the Executive Summary of the DEIS that was widely circulated all presented information about potential impacts on power costs and water quality. TVA did receive a relatively large number of comments for an EIS process; however, relative to the more than 8.3 million people in the region that TVA serves, only a very small percentage chose to participate in the EIS process.

21. It was also noted that the material, entitled "Weighing the Alternatives" containing charts listing Base Case and seven policy alternatives, as distributed as color handouts and as part of the video, is different from the same document presented on the TVA website info. It is most confusing to prepare a response when the information presented is so completely different concerning the same specific alternative. Before any determinations are made, it would appear that clarification of this difference should be made known to the public so that accurate and consistent response could be made. Also, with conflicting information presented on the charts, it is unclear how this information was obtained. **Janice L. Jones, Executive Director, Tennessee River Valley Association, 4176**

**Response to Comment 21:** Comment noted.

22. TVA is doing their best to get public input on all aspects of their operations which is the proper and responsible thing to do. From looking at information in the report it appears that the public input has been minimal despite TVA's best efforts. From the Executive Summary the total of public responses appears to be about 19,200, counting form letters and petition signatures, which amounts to about a 0.24 % sample of the public opinion. With this small an input, it seems that staff opinions will have a very great (overwhelming) impact on the final course of action. If the public does not speak up, then they have no right to complain if the final results don't suit them.

## **Appendix F3 Response to Specific Public Comments**

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You are asking us to take nearly all of your figures on faith. The computer programs and models used are from reputable sources and are widely accepted in the industry, but there appears to be no way the results could be independently verified without repeating the ROS by another entity. After the recent debacles with some companies that had their financial reports (supposedly) verified by independent auditors and the results of that, you can understand why "trust me, I know what I am doing " is no longer acceptable. **Jim Mills, 4165**

**Response to Comment 22:** See Response to Comment 20. We appreciate the recognition that TVA has made a concerted effort to obtain public input. Staff analyses, as opposed to staff opinions, have traditionally had a strong influence on preferred actions identified in TVA EISs. The ROS EIS process was not an exception. TVA attempted to conduct as open and transparent a process as possible in producing the ROS EIS and its associated analyses. This included employing nationally recognized experts from outside TVA to assist in analyses; using widely accepted models and computer programs; and coordinating analyses with a group of interested federal and state agencies, as well as public stakeholders with diverse interests.

23. Many of the public utilities are having difficulty raising capital for improvements. How does this affect TVA, especially if TVA is required to pay down its debt more rapidly than now? The scarcity of capital may also affect which course of action and improvements are finally selected. **Jim Mills, 4167**

**Response to Comment 23:** TVA has not experienced problems in raising capital, but because one of its goals is to reduce its debt, capital expenditures are held to a minimum. None of the ROS alternatives, including TVA's Preferred Alternative would involve large capital expenditures. Under the preferred alternative, about \$20 million in capital costs are expected to be incurred over a 3-year period.

24. I hope TVA is listening to the public this time around. Thank you for your consideration. **John Honey, President, Dandridge Yacht Club, 1070**

**Response to Comment 24:** Comment noted.

25. Much appreciation to all the TVA employees who created the many and somewhat varied alternatives. Once again though you have created an octopus of alternatives when those who desire a somewhat simplistic scenario get covered up in verbage. **John S. McClellan, 2032**

**Response to Comment 25:** Comment noted.

26. I don't even feel a social aspect of this is of much importance. I think the environmental effects are major concerns. **Linda Coons, 2308**

**Response to Comment 26:** Comment noted.

27. The (Road Show) presentation by TVA deserved an A+ for SPIN. I have never seen such bias mumbo jumbo misinformation on anything in my life. **Lloyd.V. Bible, 2010**

## Appendix F3 : Response to Specific Public Comments

**Response to Comment 27:** Comment noted.

28. We had hoped this would change in our lifetime, but there are so many people here that won't even come to these things because they say, and I quote, it's TVA, it's the way it will always be, it will never change. **Marilyn Allbritten, 4545**

**Response to Comment 28:** Comment noted.

29. TVA's responsibility is to consider all the alternative and come up with a compromise that will satisfy the needs of most users. **Michael A. O'Brien, 2482**

**Response to Comment 29:** TVA's Preferred Alternative was purposefully formulated with the intent of accommodating as many of the public's stated values and objectives as possible.

30. Public comments are a misleading indicator in support of this alternative. The few who stand to gain a lot are more likely to submit comments than the many who would have to share the load of adverse impacts. Increasing recreational opportunities and 'scenic integrity' for a few people, for one month, should only be given minor consideration in planning river operations. **Michael Sledjeski, 3215**

**Response to Comment 30:** See Appendix F1. TVA is aware that those commenting during EIS processes are self-selected and may not represent the opinions or preferences of the public at large. TVA uses a qualitative approach that is guided more by the merits of the comments made, than the numbers of the comments.

31. Thank you for the workshop and opportunity to comment on issues. Thanks for all the work you do and benefits TVA supplies not only to the seven states it encompasses, but the rest of the nation as well...Again thanks for the TVA system!! It's a great organization and makes many benefits to millions of people and has for many years. We love being a part of it, but feel that some policy changes are necessary now. **Mike Harris, 4555**

**Response to Comment 31:** Comment noted.

32. Based on all the data presented, including impact statements, a lot of work went into this study. I must say, however, that the average person will be overwhelmed by its volume and sometimes complexity. **Robert MacDonald, 1912**

**Response to Comment 32:** Comment noted.

33. At this time, The Nature Conservancy does not endorse any specific ROS alternative outlined in the draft PeIS. Rather, we encourage TVA to consider the outcomes of any decision on management alternatives in the context of TVA's responsibility for protecting the natural heritage of the Tennessee Valley. While other federal agencies such as the USFWS and state wildlife resource agencies hold responsibilities for managing and recovering native species, TVA remains the caretaker of the Tennessee Valley in many ways due to the extensive nature of its reservoir system.

In the coming years, TVA no doubt will be challenged to adapt to changes in regional and national power production and transmission markets. Despite the uncertainty of these

## **Appendix F3 Response to Specific Public Comments**

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future challenges, The Nature Conservancy strongly encourages TVA to remain committed to its environmental stewardship responsibilities and to explore opportunities for expanding its financial investment in protecting and restoring the Tennessee Valley's natural heritage. **Scott Davis, Executive Director, Tennessee Chapter of The Nature Conservancy, 3744**

**Response to Comment 33:** Comment noted.

34. I Just Hope And Pray That You Do Not Take A Split Vote Among The Other Plans That Keep The Water Level Higher And Allow A Hydro Electric Only Plan To Sneak In With A Lower Percentage **Scott Pisciotta, 1864**

**Response to Comment 34:** Comment noted.

35. These comments are submitted on behalf of the Tennessee River Gorge Trust, a nonprofit organization committed to the protection of land, water and wildlife resources of the Tennessee River Gorge. We commend the Tennessee Valley Authority for undertaking this Reservoir Operations Study, and we appreciate the thought that has gone into outlining various operations alternatives and the effort to include the public in the development of this study. However, this study fails to fully consider several key impacts on aquatic resources. Moreover, the study fails to offer an alternative which significantly improves water quality and benefits aquatic species. We hope you will expand upon your analysis of potential impacts on water quality and aquatic habitat in the final EIS. **Southern Environmental Law Center, 3612**

**Response to Comment 35:** The system operating parameter that appears to have the most direct effect on water quality is reservoir water retention time. TVA's 1990 EIS on its proposed Lake Improvement Plan addressed this issue. TVA changed the date for unrestricted water releases on most tributary reservoirs from June 1 to August 1 and mitigated potential water quality impacts at select locations by installing equipment to increase DO concentrations. Reversing that decision—changing back to the June 1 release date—was an element of the Summer Hydropower Alternative. Our analyses indicate that some, but not all, water quality parameters would be beneficially affected. The effect on other parameters would be variable or adverse.

It may be possible to combine operating elements in additional ways in order to achieve more consistent beneficial effects on water quality, but this would likely require more frequent and aggressive water releases. Such an alternative would be strongly opposed by a large segment of TVA reservoir users. A substantial majority of those commenting on ROS alternatives prefer a completely opposite operational change; that is, retaining water longer in order to maintain reservoir levels longer. Because of the concerns about water quality effects expressed here and by others, TVA has formulated its Preferred Alternative to lessen potential water quality impacts, as compared to other alternatives that would enhance recreation.

36. The DEIS Should Be Supplemented With an Alternative Designed to Protect Aquatic Habitat and Species. The DEIS admits that "no policy alternative represents a clear benefit to aquatic resources." DEIS at 5.7-31. Actually, most alternatives will decrease instream flow, lower DO and adversely affect biodiversity. DEIS Table 5.7-02, Table 5.7-04, Table 5.7-05; DEIS at 5.7-29. This is contrary to the stated intent of the ROS, which is to

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determine whether changes in operations policy would increase public benefits. DEIS at 1-4. **Southern Environmental Law Center, 4225**

**Response to Comment 36:** The intent of the Tailwater Habitat Alternative was to improve biodiversity and aquatic habitat by more closely approximating natural flow conditions. This was accomplished by reducing hydropower peaking and releasing a portion of the natural inflow on a continuous basis. However, this alternative would result in unacceptable adverse impacts on other operating objectives. To further address this, TVA formulated its Preferred Alternative that responds to the public's desire for increased recreational opportunities, while reducing adverse impacts associated with the action alternatives identified in the DEIS that would enhance recreation.

37. During the scoping process, the public expressed a strong desire for TVA to protect aquatic biodiversity and threatened and endangered species and to improve water quality and aquatic habitat. DEIS at 1-12. The DEIS characterizes these issues as "objectives," yet no alternative meets these objectives. An alternative which meets these objectives and provides appreciable benefits to aquatic habitat and species throughout the Tennessee River system must be evaluated as one reasonable alternative. Under NEPA, this alternative cannot be ignored. *Dubois v. USDA*, 102 F.3d 1273, 1289 (1st Cir. 1996), cert. denied 521 U.S. 1119 (1997). **Southern Environmental Law Center, 4227**

**Response to Comment 37:** See Response to Comment 36. The Tailwater Habitat Alternative was formulated specifically to enhance aquatic habitats and promote biodiversity. Unfortunately, the subsequent analyses of this alternative suggest that it largely failed to improve aquatic habitats and minimize variable effects on aquatic resources overall. TVA has now formulated its Preferred Alternative to offset some of the projected adverse effects on aquatic resources and water quality. TVA consulted with the USFWS about the potential impacts of this alternative on threatened and endangered species. TVA's analyses and USFWS' Biological Opinion are included in the EIS. TVA believes the range of alternatives analyzed during this EIS process was adequate, and that the alternative formulation process used by TVA has been well explained in the EIS. Unlike a proposal to expand a ski area and increase snow-making capacities for skiing, there are countless possible alternative policies for operating the TVA reservoir system. The objectives of the alternative suggested here were made part of the alternatives examined in this EIS.

38. While we understand that attaining the appropriate balance for all the purposes and uses of the Tennessee River System will be a difficult job, we urge that the effects of the final River System will be a difficult job, we urge that the effects of the Final River System operating policies on all of the Valley's residents be taken into consideration, especially those who are not in regions of the Valley that can take advantage of all the uses of the Tennessee River. **TVPPA, Richard C. "Dick" Crawford, President & CEO, 4239**

**Response to Comment 38:** TVA was aware that the varying segments of the public served by TVA would be benefited and affected differently by any changes it may make to its existing operations policy.

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39. It would be very helpful if the impact of each alternative on lake levels could be graphically depicted in the handouts and supporting materials. It can be challenging to determine what the impact of each alternative is predicted to be on lake levels. This is the primary concern of most attendees tonight. **Valerie Smith, 2424**

**Response to Comment 39:** Based on workshop attendee responses, reservoir operating guide curves appear to be readily understandable and may provide the graphical depiction sought by this commenter. For the workshops that TVA held throughout the TVA region on the DEIS, staff set up computers and large projection screens to show how changes in operating guidelines would affect the levels of reservoirs of interest to attendees. Elevation probability plots along with flood guides for tributary reservoirs and operating guide curves for mainstem reservoirs under the Preferred Alternative are in Appendix C.8.

40. This is a comment on the entire revised survey form. The original was more informative and easy to read but the shoreline draft which was done a few years ago was a much better way to present the information so that a person could make an informed comment. In other words, you have made a simple presentation very complicated and should just refer back to the shoreline study and redesign the format to show all the information in a chart form. Please respond **W.L. Panter, 2436**

**Response to Comment 40:** Comment noted.

### **Authority**

1. What I don't understand about TVA is why every time we have a meeting with them, with LOUD, they send a representative, they never answer questions. It's always asked who is TVA responsible to. The people or the congress? They're supposed to be -- I understand they're supposed to be responsible directly to congress. I'd like to find that out. I'd them to respond to that some way. **G. L. and Billie Bowman, 4423**

**Response to Comment 1:** TVA is a federal agency. A three-member board governs TVA operations, and Congress provides oversight of TVA activities.

2. TVA is funded by the federal government and it is the government that will be receiving benefits of a lifetime by having productive citizens earning good wages and paying taxes instead of the government having to spend on them for lack of opportunity for a better education. **George Gantte, 4547**

**Response to Comment 2:** TVA is not funded by the federal government and receives no federal appropriations to fund its activities.

3. One thing, the water originates here in Georgia, and we seem to have the least use of it of any of the people downstream. They draw it right out and send it down to do whatever they want to do with it downstream and leave our lakes practically dry most of the year. We feel that like we should have first choice on this water and that we should have a fuller lake for a much longer period of time. **Glen and Janice Boland, 4450**

**Response to Comment 3:** Comment noted.

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4. Past experience has shown, on South Holston Reservoir, that retaining greater quantities of water to extend the boating season has had the effect of reducing the ability to control flooding below the dam. There was an experiment run since 1990, and it had the effect of raising the lake level almost to its overflow level. As a result of having held back a greater quantity of water, the influx of water from the streams feeding the lake due to storms is what caused the lake level to rise to dangerous levels.

I live below the dam. Outside of the above example, TVA's management of its properties has been excellent. I have been a user of the lake, with two separate boats, I use the park facility below the dam, I occasionally fish in the river, and I live on its banks.

TVA's enabling legislation, 16 USC; Sect 381, mandates navigation below Knoxville and flood control elsewhere as the purpose for creation and continuation of the Authority. Sub-section 381h-1 states that the operation of the dams is primarily for the purpose of navigation and flood control.

If TVA, for purposes of meeting the needs of a few boaters, and dock owners, increases the amount of water behind South Holston Reservoir so as to increase the need from time to time to release greater than normal quantities of water downstream, it will have violated its purpose and will be acting outside of its legal authority. Resulting damage to me and my neighbors will be considered actionable. **James Elliott, 172**

**Response to Comment 4:** Section 9a of the TVA Act (16 U.S.C. sec. 831h-1) directs the TVA Board to operate the TVA reservoir system primarily for the purposes of promoting navigation and controlling floods and, to the extent consistent with such purposes, for the generation of electricity. Consistent with these priorities, the TVA Board has discretion to adjust operations, including achieving collateral benefits, such as recreation. Under the Preferred Alternative, potential damages from flood events with less than a 500-year frequency would be lower than under the other action alternatives and essentially the same as under the Base Case.

5. I hope that TVA will not in attempting to meet the recreational needs of boaters forget that they will be creating dangerous situations for flood control, and I would remind the Authority that it was created and that creation or that enabling Act that created TVA still states that it's created for the control of destructive flood waters in the Tennessee Water basin and Mississippi River basin in section 831 of the U. S. Code. And 831-H-1 requires that the Board regulate stream flow primarily for the purposes of promoting navigation and controlling floods, and you're authorized to provide and operate the facilities for electric energy whenever the opportunity is afforded. Recreation is really not mentioned in the Act.

So your primary object is navigation on the streams from Knoxville Dam; flood control on all the streams, particularly in the areas above Knoxville; electric energy generation when that can be accommodated without jeopardizing your flood control purpose and activity.

So what we're asking is, and I say this for all my neighbors, we're very concerned about flood control south of the dam or below the dam, South Holston Dam, and bring to your attention the fact that your governmental purpose, the reason for TVA's existence, is primarily for the control of destructive flood waters in the Tennessee River basin. **James W. Elliott, Jr., 4357**

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**Response to Comment 5:** See Response to Comment 4.

6. The comments one most often hears concerning TVA are as follows: TVA is arrogant. TVA never changes. TVA only cares about electric production. You are wasting your time trying to get them to change drawdown dates. For too long the tributary lakes have been the neglected stepchildren of the TVA system. The tributary lakes are TVA's electrical cash cow yet the benefits accrue downstream. **John Parker, 871**

**Response to Comment 6:** Comment noted.

7. We bought property up here three years ago. We had a lake when we bought it. After September, the lake went down, turned into a big red mud hole; it wasn't a lake anymore. Whose water is it anyway? I mean, if it rains up here, it seems like it ought to be our water, even though TVA did build the dam. **Marcia Papaty, 4363**

**Response to Comment 7:** Comment noted.

8. **Constraints Introduced Outside Mississippi:** The introduction of legislation by the State of Tennessee on inter basin transfers of waters on or through Tennessee stands to restrict both transportation and water resources for human use. We request that TVA use its collective influence to assure that the needs downstream are considered through this process. We also have concern that if the Great State of Tennessee claims the water from Tennessee sources that they also assume the responsibility for flooding that occurs when those waters leave that state and impact Mississippi and other states.

**Conclusion:** Our main concern is fairness and availability that will enable our communities to continue to receive water resources from the TVA reservoir system. **Mayor Larry Otis, 4349**

**Response to Comment 8:** Sections 4.5 and 5.5 address water supply issues. Appendix D9 presents an analysis of potential effects from inter-basin transfers including operation of the Tennessee–Tombigbee Waterway.

9. There is a major snag to this or any other alternative which changes the water level on Kentucky Lake and therefore Lake Barkley. Since the USACE controls Lake Barkley and per your report, they would need to do studies for which they have no money or authority, nothing can be done on either lake for some time. I believe the solution is to turn over the day to day operation of Lake Barkley to TVA, let them extend their study to the lower Ohio and Mississippi and then let them implement their findings. This will be substantially less expensive than having the USACE do a separate study by starting over with new contractors and a new approach and then trying to beat the two together for some compromise. Let the USACE continue to have over-riding authority in cases of National Emergency or Homeland Security and allow them to use their already scarce resources toward this end. **Stephen D. Hiland, 2827**

**Response to Comment 9:** TVA agrees that applying possible changes to its operating guidelines at Kentucky Reservoir is complicated. USACE expressed concerns about changing operations on Kentucky Reservoir because of the potential effect on the lower Ohio and Mississippi Rivers. Its position is that any proposed changes that would involve reduction in flood storage capacity would need to be evaluated within the context of the

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entire lower Ohio/Mississippi River system. In addition, USFWS, other agencies, and some individuals voiced concerns about changing operations on Kentucky Reservoir. The Preferred Alternative identified in the FEIS would not change the operating guide curves for Kentucky Reservoir.

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### **F3.4 Cumulative Effects**

1. The water quality modeling that was done to evaluate the water quality effects of the various alternatives is impressive. I have a concern about cumulative water quality impacts of incrementally extending summer pool levels in each reservoir operations review (TVA seems to be doing them every 10 yrs or so now). While it is good to review the operations policy, using the current policy as Base Case each time results only considers the incremental changes, which might seem acceptable, and not the cumulative changes, which might not be acceptable.

I believe this is particularly true for reservoir water quality. During the previous operation review (1987-1991), summer drawdown was delayed from about June 15 to Aug 1 in many reservoirs. This had a modest water quality impact, and now 10 years hence we are talking about further delays in summer drawdown timing, which will further impact water quality in the reservoirs. So in a short period of 10-15 years, significant impacts are likely relative to pre-1991, yet using "current" conditions as Base Case, ignoring the changes already made, is masking the true cumulative impacts.

I think this should be addressed, at least on a small scale for a few reservoirs (e.g., Douglas, Cherokee), to show how important cumulative impacts might be. And certainly if TVA repeats these lake level policy reviews every 10 years, succumbing to pressures to hold summer pools longer each time, the cumulative impacts will dwarf the incremental impacts, so cumulative impacts should be given more consideration. **Gary Hauser, 49**

**Response to Comment 1:** The analysis of the Base Case (the No-Action Alternative for purposes of this EIS) and the description of existing resource conditions in Chapter 4 capture the effects of previous operations policy changes, including the effect of extending unrestricted drawdowns from June 1 to August 1. A comparison of the water quality effects under the Base Case and the Summer Hydropower Alternative, which moves the date for unrestricted drawdowns back to June 1, suggests how water quality was affected by the changes made as a result of TVA's 1990 Lake Improvement Plan. The action alternatives that would extend the date for unrestricted drawdown would increase water retention time in reservoirs and result in adverse impacts on water quality. In the formulation of its Preferred Alternative, TVA substantially reduced the adverse effects associated with other alternatives that would enhance recreational opportunities by extending summer pool levels on a number of reservoirs. However, anoxic conditions potentially increase in a number of reservoirs in dry years for a limited period in late summer, even under the Preferred Alternative. While TVA has reconsidered its reservoir system operations policy in the past and is doing so again here, TVA is not committed to doing this periodically. Future events will dictate when and if TVA conducts another analysis of this nature. The water quality analyses conducted for the ROS suggest that it would be very difficult to further extend summer pool levels (even with mitigation) without causing, or contributing to, unacceptable water quality impacts.

### 2. The Cumulative Impacts Analysis Needs to be Strengthened

First, the DEIS portrays the effects of the reservoir operations alternatives as minor and, therefore, without significant cumulative impacts on the environment. DEIS at 6-3- 4. The DEIS ignores the reality that TVA's management of the Tennessee River has already wrought extremely significant impacts, transforming a free-flowing river to a series of reservoirs with limited stretches of river in between some of them. In addition, small impacts multiplied many times over throughout the entire Tennessee River system could, in the aggregate, significantly affect water quality and aquatic species. ~ 40 C.F.R. § 1508.7; Natural Resources Defense Council v. Hodel, 865 F.2d 288, 297-300 (D.C. Cir. 1988) ; Neighbors of Cuddy Mountain v. USFS, 137 F.3d 1372, 1378-80 (9th Cir. 1998) ; Pacific Coast Fed'n of Fishermen's Ass'ns v. Nat'l Marine Fisheries Serv., 265 F.3d 1028 (9th Cir. 2001) .

Second, the DEIS fails to consider the cumulative impact of the effects of reservoir operations combined with the effect of other activities in the Tennessee River watershed. In particular, the DEIS does not provide meaningful information about the cumulative impact of inter-basin transfers and related water withdrawals from the river. Early in 2002, the Tennessee Department of Environment and Conservation (TDEC) placed a moratorium on permits for inter-basin transfers pending the completion of this ROS. TDEC and the public expected the ROS to provide necessary information about the cumulative impacts of anticipated and potential inter-basin transfers on aquatic resources. The ROS, planned as a comprehensive study of the entire Tennessee River system, appeared well-placed to provide this long-overdue information. Not only does the DEIS fail to meet expectations, but this information is a crucial component of NEPA cumulative effects analysis.

The DEIS predicts inter-basin transfers will increase by 488 mgd by 2030, in addition to potential flows of up to 600 mgd through the Tennessee-Tombigbee Waterway. DEIS at 4.5-6; DEIS Appendix D9-2. The DEIS does not clearly state whether these transfers are in addition to existing inter-basin transfers or whether these are the total estimated transfers by 2030.

We understand the speculative nature of some of the long-term withdrawals, including potential inter-basin transfers to serve Atlanta and Birmingham, but TVA should at least outline the factors used in estimating inter-basin transfers for the 2030 time frame and identify the assumptions made and the degree of uncertainty for that estimate.

The DEIS purports to analyze the "sensitivity" of the Tennessee River to inter-basin transfers, yet the DEIS considers only the effect of water withdrawals on median reservoir elevation. Given the pressure from some members of the public to maintain reservoir levels, we are concerned that water releases from dams will be reduced if reservoir levels begin to drop as a result of large withdrawals. The DEIS ignores the effect of predicted inter-basin transfers on water quality and quantity, in particular instream flow levels necessary to protect aquatic habitat. The DEIS should evaluate the flow levels and trends necessary to

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support aquatic life in the Tennessee River and its tributaries. Based on this information, the DEIS should determine the Tennessee River's ability to accommodate water withdrawals.

Although the DEIS is vague about the source of future requests for other withdrawals from the Tennessee River system, the DEIS predicts future consumptive water needs will more than double. DEIS at 4.5-5-6. Again, we would appreciate it if you provided further detail about the uses expected to increase and the factors and assumptions involved in the estimates. Moreover, development in the Tennessee River watershed is expected to increase, bringing other pressures to bear on the watershed. Development in the region "may result in regional impacts, such as reduction in habitat, changes in surface water runoff, increased water use, and increased wastewater for disposal." DEIS at 6-15. The DEIS predicts these significant effects will occur but then breaks off the analysis.

NEPA requires TVA to consider the cumulative impact of its reservoir operations when added to the effects of other activities in the Tennessee River watershed. See 40 C.F.R. § 1508.7. Through this analysis, TVA should predict the future pressures on aquatic resources and determine how its reservoir operations will affect those resources. TVA cannot avoid this analysis by concluding that future demands on water resources "may or may not lead to cumulative impacts on the quality of water resources." DEIS at 6-3. Likewise, the DEIS cannot evade thorough analysis by concluding, without evidence, that cumulative impacts are unlikely because the effects of the alternatives and existing management plans would be within the "range of natural variability". DEIS at 6-15. What does that mean?

Further, TVA cannot defer cumulative impacts analysis until future project-level analysis. *Thomas v. Peterson*, 753 F.2d 754 (9th Cir. 1985); *Neighbors of Cuddy Mountain v. U.S.F.S.*, 137 F.3d 1372 (9th Cir. 1998). Future project-level analyses cannot conserve water resources and protect species throughout the region and is no substitute for comprehensive cumulative impacts analysis in this DEIS. Nor can the DEIS rely on other federal and state regulatory programs, "such as establishment of TMDLs" to "maintain certain levels of water quality and minimize cumulative effects," DEIS at 6-3, at least not without some evaluation of the effectiveness of those other programs. There is no support for the conclusion that these programs, standing alone, can protect aquatic resources and avoid cumulative effects. The TMDL program, in particular, has never been implemented adequately and thus far has failed to measurably improve water quality. Now, with the recent rescission of USEPA's July 2000 TMDL rules, the program appears less likely than ever to result in meaningful improvements.....

We urge you to revise this draft EIS to fully analyze the cumulative impacts of reservoir operations and other activities in the region on aquatic resources. In particular, the public and Tennessee state agencies expect the final EIS to include comprehensive, meaningful information about the cumulative effect of inter-basin transfers and other water withdrawals on aquatic species and habitat. We also urge you to develop an alternative which substantially improves water quality and benefits aquatic species. A supplemental draft EIS

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should then be released for public comment before a final decision is made. **Southern Environmental Law Center, 2283**

**Response to Comment 2:** Chapter 6 has been substantially modified, in part to respond to some of the concerns expressed here and clarify the information. Both Chapter 6 and specific resource sections in Chapters 4 and 5 discuss existing resource conditions and their trends over the next 30 years. Environmental analyses are unavoidably and inherently uncertain, especially those involving long periods and large regions. Because cumulative impact analyses require predictions about what others may do in the future that could affect resources potentially affected by a proposed action, this uncertainty can quickly become speculation when potential cumulative impacts are discussed. TVA's analysis of cumulative impacts appropriately recognizes this uncertainty and its speculative nature. In recognizing this, TVA is not seeking to avoid conducting cumulative impact analyses until more site-specific actions may be proposed and may be less speculative. Rather, failing to recognize the uncertainty and speculation involved in these analyses here could mislead others into believing that TVA's ability to predict the future is more certain than it is or can possibly be.

As suggested by a number of commenters, including the Department of the Interior, an appropriate way of addressing the uncertainty of future predictions, including cumulative impact predictions, is to monitor and measure changes to potentially affected resources and be prepared to flexibly adjust operations policy in response. This is called adaptive management. As Section 3.4.1 discusses, TVA has long used an informal adaptive management approach to management of its reservoir system and is committed to doing so in the implementation of any changes that result from the ROS. See Chapter 7 for the monitoring programs that TVA expects to conduct in order to implement this approach.

The possible consequences of inter-basin transfers are a good example of an uncertainty for which TVA accounted in its analyses. Sections 4.5 and 5.5 provide specific information and analyses about water supply and the inter-basin transfers. In the Base Case, TVA assumed that flows from the Tennessee River system down the Tennessee-Tombigbee Waterway (an inter-basin transfer) would increase up to 600 million gallons per day, albeit this amount is uncertain and involves some degree of speculation. The waterway is designed for this flow, however, and we think it is prudent to assume that it will be reached eventually. As a Base Case assumption, this is part of all of the resource analyses in the EIS.

Other inter-basin transfers are more uncertain and speculative. Not only do we not know what amounts could be involved in future inter-basin transfers, but we also do not know the location on the TVA reservoir system from which they might be withdrawn. Both of these facts are important in reasonably determining potential impacts on water quantity and other resource conditions. To get a sense of how important large inter-basin transfers could be, TVA prepared a sensitivity analysis and provided the results of this analysis in Appendix D9. TVA concluded that subject to the withdrawal location, the TVA system could handle several additional transfers from the standpoint of the quantity of water in our system. Because TVA should be able to control future inter-basin transfer proposals through its

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Section 26a permitting authority over water withdrawal structures on the Tennessee River system, TVA will be able to better account for the effects of such proposals when the specifics of any such proposals become known.

Sections 4.5 and 5.5 and Appendix D9 provide substantial details about our inter-basin transfer analyses and estimates of future demands on the TVA reservoir system. Two important technical reports provide much of the foundation for our analyses. These are referenced in Chapter 10, Literature Cited: Bohac, C. E. 2003 (Water Supply Inventory and Needs Analysis) and Hutson et al. 2003 (Estimated Use of Water in the Tennessee River Watershed in 2000 and Projections of Water Use to 2030). Both reports are in TVA's administrative file for this action. The latter report is a U.S. Geological Survey report.

3. The DEIS fails to address whether the adverse effects of these [policy] alternatives, especially cumulative effects, jeopardize the continued existence of threatened and endangered species, in violation of the Endangered Species Act. 16 U.S.C. § 1536(a) (2); 50 C.F.R. § 402.02. The survival of endangered species is already at risk. It seems likely that the adverse effects of these alternatives could reduce the numbers and distribution of species and impair reproduction, thus further reducing the likelihood that these species will recover. 50 C.F.R. § 402.02. **Southern Environmental Law Center, 2285**

**Response to Comment 3:** TVA's analysis of potential impacts on protected species in Section 5.13 considers direct and indirect effects. All cumulative effects are addressed in Chapter 6. TVA consulted with USFWS about the potential impacts of the Preferred Alternative on protected species. USFWS' Biological Opinion is included in the EIS (see Appendix G). TVA concluded that its Preferred Alternative would not adversely affect most of the protected species in the region and would not affect any species sufficiently to jeopardize their continued existence.

### F3.5 Mitigation

1. Maybe a plan to try for a trial period for the most popular alternative would be feasible. **Barry Hinkle, 1933**

**Response to Comment 1:** This suggestion is a form of adaptive management. TVA has long used an adaptive management approach to operation of its reservoir system and intends to continue to do this, regardless of which alternative is selected. This involves extensive monitoring of a number of different reservoir and ecological parameters, and flexible application of reservoir operating guidelines that consider the monitoring results. See Section 3.4 and Chapter 7.

2. I suggest that if lake levels are changed to provide for higher lake levels in late summer, fall and winter, that mitigation areas be established to replace important habitats for shorebirds and waterfowl that are reduced by such actions. **David Vogt, 3420**

**Response to Comment 2:** The FEIS more closely examines the potential impacts on migrating birds. Our analyses show that habitat changes—both increases and losses—would vary across the alternatives and across reservoirs within alternatives. Discussion of possible mitigation measures in Chapter 7 has been expanded in light of the identification of TVA's Preferred Alternative. TVA's Record of Decision will identify those mitigation measures to which TVA commits.

3. [If you choose to deviate from the Base Case] I urge TVA in the strongest terms to (1) mitigate the loss [of critical habitat for migrating shorebird, herons and egrets] by providing a comparable or greater amount of habitat distributed across the reservoir system, and (2) commit to properly manage this replacement habitat in perpetuity. **Elizabeth Wilkinson-Singley, 3422**

**Response to Comment 3:** The FEIS more closely examines potential impacts on migrating birds. The discussion of possible mitigation measures in Chapter 7 has been expanded in light of the identification of TVA's Preferred Alternative. This alternative was formulated partly to avoid or reduce potential environmental impacts associated with some of the alternatives identified in the DEIS. For example, no changes were made to the operating guides on Kentucky Reservoir—in part to avoid affecting important flats and other wildlife habitats. TVA's Record of Decision will confirm the additional mitigation measures that TVA decides to implement. Our analyses show that potential habitat changes—both increases and losses—would vary both across the alternatives and across reservoirs within alternatives.

4. Even characterizing the "Base Case" as the starting point is unfair. These lakes and reservoirs are "marketed" to the public as recreational assets. They should be operated as such, subject to minimizing adverse effects in other areas. As long as the TVA and Corps maintain shoreline control as present, any adverse effects can be mitigated to a sufficient degree. **Mark Patterson, 2900**

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**Response to Comment 4:** There are approximately 10,995 miles of shoreline along the TVA reservoir system. Of this amount, TVA has flowage easement rights only over 21 percent. This gives TVA the authority to flood the property as necessary and to control the installation of structures, but the property owner otherwise controls use of the shoreline. Of the remaining shoreline, approximately 54 percent is "owned" by TVA, but others have rights to use or cross the property to access the water. TVA has essentially total control over the remaining 25 percent. The Corps has regulatory authority over some kinds of actions that occur on TVA-controlled property, but the Corps has no "ownership" interests. The TVA Act establishes the operating priorities of the TVA reservoir system. These are navigation, flood control, and power generation. Consistent with these purposes, TVA also operates the system to achieve other benefits, such as water quality, recreation, and water supply.

5. Mitigate loss through creation of other suitable habitat, purchase of other habitats (assuming purchase isn't a high priority habitat for other valuable resources).

Evaluate (research if necessary) use of areas and impact of habitat loss to shorebird energetics during migration. **Mary Stevens, Jackson Audubon Society, 2480**

**Response to Comment 5:** See Response to Comment 3. The discussion of potential impacts on migratory shorebirds and waterfowl has been supplemented in the FEIS. Purchase of compensating habitat is routinely considered by TVA in the implementation of specific actions. TVA questions the feasibility and appropriateness of this kind of mitigation approach for a region-wide proposal such as the ROS. The potential impacts on these resources would occur, if at all, slowly over a long period of time. A better approach to addressing such potential impacts is to reformulate the proposal to reduce the risk of such impacts. TVA has done this with its Preferred Alternative.

6. Our organization urges TVA to carefully consider the detrimental effects on bird populations that may result from many of the policy alternatives. We are strongly opposed to all alternatives that call for maintaining high lake levels. We further suggest that if such alternative is selected that mitigation areas be established to replace important bird habitats lost due to changes in lake level management. We are disappointed that such mitigation measures are not described in the draft EIS; their absence limits the opportunity for the public to evaluate and comment on them. **Virginia B. Reynolds, President, Tennessee ornithological Society, 3792**

**Response to Comment 6:** See Responses to Comments 3 and 5.

### **F3.6 Out of Scope**

1. Glad that that miserable, wretched proposal years ago to have LBL theme parks, hotels, playgrounds was so despised that it was abandoned before USFS took LBL. **Anonymous, 3249**

**Response to Comment 1:** Comment noted.

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2. Public should be made more aware of the potential good or bad of plants and trees they may be placing on our shorelines so as not to damage the environment over the long term. **Anonymous, 606**

**Response to Comment 2:** To address this issue, TVA actively works in partnership with reservoir users, other citizen groups, and local agencies to provide information on native plant species that may be used in stabilizing shorelines. TVA's Native Plant Selector web site may be of assistance for the commenter in selecting appropriate native vegetation for planting along Tennessee Valley region shorelines and stream banks:  
<http://www.tva.com/river/landandshore/stabilization/plantsearch.htm>.

3. On the shoreline on Lake Hiwassee at Bear Paw we noticed several trees that were leaning into the water. If these trees fall or fall accidentally on a boat or in the water someone could get injured. Will you please look into this for us. **Anonymous, 451**

**Response to Comment 3:** TVA has sent this comment to the TVA Watershed Team that is responsible for the Hiwassee Reservoir.

4. Much attention should be paid to keeping the waters protected from the human element including limited use of houseboats, camp sites with no restroom facilities, or a dumping station that boaters are encouraged to use for boats, houseboats and campsites. **Anonymous, 2376**

**Response to Comment 4:** TVA works cooperatively with federal and state agencies with regulatory authority over activities that affect water quality in TVA reservoirs. TVA has a number of programs that are designed to encourage more environmentally sound use of its reservoirs, including its Clean Marinas Initiative.

5. There needs to be more regulation of residential development on feeder water channels into Lake Nottely as well as the River (Nottely) itself. **Arline Hodgson, 1803**

**Response to Comment 5:** TVA's SMI addressed residential shoreline development along TVA reservoirs. This culminated in a 1998 FEIS and policy changes that limit future development. Local and state agencies may regulate certain development activities in areas or circumstances where TVA does not have jurisdiction.

6. I would like to see strict enforcement by TVA of its permit responsibilities for docks, marinas, wastewater treatment systems, and the like. Shoreline development above the TVA easement that impacts the easement can be regulated through the permitting process. **Barbara Garrow, 2034**

**Response to Comment 6:** TVA recently amended its regulations that implement Section 26a of the TVA Act (TVA's permitting regulations). These amendments should enhance TVA's ability to ensure that future development along reservoir-system shorelines is acceptable. The Section 26a regulations can be accessed and viewed on TVA's web site: <http://www.tva.gov/river/26apermits/regis.htm#where>.

## **Appendix F3 Response to Specific Public Comments**

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7. A few years back there was a proposal prohibiting shoreline owners from cutting any vegetation a distance up to 6 ft from shoreline. This was opposed by many property owners. As a result of this feedback TVA abandoned this rule. I applaud TVA's willingness to listen and appreciate their soliciting of public input. **Bob Graham, 2195**

**Response to Comment 7:** Comment noted.

8. Houseboats- These are very detrimental to lake property. They at least need to be regulated to certain parts of the lake. i.e. the marina. **Carolyn Ippisch, 3134**

**Response to Comment 8:** See Response to Comment 4.

9. I think that Kentucky Dam should be staffed to enlighten visitors with personal input from former workers with enough knowledge to help them if they are visitors to the area. **Clinton Horton, 2777**

**Response to Comment 9:** Comment noted.

10. I urge continued and expanded support of the Boone Watershed Partnership since the water quality of the lake must begin with improved water quality of the 600+ streams that flow into the lake. **Don Cross, 282**

**Response to Comment 10:** Comment noted.

11. TVA police and other groups such as TDEC need a houseboat inspection program to stop sewage dumping from houseboats. The only solution is an annual inspection of all navigable houseboats and non-nav 4F structures. This step is vital to improving water quality of Boone Lake. **Don Cross, 4191**

**Response to Comment 11:** See Response to Comment 4.

12. The environmental situation of uncontrolled growth along the shoreline is a serious concern and must be managed to conserve the system for the whole valley. **Doug Triestram, 1768**

**Response to Comment 12:** See Response to Comment 5.

13. I further hope that when the board is reconstructed they decide to include at least two special members, one to represent the environmental interests and one to represent the recreational interests of land owners and users of Douglas Lake. **Drew Danko, 1026**

**Response to Comment 13:** Comment noted.

14. There is also a need for all regulations that cover Boone Lake to be enforced for everyone. There are persons who have cut trees and just let them fall into the lake **Fred Frazier, 264**

**Response to Comment 14:** TVA works in a coordinated effort with regulatory agencies that have control over such actions in order to maintain and improve water quality in its reservoir system.

15. What concerns me is the fact that some boaters are actually filling tanks or bladders provided by the boat maker, in the bottoms of their boats with several gallons of water in an

## Appendix F3 Response to Specific Public Comments

effort to make the boat heavier, therefore enabling the boat to throw out a larger wake for the wake boarders to jump and do their thing, which is alright to do but not to the 2' to 3' wakes these boats are putting out. They are really washing away the shoreline, more so than the "normal" boater. Additionally, the wakes are actually dangerous for other boaters, especially pontoon boats. I have been nearly thrown overboard on more than one occasion. They really rock a boat. In summary, I think this needs attention. **Fred Overbay, 1092**

**Response to Comment 15:** State agencies, not TVA, regulate watercraft operation on TVA's reservoirs.

16. I think you are out of the fertilizer business now. Most other companies in the south are also out of that business. I commend you for that. **Harold Andrews, 2175**

**Response to Comment 16:** Comment noted.

17. This classification doesn't exactly address the problem I'd like to bring up, but it's the closest one I could find. The problem is overboard discharges from boats, both commercial and recreational. I happen to live in a marina that has pump out facilities at the dock but there are boats here dumping overboard and don't have holding tanks. Even though the marina "rules" say boaters that are overboard discharging will be asked to leave, nothing is done. What can be done by TVA to help keep our waters clean? **Harold DeHart, 2136**

**Response to Comment 17:** See Response to Comment 4.

18. We are very much concerned that the many small islands, as well as Seven Mile Island on Pickwick Lake, are being used as personal camping areas, resulting in the destruction of these sites. In many cases, trees have been cleared and trash is always present. Are there laws that prevent the use of the islands in this destructive manner, and who enforces them, if there are any? **Judy Kirchner, 2467**

**Response to Comment 18:** This has been referred to the TVA Watershed Team that is responsible for Pickwick Reservoir.

19. Three times now while I have been typing, this computer has randomly placed the cursor up in the middle of the text and started typing there. I do not have time to make any other changes and will try to comment further over the internet on my computer. This is very frustrating!!! **Lamar Paris, 2416**

**Response to Comment 19:** We apologize for any inconvenience that this may have caused you.

20. I don't like bugs and snakes, but accept them as part of the outdoors. Too many communities are being built at the edge of our lakes and rivers and wiping out the very habitat that made the house on the lake so desirable. TVA should consider stronger restrictions for homes and communities that build on or near aquatic areas. **Lorraine Nobes, 21**

**Response to Comment 20:** See Response to Comment 5.

## **Appendix F3 Response to Specific Public Comments**

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21. Thank you so very much for your efforts to continue to educate the community on water quality. Several local farmers through your education have become aware of containment of animals in the streams increases water quality. The presentations were expertly completed and presented. Hats off to your staff. **Marianne O. Hatchett, 1406**

**Response to Comment 21:** Comment noted.

22. On a side note, I certainly would like to see the Visitor Centers at the various dams opened back up to the public, even if under some degree of tighter security. While I understand the potential devastation that could result from a terrorist attack, there should be some way that individuals that have an interest should be able to tour the facilities. **Mark Wiggins, 2283**

**Response to Comment 22:** TVA appreciates the public's interest in its dams and strives to accommodate that interest, consistent with security needs.

23. We do not understand why Cherokee County, or State of North Carolina and TVA/USDA allowed this residential subdivision to be created within Nantahala National Forest with only boundary surveys filed on April 1994 without any engineering data or information regarding existing soil types or data concerning road construction and storm drainage requirements, septic system perk test or possibility of well water potability including probably well depths. The developer L.B. Land & Timber Co. Inc. purchased 91.30 acres and subdivided the property into 56 lots. All lots were sold within two years and six months for between \$840,000 to \$1,120,000 total minimum sales value, then declared bankruptcy so the Homeowner's Association would be responsible for any problems, pretty neat deal. **Thomas L. Parker, 3996**

**Response to Comment 23:** This EIS focuses on the reservoir system operations policy, not issues of the sort identified in this comment. If this development resulted in potable water quality problems, appropriate agencies from the State of North Carolina should be contacted.

24. [S]ince Jan/Feb 2003 I have been trying to confirm the correct flood plain data that should be in effect for Cherokee County including raising flood level up 8'0" at July 2, 1995 and why it was suddenly raised. **Thomas L. Parker, 3989**

**Response to Comment 24:** This has been referred to TVA staff who are responsible for floodplain evaluations.

25. Current policy of allowing individuals to camp on lake islands and shore lines without enforced regulations or laws which protect the environment is resulting in accelerated erosion of many islands and shore lines. Individuals currently feel free to camp anywhere they please on most TVA shore lines and islands. Many of these camp sites have temporary structures, unsanitary trash littering the area, make-shift in-ground toilets or worse, and evidence of long-term occupation resulting in killing of ground vegetation through overuse or mowing and weed eating, cutting of trees, etc. This unabated abuse of precious ecologically significant sites (this should include most all river shoreline and islands) has resulted in increased island and shore line erosion and adverse environmental impact. Recommend policy change and enforcement which prohibits destructive use of our river islands and shorelines. Request a written response to this comment stating current policy and responsible enforcement organization. (Specifically, who is the enforcement

## **Appendix F3 Response to Specific Public Comments**

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authority on Pickwick Lake around the Seven Mile Island area where significant environmental damage has been observed due to camping and cutting of trees?) Also, request notification of the manner in which this comment was dispositioned, to include planned policy changes. **Tim Kirchner, 2558**

**Response to Comment 25:** This has been referred to the TVA Watershed Team that is responsible for Pickwick Reservoir. TVA works closely with federal and state agencies with regulatory authority over the kind of activities identified in this comment. Unfortunately, resource limitations at all levels hinder more aggressive enforcement.

26. This comment pertains to Water Safety rather than Dam Safety. The Georgia Law, "No wake at 100 feet from boat docks & etc" should be enforced for all water craft. **Tony E. Branan, 2953**

**Response to Comment 26:** State agencies, not TVA, regulate watercraft operation on TVA reservoirs.

27. The only constructive suggestion that I can make is that from my experience operational procedures once put in place are seldom, if ever, reviewed in light of changing conditions or environmental changes. Thus, it would seem that this study has served a very useful purpose even if no major changes are made. **Walter E. Flood, 1902**

**Response to Comment 27:** Comment noted.

28. We look forward to future years working closely with TVA to optimize all resources and provide more Green Power! **Wayne Gallik, 4169**

**Response to Comment 28:** Comment noted.

## **Appendix F3 Response to Specific Public Comments**

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### **F3.7 References**

Bohac, C. E. 2003. Water Supply Inventory and Needs Analysis. Tennessee Valley Authority, Navigation and Hydraulic Engineering. Draft. Chattanooga, TN. December.

Hutson, S. S., M. C. Koroa, and C. M. Murphee. 2003. Estimated Use of Water in the Tennessee River Watershed in 2000 and Projections of Water Use to 2030. U.S. Geological Survey. (Water Resources Investigation Report.) Draft. Memphis, TN.

Tennessee Valley Authority. 1998. Shoreline Management Initiative: An Assessment of Residential Shoreline Development Impacts in the Tennessee Valley. November. Norris, TN.

\_\_\_\_\_. 1999. Final Environmental Impact Statement–Use of Lands Acquired for the Columbia Dam Component of the Duck River Project. April.

\_\_\_\_\_. 1990. Lake Improvement Plan, Tennessee River and Reservoir System Operating and Planning Overview. Final Environmental Impact Statement. (TVA/RDG/EQS-91/1.)

## **Appendix F4**

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### **Response to Federal and State Agency Comments**

**Tennessee Valley Authority  
Reservoir Operations Study – Final Programmatic EIS**



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## Appendix F4 Response to Federal and State Agency Comments

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## **Appendix F4. Response to Federal and State Agency Comments**

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### **List of Acronyms**

ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AWFF	Alabama Wildlife and Freshwater Fisheries Division
Cfs	cubic feet per second
Corps/USACE	U.S. Army Corps of Engineers
DEIS	Draft Environmental Impact Statement
DOI	U.S. Department of Interior
Dsf	day-second-feet
EBCI	Eastern Band of Cherokee Indians
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
REMI	Regional Economic Model, Inc.
ROS	Reservoir Operations Study
TDEC	Tennessee Department of Environment and Conservation
THPO	Tribal Historic Preservation Officer
TVA	Tennessee Valley Authority
USFWS	U.S. Fish and Wildlife Service
WCSA	Washington County Public Service Authority

### F4 Response to Federal and State Agency Comments

This section of the Comment Response Appendix contains the comments that TVA received from federal and state agencies, and TVA's responses to those comments. TVA received comments from 14 state agencies, seven federal agencies, and one tribal government. The letters (or, in two instances, e-mails) that TVA received are reproduced in this section. Responses to comments follow individual correspondence and are shown with the text of the specific comment.

Nearly all resource agencies had strong reservations about any adjustments to the existing operations policy that would adversely affect water quality—most to the extent that they supported making no changes to the existing policy, the Base Case. Good water quality is an important public value. TVA carefully studied and considered water quality as it developed alternatives and created the Preferred Alternative. TVA formulated the Preferred Alternative to avoid or reduce impacts that would substantially degrade water quality and, in fact, to enhance water quality at certain locations. However, given the inherent uncertainties with any environmental analyses, TVA has identified monitoring and mitigation measures that would help offset potential adverse impacts on water quality, should they occur.

Several of the agencies acknowledged that this EIS is programmatic but nevertheless asked that TVA consider as part of the EIS or in subsequent studies various reservoir-specific issues or needs. In its responses to each agency's comments below, TVA considered it unnecessary and inappropriate to address reservoir-specific issues in a programmatic EIS. The programmatic analyses of issues that TVA has conducted would easily be overwhelmed and lost if reservoir-specific issues were also addressed. The value of a programmatic level of review is that it allows TVA, other interested agencies, and the public to be able to consider a broader perspective for the entire TVA reservoir system that is operated as an integrated whole. It would also be very difficult—perhaps impossible—to produce a study that evaluated in detail, all of the reservoir-specific issues that may be of interest to agencies or the public. Certainly, it would take much longer and would frustrate those individuals and agencies who are looking to the ROS to address their concerns about TVA's system-wide operations policy sooner rather than later. As reservoir-specific activities are proposed by TVA, either in the implementation of any ROS decision or independent of the ROS, reservoir-specific issues would be addressed and those agencies with reservoir-specific issues would be able to raise their concerns at that time, if appropriate.

Two of the agencies commented that TVA should do a better job of explaining how it ranked identified objectives and should further delineate its summary of projected impacts (i.e., explain better what is meant by "slightly adverse" or "beneficial"). The text of the EIS has been changed to do the latter. TVA's explanation of why it prefers the Preferred Alternative that is described in the FEIS indicates how TVA ranked or weighed the values and objectives that shaped the ROS process. TVA was guided by the values and objectives endorsed by the public during the ROS process, the preferences stated by commenting agencies, the economic and environmental costs of competing actions, and the priorities established for operating the TVA system in Section 9a of the TVA Act and expressed in other legislation.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **F4.1 Federal Agencies**

#### **U.S. Army Corps of Engineers Comments**

September 4, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, Tennessee 37902

Dear Mr. Nye:

Thank you for the opportunity to review and comment on the draft environmental impact statement for the TVA Reservoir Operations Study. This is a consolidated response of US Army Corps of Engineers comments from the Mississippi Valley Division, the Great Lakes and Ohio River Division and their respective districts.

The Corps is a cooperating agency under NEPA guidelines and has actively participated throughout the study. Our primary concerns are:

- Navigation on the Tennessee River
- Navigation, flood control, water quality and environmental conditions on the lower Tennessee, Cumberland, Ohio and Mississippi Rivers
- Lake Barkley and the Cumberland River Basin reservoir system
- Jurisdictional limits for Section 404 permitting

These concerns were voiced in our 4 March 2002 letter to Ms. Kathryn Jackson and have been communicated to TVA staff throughout the ROS process. This is a programmatic EIS document, and our comments will reflect that. [1]

The Corps' greatest concerns are the ultimate effects that any changes to the operating strategies of the TVA system may have on Kentucky and Barkley Lakes, the Cumberland River system and all lands and waters downstream from those projects. Our position remains as stated in the referenced letter: "that any proposed changes (at Kentucky Lake) that would involve reduction in flood storage capacity would have to be evaluated within the context of the entire lower Ohio/Mississippi River system and would possibly entail reevaluation of the Mississippi River project flood."

## **Appendix F4 Response to Federal and State Agency Comments**

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The scope of the EIS was limited to the Tennessee River watershed and the TVA power service area with only limited analysis of impacts outside of this region. Broader analysis of impacts to Barkley Lake and the Cumberland River system and to areas downstream from Kentucky and Barkley Lakes along the lower Tennessee, Cumberland, Ohio and Mississippi Rivers was not performed. Specific areas of concern were mentioned above. Any change to the regulation plan at Kentucky Lake would require a like action at Barkley Lake. The Corps has not performed any studies needed to support a change and has no motivation to change the Barkley regulation plan or funding for needed studies.

Because impacts outside of the TVA region were not fully addressed, we can't adequately determine the effects of the alternatives presented. However, since all alternatives demonstrated a negative impact on one or more resource area, it is safe to assume negative impacts in one or more resource areas outside of the TVA region are likely. All alternatives had an adverse impact on flood control, and the potential for those impacts to extend through the lower Ohio and Mississippi River systems can not be ignored.

Since no preferred alternative was presented, we can not at this time make a sound technical judgment. We are also unable to determine the scope of additional study that may be needed to address impacts throughout our area of responsibility. We welcome further cooperation later in the process as TVA formulates and presents a preferred alternative. [2]

We appreciate the opportunity to assist in this study and to review and comment on the work presented. [3] The attachment contains other specific comments.

Sincerely,

W. Chris Hinton-Lee, AIA  
Director  
Military and Technical Directorate

Enclosures

## **Appendix F4 Response to Federal and State Agency Comments**

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### Corps of Engineers Comments Draft Programmatic Environmental Impact Statement

#### Tennessee Valley Authority Reservoir Operations Study

1. All alternatives, except the Tailwater Recreation alternative, show more adverse impacts than beneficial impacts. And the Tailwater Recreation alternative shows “adverse” impacts for Flood Control. This either makes the case to maintain the Base alternative or accept the trade-offs for the Tailwater alternative. [4]
2. The Tailwater Recreation alternative is the only alternative to meet the “greater overall public value” criteria established by the ROS, with total positive benefits outweighing the adverse impacts. But it ironically reduces overall recreation benefits. [5]
3. Several of the alternatives show increasing mainstream winter pool elevations. This is indicated as a benefit to navigation in one of the alternatives, but not in the Commercial Navigation alternative. This seems to be an inconsistent application of navigation benefits. [6]
4. All but one of the alternatives is adverse to Flood Control. We need to know what part of the TN River is adversely affected and can TVA contain the flood damages within the upper or middle sections of the TN River. Otherwise it will adversely impact the Kentucky/Barkley system. As our letter states, USACE cannot endorse or implement changes to the Kentucky/Barkley system without further detailed studies. [7]
5. The Commercial Navigation alternative includes tailwater release changes from Barkley Dam. How is TVA able to include these operational changes as part of this alternative without EIS and operational impact studies of the Kentucky/ Barkley system and the lower Ohio and Mississippi Rivers? We cannot/ should not implement any changes that will reduce the Corps flood response capabilities or add to flooding problems on the Ohio/Mississippi Rivers. [8]
6. As stated in the document on page 1-13, paragraph 1.7.1; Section 9a of the TVA Act authorizes the TVA board to regulate streamflow, primarily for navigation and flood control and, when consistent with these purposes, to provide and operate facilities for the generation of electric energy. Each alternative identified in the subject report, except the base plan, impacted at least one, and in some cases several, of the primary purposes of the reservoir system. It is our position that the recommended alternative should not impact any of the primary purposes of the reservoir system or affect the Barkley pool and lower Cumberland, Tennessee, Ohio and Mississippi Rivers. [9]
7. The report does not address flood impacts to Kentucky Reservoir for any of the alternative plans. Based on the information presented in the meeting at the Memphis District on August 6<sup>th</sup>, a detailed model of the TVA Reservoir System has been developed that includes daily flows for the period 1903 through 2001. Analyses of changes in outflow from Pickwick Reservoir in

## **Appendix F4 Response to Federal and State Agency Comments**

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comparison to current conditions for any proposed plan should be detailed and documented in the report. As a result of the meeting in Memphis, TVA furnished the period of record flows for Pickwick Lake to MVD. Upon review of these flows all the proposed alternatives investigated to date will have an impact on the operation of Kentucky Lake. This would then impact the operation of Barkley Lake, which is owned and operated by the Corps of Engineers. This operational impact is unacceptable since the impacts to the areas downstream of Barkley and Kentucky Lakes have not been identified nor analyzed. For those impacts to be adequately addressed, the Lower Ohio and Mississippi Rivers would have to be studied in their entirety. Furthermore, there has not been any authority or resources granted to perform such a study. It is our recommendation that any alternative that would be defined as the preferred alternative should not impact the existing flows leaving Pickwick Lake. If an alternative is so defined, we request the appropriate documentation, which demonstrates the non-impact to the flows entering or leaving Kentucky Lake. [10]

8. Any increases in the guide curve for Kentucky Lake during the winter or spring would have an extremely high probability of being unacceptable to residents along the lower Ohio and Mississippi River Valleys due to a loss of flood control storage. [11]
9. The report does not include an alternative plan to provide a significant reduction in flood risk. Such a plan would be beneficial from a NEPA perspective, and would provide information for a purpose many consider a high priority. [12]
10. Changes that may benefit navigation on the lower Ohio River and Mississippi River would likely create environmental concerns, as increases in low flow elevations could alter critical habitat. All of these concerns would need to be addressed in the Environmental Impact Statement. [13]
11. The downstream environmental impacts in the lower Cumberland, Tennessee, Ohio and Mississippi River watersheds that occur from the proposed changes in pool operation must be fully evaluated and documented, either in this EIS or in a similar subsequent document. The potential impacts from an environmental perspective include endangered species such as the least tern and pallid sturgeon, fish and wildlife impacts, changes to riparian habitats or other ecosystem effects. [14]
12. Since the operational parameters of Kentucky Lake essentially requires the pool elevation to be below the easement level of elev. 365.0 by 1 June, any additional flow that enters Kentucky Lake from the proposed changes during late spring or early summer floods such as occurred in 2003, would have to be passed through the system. With all of the proposed alternatives, there would likely be some adverse impacts of additional flooding on unprotected downstream croplands during these late season floods. Therefore, on behalf of our downstream flood control constituents in the Lower Mississippi Valley, we cannot support any operational change in the TVA Lakes above Kentucky Lake that would increase flood flows into Kentucky Lake, thus impacting the operation of Kentucky/Barkley Lakes, and which would subsequently impact the areas downstream of the lakes including the Lower Ohio River and the Lower Mississippi Valley. [15]

## **Appendix F4 Response to Federal and State Agency Comments**

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13. The report has done an acceptable job of identifying and determining impacts associated with the alternatives proposed in the report. However, from a MVD Operations perspective the impacts to the operation/navigation program cannot be identified from the information presented in the report. Impacts to the operation of flood control features; flow lines, navigation depths, and dredging requirements cannot be determined from this document. Without a decision document, similar to a feasibility report or detailed project report, information needed to clearly identify impacts to the operation of MVD's operation programs is clearly absent. To determine impacts to operation/navigation programs would require a clear presentation of flow changes from a seasonal basis and magnitude to determine impacts to the Mississippi River systems and associated impacts to the Corps flood control and navigation programs. [16]
  
14. The leveed floodplain along the Lower Mississippi River consists of approximately 1.7 million acres of lands, exclusive of rivers, lakes, and other water bodies. These lands function as the natural overflow system of the Mississippi River and contain a diversity of habitats. There are over one-half million acres of developed agricultural lands, which include many small communities, rural residences, and businesses, along with over 1.1 million acres of environmentally sensitive lands, which could be impacted by any change in the operational policies of the TVA system. [17]

## Appendix F4 Response to Federal and State Agency Comments

### RESPONSE TO COMMENTS

1. The Corps is a cooperating agency under NEPA guidelines and has actively participated throughout the study. Our primary concerns are:

- Navigation on the Tennessee River
- Navigation, flood control, water quality and environmental conditions on the lower Tennessee, Cumberland, Ohio and Mississippi Rivers
- Lake Barkley and the Cumberland River Basin reservoir system
- Jurisdictional limits for Section 404 permitting

These concerns were voiced in our 4 March 2002 letter to Ms. Kathryn Jackson and have been communicated to TVA staff throughout the ROS process.

**Response to Comment 1:** TVA and the Corps have a long history of cooperating, not only on the evaluation of proposed actions affecting our common interests, but also in the operation of our interconnected reservoir systems and waterbodies. TVA appreciates the Corps' willingness to participate in the ROS EIS as a cooperating agency.

2. The Corps' greatest concerns are the ultimate effects that any changes to the operating strategies of the TVA system may have on Kentucky and Barkley Lakes, the Cumberland River system and all lands and waters downstream from those projects. Our position remains as stated in the referenced letter: "that any proposed changes (at Kentucky Lake) that would involve reduction in flood storage capacity would have to be evaluated within the context of the entire lower Ohio/Mississippi River system and would possibly entail reevaluation of the Mississippi River project flood."

The scope of the EIS was limited to the Tennessee River watershed and the TVA power service area with only limited analysis of impacts outside of this region. Broader analysis of impacts to Barkley Lake and the Cumberland River system and to areas downstream from Kentucky and Barkley Lakes along the lower Tennessee, Cumberland, Ohio and Mississippi Rivers was not performed. Specific areas of concern were mentioned above. Any change to the regulation plan at Kentucky Lake would require a like action at Barkley Lake. The Corps has not performed any studies needed to support a change and has no motivation to change the Barkley regulation plan or funding for needed studies.

Because impacts outside of the TVA region were not fully addressed, we can't adequately determine the effects of the alternatives presented. However, since all alternatives demonstrated a negative impact on one or more resource area, it is safe to assume negative impacts in one or more resource areas outside of the TVA region are likely. All alternatives had an adverse impact on flood control, and the potential for those impacts to extend through the lower Ohio and Mississippi River systems can not be ignored.

Since no preferred alternative was presented, we can not at this time make a sound technical judgment. We are also unable to determine the scope of additional study that may be needed to address impacts throughout our area of responsibility. We welcome further cooperation later in the process as TVA formulates and presents a preferred alternative.

## **Appendix F4 Response to Federal and State Agency Comments**

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**Response to Comment 2:** TVA developed an alternative that would allow Kentucky Reservoir levels to be held higher longer, while still addressing the Corps' concerns about potential impacts on its operation of Lake Barkley and areas downstream along the lower Tennessee, Cumberland, Ohio, and Mississippi Rivers. TVA thinks this may be possible by increasing releases through Kentucky Dam for a brief period. While TVA is still willing to consider this change, it was not identified as part of the Preferred Alternative in the FEIS because of the Corps's concerns. In addition, TVA responded to concerns from the U.S. Fish and Wildlife Service (USFWS) and others regarding impacts on waterfowl and shorebirds. This would eliminate any risk of unacceptable impacts on operation of Lake Barkley or on the Cumberland, Ohio, or Mississippi Rivers.

3. We appreciate the opportunity to assist in this study and to review and comment on the work presented.

**Response to Comment 3:** We appreciate your input to the ROS and comments on the DEIS.

4. All alternatives, except the Tailwater Recreation alternative, show more adverse impacts than beneficial impacts. And the Tailwater Recreation alternative shows "adverse" impacts for Flood Control. This either makes the case to maintain the Base alternative or accept the trade-offs for the Tailwater alternative.

**Response to Comment 4:** TVA has identified its Preferred Alternative in the FEIS. This alternative was formulated to capture the important benefits associated with other alternatives, while reducing or avoiding potential impacts.

5. The Tailwater Recreation alternative is the only alternative to meet the "greater overall public value" criteria established by the ROS, with total positive benefits outweighing the adverse impacts. But it ironically reduces overall recreation benefits.

**Response to Comment 5:** We disagree with this statement. The Tailwater Recreation Alternative would produce an increase in recreation use and associated expenditures. However, increases in power costs associated with this alternative would offset these gains, resulting in a slightly adverse impact on the regional economy. When evaluated against the performance objectives that were developed from the issues identified during the scoping phase of the study, none of the action alternatives would have a beneficial impact on all of the objectives because, under certain conditions, several of the objectives can conflict with one another. For example, extending the duration of higher summer pool levels to benefit recreation and scenic integrity has the potential to adversely affect water quality and power system reliability and cost. After extensive public review of the DEIS and additional analyses, TVA developed a Preferred Alternative. This alternative combines and adjusts elements of the alternatives identified in the DEIS to preserve desirable characteristics and to avoid or reduce adverse impacts associated with those alternatives. It would establish a balance of reservoir system operating objectives that is more responsive to changing public values and consistent with the operating priorities established by the TVA Act.

6. Several of the alternatives show increasing mainstream winter pool elevations. This is indicated as a benefit to navigation in one of the alternatives, but not in the Commercial Navigation Alternative. This seems to be an inconsistent application of navigation benefits.

## **Appendix F4 Response to Federal and State Agency Comments**

**Response to Comment 6:** The benefit to commercial navigation of increasing channel depth in winter months was calculated for the Commercial Navigation Alternative. Likewise, a reduction in benefit to navigation under the Summer Hydropower Alternative was shown for summer months. The analysis used the shipper savings or loss as an input to a regional economic input-output model (REMI).

7. All but one of the alternatives is adverse to Flood Control. We need to know what part of the TN River is adversely affected and can TVA contain the flood damages within the upper or middle sections of the TN River. Otherwise it will adversely impact the Kentucky/Barkley system. As our letter states, USACE cannot endorse or implement changes to the Kentucky/Barkley system without further detailed studies.

**Response to Comment 7:** The flood risk analysis demonstrated that most of the alternatives would result in a substantial increase in flood risk at a number of critical sites in the Tennessee Valley region, including both tributary and mainstem locations. See Section 5.22. For Kentucky Reservoir, TVA conducted a detailed investigation of the effect of alternative operations policies on the volume of water discharged from Pickwick Landing Dam. This investigation included identification of the 10 largest annual and seasonal volumes discharged over 1-, 3-, 7-, 10-, 15-, and 30-day durations in the 99-year simulated period of record. For each of these events, the incremental volumes discharged into Kentucky Reservoir were compared to the Base Case. The analysis showed that it is reasonable to expect that the differences in Pickwick discharge during these large storms can be temporarily stored in the Kentucky pool.

8. The Commercial Navigation alternative includes tailwater release changes from Barkley Dam. How is TVA able to include these operational changes as part of this alternative without EIS and operational impact studies of the Kentucky/ Barkley system and the lower Ohio and Mississippi Rivers? We cannot/ should not implement any changes that will reduce the Corps flood response capabilities or add to flooding problems on the Ohio/Mississippi Rivers.

**Response to Comment 8:** The Preferred Alternative does not include changes in Barkley operating guides or any changes in limitations to Barkley releases.

9. As stated in the document on page 1-13, paragraph 1.7.1; Section 9a of the TVA Act authorizes the TVA board to regulate streamflow, primarily for navigation and flood control and, when consistent with these purposes, to provide and operate facilities for the generation of electric energy. Each alternative identified in the subject report, except the base plan, impacted at least one, and in some cases several, of the primary purposes of the reservoir system. It is our position that the recommended alternative should not impact any of the primary purposes of the reservoir system or affect the Barkley pool and lower Cumberland, Tennessee, Ohio and Mississippi Rivers.

## **Appendix F4 Response to Federal and State Agency Comments**

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**Response to Comment 9:** Section 9a of the TVA Act sets operating priorities for the TVA reservoir system. Consistent with those priorities, the TVA Board has discretion to adjust system operations, including achieving other collateral benefits such as recreation. TVA believes that implementation of TVA's Preferred Alternative would be fully consistent with Section 9a and within the discretion of the TVA Board. The Preferred Alternative does not include changes in operation of Kentucky Reservoir. There would be minimal, if any, risk of unacceptable impacts on operation of Lake Barkley or on the Lower Cumberland, Ohio, or Mississippi Rivers.

10. The report does not address flood impacts to Kentucky Reservoir for any of the alternative plans. Based on the information presented in the meeting at the Memphis District on August 6th, a detailed model of the TVA Reservoir System has been developed that includes daily flows for the period 1903 through 2001. Analyses of changes in outflow from Pickwick Reservoir in comparison to current conditions for any proposed plan should be detailed and documented in the report. As a result of the meeting in Memphis, TVA furnished the period of record flows for Pickwick Lake to MVD. Upon review of these flows all the proposed alternatives investigated to date will have an impact on the operation of Kentucky Lake. This would then impact the operation of Barkley Lake, which is owned and operated by the Corps of Engineers. This operational impact is unacceptable since the impacts to the areas downstream of Barkley and Kentucky Lakes have not been identified nor analyzed. For those impacts to be adequately addressed, the Lower Ohio and Mississippi Rivers would have to be studied in their entirety. Furthermore, there has not been any authority or resources granted to perform such a study. It is our recommendation that any alternative that would be defined as the preferred alternative should not impact the existing flows leaving Pickwick Lake. If an alternative is so defined, we request the appropriate documentation, which demonstrates the non-impact to the flows entering or leaving Kentucky Lake.

**Response to Comment 10:** See Response to Comment 7.

11. Any increases in the guide curve for Kentucky Lake during the winter or spring would have an extremely high probability of being unacceptable to residents along the lower Ohio and Mississippi River Valleys due to a loss of flood control storage.

**Response to Comment 11:** The Preferred Alternative does not include changes to the operating guidelines for Kentucky Reservoir.

12. The report does not include an alternative plan to provide a significant reduction in flood risk. Such a plan would be beneficial from a NEPA perspective, and would provide information for a purpose many consider a high priority.

**Response to Comment 12:** TVA did initially consider an alternative that would substantially reduce flood risk by holding pool levels lower, but this was deemed unreasonable because it would adversely affect other system benefits and resources in a substantial way.

13. Changes that may benefit navigation on the lower Ohio River and Mississippi River would likely create environmental concerns, as increases in low flow elevations could alter critical habitat. All of these concerns would need to be addressed in the Environmental Impact Statement.

## **Appendix F4 Response to Federal and State Agency Comments**

**Response to Comment 13:** TVA has not proposed changes to improve navigation on the Ohio or Mississippi Rivers. TVA does not believe that any of the identified alternatives would have negatively affected critical habitats. Regardless, because of the concerns of the Corps and others, TVA decided to not alter the operating guidelines for Kentucky Reservoir as an element of the Preferred Alternative identified in the FEIS.

14. The downstream environmental impacts in the lower Cumberland, Tennessee, Ohio and Mississippi River watersheds that occur from the proposed changes in pool operation must be fully evaluated and documented, either in this EIS or in a similar subsequent document. The potential impacts from an environmental perspective include endangered species such as the least tern and pallid sturgeon, fish and wildlife impacts, changes to riparian habitats or other ecosystem effects.

**Response to Comment 14:** See Response to Comment 7. Potential impacts on the Tennessee River system from alternative operations policies have been appropriately assessed in the ROS EIS.

15. Since the operational parameters of Kentucky Lake essentially requires the pool elevation to be below the easement level of elev. 365.0 by 1 June, any additional flow that enters Kentucky Lake from the proposed changes during late spring or early summer floods such as occurred in 2003, would have to be passed through the system. With all of the proposed alternatives, there would likely be some adverse impacts of additional flooding on unprotected downstream croplands during these late season floods. Therefore, on behalf of our downstream flood control constituents in the Lower Mississippi Valley, we cannot support any operational change in the TVA Lakes above Kentucky Lake that would increase flood flows into Kentucky Lake, thus impacting the operation of Kentucky/Barkley Lakes, and which would subsequently impact the areas downstream of the lakes including the Lower Ohio River and the Lower Mississippi Valley.

**Response to Comment 15:** See Response to Comment 7.

16. The report has done an acceptable job of identifying and determining impacts associated with the alternatives proposed in the report. However, from a [Mississippi Valley Division] MVD Operations perspective the impacts to the operation/navigation program cannot be identified from the information presented in the report. Impacts to the operation of flood control features; flow lines, navigation depths, and dredging requirements cannot be determined from this document. Without a decision document, similar to a feasibility report or detailed project report, information needed to clearly identify impacts to the operation of MVD's operation programs is clearly absent. To determine impacts to operation/navigation programs would require a clear presentation of flow changes from a seasonal basis and magnitude to determine impacts to the Mississippi River systems and associated impacts to the Corps flood control and navigation programs.

**Response to Comment 16:** See Responses to Comments 7 and 11. Any changes on the Tennessee River system that would result in changes in Pickwick discharges could be mitigated by temporarily storing water in the Kentucky and Barkley pools—the purposes for which they were designed and constructed. Under the Preferred Alternative, there are times when the releases out of Pickwick would be increased, as well as times when the releases would be decreased. TVA acknowledges the potential for an increase or decrease in risk for flooding but believes that this risk would be minimal.

## **Appendix F4 Response to Federal and State Agency Comments**

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17. The leveed floodplain along the Lower Mississippi River consists of approximately 1.7 million acres of lands, exclusive of rivers, lakes, and other water bodies. These lands function as the natural overflow system of the Mississippi River and contain a diversity of habitats. There are over one-half million acres of developed agricultural lands, which include many small communities, rural residences, and businesses, along with over 1.1 million acres of environmentally sensitive lands, which could be impacted by any change in the operational policies of the TVA system.

**Response to Comment 17:** Comment noted.

## **Appendix F4 Response to Federal and State Agency Comments**

### **U.S. Army Corps of Engineers (Mississippi River Commission) Comments**

September 3, 2003

Mr. Glenn L. McCullough, Jr., Chairman  
Tennessee Valley Authority  
400 West Summit Hill Drive, ET 12A,  
Knoxville, Tennessee 37902

Dear Mr. McCullough:

The Mississippi River Commission is pleased with the opportunity to work with you regarding the Reservoir Operation study that is currently being conducted by your agency. However, we must advise that any proposed change in the operation policies of your projects could impact the projects within our jurisdiction.

We are comfortable, with the knowledge that your Board is aware of the unique relationship that our respective agencies share concerning the role that TVA Reservoirs have in reducing flood crests on the lower Ohio and Mississippi Rivers. We want to stress the importance of this relationship. We are aware that others have voiced their concerns regarding the operation of your system and that many desire to see a change in policy which would accommodate a wide-ranging set of issues covering everything from cost of power, water supply, water quality, navigation, recreation, flood risk, to economic development. We are also aware of the difficulty involved in developing a policy that sets a balance of trade-offs required to maximize the beneficial, and sometimes competing uses of water in the system. [1]

We are concerned that any change affecting the operation of Kentucky Lake will have serious impacts on the operation of Barkley Lake by the U.S. Army Corps of Engineers (USACE). This could, in turn, violate the flood control objectives for regulation of Kentucky-Barkley Reservoirs. The major USACE objectives concerning the proposed changes include safeguarding the Mississippi River levee system reducing the frequency of use of the Birds Point-New Madrid Floodway; and reducing the frequency and magnitude of flooding of lands along the lower Ohio and Mississippi Rivers that are not protected by levees. [2]

The leveed floodplain along the Lower Mississippi River consists of approximately 1.7 million acres of land, exclusive of rivers, lakes, and other water bodies. These lands function as the natural overflow system of the Mississippi River and contain a diversity of habitats. There are over one-half million acres of developed agricultural lands, which include many small communities, rural residences, and businesses, along with over 1.1 million acres of environmentally sensitive lands, which could be impacted by any change in the operational policies of the TVA system. [3]

In addition, we must be certain that any proposed change in the operational policies of the TVA system do not circumvent the authority of the Flood Control Act of 1944, which grants the USACE authority to direct the operation of Kentucky Reservoir during flood control operations on the lower Ohio and Mississippi Rivers. [4]

## **Appendix F4 Response to Federal and State Agency Comments**

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The technical staff of the Mississippi Valley Division and the Mississippi River Commission are reviewing the draft Environmental Impact Statement and will provide technical comments to your agency through our sister Division, the Great Lakes and Ohio River Division, before the suspense date. [5]

Our agencies have maintained an outstanding relationship during previous flood control activities, as well as other operations, and we will continue to work with you in the future to assure the continue success for the benefit of the nation. [6]

Sincerely,

Don T. Riley  
Brigadier General, U.S. Army  
President Designee, Mississippi  
River Commission

### **RESPONSE TO COMMENTS**

1. The Mississippi River Commission is pleased with the opportunity to work with you regarding the Reservoir Operation study that is currently being conducted by your agency. However, we must advise that any proposed change in the operation policies of your projects could impact the projects within our jurisdiction.

We are comfortable, with the knowledge that your Board is aware of the unique relationship that our respective agencies share concerning the role that TVA Reservoirs have in reducing flood crests on the lower Ohio and Mississippi Rivers. We want to stress the importance of this relationship. We are aware that others have voiced their concerns regarding the operation of your system and that many desire to see a change in policy which would accommodate a wide-ranging set of issues covering everything from cost of power, water supply, water quality, navigation, reaction, flood risk, to economic development. We are also aware of the difficulty involved in developing a policy that sets a balance of trade-offs required to maximize the beneficial, and sometimes competing uses of water in the system.

**Response to Comment 1:** TVA and the Corps have a long history of cooperating, not only on the evaluation of proposed actions affecting our common interests, but also in the operation of our interconnected reservoir systems and waterbodies. TVA appreciates the USACE's willingness to participate in the ROS EIS as a cooperating agency.

2. We are concerned that any change affecting the operation of Kentucky Lake will have serious impacts on the operation of Barkley Lake by the U.S. Army Corps of Engineers (USACE). This could, in turn, violate the flood control objectives for regulation of Kentucky-Barkley Reservoirs. The major USACE objectives concerning the proposed changes include safeguarding the Mississippi River levee system reducing the frequency of use of the Birds Point-New Madrid Floodway; and reducing the frequency and magnitude of flooding of lands along the lower Ohio and Mississippi Rivers that are not protected by levees.

## **Appendix F4 Response to Federal and State Agency Comments**

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**Response to Comment 2:** TVA developed an alternative that would allow Kentucky Reservoir levels to be held higher longer, while still addressing the Corps' concerns about potential impacts on its operation of Lake Barkley and areas downstream along the lower Tennessee, Cumberland, Ohio, and Mississippi Rivers. TVA thinks this may be possible by increasing releases through Kentucky Dam for a brief period. While TVA is still willing to consider this change, it was not identified as part of the Preferred Alternative in the FEIS because of the Corps' concerns. This also responded to concerns of the USFWS and others regarding impacts on waterfowl and shorebirds that rely on Kentucky Reservoir habitat. This would eliminate any risk of unacceptable impacts on operation of Lake Barkley or on the Cumberland, Ohio, or Mississippi Rivers.

3. The levee floodplain along the Lower Mississippi River consists of approximately 1.7 million acres of land, exclusive of rivers, lakes, and other water bodies. These lands function as the natural overflow system of the Mississippi River and contain a diversity of habitats. There are over one-half million acres of developed agricultural lands, which include many small communities, rural residences, and businesses, along with over 1.1 million acres of environmentally sensitive lands, which could be impacted by any change in the operational policies of the TVA system.

**Response to Comment 3:** See Response to Comment 2.

4. In addition, we must be certain that any proposed change in the operational policies of the TVA system do not circumvent the authority of the Flood Control Act of 1944, which grants the USACE authority to direct the operation of Kentucky Reservoir during flood control operations on the lower Ohio and Mississippi Rivers.

**Response to Comment 4:** The Preferred Alternative does not include changes to the operating guidelines for Kentucky Reservoir.

5. The technical staff of the Mississippi Valley Division and the Mississippi River Commission are reviewing the draft Environmental Impact Statement and will provide technical comments to your agency through our sister Division, the Great Lakes and Ohio River Division, before the suspense date.

**Response to Comment 5:** Comment noted.

6. Our agencies have maintained an outstanding relationship during previous flood control activities, as well as other operations, and we will continue to work with you in the future to assure the continue success for the benefit of the nation.

**Response to Comment 6:** Comment noted.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **U.S. Army Corps of Engineers (Wilmington District) Comments**

August 11, 2003

Regulatory Division

Action ID 200331119

David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, Tennessee 37902

Dear Mr. Nye:

Reference your request for review and comment on the Draft Programmatic Environmental Impact Statement for the Tennessee Valley Authority's (TVA) Reservoir Operations Study dated June 2003. The following comments pertain to the portion of the system within the Wilmington District's regulatory jurisdiction in North Carolina, which includes Hiwassee, Chatuge, and Fontana Reservoirs.

The various alternatives discussed in the document differ on how much reservoir levels rise and fall, when changes in the reservoir levels occur, and the amount of water flowing through the reservoir system at various times of the year. None of the alternatives discussed indicate that construction activities within waters of the United States will occur. [1]

Any construction, which involves the discharge of dredged and/or fill material into waters of the United States, would require Department of the Army (DA) authorization pursuant to Section 404 of the Clean Water Act prior to the initiation of the project. Additionally, Fontana Reservoir is considered navigable and is subject to regulation pursuant to Section 10 of the Rivers and Harbors Act of 1899. Section 10 jurisdiction would regulate any work in, under, or over Fontana Reservoir. [2]

We appreciate the opportunity to comment on the Draft Environmental Impact Statement. If you have any questions, I may be contacted at either (828) 271-7980, extension 6, or by E-mail at [david.k.baker@usace.army.mil](mailto:david.k.baker@usace.army.mil). [3]

Sincerely,

David K. Baker  
Project Manager  
Asheville Regulatory Field Office

## Appendix F4 Response to Federal and State Agency Comments

### RESPONSE TO COMMENTS

1. The various alternatives discussed in the document differ on how much reservoir levels rise and fall, when changes in the reservoir levels occur, and the amount of water flowing through the reservoir system at various times of the year. None of the alternatives discussed indicate that construction activities within waters of the United States will occur.

**Response to Comment 1:** Comment noted.

2. Any construction, which involves the discharge of dredged and/or fill material into waters of the United States, would require Department of the Army (DA) authorization pursuant to Section 404 of the Clean Water Act prior to the initiation of the project. Additionally, Fontana Reservoir is considered navigable and is subject to regulation pursuant to Section 10 of the Rivers and Harbors Act of 1899. Section 10 jurisdiction would regulate any work in, under, or over Fontana Reservoir.

**Response to Comment 2:** Comment noted.

3. We appreciate the opportunity to comment on the Draft Environmental Impact Statement. If you have any questions, I may be contacted at either (828) 271-7980, extension 6, or by E-mail at [david.k.baker@usace.army.mil](mailto:david.k.baker@usace.army.mil).

**Response to Comment 3:** TVA and the Corps have a long history of cooperating, not only on the evaluation of proposed actions affecting our common interests, but also in the operation of our interconnected reservoir systems and waterbodies. TVA appreciates the Corps' willingness to participate in the ROS EIS as a cooperating agency.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **U.S. Department of Interior (Bureau of Indian Affairs, National Park Service, and U.S. Fish and Wildlife Service) Comments**



United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
Post Office Box 649  
Albuquerque, New Mexico 87103

September 3, 2003

ER 03/579

David Nye  
Reservoir Operations Study Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT 11A  
Knoxville, Tennessee 37902

Dear Mr. Nye:

The U.S. Department of the Interior (DOI) has reviewed the Draft Programmatic Environmental Impact Statement (DEIS) on the Reservoir Operations Study (ROS), Tennessee, Alabama, Kentucky, Georgia, Mississippi, North Carolina, and Virginia, 129 Counties. The U.S. Fish and Wildlife Service (FWS) of the DOI formally cooperated with the Tennessee Valley Authority (TVA) and the U.S. Army Corps of Engineers (Corps) in the preparation of the DEIS. The Bureau of Indian Affairs and National Park Service (NPS) of the DOI, along with FWS, served on a 17-member Interagency Team that helped guide the process. Many of the concerns of the DOI have been addressed as a result of this participation. [1] However, we are providing the following additional general and specific comments for your consideration as you prepare the final document.

#### **General Comments**

The DEIS, with the exception of Chapter 7, is concise and well written. [2] However, the programmatic approach utilized by TVA does not allow reviewers and decision makers to identify and analyze specific mitigation strategies. [3] Although we applaud TVA's effort in undertaking such an important evaluation of its current reservoir operations, we suggest that further, sub-basin-, reservoir-, and/or ecoregion-specific evaluations be undertaken in the near future to refine the level of resolution such that operations recommendations can be appropriately developed that account for regional resource complexities and peculiarities. A programmatic EIS should identify site- or region-specific data gaps and uncertainties. [4] Further study and public input should be used to make local decisions. [5] In our opinion, the uses of the waterway that are the most frequently supported by select segments of the public will have impacts and require mitigation; Chapter 7 does not provide us the level of information we believe will be necessary to provide reasoned and informed comments on the action alternatives. [6]

## **Appendix F4 Response to Federal and State Agency Comments**

The DOI strongly supports TVA's implicit commitment to maintaining the achievements in water quality and habitat improvements garnered to date in its implementation of the Lake Improvement Plan and Reservoir Release Improvement Plan. However, we believe these commitments should be incorporated into the Record of Decision for this process and expressly stated in the executive summary section of the final EIS and integrated within the selected preferred alternative. [7]

We recommend that TVA's stated purpose, to determine the changes in the reservoir operations policy, if any, that would produce "greater public value," be refined. The phrase is poorly defined and could easily be perceived as subjective (page 1-4, section 1:2) and lacking in a commitment to provide needed resources to mitigate identified needs. TVA should work with its planning partners to develop clear, dichotomous selection criteria to define and rank "public value." These selection and ranking criteria should be guided by TVA's mission, legal and regulatory constraints and opportunities, and public input received during scoping and subsequent processes. [8]

In large part, this concern focuses on the terms "public" and "value." The "public" that TVA is responsible to reflect a tremendous range of perspectives, opinions, and values. We recognize that "public" includes ratepayers, shoreline property owners, reservoir users, and other stakeholders and interested parties. "Public" includes individuals and organizations that have attended workshops and meetings, responded to telephone surveys, or otherwise participated in the planning process. "Public" includes the citizens of states impacted by the TVA system of impoundments, power generation and transmission facilities, and who are indirectly affected, whether they actively participate in the planning process or not. We recognize that "public" includes all Americans, from present and future generations. Finally, we recognize that "public" means government agencies with jurisdiction by law and expertise, and American Indian tribes, particularly the Cherokee, Chickasaw, Choctaw, Shawnee, and Creek tribes, which TVA must afford government-to-government rights. The TVA planning and decision-making process should not be biased by the sheer number of comments from small segments of the public, nor by the level of passion or personalities of individuals involved in the planning process. [9] It is incumbent on TVA to establish unambiguous, objective selection and ranking criteria, so that reviewers and decision makers can be assured of a transparent planning and decision-making process. Public value, as used in the DEIS, is unsuitable as a planning guideline or decision-making criterion. [10]

A refinement of the project purpose, and the development of selection criteria, should identify the methods that TVA proposes to use to resolve competing public values. The priorities generated in public workshops should contribute to the discussion of "greater public value." Those priorities (in order) are recreation, environmental protection, flood control, cheap power and clean water. The other alternatives analyzed in the DEIS do not necessarily reflect the priorities established by workshop participants for the public resources diverted by TVA. [11]

We recommend TVA expand the discussion to describe cost issues associated with alternatives and mitigation measures from various perspectives. The standard Federal government economic analysis may not be a useful tool for individuals who have been educated to externalize all costs except the fees they are directly responsible for paying. In our opinion, the DEIS would be a more valuable tool for such individuals if it explained the costs of each alternative and mitigation measure and how those costs would most likely be met. In our experience, some capital improvements could create new costs, which may be assumed by ratepayers and recreational or access facility users. Some alternatives and mitigation measures could reduce operational flexibility, or create episodic shortages of power, which might mean that replacement power costs would be accrued. [12] Reviewers and decision makers would benefit from a DEIS that is understandable to the range of perspectives and values associated with the "public." [13]

## **Appendix F4 Response to Federal and State Agency Comments**

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For example, page 4.4-2, “Regulatory Programs and TVA Management Activities” states that TVA has made the commitment to not reverse any improvements in dissolved oxygen concentrations (DO) resulting from previous improvement programs. Yet there is no discussion of the capital investments that would be required to keep the DO levels at an acceptable level. Page 1-4, section 1.2, only states that “changes to operations that require additional capital or operating expenditures would need to be funded by either TVA or others.” [14]

At a minimum, we suggest TVA at least analyze the two alternatives most favored by the workshop participants and survey respondents, specifically, to extend the summer pool levels and protect the environment. The analysis should determine if mitigation can achieve an acceptable DO while making those goals compatible. Furthermore, the mitigation analysis should explain funding mechanisms that would allow the two goals to be simultaneously implemented. Likewise, if the goals and the DO levels are not compatible, the analysis should document the tradeoffs (gains and losses) associated with the approach selected. [15]

Because the potential influence of economics is likely to weigh heavily in determining a preferred alternative, the ROS should be careful to note that classical economic theory, upon which TVA’s economic models are based, relies on two key assumptions that are violated within ecological systems. These are the principles of substitutability and reversibility. Given DOI’s (and presumably TVA’s) interests in protecting and managing resources for this and future generations, a thorough discussion of these assumptions and their relevance to the TVA ecosystem is essential.

Substitutability implies that when one resource is diminished, it can be replaced by another similar resource. In ecological systems such as rivers, this assumption potentially fails since individual species are often closely co-evolved with their environments allowing them to exist within a relatively narrow range of physical, chemical, and biological parameters. Switching to another resource is often not an option.

Similarly, reversibility in economic theory implies that economic trends caused by a particular decision can be reversed once the decision is reversed. In ecological systems, this assumption has a high likelihood of failure. For example, relatively minute changes in ecological community structure can have permanent effects that cascade the though the community and potentially the entire ecosystem. The classic example of this phenomenon is the extirpation of a keystone species. Once this critical ecological link is extirpated, the system can never recover to its pre-extirpation state. Exacerbating the situation, the loss of a keystone species can result of the loss of additional species and/or wholesale changes in ecological functions and services. [16]

We recommend the DEIS discussion of the underlying limnetic patterns and processes be enhanced with more obvious cross-references. The DEIS should provide reviewers and decision makers with a comprehensive discussion of biological, chemical, and physical patterns and processes, how they are influenced by specific operational regimes, and what mitigation options are available. We are particularly concerned that the discussion about dissolved oxygen concentrations and reservoir pool elevations, on page 2-25, section 2.3.6, and elsewhere, be understood by reviewers and decision makers. Section 4.4 has a good discussion of the impacts of residence time and stratification on dissolved oxygen. Section 5.4.3 and 5.7.2 have a good discussion of DO impacts due to alternatives. However, additional clarity on the meaning of the impacts and possible solutions to the impacts is needed. This specific issue is the best example of where the public needs a greater understanding of TVA’s priorities, limitations, and costs. DO is often the main limiting factor when considering extending the high summer pool levels desired by the public. [17]

## **Appendix F4 Response to Federal and State Agency Comments**

We recommend select information in the DEIS be cited as a range of values, including error terms, variance, and other sources of uncertainty. This is particularly relevant for those parameters that may significantly influence decision making, such as hydroelectric power generation capacity. Page 2-7 (Hydropower Generation Facilities), page 3-10 (Hydro Modernization Program), and other sections of text indicate that the Base Case for the alternative comparison uses upgraded electrical capacity values for the 21 turbine units that are still in the process of being upgraded to modern standards. We recognize the need to utilize some common metric as a standard for comparison but encourage TVA to inform reviewers and decision makers about the weaknesses inherent in the selected metrics. [18]

Actual or firm power generation values can only be obtained with in-place units. The subject 21 units are not yet modified, or "in situ." It is common for actual power values for any given generator to be below the rated power value, due to a myriad of circumstances. With a total of 109 units, the variation between actual firm and 21 in-situ power production for the 21 units could represent a significant underestimate of power generation in the DEIS. The uncertainty associated with using rated or projected power values could have a significant impact on the comparison of alternatives, especially when power production is a determining factor. Identifying the range of values, from rated through existing in situ at various efficiencies, would, in our opinion, provide a more transparent analysis than the strict use of rated power values. [19]

Neither section 4.18 nor 5.18 on Cultural Resources mentions whether any American Indian tribes were consulted. The subject TVA projects are located in an area where at least five federally recognized tribes have been or are located (Cherokee, Chickasaw, Choctaw, Shawnee, and Creek) and may attach aboriginal, religious, and cultural significance. Accordingly, pursuant to section 106 of the National Historic Preservation Act (NHPA), such tribes must be consulted about cultural resources affected by these projects, including consultations regarding the identification of cultural properties, the appropriate scope of the area of potential effects, and the development of any Historic Properties Management Plan. See, e.g., 36 C.F.R. 800.2(c)(2)(B)(ii). A list of potentially affected tribes is enclosed for your use as appropriate.

Regulations implementing the NHPA contemplate that Indian tribes be provided both a meaningful and early opportunity to participate in the section 106 planning process. The regulations further require that the agency make a reasonable and good faith effort to identify historic properties that may be affected by the undertaking and gather sufficient information to evaluate the eligibility of these properties for the National Register. See, e.g., 36 C.F.R. 800.4(b). Consultation with the State Historic Preservation Officer does not satisfy this requirement. [20]

We recommend the DEIS enhance discussions about the relationship between the need for low temperature cooling water for power plants and the impact on warm water species by releasing cold water from Fontana Dam; mitigation options should be discussed in detail. TVA acknowledges the impacts on aquatic resources by creating a dam system in section 4.7 and notes the need for cool water used for power plant cooling in section 4.23.5, but reviewers and decision makers would benefit from a more thorough discussion of underlying issues, alternatives and implications, and mitigation strategies. The cold water released from Fontana Dam is a major inhibiting factor in the existence of native fish populations in the Little Tennessee River and the reservoir system operated by the APGI Tapoco Project as well as the Tennessee River. Fontana Dam could have an inlet tower installed to select the water from anywhere in the water column and have much greater control of the temperature of the water released. However, the release of warmer water to support native fish conflicts with cooling water needs for power plants along the Tennessee River. [21]

## **Appendix F4 Response to Federal and State Agency Comments**

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Throughout the document, TVA interchangeably refers to existing conditions or the current reservoir operations as Base Case, no-policy alternative, or no-action alternative. For clarification, we recommend TVA utilize one description for this alternative. [22] Specific details related to operational policy changes that may be proposed at each of TVA's facilities are needed to fully assess the impacts of the individual alternatives. For all alternatives, site-specific spatial and temporal information concerning projected water elevations and releases for each reservoir and associated tailwater is also needed to fully evaluate potential impacts to existing resources. [23]

Based on analyses completed to date, most of the action alternatives would produce substantially higher minimum water elevations downstream from the mainstem dams. The recreation-based alternatives would also result in higher water elevations and delayed winter pool drawdowns in the tributary reservoirs. The Equalized Summer/Winter Flood Risk Alternative would produce minimum water elevations similar to the Base Case alternative. All of the other alternatives would yield higher minimum water levels. The Commercial Navigation Alternative would result in an increase in the winter flood guides of 2 feet on the mainstem reservoirs. Recent flood risk analyses have indicated that potential delayed winter pool drawdowns would result in a 33% increase in high water occurrences at 363' MSL, a 12% increase at 362' MSL, and a 17% increase at 361' MSL, in Kentucky Reservoir. A similar evaluation performed for Wheeler Reservoir indicated a 33% decrease at 559' MSL and a 17% increase at 558' MSL. As it becomes available, we would appreciate additional information regarding flood risk analyses performed in other mainstem pools utilized for navigation. [24]

In general terms, most alternatives would increase reservoir retention times, which would decrease dissolved oxygen (DO) and increase chlorophyll concentrations within the reservoirs. Low DO concentrations reduce the assimilative capacities in the reservoirs and result in near anoxic conditions in the hypolimnion. Other changes in water quality parameters would be expected in the reservoirs and associated tailwater releases. Since a preferred alternative is not known at this time, it is impossible to predict, with any degree of accuracy, specific expected changes in water quality within mainstem or tributary reservoirs or tailwater reaches. [25]

Water quality modeling to date indicates that most changes in currently observed (Base Case ) DO patterns would be minor, with the exception of the Tailwater Habitat Alternative. More water volume with average DO concentrations less than 2 mg/l would be expected. This potential change would be especially problematic downstream of Wilson Dam. Modeling also indicated potential changes in DO patterns within Kentucky and Chickamauga Reservoirs. Minor temporal changes in DO patterns (more hours with DO concentrations less than 2 mg/l) would be expected with implementation of Reservoir Recreation Alternative A downstream of Guntersville Dam and Reservoir Recreation Alternative B downstream of Pickwick Dam. All of the action alternatives would produce higher average water temperatures in the Hiwassee River.

Conversely, all of the action alternatives would produce substantially lower average temperatures below TVA facilities on the Holston River. [26]

The DEIS does not include a thorough discussion of potential changes to flow regimes and water quality downstream of Kentucky Dam. Due to the significance of the mussel and fishery resources downstream of Kentucky Dam, we believe a detailed analysis of the potential effects of the preferred alternative is warranted in the final EIS. The DEIS also does not include a thorough discussion of potential changes to flow regimes and water quality in Lake Barkley (Cumberland River). Due to the hydrological connection to Kentucky Reservoir, we believe this evaluation is warranted in the final EIS in order to evaluate potential effects to existing operations at Cross Creeks National Wildlife Refuge (NWR). [27]

## Appendix F4 Response to Federal and State Agency Comments

Given the vast degree of uncertainty associated with the influence of dam operations on river resources (e.g., native assemblages of aquatic species, economic resources), we strongly encourage TVA to establish an adaptive management process as an integral component of its operations. In a letter to TVA dated June 7, 2002, the NPS proposed the following adaptive management measures:

*Develop and apply an ongoing adaptive management approach to river operations that balances cultural, economic, and environmental resources uses and values.*

**Rationale:** Adaptive management of river operations entails making periodic incremental adjustments to operating procedures (e.g., release schedules, reservoir levels, instream flows, etc.) based on ongoing monitoring and analysis (Primack, R.B. 1998. *Essentials of Conservation Biology*, Second Edition. Sinauer Associates Publishers. Sunderland, MA.). The intent of adaptive management is to optimize the management capacity of TVA and all of its stakeholders. The application of adaptive management can increase the effectiveness of management decisions while thereby reducing associated long-term management costs (Johnson, B.L. 1999. *The role of adaptive management as an operational approach for resource management agencies*. *Conservation Ecology* 3(2): 8. [online] URL: <http://www.consecol.org/vol3/iss2/art8.>)

*Suggested components of an adaptive management alternative may include:*

- Establish a multi-stakeholder Adaptive River Operation Council (AROC): The AROC would consist of TVA personnel, representatives of associated agencies, technical experts from the social and natural environments, and other stakeholders such as watershed organizations, homeowner groups, and industrial interests. The goal of the AROC would be to host periodic meetings and workshops to design and evaluate monitoring and modeling efforts, detect resource trends, and suggest site-specific incremental operational changes to the TVA Board of Directors. For example, the AROC might meet annually to evaluate and assess trends of previously collected field data and new modeling results. In some cases, smaller working groups consisting of a subset of AROC members could develop recommended incremental alterations to propose to the broader council and ultimately the Board.
- Develop an Adaptive River Operation Monitoring Program. The AROMP would use ongoing TVA water quality and biological monitoring, and if needed, be broadened to incorporate system-wide resource objectives and public concerns. The AROMP might also entail computer modeling. [28]

Since the DEIS does not state a preferred alternative, the DOI suggests the notion of a blended alternative. A blended alternative should seek a balance in all public values (including those of future generations), but it should especially account for resource protection where the greatest amount of uncertainty and irreversible consequence reside. A blended alternative can best service the public value of this and future generations through long-term adaptive management and the ability to function on a site-specific basis. Alternatives Reservoir Recreation A and B along with Tailwater Recreation and Tailwater Habitat appear to collectively offer the greatest amount of public values as depicted by Table ES-01. An adaptive, long-term blending of these alternatives with site-specific flexibility is likely to produce a high degree of public value. [29]

### Specific Editorial Comments

Executive Summary, pages ES-13 to ES-20, and Table ES-02, Summary of Impacts by Policy Alternative: Without specific technical analyses for a preferred alternative or proposed policy change,

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these general representations should be qualified as projections that require further technical evaluation. To the average reader, a simplification of a diverse reservoir system can misrepresent realistic impacts that may occur within individual reservoirs. [30] The evaluation of wildlife under the terrestrial ecology category (Page ES-16) is too broad and does not recognize the potential for specific adverse effects to a variety of wildlife species. Specific groups of wildlife species (e.g., waterfowl, wading birds, reptiles, and amphibians) should be addressed separately. [31]

Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, pages 3-6 and 3-7: Reservoir Recreation Alternative A is grouped with the Base Case on this page, followed by the introduction of a column heading entitled “Policy Alternatives” on the next page (and all remaining pages of this table). This suggests that Reservoir Recreation Alternative A is not a policy alternative. [32]

Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Base Case, first bullet under column entitled “Reservoir Operating Guidelines:” For clarification and consistency, we suggest changing the wording from “and restrict drawdown during June and July” to AY and continue to restrict drawdown until August 1.” [33]

Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Reservoir Recreation Alternative A, third bullet under column entitled “Reservoir Operating Guidelines:” For clarification, we suggest changing the wording from “Begin unrestricted TR drawdown on Labor Day” to “Delay unrestricted TR drawdown to Labor Day.” [34]

Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Reservoir Recreation Alternative A, fifth bullet under column entitled “Reservoir Operating Guidelines:” Insert “winter” into the phrase “Raise MR flood guides.” [35]

Section 3.3.3, Alternatives Evaluated in Detail, Reservoir Recreation Alternative B, page 3-13, 4<sup>th</sup> full paragraph: It appears that both Reservoir Recreation Alternative B and A result in higher winter reservoir levels on tributary reservoirs, relative to the Base Case. Please clarify the discussion. [36]

Section 3.3, Alternatives Evaluated in Detail, pages 3-14 and throughout: Comparison statements throughout this section need to be more explicit: reduce/increase relative to Base Case, the Alternative previously discussed, or both? [37]

Section 3.3.8, Alternatives Evaluated in Detail, Tailwater Habitat Alternative, page 3-18, last two paragraphs: The last full paragraph on this page (beginning “Under the Tailwater Habitat Alternative”) states that this alternative will result in more variable flows, whereas the following paragraph (beginning with the subheading “Achievement and Objectives”) states that this alternative will increase stability in tailwater flows. These statements appear to contradict one another. [38]

Section 3.5.2, Reservoir Operations Policy Alternatives, Table 3.5-01: The “\$” symbol should be used consistently throughout the table to denote monetary figures (it is not used in the row entitled “Lowering the cost of transporting materials on the commercial waterway,” although the footnote indicates that the figures in each cell in this row are in millions of dollars). [39]

Section 3.5, Reservoir Operations Policy Alternatives, Aquatic Plants, Page 3-30, Table 3.5-02: We recommend that you include a footnote to this table in order to make it clear that this category includes an assessment of invasive aquatic plants. [40]

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Section 3.5, Reservoir Operations Policy Alternatives, Terrestrial Ecology, Page 3-31, Table 3.5-02: Note that impacts to Wildlife differ from Migratory Shorebirds and Plant Communities (these latter two resource areas are affected similarly by the proposed set of alternatives). Is this because the category “Plant Communities” is actually focused upon impacts to lowland or wetland, communities? If so, this should be clarified as a footnote to the table. [41]

Section 3.5, Reservoir Operations Policy Alternatives, Page 3-37, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: This section is unclear. The previous paragraph states that Reservoir Recreation Alternative B and the Tailwater Habitat Alternative would have the most adverse impact on water quality. It seems the intent of this sentence to state that these two alternatives (Reservoir Recreation Alternative A and the Tailwater Recreation Alternative) would impact water quality more on the mainstem (than the tributary) reservoirs but that these impacts would still be less than Reservoir Recreation Alternative B and/or the Tailwater Habitat Alternative. [42]

Section 3.5, Page 3-37, 2<sup>nd</sup> paragraph: Enhance the discussion of how the increased erosion anticipated under the Tailwater Habitat Alternative would affect aquatic organisms, including federally threatened and endangered species. [43]

Section 3.5, Page 3-37, 3<sup>rd</sup> paragraph, last sentence: We suggest that the discussion of Reservoir Recreation Alternative B be re-written for proper emphasis of the issue. Reservoir Recreation Alternative B would result in more adverse impacts than the other alternatives, largely due to extending the summer reservoir levels into late summer and early fall, which would inundate flats at times when these habitats are normally exposed and able to provide important habitat to migratory waterfowl and shorebirds. [44]

Section 4.7, Aquatic Resources, throughout: A more detailed evaluation of potential changes in available spawning and nursery habitat as a result of implementation of the various alternatives is needed. The relationship between various wetland vegetative types, their position in the landscape, and aquatic species productivity is not discussed adequately. [45]

Section 4.8, Wetlands, throughout: Typographical error: “THE TVA” should be changed to AThe TVA.” [46]

Section 4.8, Wetlands, page 4.8-6, Table 4.8-02: The invested agency for the Swan Creek Dewatering Unit should be the Alabama Department of Conservation and Natural Resources. [47]

Section 4.8, Wetlands, page 4.8-12, 1<sup>st</sup> paragraph, last sentence: Hyperlink error: The location of the report referenced by the first hyperlink in the series (<http://ncseonline.org>Y.) appears to have changed; typing in this full link produces an error message that the page cannot be found. [48]

Section 4.8, Wetlands, page 4.8-13, 2<sup>nd</sup> paragraph, last sentence: Hyperlink error: The location of the report referenced by the first hyperlink in the series (<http://hydra.gsa.gov>Y.) also appears to have changed; typing in this link produces a “re-direct” message indicating that the information is now found within the [www.gsa.gov](http://www.gsa.gov) website. [49]

Section 4.8, Wetlands, page 4.8-13, last paragraph, last few sentences: The statements describing the unique biological resources associated with wetland habitats directly parallel the content of Sections 4.10 (Terrestrial Ecology), Section 4.7 (Aquatic Resources), and 4.13 (Threatened and Endangered Species). The interdependency of these resources should be emphasized via a reference to these sections. In particular, globally imperiled wetland plant communities known or with potential to occur within the study area are listed in Section 4.10, Table 4.10-01 (page 4.10-3). [50]

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Section 4.9, Aquatic Plants, page 4.9-2, Table 4.9-01: For consistency, the taxonomic authority should either be given for all or none of the species listed. [51]

Section 4.9, Aquatic Plants, page 4.9-3, last paragraph: We do not dispute that natural environmental variation (in weather, water flow, nutrient cycling, light availability) “tend(s) to surpass the effect of reservoir operational activities.” However, as worded, this paragraph in the DEIS implies that changes in reservoir operations would be expected to produce little change in the coverage of aquatic plant species relative to these more natural (i.e., unpredictable) sources of environmental variation. However, some of the proposed alternatives may, through direct manipulation of water levels, also indirectly generate the very conditions that have been observed to affect the coverage of these species (as described in this paragraph B i.e., “higher stream flows, high turbidity, cold water temperatures”), especially in the tailwater regions. [52]

Section 4.10.5, Terrestrial Ecology, page 4.10-9, 1<sup>st</sup> paragraph: It is stated that “potential changes in bottomland hardwood forest, scrub-shrub wetlands, emergent wetlands, aquatic vegetation, flats, and other communities potentially affected by reservoir levels could affect terrestrial wildlife populations.” The word “could” should be replaced with “would.” When changes as significant as those addressed in this document are implemented, certain wildlife populations (e.g., shorebirds and waterfowl) will be significantly impacted. [53]

Section 4.10.5, Terrestrial Ecology, page 4.10-9, 4<sup>th</sup> paragraph: It is stated that “flats, isolated pools, and shallow water are created by current drawdown regimes in early August.” This is correct for many reservoirs but not all. The drawdown on Kentucky and Barkley Reservoirs starts in early July. This date is significant as it provides adequate shorebird habitat during the peak migration period to provide habitat for early migrating waterfowl (e.g., blue-winged teal) and to produce the annual plants (forage) needed by wintering waterfowl. [54]

Section 4.10, Terrestrial Ecology, page 4.10-6, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: “Tables 4.10-01 and 4.10-02 present the names, global ranks, and distribution of the imperiled lowland communities.” In this sentence “lowland” should be changed to “wetland,” since the term “lowland” (as being applied in the DEIS) encompasses more community types than would be expected in NatureServe’s subset of “wetland” communities (from which this table was created). [55]

Section 4.10, Terrestrial Ecology, page 4.10-8, 2<sup>nd</sup> and last paragraphs: The discussion of “Future Trends” under Upland Plant Communities (last paragraph) also applies to the anticipated Future Trends for Lowland Plant Communities (2<sup>nd</sup> paragraph). [56]

Section 4.11, Invasive Terrestrial and Aquatic Animals and Terrestrial Plants, throughout: The information provided in the DEIS is not of sufficient detail for evaluation of the rationale for focusing upon those species of invasive terrestrial animals and plants specifically named in the discussion. The discussion in the DEIS should clarify whether or not those species mentioned are those which pose the greatest threat throughout the Tennessee Valley or are specifically those that pose the greatest risk with respect to changes in reservoir operation policies. [57]

Section 4.13, Threatened and Endangered Species, page 4.13-1, 3<sup>rd</sup> paragraph: The phrase “reservoir-like reservoirs” appears to contain a typographical error. [58]

Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-9, Table 4.14-02: Swan Creek Wildlife Management Area (WMA) and Mallard-Fox Creek WMA should be identified as managed areas and/or ecologically significant sites within Wheeler Reservoir. [59]

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Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-16, 1<sup>st</sup> paragraph: The Alabama cavefish is not located on Wheeler NWR. It is endemic to Key Cave NWR. Key Cave NWR is managed by Wheeler NWR staff. The correct scientific name for the species is *Speoplatyrhinus poulsoni*. [60]

Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-16: Significant stands of water tupelo (*Nyssa aquatica*) forested wetlands occur within Wheeler Reservoir on Wheeler NWR. The Beaverdam Creek Swamp National Natural Landmark in Limestone County, Alabama, contains approximately 530 acres of water tupelo. Approximately 20% of the area is permanently flooded and contains a mature, pure stand of water tupelo. The remainder of the area is intermittently flooded and is dominated by water tupelo and black gum (*Nyssa sylvatica*).

Pure tupelo swamps of this size and integrity are quite rare and its significance led to its designation as a National Natural Landmark. This information should also be included and referenced in Appendix D5, page D5-5. [61]

Section 4.17, Prime Farmland, Table 4.17-03: Footnote No. 2 should be Natural Resources Conservation Service. [62]

Section 5.8.5, Wetlands, page 5.8-5, 3<sup>rd</sup> paragraph: Under a discussion of Reservoir Recreation Alternative B and the Tailwater Recreation Alternative, it is stated that “the increase in winter pool elevations could interfere with wetlands with controlled water levels on Kentucky, Wheeler, and Douglas Reservoirs.” This sentence stands alone without any additional qualification. We recommend that the following specific information be included in this discussion: 1) a list of managed wetlands potentially impacted (e.g., Camden and Barkley WMAs, Tennessee NWR, Wheeler NWR); 2) the potential increased impacts of flooding, such as the increased cost to upgrade and repair infrastructure and the additional threats to wildlife habitat (e.g., agricultural crop production, bottomland hardwoods, moist-soil management units); and 3) the potential impacts to public recreation activities (i.e., hunting, fishing, bird watching) that occur on these areas. [63]

Section 5.8.8, Wetlands, page 5.8-8, 2<sup>nd</sup> paragraph: Under a discussion of the Commercial Navigation Alternative, the potential for a loss of flats due to the rise in the minimum winter pool level of mainstem reservoirs is not included. The mudflat wetland habitat type is extremely important to waterfowl, bald and golden eagles, gulls, terns, and many other species of migratory birds. The DOI does not concur with the conclusion that there will be overall positive effects on mainstem reservoirs. [64]

Section 5.10.4, Terrestrial Ecology, page 5.10-3, 1<sup>st</sup> paragraph: Under a discussion of the Commercial Navigation Alternative, it is stated that “the area inundated by water would increase, potentially creating additional shallow-water foraging habitat for waterfowl and wading birds.” Why would an equal amount of shallow-water habitat not be available under the Base Case Alternative? The shallow-water area should be essentially equal but at a lower elevation. The result of raising the winter pool is not a gain in shallow-water habitat. It is a loss of mudflat habitat. [65]

Section 5.10.6, Terrestrial Ecology, page 5.10-5, 3<sup>rd</sup> paragraph: Under a discussion of wildlife communities, it is stated that “although flats would not be available to most shorebirds migrating during late summer or early fall, extended high water levels could benefit early-migrating waterfowl such as blue-winged teal and wood ducks.” We recommend that blue-winged teal (*Anas discors*) be removed from this sentence. Mudflats are a preferred habitat for blue-winged teal, where they forage on seeds of various grasses and sedges. It is unlikely that they will utilize the woody habitats that are flooded during summer pool. [66]

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Section 5.10.8, Terrestrial Ecology, page 5.10-6, 6<sup>th</sup> paragraph: Under a discussion of the Summary of Impacts, it is stated that “except for the Summer Hydropower Alternative, changes in operations under all policy alternatives would result in limited effects on most waterfowl, semi-aquatic mammals, and non-game wildlife, as they would adapt to changing conditions.” This statement is repeated in other subsections of the Terrestrial Ecology Section. While we agree this statement is generally true, how they adapt may not be desirable to resource managers and the public. It has been determined from data collected during waterfowl surveys conducted on Tennessee NWR over the last 7 years that over 50% of the waterfowl use on the refuge occurs on the reservoir. The resultant adaptations may include reduced localized populations of both migratory and resident wildlife. Waterfowl and other migratory birds may adapt to a significant habitat change by migrating to other areas or utilizing undesirable habitat(s). The overall loss of mudflats will result in a lower local carrying capacity for waterfowl. It is also stated that “due to the anticipated decrease in flats habitat, shorebirds would be adversely affected during fall migration periods under these alternatives.” We recommend that waterfowl also be added to this sentence. [67]

Section 5.13, Threatened and Endangered Species, throughout: The level of discussion provided in the DEIS makes it difficult to identify and compare anticipated impacts to specific species of protected plants or animals, or populations of these species, within and among the various policy alternatives proposed. While a site-specific analysis may be beyond the scope of this broad overview of the entire set of proposed alternatives, we expect that it will be presented for the preferred alternative in the final EIS. For example, the potential for adverse affects to the green pitcher plant (*Sarracenia oreophila*) has been identified under the Summer Hydropower Alternative, but from the discussion, it is not possible to determine whether TVA anticipates similar affects to this species under the other alternatives proposed. Further, although adverse impacts to this species are identified under that alternative, the magnitude of these impacts is unclear. The discussion should address whether individual plants, an entire population, or the entire species be adversely impacted by this alternative. [68]

Section 5.13.2, Threatened and Endangered Species, pages 5.13-11 to 5.13-12, 5<sup>th</sup> paragraph: It is stated that “bald eagles and gray bats could be benefitted by Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Commercial Navigation Alternative, the Tailwater Recreation Alternative, and the Tailwater Habitat Alternative to the extent that each alternative would increase the size of reservoir pools and increase the numbers of food items (mostly fish and waterfowl for the eagles and adult aquatic insects for gray bats).” Eagles are commonly observed on the flats feeding on stranded fish and dead waterfowl. This suggests that the mudflats may be an important habitat component of the bald eagle (*Haliaeetus leucocephalus*) in the ROS area. We also question TVA’s conclusion that raising the pool levels during the fall and winter will increase waterfowl numbers. In fact, we believe that increasing pool levels in fall and winter would likely have the opposite effect. Any increase in the production of adult aquatic insects would likely be minor. Potential adverse effects, however slight, to the gray bats’ foraging habitats do not appear to have been considered. [69]

Section 5.13.2, Threatened and Endangered Species, page 5.13-12, 3<sup>rd</sup> paragraph: The evaluation of potential impacts to the federally endangered least tern (*Sterna antillarum*) should not be limited to nesting habitat. Least terns have been observed resting and feeding on flats on Kentucky Reservoir during fall migration. [70]

Section 5.22.2, Flood Control, page 5.22-1, 3<sup>rd</sup> paragraph: It is stated that “the analysis for flood risk did not consider areas downstream of Savannah, Tennessee.” We recommend that other areas on Kentucky and Barkley Reservoirs be included in the flood risk analysis. Although we appreciate receiving additional limited information regarding potential flood risk on Tennessee NWR and Wheeler NWR since the publication of the DEIS, we believe additional evaluations are warranted for Cross Creeks NWR

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(Barkley Reservoir) and the numerous State WMA's throughout the Tennessee Valley. Additional evaluations of Tennessee NWR and Wheeler NWR would also appear to be warranted. [71]

Section 6.2.7, Cumulative Impacts, page 6-5, 3<sup>rd</sup> paragraph: It is stated that "these changes may have the potential to cause some adverse impacts on federally listed threatened and endangered species; however, the level of impact would be small and not significant enough to jeopardize the continued existence of these species." Under the Base Case alternative, populations of certain federally listed species will likely continue to decline in numbers and health. There are certain species listed as endangered (e.g., turgid blossom pearl mussel) that are likely extinct; no observations have been reported since the early 1900's. We believe TVA's conclusion regarding cumulative impacts to federally endangered and threatened species is premature and without factual foundation since no preferred alternative has been selected or analyzed in detail. We recommend analysis. Appropriate conclusions and supporting analysis should be submitted in a clearly labeled biological assessment (BA) concurrent with the final EIS. [72]

Table D1-01: Typographical error. It is Fort Loudoun, but the location is Loudon County not Loudoun County. [73]

### **Specific Resource Category Comments**

#### **Endangered Species**

We recommend that you clearly address how the alternatives consider the requirements of section 7(a)(1) and 7(a)(2) of the Endangered Species Act (ESA). These parts of section 7 of the ESA include the requirement to evaluate the potential for jeopardy, as well as the mandate that federal agencies further the conservation of federally listed species. We are generally concerned with the management of water releases from specific reservoirs, the impact of hypolimnetic discharges on federally listed mussel and fish species, and the impact of scouring on tailwater habitats. These issues are especially problematic below Kentucky, Wilson, Douglas, Cherokee, Fontana, and Tims Ford Reservoirs. While we appreciate the proposed mitigation of the current minimum flow regime in the Appalachia cut-off, we do not believe that this mitigation proposal should be limited to all alternatives except the Base Case. We would expect TVA to pursue those potential improvements regardless of a preferred alternative for the ROS. [74]

We anticipate a detailed BA as part of the final EIS which will evaluate the effects of the preferred alternative and the Base Case. The BA should include a complete description of the selected alternative, the effects of those actions associated with the ROS, and a determination of effect to listed species at a site-specific level. We have appreciated the ongoing dialogue with

TVA staff regarding the approach to the preparation of the BA, as well as our preferred approach in preparing the required biological opinion. [75]

#### **Migratory Birds on Tennessee NWR, Cross Creeks NWR, and Wheeler NWR**

Tennessee NWR and Wheeler NWR are designated Globally Important Bird Areas and could be significantly affected by several of the identified alternatives. The Tennessee NWR bird checklist shows 10 waders and bitterns and over 30 shorebirds that could be affected by a change in habitat availability (<http://tennesseerefuge.fws.gov/tnbirds.pdf>). Undoubtedly, other

changes will occur elsewhere in the Tennessee Valley as well, yet these effects are poorly understood. The cumulative effects of proposed changes in the pool levels of various reservoirs on bird usage, primarily roosting and foraging, are unknown and will be extremely difficult to ascertain.

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During fall migration, thousands of shorebirds utilize the mudflats on Kentucky, Barkley, and Wheeler Reservoirs. The average peak fall migration of shorebirds is around mid-August. Typically, during this period of the year, shorebird habitat is extremely limited due to dry conditions and dense vegetation that has developed through the summer adjacent to the reservoirs and other impounded waters. For this reason, the fall drawdown of Kentucky and Barkley Reservoirs is extremely important. Since most shorebird species prefer habitats that are open and away from dense cover, the water level needs to be low enough to expose flats that are not covered by woody vegetation. On Kentucky and Barkley Reservoirs, the elevation of summer pool is 359' MSL and woody vegetation typically extends down to elevation 357.5' MSL. For adequate mudflat habitat to be available, the pool elevation needs to be around 356.5' MSL. Under the existing operation schedules for these reservoirs, this level is usually reached during mid to late August.

Blue-winged teal are the first migrating waterfowl to arrive. The Tennessee Valley is along one of two major migration corridors for this species. This migration route extends from Manitoba to Florida. They first arrive during early August, with the peak period of migration occurring around mid-September. Like shorebirds, blue-winged teal heavily utilize the mudflats on the reservoirs for feeding and loafing. They commonly feed on the seeds of sedges, grasses, and smartweed that were deposited on the flats in previous years, as well as on insects and mollusks that may be present. During the migration period, it is important for extensive mudflats with an abundant source of food to be present on Kentucky, Barkley, and Wheeler Reservoirs. The existing management of these reservoirs provides excellent habitat at the appropriate time of the year for blue-winged teal to utilize during migration. The drawdown also coincides with a special early duck season that provides recreational opportunities to a large number of hunters, many of which hunt on the mudflats of the reservoirs.

Traditionally, migrant Canada geese (*Branta canadensis*) from the Southern James Bay Population (SJB) would winter in large numbers within the Tennessee Valley. The December populations of SJB geese in Tennessee prior to 1990 averaged over 40,000. The portion of the population that migrates into the Tennessee Valley has sharply declined to a present December

average of less than 10,000 SJB geese in Tennessee. Even though the overall population level of the SJB has stabilized, the decline in the numbers that migrate to the Tennessee Valley continues. Migrant geese first arrive on Tennessee NWR around September 20, and generally will remain within the vicinity of the Refuge until late winter. At this time of year, typically the only habitat available are the flats associated with the reservoir. Geese browse the new growth of annual grasses and sedges that occur on these flats. The existing fall drawdown schedule for Kentucky, Barkley, and Wheeler Reservoirs provides mudflat habitat for these early migrants.

Several of the ROS alternatives would result in a significant loss of mudflat habitat on Kentucky, Barkley and Wheeler Reservoirs. Delays in the fall drawdown would eliminate or significantly reduce the quantity and quality of mudflat habitat available on these reservoirs to shorebirds and early migrating waterfowl.

Reservoir Recreation Alternative A will extend the summer elevation through August 1 with only a 1-foot drop by September 1. Specific drawdown dates are not determined for the Tailwater Habitat Alternative, but the DEIS specifically mentions that the impacts on flats under this alternative would be similar to those of the Reservoir Recreation Alternative A. These two alternatives will likely result in a complete loss of mudflat habitat during the peak shorebird fall migration. The description of these alternatives in the DEIS does not provide elevation information beyond September 1. Without a projected water elevation for mid-September when the peak blue-winged teal migration occurs and SJB of Canada geese

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first arrive, the quantity of habitat that will be available is unknown. However, we expect the quality to be degraded due to the delay in germination of annual plants on the flats.

Reservoir Recreation Alternative B, the Equalized Summer/Winter Flood Risk Alternative, and the Tailwater Recreation Alternative extend the summer elevation of Kentucky and Barkley Reservoirs through September 1. We anticipate these alternatives would result in a complete loss of desirable mudflat habitat during most of the fall shorebird and blue-winged teal migration period. Habitat for SJBP geese will be extremely limited and the quality will be degraded due to the delay in germination of annual plants on the flats.

The anticipated impacts of the alternatives that delay the fall drawdown are 1) a complete loss of fall mudflat habitat for the majority of shorebirds that migrate through the area; 2) a significant-to-complete loss of fall mudflat habitat for blue-winged teal; and 3) a significant loss or degradation of fall mudflat habitat for early migrating SJBP of Canada geese. Local population declines of shorebirds, blue-winged teal, and SJBP geese that migrate into the area are expected if the fall drawdown of Kentucky, Barkley, and Wheeler Reservoirs is delayed.

Approximately 300,000 ducks and geese, 100 bald eagles, and tens-of-thousands of other wetland-dependent migratory birds typically occur on Tennessee and Cross Creeks National Wildlife Refuges during the peak wintering period. It has been determined from our data collected during waterfowl surveys over the past 7 years that 56% of the duck use and 48% of the goose use on Tennessee NWR occurs on Kentucky Reservoir as compared to the use that occurs in our intensively managed waterfowl impoundments. Under the current reservoir operation policy, the winter pool elevation of Kentucky and Barkley Reservoirs is 354' MSL. This level fluctuates throughout the winter depending upon several factors but is largely influenced by rainfall. During most of the winter, extensive mudflats with important food resources are available for migratory birds.

Large numbers of waterfowl concentrate on the flats of the refuges to rest and feed. Canada geese and wigeon (*Anas americana*) browse on the annual plants that germinate each year during the late summer and fall drawdown period. Mudflats are the preferred habitat for green-winged teal (*Anas crecca*) within this area. When large expanses of flats are present, the majority of teal on the refuges will occur within this habitat. Greenwings forage on the seeds of annual plants that have been deposited on the flats in previous years, as well as insects and mollusks.

Bald eagles are regularly observed on the flats of Tennessee NWR and Wheeler NWR scavenging the carcasses of fish and waterfowl. As the drawdown occurs, fish occasionally get trapped in shallow waters and become an easy source of food for eagles. Gulls, terns, and wading birds utilize the flats of the reservoirs in large numbers throughout the drawdown and winter pool periods. The flats are primarily used for resting areas and are typically adjacent to shallow-water feeding sites.

We anticipate the alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) would significantly impact the amount and quality of forage produced by annual plants that germinate on the flats. Canada geese, wigeon, and green-winged teal are the waterfowl species that likely will be impacted the most because they are more dependant upon the vegetation grown on the flats.

The Commercial Navigation Alternative raises the minimum winter pool level 2 feet, from elevation 354' MSL to 356' MSL. This increase would permanently eliminate a large portion of the flats that occur on the refuge. The vast mudflats and shallow water areas that occur near the mouth of the Duck River on

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Tennessee NWR frequently support in excess of 50,000 ducks and geese. We expect that much of this important habitat would be flooded too deep for puddle ducks if winter pool levels are raised 2 feet. Under this alternative, the overall loss of winter mudflats would have significant negative impacts on several waterfowl species, primarily geese and puddle ducks. Bald eagles, gulls, terns, and wading birds would also suffer a significant loss in habitat. [76]

### **Migratory Birds in the Remainder of the Tennessee Valley**

We are concerned about the potential for impacts to migratory birds by several of the alternatives described in the DEIS. Our primary concern is that all of the identified alternatives, except the “no action” alternative, would produce adverse impacts to habitats used by migrating shorebirds, especially foraging habitat areas of wading birds. This discussion and our recommendations are based on the premise that dam removal and river restoration are outside the scope of this study. Our comments and concerns would differ if this premise is inaccurate.

If an alternative other than the Base Case (no action) is selected and implemented, pool levels would be significantly altered during the peak shorebird migration period. Depending on precipitation and other factors, pool levels would be low, but most times too high to provide the kind of habitat available for them in most normal years. Either way, changes in current TVA operations policy would greatly reduce or potentially eliminate this habitat type for migrating shorebirds, as well as for resident and migrant waders that utilize these areas for foraging and roosting/resting. This is a significant change in the current operation and represents an unquantified impact on the birds that use these resources at this time of year. Reduction in

habitat availability in the Tennessee Valley would require the birds currently utilizing this resource to locate and exploit a resource base in other areas. Little of the type and quality of this habitat exists in the region. This is especially true for the eastern part of the Tennessee Valley where limited suitable alternative habitat is available at this time of year (Chuck Nicholson, TVA, personal communication). Until baseline information is obtained, an unknown and perhaps unmitigable effect would be produced. Therefore, before any action other than the Base Case is considered for implementation, specific spatial and temporal information is needed for evaluation.

Unfortunately, we do not have comprehensive survey information for shorebirds across the TVA reservoir system. We do, however, know of several “hot-spots” such as Musick Campground on South Holston Reservoir, Rankin Bottoms on Douglas Reservoir, Savannah Bay on Chickamauga Reservoir, and Pace Point and Britton Ford areas on Kentucky Reservoir (which are within Tennessee NWR). In the past, notable numbers of shorebirds have also been reported from other sites such as the Town Creek area on Wilson Reservoir and the Swan Creek area on Wheeler Reservoir. These areas support from dozens to thousands of shorebirds during late summer-early fall during years of “normal” rainfall and reservoir operation. Typically, the lakes are being slowly drawn down during this time, providing expanses of moist mudflats coincident with the peak fall shorebird migration. Common species include killdeer (*Charadrius vociferus*), semipalmated plovers (*Charadrius semipalmatus*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), solitary sandpipers (*Tringa solitaria*), spotted sandpipers (*Actitis macularia*), pectoral sandpipers (*Calidris melanotos*), short-billed dowitchers (*Limnodromus griseus*), long-billed dowitchers (*Limnodromus scolopaceus*), least sandpipers (*Calidris minutilla*), Western sandpipers (*Calidris mauri*), and semipalmated sandpipers (*Calidris pusilla*). Other regularly occurring but less numerous species include black-bellied plovers (*Pluvialis squatarola*), stilt sandpipers (*Micropalama himantopus*), ruddy turnstones (*Arenaria interpres*), and other peeps. An occasional godwit and phalarope may also be encountered. Many of these areas also support large

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numbers of herons and egrets during late summer. Great blue herons (*Ardea herodias*) and great egrets (*Casmerodius albus*) are most numerous, and total counts are frequently in the hundreds.

There are significant data gaps that have not been addressed in the DEIS that need attention before informed decision-making and selection of an appropriate alternative can be completed. With regard to migratory birds and resident birds that use specific habitat areas for foraging and roosting, changes in habitat availability and quality will strongly correlate with changes in bird behavior, migration, foraging, resting, and energy expense during passage through and use of these habitats in the Tennessee Valley. We recommend that TVA address the following issues and information gaps before selection of a preferred alternative:

1. All known data on species occurrence, numbers, and current usage of late-season habitats should be compiled in lieu of comprehensive surveys for shorebird and wading bird use over the entire project area. Such a comprehensive picture of late-season habitats would allow for the evaluation of the overall impact of the various alternatives relative to the availability of other potential sites which would not be affected by changes in reservoir operations policy. This synthesis of information would provide a better means to understand the impact of the various alternatives on migratory birds.
2. Assess the theoretical potential for reservoir habitat loss and shorebird use with each alternative by modeling (Geographic Information System) effects of pool levels on habitat loss during the seasons most heavily utilized by shorebirds and waders, throughout the region.
3. Assess the potential to mitigate effects of potential loss of habitat through:
  - a. Creation of other suitable habitats.
  - b. Purchase of other suitable habitats.
  - c. Purchase and conversion of unsuitable habitat to suitable habitat (assuming the purchase isn't a high priority habitat for other valuable wildlife resources).
4. Evaluate the potential to avoid impact to certain high quality areas (e.g., Rankin Bottoms), and nominate these areas as Important Bird Areas.
5. Develop research programs to determine utilization of areas and impact of habitat loss to shorebird energetics during migration.
6. Develop a mitigation plan for loss of habitats. [77]

### **National Wildlife Refuge Infrastructure and Existing Habitat**

There are over 10,000 acres of managed waters within dozens of impoundments on Tennessee NWR, Cross Creeks NWR, and Wheeler NWR. Management emphasis in these impoundments is primarily focused on waterfowl, but many other wildlife species benefit from this valuable wetland habitat. During early spring, prior to the reservoirs being raised to summer pool, the water level in most of these impoundments is lowered to produce various foods for waterfowl. A variety of habitats is provided in these impoundments, including agricultural crops, moist soil vegetation, and forested wetlands. Many of the impoundments are situated at a low elevation and do not have mechanical pumping capabilities. On these impoundments the water has to be removed when the reservoir is at winter pool. Even some of the

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impoundments with pumping capabilities are managed by gravity drawdown to reduce costs associated with their management.

The Commercial Navigation Alternative would raise the winter pool level 2 feet from elevation 354' MSL to 356' MSL on Kentucky Reservoir and from 554' MSL to 556' MSL on Wheeler Reservoir. This increase would greatly reduce the acreage that can be managed on all three refuges, especially on Cross Creeks NWR. Tennessee NWR and Wheeler NWR have pumping capabilities within several impoundments, but with an increase in the reservoir winter pool elevation, pumping costs would increase substantially or managed habitat acreage would be substantially reduced.

All of the managed impoundments on these refuges are subject to flooding. Spring floods are common and occur in most years. Management strategies on the refuges have adapted to this situation, and good quality waterfowl habitat is produced in spite of spring flooding. Early summer floods (June) are less common and do have adverse impacts on the quality and quantity of waterfowl habitats, especially the agricultural crops. Late summer and fall floods are very rare, but when they occur the impacts on these habitats generally result in a total loss of food production for the year. Winter floods are uncommon and usually only occur after January. The impacts from winter flooding to waterfowl foods have been limited in the past, but an early winter flood could cause most of the habitats to be unavailable to waterfowl due to the water depth. Floods in any season would cause significant damage to refuge infrastructure (e.g., levees, water control structures, roads, etc.).

All of the alternatives addressed in the DEIS would increase the risk and potential impacts of flooding on Tennessee NWR, Cross Creeks NWR, and Wheeler NWR above that of the Base Case. Depending on the preferred alternative and precipitation patterns in the Tennessee Valley, flooding risks may also be substantially increased on Wheeler NWR. To varying degrees and during different seasons of the year, each alternative would reduce flood storage within the Tennessee Valley System. Insufficient information is provided in the DEIS to determine the significance of the increased flood risk. When a preferred alternative is selected (if other than the Base Case), a detailed analysis of the flood risk for each refuge should be conducted so that an adequate assessment of the impacts can be made.

The scrub/shrub and forested wetlands that ring Kentucky, Barkley, and Wheeler Reservoirs provide important habitats for many species of fish, mammals, amphibians, reptiles, birds, and insects. These wetlands vary from narrow bands along the shoreline to extensive forests within the creek bottoms. From May to July, several thousands of acres of buttonbush (*Cephalanthus occidentalis*) and willow (*Salix* spp.) thickets are shallowly flooded while the reservoirs are at summer pool. Outside the summer pool period, primarily during the winter and spring, these wooded wetlands periodically flood during heavy rainfall events.

When the scrub/shrub and forested wetlands are flooded, waterfowl use these habitats extensively. Wood ducks require dense cover as brood habitat. The willow-buttonbush thickets provide an excellent overhead cover and at the same time are open enough at the water surface to allow the wood duck broods to move easily and feed on the numerous invertebrates that are present. These woody wetland thickets also provide valuable spawning and nursery habitat for a variety of fish and invertebrate species. During the winter and early spring when these habitats flood, mallards (*Anas platyrhynchos*), black ducks (*Anas rubripes*), and wood ducks move into these newly flooded areas to take advantage of a wide variety of food resources.

Many other species of birds utilize this riparian zone for nesting, foraging, and migration stopover habitat. Heron rookeries occur on islands and in bald cypress (*Taxodium distichum*) sloughs in several locations on Tennessee and Wheeler NWRs. The prothonotary warbler (*Protonotaria citrea*), a Partners In Flight

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(PIF) priority species within the Central Hardwoods and East Gulf Coastal Plains Bird Conservation Regions, is a relatively common breeding bird within the riparian zones of Kentucky, Barkley, and Wheeler Reservoirs. This warbler is limited to bottomland habitats and nests in cavities that are located over or very close to water.

The alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) are expected to have significant negative impacts on the scrub/shrub and forested wetlands along Kentucky, Barkley, and Wheeler Reservoirs. Depending on the preferred alternative and precipitation patterns within the Tennessee Valley, these impacts may also be expected to occur on Wheeler Reservoir. Extending the duration that these habitats are inundated during the growing season would dramatically shrink the willow-buttonbush, water tupelo, and bald-cypress plant communities and alter the plant composition of the bottomland hardwoods. The loss of the woody vegetation that is currently inundated at summer pool would negatively impact aquatic organism productivity. We anticipate that the productivity of the local wood duck populations and the quantity and quality of this wintering waterfowl habitat would also be reduced. We expect that the woody plant communities in this zone would be replaced by emergent aquatic plants that would not provide suitable spawning and nursery habitat, wood duck brood cover, or foraging areas for wintering waterfowl. In many cases, these emergent aquatic plant communities may be dominated by invasive exotic species such as alligatorweed (*Achyranthes philoxeroides*) and *Phragmites*.

Shoreline erosion is a major problem along Kentucky, Barkley, and Wheeler Reservoirs. The results are a loss of riparian and upland habitats and decreased water quality. Shoreline stabilization has become a high priority for Tennessee, Cross Creeks, and Wheeler NWRs to protect upland habitats and important archeological sites and to stabilize river islands. We are currently partnering with TVA to stabilize several sites on Tennessee NWR and anticipate this project to continue indefinitely. Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Tailwater Habitat Alternative, and Tailwater Recreation Alternative are listed in the DEIS as having the potential to accelerate the rate of shoreline erosion. [78]

### Units of the National Park System

The DOI, through the NPS, is mandated by Congress to oversee issues relating to our national parks, particularly "...to conserve the scenery and the natural and historic objects and the wildlife therein, and provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of this and future generations..." (National Park Service Organic Act of 1916). Several units of the National Park System, including Great Smoky Mountain National Park (GRSM), Chickamauga-Chattanooga National Military Park, Shiloh National Military Park, Natchez Trace Parkway, and the Trail of Tears National Historic Trail are, or could be, affected by TVA's reservoir operations. For example, GRSM continues to be negatively affected by airborne emissions from TVA's fossil generation, among other regional sources. Should hydro generation be altered such that fossil generation is increased, the air quality and related ecosystem problems in GRSM could be exacerbated. Bank erosion and other impacts associated with archeology and biota within the riparian corridor that result from hydrologic alterations (e.g., ramping) are issues of concern for all park units adjacent to TVA waters. Units of the National Park System are *not* currently listed in the ROS. Potential impacts to these units should be thoroughly evaluated and included in the final EIS. [79]

In addition, a host of other federal laws, such as the Wild and Scenic Rivers Act, PL 90-542 and the Outdoor Recreation Act, PL 88-29, provide NPS with a mandate to look beyond the boundaries of the national parks in the interest of protecting the public's interests in river and outdoor recreation resources.

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In general, NPS has an interest in protecting and promoting natural resources, recreational opportunities, aesthetics, and historical and archeological resources. More specific to TVA operations, NPS interests lie in recreational access/facilities, instream flows for recreation and aquatic habitat conservation, riparian corridor protection, and natural streambank stability. [80]

The NPS manages wetlands in compliance with Director's Order #77-1 which establishes standards and requirements for implementing E.O. 11990 and in compliance with Section 404 of the Clean Water Act. In following DO #77-1 the NPS is responsible for documenting any adverse impacts to wetland habitats including explanations on the final preferred alternative which will result in wetland losses or degradation. Therefore, the NPS should continue to be an integral part of the Interagency team to develop the final EIS and consideration should be given to direct, indirect and cumulative impacts to wetland habitats within and adjacent to NPS lands.

According to the ROS, approximately 183,000 acres of wetlands are within the projected groundwater influence area of the TVA reservoir system, therefore, there is the strong likelihood that wetlands associated with the operational changes of TVA reservoirs may significantly affect these aquatic habitats found on NPS lands within the Tennessee River system.

The DEIS identifies isolated wetlands as one type which is especially sensitive to groundwater alterations which could occur due to operational changes by TVA. The document also states that these wetlands have lost protection under the CWA due to the recent Supreme Court case decision (SWANCC 2000); however, the SWANCC decision was based on the definition of navigable waters and NPS defines wetlands based on the various parameters of soil, vegetation and hydrology as described in the U.S. Fish and Wildlife Services' "*Classification of Wetlands and Deepwater Habitats of the United States*" (FWS/PBS-79-31). The NPS guidance (Director's Order #77-1) which establishes requirements for the protection of wetlands, therefore, includes more wetland habitat types than those defined by the Corps including the protection of "isolated" wetland habitats. Wetland delineations on NPS lands must meet the requirements of the CWA, Section 404 and NPS wetland protection policies as required by Director's Order #77-1. The SWANCC decision eliminates many of the wetland types which will, however, continue to receive protection under the National Park Service definition of wetland habitats. Additionally, indirect adverse impacts to wetland habitat can result in increased flood risks and changes in visitor use due to alterations of water levels in upstream reservoirs which are located on adjacent rivers to park lands. [81]

### **Project Minimum Flows, Tailwater Fisheries, and Mussels**

Since the minimum flow regimes provided at certain tributary reservoir tailwaters were derived using FWS techniques, we point out that the techniques were intended to provide common ground for negotiated flow regimes and are not necessarily the cutting edge of river restoration science. The methodologies have deficiencies which must be understood by users, such as the rudimentary nature of minimum flow calculations, and the vintage of some techniques and curves. We suggest that with some additional refinements, science-based minimum flows within these tailwaters could render additional benefits to the tailwater aquatic and terrestrial communities. Elsewhere within the Tennessee Valley, the FWS has initiated the development of minimum flow regimes which offer seasonally-variable flows reflective of natural run-off characteristics. We also plan to measure aquatic and riparian responses to these events. These minimum flow regimes are more refined in terms of magnitude, duration, and timing of minimum flows, as well as peak flows, so that they may offer periodic pulses for sediment transport, trigger ecological processes, and serve as behavioral cues. [82]

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We recommend the development of a process to consider and/or reconsider in detail the minimum flow regime at specific tributary and mainstem tailwaters necessary to enhance aquatic and riparian systems, within system constraints (i.e., navigation, flood control, power generation, and recreation). This process should include the formation of an interdisciplinary team of scientists familiar with the tailwater systems and techniques for developing continuous minimum flow regimes. Key considerations should include timing of flows, magnitude, rate of change, and water quality (e.g., DO, thermal characteristics, etc.). [83]

We recommend the development and refinement of minimum flow regimes for the specific objective of benefiting tailwater fisheries and aquatic communities at tributary and mainstem reservoirs. There are remnants of significant natural communities which would benefit from this process in the tailwaters of Chatuge, Nottely, Cherokee, Douglas, and Blue Ridge Reservoirs. Since many of the existing minimum flow regimes are measured as a daily average, rather than instantaneous flow, we believe that significant benefits would accrue from refinements that provide continuous flows for aquatic and riparian communities. Additionally, we would like to develop a beneficial minimum flow regime for the bypassed reaches of stream at Appalachia and the Ocoee Reservoirs. [84]

The FWS has initiated a multi-year study of the effects of stream regulation on freshwater mussels, and we welcome the opportunity to include some of the TVA tributary and mainstem project tailwaters within the experimental design. The objective of this study is to develop methodologies necessary to evaluate the impacts of flow regime changes on these mussel populations. Freshwater mussels are the most critically endangered faunal group in the United States. The construction and operation of TVA dams have and continue to adversely affect many freshwater mussel populations, and in part, these facilities have been responsible for the extinction of several species. Although water quality and temperature of the discharges have and continue to impact some mussel populations, there is a growing body of evidence that altered hydrographs are the primary cause for the decline and endangerment of many species. In order to protect and enhance the remaining populations of mussels in the Tennessee Valley, we believe there is an urgent need to provide adequate flows. The ROS provides a unique opportunity to evaluate flow regimes necessary to sustain healthy mussel populations; however, there is no empirically based method for determining a flow regime suitable for mussels. We suggest a study conducted over a 5-year period which monitors behavioral and physiological attributes might provide the best means of evaluating the effects of changes in flow regimes on mussel populations. There are also opportunities for TVA to assist in an expanded study through funding and aquatic sampling at select TVA tailwaters. [85]

It is unclear why hydroturbine ramping rates are not included in a comprehensive study of reservoir operations. Rapid ramping rates cause severe erosion, potentially impacting archeological and ecological resources. [86]

### **Reservoir Fisheries**

The metrics utilized in the DEIS evaluation of aquatic resources focused on DO, temperature, and reservoir hydrodynamics. As concluded in the DEIS, no policy alternative represents a clear benefit to reservoir aquatic resources. Based on water quality modeling performed to date, some degradation of the existing aquatic resources could be expected for several of the alternatives. The DEIS did not make a strong correlation between contiguous, adjacent, and peripheral wetland habitat types and sport fishery productivity. Many of these areas have the potential to change, due to increased water levels, and there could be significant effects to sport fishery spawning and nursery areas. The continued expansion of invasive aquatic emergent vegetation and non-native fish populations is also problematic for spawning and nursery wetland habitats. [87]

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The alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) are expected to have significant negative impacts on the scrub/shrub and forested wetlands along Kentucky, Barkley, and Wheeler Reservoirs.

Extending the duration that these habitats are inundated during the growing season will dramatically shrink the willow-buttonbush, water tupelo, and bald-cypress plant communities and alter the plant composition of the bottomland hardwoods. It is expected that the woody plant communities in this zone will be replaced by emergent aquatic plants. In many cases, these emergent aquatic plant communities may be dominated by invasive exotic species such as alligatorweed and *Phragmites*. We believe the final EIS should fully evaluate the potential changes in reservoir wetland habitat type associated with the preferred alternative. Those results should be considered in addition to the metrics evaluated in the DEIS and any refinement to the water quality model(s) once a preferred alternative is selected. [88]

### **Aquatic Enhancement and Mitigation Opportunities**

#### **Investigate additional fish and mussel restoration efforts at tributary and mainstem tailwaters.**

There are opportunities to restore native fishes and fisheries through reintroductions at several tailwaters. TVA and the FWS have been involved with several successful reintroduction efforts. We encourage the continued involvement by TVA in these efforts. [89]

**Enhance cold/cool-water tailwaters.** We recommend enhancement of aquatic conditions for native aquatic communities by provision of warmer water during summer, with less rapid daily fluctuations, and better oxygenation. Where increased water temperatures are not practical, measures could include cooperation with other agencies and organizations to enhance nearby streams that were fragmented by the construction and operation of TVA Reservoirs. These streams have experienced limited colonization and smaller population sizes of their aquatic communities. Although the Fontana and Tims Ford projects provide a significant challenge in this regard, we recognize the significant impairments their deep, cold water releases and drastic fluctuations impose on the Lower Little Tennessee River and Elk River, respectively. The dominating effects of the operation of the Fontana and Tims Ford projects have tremendous implications for our ability to recover several listed species of fish and mussels. We expect TVA to continue to cooperate in the recovery of listed species where it can and to work with us to identify measures to overcome the continued impairment of the Lower Little Tennessee River and Elk River. [90]

Although the scope of the DEIS does not include facilities on the Duck River, we believe significant potential for improvement exists in the Normandy tailwaters. This is due in part to the existing multi-port release mechanism and the questionable condition of the managed trout fishery below Normandy Dam. [91]

**Provide fishways.** There are opportunities to allow for upstream and downstream passage of fishes to enhance fish populations at mainstem and tributary reservoirs. The need for fishways for species such as lake sturgeon (*Acipenser fulvescens*), black buffalo (*Ictiobus niger*), smallmouth buffalo (*Ictiobus bubalus*), freshwater drum (*Aplodinotus grunniens*), sauger (*Stizostedion canadense*), walleye (*Stizostedion vitreum*), paddlefish (*Polyodon spathula*), and river redhorse (*Moxostoma carinatum*) could be estimated from cooperative review of existing and future fish sampling from seasons when species congregate at tailwaters, as well as presence/absence data from historical spawning areas. We recommend a systematic approach to providing efficient and timely fish passage at TVA facilities. [92]

**Develop an advanced schedule for decommissioning and dam removal.** We recommend that TVA begin to identify and prioritize its dams/reservoirs for eventual removal. It is never too early to project a

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schedule for removal of these facilities and to plan for restoration of the natural riverine conditions of the Tennessee Valley. Parameters to consider are relative length of reaches potentially restored by dam removal(s), value of and alternate sources of energy provided by the hydroelectric generation capacity, connectivity/fragmentation of the river system, and the benefit to species and natural communities. For TVA developments with the least storage capacity, least generation capacity, and fewest reservoir-dependent neighbors, a tentative time line and plan for removal could be developed. It is important to begin limiting future dependency on these reservoirs sooner than later, reversing trends toward more dependency on their presence, while emphasizing alternate uses of a riverine ecosystem. [93]

**Maintain Ecological Staffing.** We recognize the value of TVA's professional staff in guiding and implementing the ROS. We encourage you to maintain adequate staffing and funding in these areas, with a focus on continuity, science, and professionalism. Based on the above considerations, the DOI encourages TVA to maintain its existing policy and conditions within the system by selection of the Base Case alternative presented in the DEIS. TVA has made a substantial investment in improving water quality and habitat conditions within its reservoirs and tailwaters over the years, and we believe that those improvements could be substantially compromised by a majority of the other alternatives. [94]

We appreciate the opportunity to comment on this DEIS. We trust that our comments will be of use as you prepare the final document and that you will continue to involve DOI bureaus in your ongoing planning activities. If you need additional information, please feel free to contact Gregory Hogue, Regional Environmental Officer in Atlanta, Georgia, at (404) 331-4524 or myself at (505) 766-3565.

Sincerely,

Stephen R. Spencer  
Acting Regional Environmental Officer

Enclosure

## **Appendix F4 Response to Federal and State Agency Comments**

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Federally-recognized tribes potentially affected by TVA operations in Tennessee, Alabama, Kentucky, Georgia, Mississippi, North Carolina and Virginia.

Cherokee Nation  
PO Box 948  
Chadwick Smith, Principal Chief  
Tahlequah, OK 74465

United Keetoowah Band of Cherokee Indians  
PO Box 746  
Dallas Proctor, Chief  
Tahlequah, OK 74465

Eastern Band of Cherokee Indians  
Qualla Boundary  
PO Box 455  
Leon Jones, Principal Chief  
Cherokee, NC 28719

Chickasaw Nation  
PO Box 1548  
Bill Anoatubby, Governor  
Ada, OK 74821

Muscogee (Creek) Nation  
PO Box 580  
R. Perry Beaver, Principal Chief  
Okmulgee, OK 74447

Poarch Creek Indians  
5811 Jack Springs Road  
Eddie L. Tullis, Chairman  
Atmore, AL 36502

Eastern Shawnee Tribe of Oklahoma  
PO Box 350  
Charles D. Enyart, Chief  
Seneca, MO 64865

Shawnee Tribe  
PO Box 189  
Ron Sparkman, Chairman  
Miami, OK 74355

Absentee-Shawnee Tribe of Indians of Oklahoma  
2025 S. Gordon Cooper Drive  
James "Lee" Edwards, Jr., Governor  
Shawnee, OK 74801

For additional information, contact Kurt Chandler, Bureau of Indian Affairs, Eastern States Regional Office, Nashville, Tennessee, (615) 467-1677

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### RESPONSE TO COMMENTS

1. The Bureau of Indian Affairs and National Park Service (NPS) of the DOI, along with FWS, served on a 17-member Interagency Team that helped guide the process. Many of the concerns of the DOI have been addressed as a result of this participation.

**Response to Comment 1:** One of TVA's objectives in establishing the referenced Interagency Team was to provide interested federal and state agencies with an opportunity to participate in guiding and influence the ROS, and its associated analyses. TVA appreciates the acknowledgement that the DOI found its involvement on the team useful.

2. However, we are providing the following additional general and specific comments for your consideration as you prepare the final document. ...The DEIS, with the exception of Chapter 7, is concise and well written.

**Response to Comment 2:** Comment noted. A concise, well-written document was one of TVA's goals for the ROS EIS.

3. However, the programmatic approach utilized by TVA does not allow reviewers and decision makers to identify and analyze specific mitigation strategies.

**Response to Comment 3:** Because the ROS EIS is a programmatic review of alternative operations policies for TVA's entire integrated reservoir system, mitigation measures are appropriately scaled to a reservoir-system level. Further delineation of feasible system-wide mitigation measures is now possible with the identification of TVA's Preferred Alternative, and this has been done in the FEIS.

4. Although we applaud TVA's effort in undertaking such an important evaluation of its current reservoir operations, we suggest that further, sub-basin-, reservoir-, and/or ecoregion-specific evaluations be undertaken in the near future to refine the level of resolution such that operations recommendations can be appropriately developed that account for regional resource complexities and peculiarities. A programmatic EIS should identify site- or region-specific data gaps and uncertainties.

**Response to Comment 4:** As suggested, more reservoir- or site-specific analyses would be undertaken in the future, as appropriate. This would be done if any ROS decision results in discrete proposed actions at the reservoir- or site-specific level, or when actions independent of the ROS are proposed. Such future proposals would either tier from or reference the ROS EIS.

5. Further study and public input should be used to make local decisions.

**Response to Comment 5:** See Response to Comment 4. The ROS EIS provides TVA a sound basis for making reservoir-system level decisions, including implementation of any operations policy changes approved by the TVA Board across the affected reservoirs. If discrete actions are proposed on specific reservoirs in the future, TVA would conduct additional analyses and seek public input, as appropriate.

6. In our opinion, the uses of the waterway that are the most frequently supported by select segments of the public will have impacts and require mitigation; Chapter 7 does not provide us the level of information we believe will be necessary to provide reasoned and informed comments on the action alternatives.

**Response to Comment 6:** See Response to Comment 3. TVA agrees that many of the operational changes preferred by those commenting on the DEIS would result in adverse environmental impacts and should be mitigated. As suggested later by DOI, TVA

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developed the Preferred Alternative to reduce or avoid the adverse impacts associated with the alternatives presented in the DEIS. Additional information about mitigation has been provided in Chapter 7...

7. The DOI strongly supports TVA's implicit commitment to maintaining the achievements in water quality and habitat improvements garnered to date in its implementation of the Lake Improvement Plan and Reservoir Release Improvement Plan. However, we believe these commitments should be incorporated into the Record of Decision for this process and expressly stated in the executive summary section of the final EIS and integrated within the selected preferred alternative.

**Response to Comment 7:** TVA is committed to maintaining water quality and other improvements that resulted from its 1990 Lake Improvement Plan. TVA committed to those actions in the Record of Decision that finalized the process for that EIS. The Preferred Alternative identified in the FEIS reflects TVA's ongoing commitment.

8. We recommend that TVA's stated purpose, to determine the changes in the reservoir operations policy, if any, that would produce "greater public value," be refined. The phrase is poorly defined and could easily be perceived as subjective (page 1-4, section 1.2) and lacking in a commitment to provide needed resources to mitigate identified needs. TVA should work with its planning partners to develop clear, dichotomous selection criteria to define and rank "public value." These selection and ranking criteria should be guided by TVA's mission, legal and regulatory constraints and opportunities, and public input received during scoping and subsequent processes.

**Response to Comment 8:** From the beginning of the ROS and the scoping of the EIS, TVA identified greater public value as its objective for proposing changes to its reservoir system operations policy. TVA agrees that "public value" is inherently subjective because it encompasses a wide range of perspectives and opinions held by the diverse group of stakeholders that benefit from the operation of the reservoir system. This is why TVA has aggressively sought input on values from the broadest possible range of the public and interested federal and state agencies. As discussed in Appendix F1 under "Introduction to the Comment Response Appendix," TVA used a variety of techniques to achieve this. TVA expressly sought and received numerous comments about values, frequently with expressed or implicit statements of preference among identified values. These statements help describe the meaning of public value in ways that will contribute directly to decision making. TVA's efforts to objectively weigh and rank identified values is expressed by the formulation of its Preferred Alternative presented in the FEIS. As with most matters concerning public policy, the final decision to be made is subjective, and decision makers must take staff recommendations, public input, and other factors into consideration in their efforts to serve the public interest in the best way possible.

9. In large part, this concern focuses on the terms "public" and "value." The "public" that TVA is responsible to reflects a tremendous range of perspectives, opinions, and values. We recognize that "public" includes ratepayers, shoreline property owners, reservoir users, and other stakeholders and interested parties. "Public" includes individuals and organizations that have attended workshops and meetings, responded to telephone surveys, or otherwise participated in the planning process. "Public" includes the citizens of states impacted by the TVA system of impoundments, power generation and transmission facilities, and who are indirectly affected, whether they actively participate in the planning process or not. We recognize that "public" includes all Americans, from present and future generations. Finally, we recognize that "public" means government agencies with jurisdiction by law and

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expertise, and American Indian tribes, particularly the Cherokee, Chickasaw, Choctaw, Shawnee, and Creek tribes, which TVA must afford government-to-government rights. The TVA planning and decision-making process should not be biased by the sheer number of comments from small segments of the public, nor by the level of passion or personalities of individuals involved in the planning process.

**Response to Comment 9:** See Response to Comment 8 and "Introduction to the Comment Response Appendix" in Appendix F1. TVA agrees that the public has many perspectives and interests. It includes those who chose to participate in the ROS EIS process and those who did not; private citizens, and public agencies. TVA used a qualitative approach that was guided more by the merits of the comments made than the numbers of comments.

10. It is incumbent on TVA to establish unambiguous, objective selection and ranking criteria, so that reviewers and decision makers can be assured of a transparent planning and decision-making process. Public value, as used in the DEIS, is unsuitable as a planning guideline or decision-making criterion.

**Response to Comment 10:** See Response to Comment 8. We disagree that public value is an inappropriate planning criteria. Public value is discernible and has been repeatedly articulated by those commenting during the scoping and DEIS processes. In comments from its representatives on the Interagency Team and its comments here, DOI has itself expressed its views about values. Objective criteria were established and used in the ROS process. The results of these efforts are reflected in TVA's Preferred Alternative. For example, because all of the action alternatives evaluated in DEIS would result in unacceptable increases in flood risk, combined elements of TVA's Preferred Alternative were incrementally adjusted to meet the flood risk evaluation criterion described in Section 5.22.

11. A refinement of the project purpose, and the development of selection criteria, should identify the methods that TVA proposes to use to resolve competing public values. The priorities generated in public workshops should contribute to the discussion of "greater public value." Those priorities (in order) are recreation, environmental protection, flood control, cheap power and clean water. The other alternatives analyzed in the DEIS do not necessarily reflect the priorities established by workshop participants for the public resources diverted by TVA.

**Response to Comment 11:** The statements of, and preferences among, values that were made during scoping and the DEIS review process were part of TVA's discussion of public values with interested members of the public and other agencies. The values identified by DOI in this comment were among the values identified during the EIS process. The values and associated objectives were used to formulate the alternatives presented and analyzed in the DEIS. TVA's preferred alternative expresses how TVA weighed the identified public values.

12. We recommend TVA expand the discussion to describe cost issues associated with alternatives and mitigation measures from various perspectives. The standard Federal government economic analysis may not be a useful tool for individuals who have been educated to externalize all costs except the fees they are directly responsible for paying. In our opinion, the DEIS would be a more valuable tool for such individuals if it explained the costs of each alternative and mitigation measure and how those costs would most likely be met. In our experience, some capital improvements could create new costs, which may be assumed by ratepayers and recreational or access facility users. Some alternatives and

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mitigation measures could reduce operational flexibility, or create episodic shortages of power, which might mean that replacement power costs would be accrued.

**Response to Comment 12:** The cost impact of alternative operations policies on TVA's power system was identified in the DEIS. This information has been expanded in the FEIS and now includes mitigation cost estimates as requested.

13. Reviewers and decision makers would benefit from a DEIS that is understandable to the range of perspectives and values associated with the "public."

**Response to Comment 13:** TVA agrees that both the public and decision makers benefit from an understandable discussion of values. Although we believe that the ROS Scoping Document and the DEIS explain how the major public issues reflecting underlying values were used to develop a set of performance objectives to evaluate the policy alternatives, we further clarified the discussion in the FEIS. For example, Table 1.6-03 was added to better define the performance objectives.

14. For example, page 4.4-2, "Regulatory Programs and TVA Management Activities" states that TVA has made the commitment to not reverse any improvements in dissolved oxygen (DO) concentrations resulting from previous improvement programs. Yet there is no discussion of the capital investments that would be required to keep the DO levels at an acceptable level. Page 1-4, section 1.2, only states that "changes to operations that require additional capital or operating expenditures would need to be funded by either TVA or others."

**Response to Comment 14:** See Response to Comment 12 and Table 5.23-03.

15. At a minimum, we suggest TVA at least analyze the two alternatives most favored by the workshop participants and survey respondents, specifically, to extend the summer pool levels and protect the environment. The analysis should determine if mitigation can achieve an acceptable DO while making those goals compatible. Furthermore, the mitigation analysis should explain funding mechanisms that would allow the two goals to be simultaneously implemented. Likewise, if the goals and the DO levels are not compatible, the analysis should document the tradeoffs (gains and losses) associated with the approach selected.

**Response to Comment 15:** The alternatives presented in the DEIS did analyze the impacts of extending summer pool levels on water quality, other environmental factors, the regional economy, and system operating objectives. TVA designed the alternatives that were evaluated in detail in the DEIS to reflect the broad range of issues and recommendations that were identified during scoping. This enabled a determination of the full range of associated potential impacts. Results of the analyses were then used to determine which elements of the alternatives would and would not meet evaluation criteria that were established for the primary system operating objectives, such as reducing the risk of floods. TVA developed its Preferred Alternative in order to maintain flood risk at acceptable levels, while preserving desirable characteristics that were associated with the other alternatives. Generally, descriptions of the mitigation measures that TVA would implement and how the costs of these measures would be funded are included in the Record of Decision.

16. Because the potential influence of economics is likely to weigh heavily in determining a preferred alternative, the ROS should be careful to note that classical economic theory, upon which TVA's economic models are based, relies on two key assumptions that are violated within ecological systems. These are the principles of substitutability and

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reversibility. Given DOI's (and presumably TVA's) interests in protecting and managing resources for this and future generations, a thorough discussion of these assumptions and their relevance to the TVA ecosystem is essential.

Substitutability implies that when one resource is diminished, it can be replaced by another similar resource. In ecological systems such as rivers, this assumption potentially fails since individual species are often closely co-evolved with their environments allowing them to exist within a relatively narrow range of physical, chemical, and biological parameters. Switching to another resource is often not an option.

Similarly, reversibility in economic theory implies that economic trends caused by a particular decision can be reversed once the decision is reversed. In ecological systems, this assumption has a high likelihood of failure. For example, relatively minute changes in ecological community structure can have permanent effects that cascade through the community and potentially the entire ecosystem. The classic example of this phenomenon is the extirpation of a keystone species. Once this critical ecological link is extirpated, the system can never recover to its pre-extirpation state. Exacerbating the situation, the loss of a keystone species can result in the loss of additional species and/or wholesale changes in ecological functions and services.

**Response to Comment 16:** TVA has taken steps to ensure that these two assumptions are not applied in the context of ecological systems. An inherent risk of assigning monetary values to the identified environmental impacts is that some readers might assume that TVA was suggesting that it could buy substitutes for affected ecosystems or pay to reverse such impacts. Rather than assigning monetary values, TVA preferred to state environmental costs in their natural metrics, such as increases or decreases in DO, and did so in the ROS analyses.

17. We recommend the DEIS discussion of the underlying limnetic patterns and processes be enhanced with more obvious cross-references. The DEIS should provide reviewers and decision makers with a comprehensive discussion of biological, chemical, and physical patterns and processes, how they are influenced by specific operational regimes, and what mitigation options are available. We are particularly concerned that the discussion about dissolved oxygen concentrations and reservoir pool elevations, on page 2-25, section 2.3.6, and elsewhere, be understood by reviewers and decision makers. Section 4.4 has a good discussion of the impacts of residence time and stratification on dissolved oxygen. Section 5.4.3 and 5.7.2 have a good discussion of DO impacts due to alternatives. However, additional clarity on the meaning of the impacts and possible solutions to the impacts is needed. This specific issue is the best example of where the public needs a greater understanding of TVA's priorities, limitations, and costs. DO is often the main limiting factor when considering extending the high summer pool levels desired by the public.

**Response to Comment 17:** Additional information about mitigation measures has been added to Chapter 7 in the FEIS. See Response to Comment 3. TVA agrees that DO is often a limiting factor when considering higher lake levels. Reducing potential water quality impacts was one of the primary drivers in the formulation of TVA's Preferred Alternative. Additional cross-references have been included in the FEIS.

18. We recommend select information in the DEIS be cited as a range of values, including error terms, variance, and other sources of uncertainty. This is particularly relevant for those parameters that may significantly influence decision making, such as hydroelectric power generation capacity. Page 2-7 (Hydropower Generation Facilities), page 3-10 (Hydro Modernization Program), and other sections of text indicate that the Base Case for the

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alternative comparison uses upgraded electrical capacity values for the 21 turbine units that are still in the process of being upgraded to modern standards. We recognize the need to utilize some common metric as a standard for comparison but encourage TVA to inform reviewers and decision makers about the weaknesses inherent in the selected metrics.

**Response to Comment 18:** TVA readily acknowledges that uncertainties are associated with all of the ROS analyses—particularly the computer-program-driven analyses, which provide the backbone for most of the ROS analyses. The appendices to the EIS (both Draft and Final) describe the models and identify their more important limitations. For example, TVA noted that the Weekly Scheduling Model, which provides the analytical foundation for most of the ROS analyses, produces only average weekly discharges. As explained in the model description appendix, this limitation for ROS water quality modeling required TVA to estimate hourly discharges with a different computer program. These limitations were described textually and were not always mathematically characterized. For most readers, textual explanations are more informative than mathematical characterizations. However, detailed box plots showing the variability of results were included in Appendix C.8. Appendix C also identified assumptions and limitations of other important analyses. To further aid the reader in understanding uncertainties, additional graphical depictions of probability ranges associated with resulting reservoir elevations have been included in Appendix C in the FEIS.

19. Actual or firm power generation values can only be obtained with in-place units. The subject 21 units are not yet modified, or “in situ.” It is common for actual power values for any given generator to be below the rated power value, due to a myriad of circumstances. With a total of 109 units, the variation between actual firm and 21 in-situ power production for the 21 units could represent a significant underestimate of power generation in the DEIS. The uncertainty associated with using rated or projected power values could have a significant impact on the comparison of alternatives, especially when power production is a determining factor. Identifying the range of values, from rated through existing in situ at various efficiencies, would, in our opinion, provide a more transparent analysis than the strict use of rated power values.

**Response to Comment 19:** Although some uncertainty accompanies projecting unit generation levels, the experience of being well into the modernization of its hydroelectric units increases TVA's confidence in its projections. To the extent that the projections may be in error, the error would have been applied across all alternatives and would therefore not affect their relative comparisons.

20. Neither section 4.18 nor 5.18 on Cultural Resources mentions whether any American Indian tribes were consulted. The subject TVA projects are located in an area where at least five federally recognized tribes have been or are located (Cherokee, Chickasaw, Choctaw, Shawnee, and Creek) and may attach aboriginal, religious, and cultural significance. Accordingly, pursuant to section 106 of the National Historic Preservation Act (NHPA), such tribes must be consulted about cultural resources affected by these projects, including consultations regarding the identification of cultural properties, the appropriate scope of the area of potential effects, and the development of any Historic Properties Management Plan. See, e.g., 36 C.F.R. 800.2(c)(2)(B)(ii). A list of potentially affected tribes is enclosed for your use as appropriate.

Regulations implementing the NHPA contemplate that Indian tribes be provided both a meaningful and early opportunity to participate in the section 106 planning process. The regulations further require that the agency make a reasonable and good faith effort to

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identify historic properties that may be affected by the undertaking and gather sufficient information to evaluate the eligibility of these properties for the National Register. See, e.g., 36 C.F.R. 800.4(b). Consultation with the State Historic Preservation Officer does not satisfy this requirement.

**Response to Comment 20:** TVA has invited 17 federally recognized Indian tribes to be consulting parties in the process that addresses effects on historic properties, consistent with Section 106 of the National Historic Preservation Act. TVA is executing an agreement with the seven Tennessee Valley region State Historic Preservation Officers and other consulting parties, outlining the actions TVA would take to avoid or mitigate adverse effects on historic properties associated with the Preferred Alternative.

21. We recommend the DEIS enhance discussions about the relationship between the need for low temperature cooling water for power plants and the impact on warm water species by releasing cold water from Fontana Dam; mitigation options should be discussed in detail. TVA acknowledges the impacts on aquatic resources by creating a dam system in section 4.7 and notes the need for cool water used for power plant cooling in section 4.23.5, but reviewers and decision makers would benefit from a more thorough discussion of underlying issues, alternatives and implications, and mitigation strategies. The cold water released from Fontana Dam is a major inhibiting factor in the existence of native fish populations in the Little Tennessee River and the reservoir system operated by the APGI Tapoco Project as well as the Tennessee River. Fontana Dam could have an inlet tower installed to select the water from anywhere in the water column and have much greater control of the temperature of the water released. However, the release of warmer water to support native fish conflicts with cooling water needs for power plants along the Tennessee River.

**Response to Comment 22:** Changes have been made in the FEIS to address this issue (see Sections 4.7 and 5.7).

22. Throughout the document, TVA interchangeably refers to existing conditions or the current reservoir operations as Base Case, no-policy alternative, or no-action alternative. For clarification, we recommend TVA utilize one description for this alternative.

**Response to Comment 22:** Changes have been made to improve the use of consistent terminology throughout the FEIS.

23. Specific details related to operational policy changes that may be proposed at each of TVA's facilities are needed to fully assess the impacts of the individual alternatives. For all alternatives, site-specific spatial and temporal information concerning projected water elevations and releases for each reservoir and associated tailwater is also needed to fully evaluate potential impacts to existing resources.

**Response to Comment 23:** The ROS analyses do contain detailed information about the potential effect of the alternatives on reservoir-specific parameters, such as elevations and flows. TVA makes additional technical information available on request. Most readers would have little use for such details and are more interested in a broader perspective on issues that interest them specifically. The ROS EIS contains the latter. However, the appendices provide additional details, including box plots and tables that show estimated elevations on a weekly basis across reservoirs by each alternative (see Appendix C). Additional details also have been provided in the FEIS for TVA's Preferred Alternative.

24. Based on analyses completed to date, most of the action alternatives would produce substantially higher minimum water elevations downstream from the mainstem dams. The

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recreation-based alternatives would also result in higher water elevations and delayed winter pool drawdowns in the tributary reservoirs. The Equalized Summer/Winter Flood Risk Alternative would produce minimum water elevations similar to the Base Case alternative. All of the other alternatives would yield higher minimum water levels. The Commercial Navigation Alternative would result in an increase in the winter flood guides of 2 feet on the mainstem reservoirs. Recent flood risk analyses have indicated that potential delayed winter pool drawdowns would result in a 33% increase in high water occurrences at 363' MSL, a 12% increase at 362' MSL, and a 17% increase at 361' MSL, in Kentucky Reservoir. A similar evaluation performed for Wheeler Reservoir indicated a 33% decrease at 559' MSL and a 17% increase at 558' MSL. As it becomes available, we would appreciate additional information regarding flood risk analyses performed in other mainstem pools utilized for navigation.

**Response to Comment 24:** Additional information about flood risk has been provided in the FEIS. Substantial additional data exist that support the summary data provided in the EIS. TVA makes this information available on request.

25. In general terms, most alternatives would increase reservoir retention times, which would decrease dissolved oxygen (DO) and increase chlorophyll concentrations within the reservoirs. Low DO concentrations reduce the assimilative capacities in the reservoirs and result in near anoxic conditions in the hypolimnion. Other changes in water quality parameters would be expected in the reservoirs and associated tailwater releases. Since a preferred alternative is not known at this time, it is impossible to predict, with any degree of accuracy, specific expected changes in water quality within mainstem or tributary reservoirs or tailwater reaches.

**Response to Comment 25:** As noted by DOI in Comment 26, TVA modeled potential water quality changes associated with each of the alternatives and summarized the results in the EIS. This was also done in the FEIS for TVA's Preferred Alternative. TVA believes that these results are reasonably accurate. To the extent that the projections may be in error, the error would have been applied across all alternatives and therefore would not affect their relative comparisons.

26. Water quality modeling to date indicates that most changes in currently observed (Base Case ) DO patterns would be minor, with the exception of the Tailwater Habitat Alternative. More water volume with average DO concentrations less than 2 mg/l would be expected. This potential change would be especially problematic downstream of Wilson Dam. Modeling also indicated potential changes in DO patterns within Kentucky and Chickamauga Reservoirs. Minor temporal changes in DO patterns (more hours with DO concentrations less than 2 mg/l) would be expected with implementation of Reservoir Recreation Alternative A downstream of Guntersville Dam and Reservoir Recreation Alternative B downstream of Pickwick Dam. All of the action alternatives would produce higher average water temperatures in the Hiwassee River. Conversely, all of the action alternatives would produce substantially lower average temperatures below TVA facilities on the Holston River.

**Response to Comment 26:** This summary identifies some of the general effects of the alternatives on various water quality characteristics. The intent of examining a fairly wide range of alternatives in the DEIS was to be able to identify when and where different possible operations policies would adversely affect water quality and other characteristics of the river system. These results identified components and limits that contributed to the formulation of the Preferred Alternative.

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27. The DEIS does not include a thorough discussion of potential changes to flow regimes and water quality downstream of Kentucky Dam. Due to the significance of the mussel and fishery resources downstream of Kentucky Dam, we believe a detailed analysis of the potential effects of the preferred alternative is warranted in the final EIS. The DEIS also does not include a thorough discussion of potential changes to flow regimes and water quality in Lake Barkley (Cumberland River). Due to the hydrological connection to Kentucky Reservoir, we believe this evaluation is warranted in the final EIS in order to evaluate potential effects to existing operations at Cross Creeks National Wildlife Refuge (NWR).

**Response to Comment 27:** Under the Preferred Alternative, TVA did not anticipate substantial changes in average flow conditions below Kentucky Reservoir. Consequently, mussel resources were expected to respond as they would under the Base Case. TVA's Preferred Alternative does not include changes in Barkley operating guides; therefore, no need for changes in the management of the Cross Creeks National Wildlife Refuge is anticipated.

28. Given the vast degree of uncertainty associated with the influence of dam operations on river resources (e.g., native assemblages of aquatic species, economic resources), we strongly encourage TVA to establish an adaptive management process as an integral component of its operations. In a letter to TVA dated June 7, 2002, the NPS proposed the following adaptive management measures:

*Develop and apply an ongoing adaptive management approach to river operations that balances cultural, economic, and environmental resources uses and values.*

**Rationale:** Adaptive management of river operations entails making periodic incremental adjustments to operating procedures (e.g., release schedules, reservoir levels, and instream flows) based on ongoing monitoring and analysis (Primack 1998). The intent of adaptive management is to optimize the management capacity of TVA and all of its stakeholders. The application of adaptive management can increase the effectiveness of management decisions while thereby reducing associated long-term management costs (Johnson, B. L. 1999. The role of adaptive management as an operational approach for resource management agencies. Conservation Ecology 3(2): 8. [online] URL: <http://www.consecol.org/vol3/iss2/art8.>)

**Suggested components of an adaptive management alternative may include:**

Establish a multi-stakeholder Adaptive River Operation Council (AROC): The AROC would consist of TVA personnel, representatives of associated agencies, technical experts from the social and natural environments, and other stakeholders such as watershed organizations, homeowner groups, and industrial interests. The goal of the AROC would be to host periodic meetings and workshops to design and evaluate monitoring and modeling efforts, detect resource trends, and suggest site-specific incremental operational changes to the TVA Board of Directors. For example, the AROC might meet annually to evaluate and assess trends of previously collected field data and new modeling results. In some cases, smaller working groups consisting of a subset of AROC members could develop recommended incremental alterations to propose to the broader council and ultimately the Board.

Develop an Adaptive River Operation Monitoring Program. The AROMP would use ongoing TVA water quality and biological monitoring, and if needed, be broadened to incorporate system-wide resource objectives and public concerns. The AROMP might also entail computer modeling.

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**Response to Comment 28:** As discussed in Chapter 3, TVA believes that it already uses an adaptive management approach because of the inherent flexibility of its operating guidelines, the routine extensive monitoring of reservoir system parameters, and its ability to react to monitoring results by appropriately adjusting operations within the guidelines. TVA expects to continue this approach regardless of any decisions that are made as a result of the ROS. TVA always welcomes suggestions for improving operations and freely shares the monitoring data that are collected.

29. Since the DEIS does not state a preferred alternative, the DOI suggests the notion of a blended alternative. A blended alternative should seek a balance in all public values (including those of future generations), but it should especially account for resource protection where the greatest amount of uncertainty and irreversible consequence reside. A blended alternative can best service the public value of this and future generations through long-term adaptive management and the ability to function on a site-specific basis. Alternatives Reservoir Recreation A and B along with Tailwater Recreation and Tailwater Habitat appear to collectively offer the greatest amount of public values as depicted by Table ES-01. An adaptive, long-term blending of these alternatives with site-specific flexibility is likely to produce a high degree of public value.

**Response to Comment 29:** As suggested, TVA has developed a Preferred Alternative that combines desirable features of the alternatives identified in the DEIS. It is agreed that implementing this Preferred Alternative—with sufficient site-specific flexibility (adaptability)—is likely to improve the public value of TVA's reservoir system without resulting in unacceptable environmental impacts.

30. Executive Summary, pages ES-13 to ES-20, and Table ES-02, Summary of Impacts by Policy Alternative: Without specific technical analyses for a preferred alternative or proposed policy change, these general representations should be qualified as projections that require further technical evaluation. To the average reader, a simplification of a diverse reservoir system can misrepresent realistic impacts that may occur within individual reservoirs.

**Response to Comment 30:** The FEIS contains TVA's Preferred Alternative and associated analyses of that alternative. TVA has continued to use general representations of impacts because it is believed that this best allows most readers to easily compare and understand the implications of the alternatives. Specific technical analyses provide further details for these general representations; some of the details of these analyses are provided in the appendices. See Responses to Comments 18 and 23.

31. The evaluation of wildlife under the terrestrial ecology category (Page ES-16) is too broad and does not recognize the potential for specific adverse effects to a variety of wildlife species. Specific groups of wildlife species (e.g., waterfowl, wading birds, reptiles, and amphibians) should be addressed separately.

**Response to Comment 31:** Initially, it was planned that the Executive Summary would summarize impacts for a broad variety of wildlife; however, because there was a greater potential for impacts on shorebirds than other species, they were highlighted in the Executive Summary. As noted in the EIS, the alternatives would result in both beneficial and adverse impacts on wildlife. These impacts are addressed in Section 5.10.

32. Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, pages 3-6 and 3-7: Reservoir Recreation Alternative A is grouped with the Base Case on this page, followed by the introduction of a column heading entitled "Policy Alternatives" on the next page (and all

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remaining pages of this table). This suggests that Reservoir Recreation Alternative A is not a policy alternative.

**Response to Comment 32:** This has been changed in the FEIS.

33. Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Base Case, first bullet under column entitled "Reservoir Operating Guidelines:" For clarification and consistency, we suggest changing the wording from "and restrict drawdown during June and July" to "and continue to restrict drawdown until August 1."

**Response to Comment 33:** This has been changed in the FEIS.

34. Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Reservoir Recreation Alternative A, third bullet under column entitled "Reservoir Operating Guidelines:" For clarification, we suggest changing the wording from "Begin unrestricted TR drawdown on Labor Day" to "Delay unrestricted TR drawdown to Labor Day."

**Response to Comment 34:** Additional information has been included in the FEIS to better explain this concept.

35. Section 3.3, Alternatives Evaluated in Detail, Table 3.3-01, page 3-6, Reservoir Recreation Alternative A, fifth bullet under column entitled "Reservoir Operating Guidelines:" Insert "winter" into the phrase "Raise MR flood guides."

**Response to Comment 35:** This change has been made in the FEIS.

36. Section 3.3.3, Alternatives Evaluated in Detail, Reservoir Recreation Alternative B, page 3-13, 4<sup>th</sup> full paragraph: It appears that both Reservoir Recreation Alternative B and A result in higher winter reservoir levels on tributary reservoirs, relative to the Base Case. Please clarify the discussion.

**Response to Comment 36:** Additional information has been included in the FEIS to better explain this concept.

37. Section 3.3, Alternatives Evaluated in Detail, pages 3-14 and throughout: Comparison statements throughout this section need to be more explicit: reduce/increase relative to Base Case, the Alternative previously discussed, or both?

**Response to Comment 37:** Additional information has been included in the FEIS to better explain this concept.

38. Section 3.3.8, Alternatives Evaluated in Detail, Tailwater Habitat Alternative, page 3-18, last two paragraphs: The last full paragraph on this page (beginning "Under the Tailwater Habitat Alternative") states that this alternative will result in more variable flows, whereas the following paragraph (beginning with the subheading "Achievement and Objectives") states that this alternative will increase stability in tailwater flows. These statements appear to contradict one another.

**Response to Comment 38:** Additional information has been included in the FEIS to better explain this concept.

39. Section 3.5.2, Reservoir Operations Policy Alternatives, Table 3.5-01: The "\$" symbol should be used consistently throughout the table to denote monetary figures (it is not used in the row entitled "Lowering the cost of transporting materials on the commercial waterway," although the footnote indicates that the figures in each cell in this row are in millions of dollars).

**Response to Comment 39:** This has been changed in the FEIS.

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40. Section 3.5, Reservoir Operations Policy Alternatives, Aquatic Plants, Page 3-30, Table 3.5-02: We recommend that you include a footnote to this table in order to make it clear that this category includes an assessment of invasive aquatic plants.

**Response to Comment 40:** The footnote has been added in the FEIS.

41. Section 3.5, Reservoir Operations Policy Alternatives, Terrestrial Ecology, Page 3-31, Table 3.5-02: Note that impacts to Wildlife differ from Migratory Shorebirds and Plant Communities (these latter two resource areas are affected similarly by the proposed set of alternatives). Is this because the category "Plant Communities" is actually focused upon impacts to lowland or wetland, communities? If so, this should be clarified as a footnote to the table.

**Response to Comment 41:** The focus was on both upland and lowland plant communities. Because the policy alternatives involve the timing and duration of fluctuating water levels, effects on lowland plant communities are more widespread and of greater magnitude than those on upland plant communities.

42. Section 3.5, Reservoir Operations Policy Alternatives, Page 3-37, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: This section is unclear. The previous paragraph states that Reservoir Recreation Alternative B and the Tailwater Habitat Alternative would have the most adverse impact on water quality. It seems the intent of this sentence to state that these two alternatives (Reservoir Recreation Alternative A and the Tailwater Recreation Alternative) would impact water quality more on the mainstem (than the tributary) reservoirs but that these impacts would still be less than Reservoir Recreation Alternative B and/or the Tailwater Habitat Alternative.

**Response to Comment 42:** The commenter's interpretation of the content of these sentences is correct. To eliminate possible confusion, the sentences have been reworded in the FEIS.

43. Section 3.5, Page 3-37, 2<sup>nd</sup> paragraph: Enhance the discussion of how the increased erosion anticipated under the Tailwater Habitat Alternative would affect aquatic organisms, including federally threatened and endangered species.

**Response to Comment 43:** In the FEIS, this paragraph has been expanded to include additional information from revisions made in Section 5.16 (Shoreline Erosion), Section 5.7 (Aquatic Resources), and Section 5.13 (Threatened and Endangered Species).

44. Section 3.5, Page 3-37, 3<sup>rd</sup> paragraph, last sentence: We suggest that the discussion of Reservoir Recreation Alternative B be re-written for proper emphasis of the issue. Reservoir Recreation Alternative B would result in more adverse impacts than the other alternatives, largely due to extending the summer reservoir levels into late summer and early fall, which would inundate flats at times when these habitats are normally exposed and able to provide important habitat to migratory waterfowl and shorebirds.

**Response to Comment 44:** The public and other agencies commenting on the identified alternatives appear to understand the elements of the identified alternatives. Nevertheless, TVA further clarified descriptions throughout the FEIS.

45. Section 4.7, Aquatic Resources, throughout: A more detailed evaluation of potential changes in available spawning and nursery habitat as a result of implementation of the various alternatives is needed. The relationship between various wetland vegetative types, their position in the landscape, and aquatic species productivity is not discussed adequately.

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**Response to Comment 45:** Additional discussion of fish spawning requirements has been added to the FEIS.

46. Section 4.8, Wetlands, throughout: Typographical error: "THE TVA" should be changed to "The TVA."

**Response to Comment 46:** This typographical error has been corrected in the FEIS.

47. Section 4.8, Wetlands, page 4.8-6, Table 4.8-02: The invested agency for the Swan Creek Dewatering Unit should be the Alabama Department of Conservation and Natural Resources.

**Response to Comment 47:** Table 4.8-02 in the FEIS has been changed to reflect that the Alabama Department of Conservation and Natural Resources is the correct invested agency at the Swan Creek Dewatering Unit.

48. Section 4.8, Wetlands, page 4.8-12, 1<sup>st</sup> paragraph, last sentence: Hyperlink error: The location of the report referenced by the first hyperlink in the series (<http://ncseonline.org>Y.) appears to have changed; typing in this full link produces an error message that the page cannot be found.

**Response to Comment 48:** Text has been changed in Section 4.8 to indicate the authors of the referenced document and the date the document was published. The full citation of the report with an updated hyperlink has been added to Chapter 10.

49. Section 4.8, Wetlands, page 4.8-13, 2<sup>nd</sup> paragraph, last sentence: Hyperlink error: The location of the report referenced by the first hyperlink in the series (<http://hydra.gsa.gov>.) also appears to have changed; typing in this link produces a "re-direct" message indicating that the information is now found within the [www.gsa.gov](http://www.gsa.gov) website.

**Response to Comment 49:** See Response to Comment 48.

50. Section 4.8, Wetlands, page 4.8-13, last paragraph, last few sentences: The statements describing the unique biological resources associated with wetland habitats directly parallel the content of Sections 4.10 (Terrestrial Ecology), Section 4.7 (Aquatic Resources), and 4.13 (Threatened and Endangered Species). The interdependency of these resources should be emphasized via a reference to these sections. In particular, globally imperiled wetland plant communities known or with potential to occur within the study area are listed in Section 4.10, Table 4.10-01 (page 4.10-3).

**Response to Comment 50:** Appropriate references have been inserted into Section 4.8. Text has been added to reference additional related discussions in Section 4.7 (Aquatic Resources), Section 4.10 (Terrestrial Resources), Section 4.13, (Threatened and Endangered Species), and Section 4.14 (Managed Areas and Ecologically Significant Sites).

51. Section 4.9, Aquatic Plants, page 4.9-2, Table 4.9-01: For consistency, the taxonomic authority should either be given for all or none of the species listed.

**Response to Comment 51:** Taxonomic authority is no longer included for the species listed.

52. Section 4.9, Aquatic Plants, page 4.9-3, last paragraph: We do not dispute that natural environmental variation (in weather, water flow, nutrient cycling, light availability) "tend(s) to surpass the effect of reservoir operational activities." However, as worded, this paragraph in the DEIS implies that changes in reservoir operations would be expected to produce little change in the coverage of aquatic plant species relative to these more natural (i.e.,

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unpredictable) sources of environmental variation. However, some of the proposed alternatives may, through direct manipulation of water levels, also indirectly generate the very conditions that have been observed to affect the coverage of these species (as described in this paragraph B i.e., “higher stream flows, high turbidity, cold water temperatures”), especially in the tailwater regions.

**Response to Comment 52:** The analysis of impacts on aquatic plants focused on changes in elevation and duration of inundation. Although changes in flow, turbidity, and temperature can affect coverage of aquatic plants, the changes in these parameters that would occur as a result of the alternatives are expected to be on a smaller scale than changes caused by natural hydrologic and climatic events. Aquatic plants are absent or minimal for several miles downstream of most TVA mainstem dams due to a lack of habitat (e.g., embayments and inlets) and the high flows associated with spill events and hydropower generation.

- 53 Section 4.10.5, Terrestrial Ecology, page 4.10-9, 1<sup>st</sup> paragraph: It is stated that “potential changes in bottomland hardwood forest, scrub-shrub wetlands, emergent wetlands, aquatic vegetation, flats, and other communities potentially affected by reservoir levels could affect terrestrial wildlife populations.” The word “could” should be replaced with “would.” When changes as significant as those addressed in this document are implemented, certain wildlife populations (e.g., shorebirds and waterfowl) will be significantly impacted.

**Response to Comment 53:** Changes were made in the FEIS.

54. Section 4.10.5, Terrestrial Ecology, page 4.10-9, 4<sup>th</sup> paragraph: It is stated that “flats, isolated pools, and shallow water are created by current drawdown regimes in early August.” This is correct for many reservoirs but not all. The drawdown on Kentucky and Barkley Reservoirs starts in early July. This date is significant as it provides adequate shorebird habitat during the peak migration period to provide habitat for early migrating waterfowl (e.g., blue-winged teal) and to produce the annual plants (forage) needed by wintering waterfowl.

**Response to Comment 54:** Changes were made in the FEIS.

55. Section 4.10, Terrestrial Ecology, page 4.10-6, 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: “Tables 4.10-01 and 4.10-02 present the names, global ranks, and distribution of the imperiled lowland communities...” In this sentence “lowland” should be changed to “wetland,” since the term “lowland” (as being applied in the DEIS) encompasses more community types than would be expected in NatureServe’s subset of “wetland” communities (from which this table was created).

**Response to Comment 55:** Comment noted. Changes were not made because lowland, in this context, included more than wetlands.

56. Section 4.10, Terrestrial Ecology, page 4.10-8, 2<sup>nd</sup> and last paragraphs: The discussion of “Future Trends” under Upland Plant Communities (last paragraph) also applies to the anticipated Future Trends for Lowland Plant Communities (2<sup>nd</sup> paragraph).

**Response to Comment 56:** Future trends for these two plant communities are similar. Declines are partly attributed to the direct impacts of various land uses, such as timber harvesting, agriculture, and urban and rural development, and partly to associated impacts from increases in invasive exotic species. Trends for lowland communities are addressed in Section 4.8, Wetlands.

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57. Section 4.11, Invasive Terrestrial and Aquatic Animals and Terrestrial Plants, throughout: The information provided in the DEIS is not of sufficient detail for evaluation of the rationale for focusing upon those species of invasive terrestrial animals and plants specifically named in the discussion. The discussion in the DEIS should clarify whether or not those species mentioned are those which pose the greatest threat throughout the Tennessee Valley or are specifically those that pose the greatest risk with respect to changes in reservoir operation policies.

**Response to Comment 57:** The rationale for choosing to focus on the species addressed was mistakenly presented in Section 5.11 in the DEIS. The appropriate changes were made in the FEIS.

58. Section 4.13, Threatened and Endangered Species, page 4.13-1, 3<sup>rd</sup> paragraph: The phrase "reservoir-like reservoirs" appears to contain a typographical error.

**Response to Comment 58:** The error has been corrected in the FEIS.

59. Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-9, Table 4.14-02: Swan Creek Wildlife Management Area (WMA) and Mallard-Fox Creek WMA should be identified as managed areas and/or ecologically significant sites within Wheeler Reservoir.

**Response to Comment 59:** Table 4.14-02 in the DEIS was originally intended to list a sample of the various managed areas and ecologically significant sites in the ROS study area. To avoid confusion, the table has been deleted from the FEIS.

60. Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-16, 1<sup>st</sup> paragraph: The Alabama cavefish is not located on Wheeler NWR. It is endemic to Key Cave NWR. Key Cave NWR is managed by Wheeler NWR staff. The correct scientific name for the species is *Speoplatyrhinus poulsoni*.

**Response to Comment 60:** Corrections were made to Section 4.14 in the FEIS.

61. Section 4.14, Managed Areas and Ecologically Sensitive Sites, page 4.14-16: Significant stands of water tupelo (*Nyssa aquatica*) forested wetlands occur within Wheeler Reservoir on Wheeler NWR. The Beaverdam Creek Swamp National Natural Landmark in Limestone County, Alabama, contains approximately 530 acres of water tupelo. Approximately 20% of the area is permanently flooded and contains a mature, pure stand of water tupelo. The remainder of the area is intermittently flooded and is dominated by water tupelo and black gum (*Nyssa sylvatica*). Pure tupelo swamps of this size and integrity are quite rare and its significance led to its designation as a National Natural Landmark. This information should also be included and referenced in Appendix D5, page D5-5.

**Response to Comment 61:** Potential impacts on this community type are discussed in Section 5.10.

62. Section 4.17, Prime Farmland, Table 4.17-03: Footnote No. 2 should be Natural Resources Conservation Service.

**Response to Comment 62:** This footnote was corrected in the FEIS.

63. Section 5.8.5, Wetlands, page 5.8-5, 3<sup>rd</sup> paragraph: Under a discussion of Reservoir Recreation Alternative B and the Tailwater Recreation Alternative, it is stated that "the increase in winter pool elevations could interfere with wetlands with controlled water levels on Kentucky, Wheeler, and Douglas Reservoirs." This sentence stands alone without any additional qualification. We recommend that the following specific information be included in this discussion: 1) a list of managed wetlands potentially impacted (e.g., Camden and

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Barkley WMAs, Tennessee NWR, Wheeler NWR); 2) the potential increased impacts of flooding, such as the increased cost to upgrade and repair infrastructure and the additional threats to wildlife habitat (e.g., agricultural crop production, bottomland hardwoods, moist-soil management units); and 3) the potential impacts to public recreation activities (i.e., hunting, fishing, bird watching) that occur on these areas.

**Response to Comment 63:** Section 4.8.2 contains a concise discussion that lists reservoirs with wetlands with controlled water levels, a discussion of issues related to management of these areas, and some of the implications that increased winter pool levels might have on infrastructure and management. Table 4.8-02 contains a list of each managed wetland by reservoir. Section 5.8 contains a description of potential adverse impacts on reservoirs with managed wetlands. Section 5.10 (Terrestrial Ecology) and Section 5.14 (Managed Areas and Ecologically Significant Sites) contain additional discussion of potential impacts on wetlands with artificially controlled water levels.

64. Section 5.8.8, Wetlands, page 5.8-8, 2nd paragraph: Under a discussion of the Commercial Navigation Alternative, the potential for a loss of flats due to the rise in the minimum winter pool level of mainstem reservoirs is not included. The mudflat wetland habitat type is extremely important to waterfowl, bald and golden eagles, gulls, terns, and many other species of migratory birds. The DOI does not concur with the conclusion that there will be overall positive effects on mainstem reservoirs.

**Response to Comment 64:** As stated in Section 5.8, the Commercial Navigation Alternative does not differ substantially from the Base Case. The Commercial Navigation Alternative would not affect summer pool duration of mainstem reservoirs; therefore, it would not affect the exposure of flats for migrating birds during late summer and fall. The Commercial Navigation Alternative would increase summer pool duration on five tributary reservoirs (Hiwassee, Nottely, Fontana, Douglas, and Watauga). These increases would delay exposure of flats in late summer between 1 and 4 weeks. Douglas Lake has the largest amount of flats of the five affected reservoirs. Summer drawdown would be delayed up to 3 weeks under the Commercial Navigation Alternative.

As described in Section 5.8, the Commercial Navigation Alternative could increase winter pool levels from 1.5 to 1.7 feet over the Base Case on seven mainstem reservoirs. The increase in winter pool levels on affected mainstem reservoirs would primarily reduce exposure of flats during winter months. The positive effects of the Commercial Navigation Alternative on other wetlands habitat on mainstem reservoirs would help to offset the adverse effects of this alternative on flats.

65. Section 5.10.4, Terrestrial Ecology, page 5.10-3, 1st paragraph: Under a discussion of the Commercial Navigation Alternative, it is stated that "the area inundated by water would increase, potentially creating additional shallow-water foraging habitat for waterfowl and wading birds." Why would an equal amount of shallow-water habitat not be available under the Base Case Alternative? The shallow-water area should be essentially equal but at a lower elevation. The result of raising the winter pool is not a gain in shallow-water habitat. It is a loss of mudflat habitat.

**Response to Comment 65:** This alternative would result in more shallow-water surface area during winter than under the Base Case. The paragraph originally stated that there would be an overall reduction of flats under this alternative. TVA adjusted the text in the FEIS to better present the information.

66. Section 5.10.6, Terrestrial Ecology, page 5.10-5, 3<sup>rd</sup> paragraph: Under a discussion of wildlife communities, it is stated that "although flats would not be available to most

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shorebirds migrating during late summer or early fall, extended high water levels could benefit early-migrating waterfowl such as blue-winged teal and wood ducks." We recommend that blue-winged teal (*Anas discors*) be removed from this sentence. Mudflats are a preferred habitat for blue-winged teal, where they forage on seeds of various grasses and sedges. It is unlikely that they will utilize the woody habitats that are flooded during summer pool.

**Response to Comment 66:** Appropriate changes were made to the FEIS.

67. Section 5.10.8, Terrestrial Ecology, page 5.10-6, 6<sup>th</sup> paragraph: Under a discussion of the Summary of Impacts, it is stated that "except for the Summer Hydropower Alternative, changes in operations under all policy alternatives would result in limited effects on most waterfowl, semi-aquatic mammals, and non-game wildlife, as they would adapt to changing conditions." This statement is repeated in other sub-sections of the Terrestrial Ecology Section. While we agree this statement is generally true, how they adapt may not be desirable to resource managers and the public. It has been determined from data collected during waterfowl surveys conducted on Tennessee NWR over the last 7 years that over 50% of the waterfowl use on the refuge occurs on the reservoir. The resultant adaptations may include reduced localized populations of both migratory and resident wildlife. Waterfowl and other migratory birds may adapt to a significant habitat change by migrating to other areas or utilizing undesirable habitat(s). The overall loss of mudflats will result in a lower local carrying capacity for waterfowl. It is also stated that "due to the anticipated decrease in flats habitat, shorebirds would be adversely affected during fall migration periods under these alternatives." We recommend that waterfowl also be added to this sentence.

**Response to Comment 67:** Appropriate changes were made to the FEIS.

68. Section 5.13, Threatened and Endangered Species, throughout: The level of discussion provided in the DEIS makes it difficult to identify and compare anticipated impacts to specific species of protected plants or animals, or populations of these species, within and among the various policy alternatives proposed. While a site-specific analysis may be beyond the scope of this broad overview of the entire set of proposed alternatives, we expect that it will be presented for the preferred alternative in the final EIS. For example, the potential for adverse affects to the green pitcher plant (*Sarracenia oreophila*) has been identified under the Summer Hydropower Alternative, but from the discussion, it is not possible to determine whether TVA anticipates similar affects to this species under the other alternatives proposed. Further, although adverse impacts to this species are identified under that alternative, the magnitude of these impacts is unclear. The discussion should address whether individual plants, an entire population, or the entire species be adversely impacted by this alternative.

**Response to Comment 68:** A site-specific analysis for each of the 526 federal- and state-listed endangered, threatened, or otherwise protected species is outside the scope of this programmatic EIS. However, TVA has conducted species-specific analyses with regard to the Preferred Alternative for 59 federal-listed or identified candidate species. The results of those analyses are summarized in Section 5.13 in the FEIS. If a decision is made to change reservoir operations, it is anticipated that monitoring and adaptive response will be an important component of the implementation plan.

69. Section 5.13.2, Threatened and Endangered Species, pages 5.13-11 to 5.13-12, 5<sup>th</sup> paragraph: It is stated that "bald eagles and gray bats could be benefited by Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Commercial Navigation Alternative, the Tailwater Recreation Alternative, and the Tailwater Habitat Alternative to the

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extent that each alternative would increase the size of reservoir pools and increase the numbers of food items (mostly fish and waterfowl for the eagles and adult aquatic insects for gray bats)." Eagles are commonly observed on the flats feeding on stranded fish and dead waterfowl. This suggests that the mudflats may be an important habitat component of the bald eagle (*Haliaeetus leucocephalus*) in the ROS area. We also question TVA's conclusion that raising the pool levels during the fall and winter will increase waterfowl numbers. In fact, we believe that increasing pool levels in fall and winter would likely have the opposite effect. Any increase in the production of adult aquatic insects would likely be minor. Potential adverse effects, however slight, to the gray bats' foraging habitats do not appear to have been considered.

**Response to Comment 69:** The effects of the alternatives on flats and other shoreline habitats were an important component of the terrestrial ecology evaluation. The EIS section has been revised to better address the subject. In addition, TVA prepared a Biological Assessment and has received a Biological Opinion (Appendix G) from the USFWS that specifically addresses the potential for impacts on federal-protected species such as the bald eagle and gray bat. Sections 4.13 and 5.13 were modified in the FEIS in order to be consistent with relevant parts of the Biological Assessment, Biological Opinion, and Terrestrial Ecology sections.

70. Section 5.13.2, Threatened and Endangered Species, page 5.13-12, 3rd paragraph: The evaluation of potential impacts to the federally endangered least tern (*Sterna antillarum*) should not be limited to nesting habitat. Least terns have been observed resting and feeding on flats on Kentucky Reservoir during fall migration.

**Response to Comment 70:** See Response to Comment 69. Potential impacts on the least tern have been addressed in TVA's Biological Assessment and the USFWS Biological Opinion. Sections 4.13 and 5.13 were appropriately modified in the FEIS to summarize these analyses.

71. Section 5.22.2, Flood Control, page 5.22-1, 3rd paragraph: It is stated that "the analysis for flood risk did not consider areas downstream of Savannah, Tennessee." We recommend that other areas on Kentucky and Barkley Reservoirs be included in the flood risk analysis. Although we appreciate receiving additional limited information regarding potential flood risk on Tennessee NWR and Wheeler NWR since the publication of the DEIS, we believe additional evaluations are warranted for Cross Creeks NWR (Barkley Reservoir) and the numerous State WMA's throughout the Tennessee Valley. Additional evaluations of Tennessee NWR and Wheeler NWR would also appear to be warranted.

**Response to Comment 71:** While the area downstream of Savannah was not included in the flood risk simulation model, TVA did evaluate the likely impact of changes in Pickwick discharges on Kentucky and Barkley pool levels. The analysis demonstrated that it is reasonable to expect that changes in Pickwick discharges associated with the implementation of any of the alternatives considered could be accommodated in Kentucky and Barkley Reservoirs. Temporary, minor increases in pool levels would result under TVA's Preferred Alternative. For the 10 largest historical events that have occurred during the March through May season, the average total increase in Pickwick discharge volumes over a 30-day period for the Preferred Alternative was about 156,000 day-second-feet (dsf). For June and July, the average increase is about 11,800 dsf. These volumes can easily be stored as required in Kentucky and Barkley Reservoirs without aggravating downstream flooding conditions.

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72. Section 6.2.7, Cumulative Impacts, page 6-5, 3rd paragraph: It is stated that “these changes may have the potential to cause some adverse impacts on federally listed threatened and endangered species; however, the level of impact would be small and not significant enough to jeopardize the continued existence of these species.” Under the Base Case alternative, populations of certain federally listed species will likely continue to decline in numbers and health. There are certain species listed as endangered (e.g., turgid blossom pearly mussel) that are likely extinct; no observations have been reported since the early 1900’s. We believe TVA’s conclusion regarding cumulative impacts to federally endangered and threatened species is premature and without factual foundation since no preferred alternative has been selected or analyzed in detail. We recommend analysis. Appropriate conclusions and supporting analysis should be submitted in a clearly labeled biological assessment (BA) concurrent with the final EIS.

**Response to Comment 72:** The FEIS contains analyses of TVA’s Preferred Alternative, including potential impacts on listed species. These analyses include TVA’s Biological Assessment that was submitted to USFWS for review. The USFWS review of that Biological Assessment is contained in their Biological Opinion (Appendix G) for the ROS. Section 6.2.8, which addresses cumulative impacts for threatened and endangered species, has been revised as appropriate to incorporate input provided by USFWS in the Biological Opinion, as well as other relevant information developed as a result of public and agency comments on the DEIS.

73. Table D1-01: Typographical error. It is Fort Loudoun, but the location is Loudon County not Loudoun County.

**Response to Comment 73:** This has been corrected in the FEIS.

74. We recommend that you clearly address how the alternatives consider the requirements of section 7(a)(1) and 7(a)(2) of the Endangered Species Act (ESA). These parts of section 7 of the ESA include the requirement to evaluate the potential for jeopardy, as well as the mandate that federal agencies further the conservation of federally listed species. We are generally concerned with the management of water releases from specific reservoirs, the impact of hypolimnetic discharges on federally listed mussel and fish species, and the impact of scouring on tailwater habitats. These issues are especially problematic below Kentucky, Wilson, Douglas, Cherokee, Fontana, and Tims Ford Reservoirs. While we appreciate the proposed mitigation of the current minimum flow regime in the Apalachia cut-off, we do not believe that this mitigation proposal should be limited to all alternatives except the Base Case. We would expect TVA to pursue those potential improvements regardless of a preferred alternative for the ROS.

**Response to Comment 74:** TVA prepared and submitted a Biological Assessment to USFWS that contains analyses of potential impacts of TVA’s Preferred Alternative on listed species. The USFWS Biological Opinion on this project is provided as Appendix G to this EIS. As indicated in the Biological Assessment and the Biological Opinion, the minimum flow augmentation at Apalachia Dam is included in the Preferred Alternative.

75. We anticipate a detailed BA as part of the final EIS which will evaluate the effects of the preferred alternative and the Base Case. The BA should include a complete description of the selected alternative, the effects of those actions associated with the ROS, and a determination of effect to listed species at a site-specific level. We have appreciated the ongoing dialogue with TVA staff regarding the approach to the preparation of the BA, as well as our preferred approach in preparing the required biological opinion.

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**Response to Comment 75:** See Responses to Comments 71, 72, and 74. TVA appreciates the willingness of USFWS biologists to facilitate this large consultation effort.

### **76. Migratory Birds on Tennessee NWR , Cross Creeks NWR, and Wheeler NWR**

Tennessee NWR and Wheeler NWR are designated Globally Important Bird Areas and could be significantly affected by several of the identified alternatives. The Tennessee NWR bird checklist shows 10 waders and bitterns and over 30 shorebirds that could be affected by a change in habitat availability (<http://tennesseerefuge.fws.gov/tnbirds.pdf>). Undoubtedly, other changes will occur elsewhere in the Tennessee Valley as well, yet these effects are poorly understood. The cumulative effects of proposed changes in the pool levels of various reservoirs on bird usage, primarily roosting and foraging, are unknown and will be extremely difficult to ascertain.

During fall migration, thousands of shorebirds utilize the mudflats on Kentucky, Barkley, and Wheeler Reservoirs. The average peak fall migration of shorebirds is around mid-August. Typically, during this period of the year, shorebird habitat is extremely limited due to dry conditions and dense vegetation that has developed through the summer adjacent to the reservoirs and other impounded waters. For this reason, the fall drawdown of Kentucky and Barkley Reservoirs is extremely important. Since most shorebird species prefer habitats that are open and away from dense cover, the water level needs to be low enough to expose flats that are not covered by woody vegetation. On Kentucky and Barkley Reservoirs, the elevation of summer pool is 359' MSL and woody vegetation typically extends down to elevation 357.5' MSL. For adequate mudflat habitat to be available, the pool elevation needs to be around 356.5' MSL. Under the existing operation schedules for these reservoirs, this level is usually reached during mid to late August.

Blue-winged teal are the first migrating waterfowl to arrive. The Tennessee Valley is along one of two major migration corridors for this species. This migration route extends from Manitoba to Florida. They first arrive during early August, with the peak period of migration occurring around mid-September. Like shorebirds, blue-winged teal heavily utilize the mudflats on the reservoirs for feeding and loafing. They commonly feed on the seeds of sedges, grasses, and smartweed that were deposited on the flats in previous years, as well as on insects and mollusks that may be present. During the migration period, it is important for extensive mudflats with an abundant source of food to be present on Kentucky, Barkley, and Wheeler Reservoirs. The existing management of these reservoirs provides excellent habitat at the appropriate time of the year for blue-winged teal to utilize during migration. The drawdown also coincides with a special early duck season that provides recreational opportunities to a large number of hunters, many of which hunt on the mudflats of the reservoirs.

Traditionally, migrant Canada geese (*Branta canadensis*) from the Southern James Bay Population (SJBP) would winter in large numbers within the Tennessee Valley. The December populations of SJBP geese in Tennessee prior to 1990 averaged over 40,000. The portion of the population that migrates into the Tennessee Valley has sharply declined to a present December average of less than 10,000 SJBP geese in Tennessee. Even though the overall population level of the SJBP has stabilized, the decline in the numbers that migrate to the Tennessee Valley continues. Migrant geese first arrive on Tennessee NWR around September 20, and generally will remain within the vicinity of the Refuge until late winter. At this time of year, typically the only habitat available are the flats associated with the reservoir. Geese browse the new growth of annual grasses and sedges that occur

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on these flats. The existing fall drawdown schedule for Kentucky, Barkley, and Wheeler Reservoirs provides mudflat habitat for these early migrants.

Several of the ROS alternatives would result in a significant loss of mudflat habitat on Kentucky, Barkley and Wheeler Reservoirs. Delays in the fall drawdown would eliminate or significantly reduce the quantity and quality of mudflat habitat available on these reservoirs to shorebirds and early migrating waterfowl.

Reservoir Recreation Alternative A will extend the summer elevation through August 1 with only a 1-foot drop by September 1. Specific drawdown dates are not determined for the Tailwater Habitat Alternative, but the DEIS specifically mentions that the impacts on flats under this alternative would be similar to those of the Reservoir Recreation Alternative A. These two alternatives will likely result in a complete loss of mudflat habitat during the peak shorebird fall migration. The description of these alternatives in the DEIS does not provide elevation information beyond September 1. Without a projected water elevation for mid-September when the peak blue-winged teal migration occurs and SJBP of Canada geese first arrive, the quantity of habitat that will be available is unknown. However, we expect the quality to be degraded due to the delay in germination of annual plants on the flats.

Reservoir Recreation Alternative B, the Equalized Summer/Winter Flood Risk Alternative, and the Tailwater Recreation Alternative extend the summer elevation of Kentucky and Barkley Reservoirs through September 1. We anticipate these alternatives would result in a complete loss of desirable mudflat habitat during most of the fall shorebird and blue-winged teal migration period. Habitat for SJBP geese will be extremely limited and the quality will be degraded due to the delay in germination of annual plants on the flats.

The anticipated impacts of the alternatives that delay the fall drawdown are 1) a complete loss of fall mudflat habitat for the majority of shorebirds that migrate through the area; 2) a significant-to-complete loss of fall mudflat habitat for blue-winged teal; and 3) a significant loss or degradation of fall mudflat habitat for early migrating SJBP of Canada geese. Local population declines of shorebirds, blue-winged teal, and SJBP geese that migrate into the area are expected if the fall drawdown of Kentucky, Barkley, and Wheeler Reservoirs is delayed.

Approximately 300,000 ducks and geese, 100 bald eagles, and tens-of-thousands of other wetland-dependent migratory birds typically occur on Tennessee and Cross Creeks National Wildlife Refuges during the peak wintering period. It has been determined from our data collected during waterfowl surveys over the past 7 years that 56% of the duck use and 48% of the goose use on Tennessee NWR occurs on Kentucky Reservoir as compared to the use that occurs in our intensively managed waterfowl impoundments. Under the current reservoir operation policy, the winter pool elevation of Kentucky and Barkley Reservoirs is 354' MSL. This level fluctuates throughout the winter depending upon several factors but is largely influenced by rainfall. During most of the winter, extensive mudflats with important food resources are available for migratory birds.

Large numbers of waterfowl concentrate on the flats of the refuges to rest and feed. Canada geese and wigeon (*Anas americana*) browse on the annual plants that germinate each year during the late summer and fall drawdown period. Mudflats are the preferred habitat for green-winged teal (*Anas crecca*) within this area. When large expanses of flats are present, the majority of teal on the refuges will occur within this habitat. Greenwings forage on the seeds of annual plants that have been deposited on the flats in previous years, as well as insects and mollusks.

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Bald eagles are regularly observed on the flats of Tennessee NWR and Wheeler NWR scavenging the carcasses of fish and waterfowl. As the drawdown occurs, fish occasionally get trapped in shallow waters and become an easy source of food for eagles. Gulls, terns, and wading birds utilize the flats of the reservoirs in large numbers throughout the drawdown and winter pool periods. The flats are primarily used for resting areas and are typically adjacent to shallow-water feeding sites.

We anticipate the alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) would significantly impact the amount and quality of forage produced by annual plants that germinate on the flats. Canada geese, wigeon, and green-winged teal are the waterfowl species that likely will be impacted the most because they are more dependant upon the vegetation grown on the flats.

The Commercial Navigation Alternative raises the minimum winter pool level 2 feet, from elevation 354' MSL to 356' MSL. This increase would permanently eliminate a large portion of the flats that occur on the refuge. The vast mudflats and shallow water areas that occur near the mouth of the Duck River on Tennessee NWR frequently support in excess of 50,000 ducks and geese. We expect that much of this important habitat would be flooded too deep for puddle ducks if winter pool levels are raised 2 feet. Under this alternative, the overall loss of winter mudflats would have significant negative impacts on several waterfowl species, primarily geese and puddle ducks. Bald eagles, gulls, terns, and wading birds would also suffer a significant loss in habitat.

**Response to Comment 76:** TVA appreciates this background information and the comments regarding migratory birds. The discussion of migratory birds has been expanded in the FEIS.

### **77. Migratory Birds in the Remainder of the Tennessee Valley**

We are concerned about the potential for impacts to migratory birds by several of the alternatives described in the DEIS. Our primary concern is that all of the identified alternatives, except the "no action" alternative, would produce adverse impacts to habitats used by migrating shorebirds, especially foraging habitat areas of wading birds. This discussion and our recommendations are based on the premise that dam removal and river restoration are outside the scope of this study. Our comments and concerns would differ if this premise is inaccurate.

If an alternative other than the Base Case (no action) is selected and implemented, pool levels would be significantly altered during the peak shorebird migration period. Depending on precipitation and other factors, pool levels would be low, but most times too high to provide the kind of habitat available for them in most normal years. Either way, changes in current TVA operations policy would greatly reduce or potentially eliminate this habitat type for migrating shorebirds, as well as for resident and migrant waders that utilize these areas for foraging and roosting/resting. This is a significant change in the current operation and represents an unquantified impact on the birds that use these resources at this time of year. Reduction in habitat availability in the Tennessee Valley would require the birds currently utilizing this resource to locate and exploit a resource base in other areas. Little of the type and quality of this habitat exists in the region. This is especially true for the eastern part of the Tennessee Valley where limited suitable alternative habitat is available at this time of year (Chuck Nicholson, TVA, personal communication). Until baseline information is obtained, an unknown and perhaps unmitigable effect would be produced. Therefore,

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before any action other than the Base Case is considered for implementation, specific spatial and temporal information is needed for evaluation.

Unfortunately, we do not have comprehensive survey information for shorebirds across the TVA reservoir system. We do, however, know of several "hot-spots" such as Musick Campground on South Holston Reservoir, Rankin Bottoms on Douglas Reservoir, Savannah Bay on Chickamauga Reservoir, and Pace Point and Britton Ford areas on Kentucky Reservoir (which are within Tennessee NWR). In the past, notable numbers of shorebirds have also been reported from other sites such as the Town Creek area on Wilson Reservoir and the Swan Creek area on Wheeler Reservoir. These areas support from dozens to thousands of shorebirds during late summer-early fall during years of "normal" rainfall and reservoir operation. Typically, the lakes are being slowly drawn down during this time, providing expanses of moist mudflats coincident with the peak fall shorebird migration. Common species include killdeer (*Charadrius vociferus*), semipalmated plovers (*Charadrius semipalmatus*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), solitary sandpipers (*Tringa solitaria*), spotted sandpipers (*Actitis macularia*), pectoral sandpipers (*Calidris melanotos*), short-billed dowitchers (*Limnodromus griseus*), long-billed dowitchers (*Limnodromus scolopaceus*), least sandpipers (*Calidris minutilla*), Western sandpipers (*Calidris mauri*), and semipalmated sandpipers (*Calidris pusilla*). Other regularly occurring but less numerous species include black-bellied plovers (*Pluvialis squatarola*), stilt sandpipers (*Micropalama himantopus*), ruddy turnstones (*Arenaria interpres*), and other peeps. An occasional godwit and phalarope may also be encountered. Many of these areas also support large numbers of herons and egrets during late summer. Great blue herons (*Ardea herodias*) and great egrets (*Casmerodius albus*) are most numerous, and total counts are frequently in the hundreds.

There are significant data gaps that have not been addressed in the DEIS that need attention before informed decision-making and selection of an appropriate alternative can be completed. With regard to migratory birds and resident birds that use specific habitat areas for foraging and roosting, changes in habitat availability and quality will strongly correlate with changes in bird behavior, migration, foraging, resting, and energy expense during passage through and use of these habitats in the Tennessee Valley. We recommend that TVA address the following issues and information gaps before selection of a preferred alternative:

1. All known data on species occurrence, numbers, and current usage of late-season habitats should be compiled in lieu of comprehensive surveys for shorebird and wading bird use over the entire project area. Such a comprehensive picture of late-season habitats would allow for the evaluation of the overall impact of the various alternatives relative to the availability of other potential sites which would not be affected by changes in reservoir operations policy. This synthesis of information would provide a better means to understand the impact of the various alternatives on migratory birds.
2. Assess the theoretical potential for reservoir habitat loss and shorebird use with each alternative by modeling (Geographic Information System) effects of pool levels on habitat loss during the seasons most heavily utilized by shorebirds and waders, throughout the region.
3. Assess the potential to mitigate effects of potential loss of habitat through:
  - a. Creation of other suitable habitats.
  - b. Purchase of other suitable habitats.

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- c. Purchase and conversion of unsuitable habitat to suitable habitat (assuming the purchase isn't a high priority habitat for other valuable wildlife resources).
4. Evaluate the potential to avoid impact to certain high quality areas (e.g., Rankin Bottoms), and nominate these areas as Important Bird Areas.
5. Develop research programs to determine utilization of areas and impact of habitat loss to shorebird energetics during migration.
6. Develop a mitigation plan for loss of habitats.

**Response to Comment 77:** In part to address these concerns, TVA formulated its Preferred Alternative to largely leave unchanged operations on Kentucky and Barkley Reservoirs. Consequently, under the preferred alternative, there would be no noticeable effects on wildlife resources at these reservoirs or on Kentucky Reservoir's important flats. With regard to other specific sites throughout the Tennessee Valley region, the Preferred Alternative would not affect shorebird and wading bird resources on Chickamauga Reservoir and would have only limited impacts on shorebird and wading bird populations on Douglas Reservoir. The extension of summer pool levels on most mainstem reservoirs, however, would delay development of flats on Wheeler and Pickwick Reservoirs. Although existing operations limit the use of flats on these reservoirs until the latter half of the migratory season, an extended summer pool would aggravate this situation. TVA is considering several options to address these impacts (see Chapter 7).

### **78. National Wildlife Refuge Infrastructure and Existing Habitat**

There are over 10,000 acres of managed waters within dozens of impoundments on Tennessee NWR, Cross Creeks NWR, and Wheeler NWR. Management emphasis in these impoundments is primarily focused on waterfowl, but many other wildlife species benefit from this valuable wetland habitat. During early spring, prior to the reservoirs being raised to summer pool, the water level in most of these impoundments is lowered to produce various foods for waterfowl.

A variety of habitats is provided in these impoundments, including agricultural crops, moist soil vegetation, and forested wetlands. Many of the impoundments are situated at a low elevation and do not have mechanical pumping capabilities. On these impoundments the water has to be removed when the reservoir is at winter pool. Even some of the impoundments with pumping capabilities are managed by gravity drawdown to reduce costs associated with their management.

The Commercial Navigation Alternative would raise the winter pool level 2 feet from elevation 354' MSL to 356' MSL on Kentucky Reservoir and from 554' MSL to 556' MSL on Wheeler Reservoir. This increase would greatly reduce the acreage that can be managed on all three refuges, especially on Cross Creeks NWR. Tennessee NWR and Wheeler NWR have pumping capabilities within several impoundments, but with an increase in the reservoir winter pool elevation, pumping costs would increase substantially or managed habitat acreage would be substantially reduced.

All of the managed impoundments on these refuges are subject to flooding. Spring floods are common and occur in most years. Management strategies on the refuges have adapted to this situation, and good quality waterfowl habitat is produced in spite of spring flooding. Early summer floods (June) are less common and do have adverse impacts on the quality and quantity of waterfowl habitats, especially the agricultural crops. Late summer and fall floods are very rare, but when they occur the impacts on these habitats generally result in a total loss of food production for the year. Winter floods are uncommon

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and usually only occur after January. The impacts from winter flooding to waterfowl foods have been limited in the past, but an early winter flood could cause most of the habitats to be unavailable to waterfowl due to the water depth. Floods in any season would cause significant damage to refuge infrastructure (e.g., levees, water control structures, roads, etc.).

All of the alternatives addressed in the DEIS would increase the risk and potential impacts of flooding on Tennessee NWR, Cross Creeks NWR, and Wheeler NWR above that of the Base Case. Depending on the preferred alternative and precipitation patterns in the Tennessee Valley, flooding risks may also be substantially increased on Wheeler NWR. To varying degrees and during different seasons of the year, each alternative would reduce flood storage within the Tennessee Valley System. Insufficient information is provided in the DEIS to determine the significance of the increased flood risk. When a preferred alternative is selected (if other than the Base Case), a detailed analysis of the flood risk for each refuge should be conducted so that an adequate assessment of the impacts can be made.

The scrub/shrub and forested wetlands that ring Kentucky, Barkley, and Wheeler Reservoirs provide important habitats for many species of fish, mammals, amphibians, reptiles, birds, and insects. These wetlands vary from narrow bands along the shoreline to extensive forests within the creek bottoms. From May to July, several thousands of acres of buttonbush (*Cephalanthus occidentalis*) and willow (*Salix* spp.) thickets are shallowly flooded while the reservoirs are at summer pool. Outside the summer pool period, primarily during the winter and spring, these wooded wetlands periodically flood during heavy rainfall events.

When the scrub/shrub and forested wetlands are flooded, waterfowl use these habitats extensively. Wood ducks require dense cover as brood habitat. The willow-buttonbush thickets provide an excellent overhead cover and at the same time are open enough at the water surface to allow the wood duck broods to move easily and feed on the numerous invertebrates that are present. These woody wetland thickets also provide valuable spawning and nursery habitat for a variety of fish and invertebrate species. During the winter and early spring when these habitats flood, mallards (*Anas platyrhynchos*), black ducks (*Anas rubripes*), and wood ducks move into these newly flooded areas to take advantage of a wide variety of food resources.

Many other species of birds utilize this riparian zone for nesting, foraging, and migration stopover habitat. Heron rookeries occur on islands and in bald cypress (*Taxodium distichum*) sloughs in several locations on Tennessee and Wheeler NWRs. The prothonotary warbler (*Protonotaria citrea*), a Partners In Flight (PIF) priority species within the Central Hardwoods and East Gulf Coastal Plains Bird Conservation Regions, is a relatively common breeding bird within the riparian zones of Kentucky, Barkley, and Wheeler Reservoirs. This warbler is limited to bottomland habitats and nests in cavities that are located over or very close to water.

The alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) are expected to have significant negative impacts on the scrub/shrub and forested wetlands along Kentucky, Barkley, and Wheeler Reservoirs. Depending on the preferred alternative and precipitation patterns within the Tennessee Valley, these impacts may also be expected to occur on Wheeler Reservoir. Extending the duration that these habitats are inundated during the

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growing season would dramatically shrink the willow-buttonbush, water tupelo, and bald-cypress plant communities and alter the plant composition of the bottomland hardwoods. The loss of the woody vegetation that is currently inundated at summer pool would negatively impact aquatic organism productivity. We anticipate that the productivity of the local wood duck populations and the quantity and quality of this wintering waterfowl habitat would also be reduced. We expect that the woody plant communities in this zone would be replaced by emergent aquatic plants that would not provide suitable spawning and nursery habitat, wood duck brood cover, or foraging areas for wintering waterfowl. In many cases, these emergent aquatic plant communities may be dominated by invasive exotic species such as alligatorweed (*Achyranthes philoxeroides*) and *Phragmites*.

Shoreline erosion is a major problem along Kentucky, Barkley, and Wheeler Reservoirs. The results are a loss of riparian and upland habitats and decreased water quality. Shoreline stabilization has become a high priority for Tennessee, Cross Creeks, and Wheeler NWRs to protect upland habitats and important archeological sites and to stabilize river islands. We are currently partnering with TVA to stabilize several sites on Tennessee NWR and anticipate this project to continue indefinitely. Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Tailwater Habitat Alternative, and Tailwater Recreation Alternative are listed in the DEIS as having the potential to accelerate the rate of shoreline erosion.

**Response to Comment 78:** Specific managed areas that could be affected are addressed in Section 4.14 and the possible effects on various features of such areas are analyzed in greater detail in discipline-specific sections—including Section 4.8 (Wetlands), Section 4.10 (Terrestrial Ecology), and Section 4.13 (Threatened and Endangered Species). Additional information about potential flooding in national wildlife refuges has been added to the FEIS.

79. The DOI, through the NPS, is mandated by Congress to oversee issues relating to our national parks, particularly "...to conserve the scenery and the natural and historic objects and the wildlife therein, and provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of this and future generations..." (National Park Service Organic Act of 1916). Several units of the National Park System, including Great Smoky Mountain National Park (GRSM), Chickamauga-Chattanooga National Military Park, Shiloh National Military Park, Natchez Trace Parkway, and the Trail of Tears National Historic Trail are, or could be, affected by TVA's reservoir operations. For example, GRSM continues to be negatively affected by airborne emissions from TVA's fossil generation, among other regional sources. Should hydro generation be altered such that fossil generation is increased, the air quality and related ecosystem problems in GRSM could be exacerbated. Bank erosion and other impacts associated with archeology and biota within the riparian corridor that result from hydrologic alterations (e.g., ramping) are issues of concern for all park units adjacent to TVA waters. Units of the National Park System are *not* currently listed in the ROS. Potential impacts to these units should be thoroughly evaluated and included in the final EIS.

**Response to Comment 79:** While some alternatives would result in slightly more fossil generation and others less, TVA does not believe that these slight potential emission changes would result in a substantial change in air quality (see Section 5.2). TVA's ongoing emissions control programs for nitrogen oxides and sulfur dioxide would continue to reduce TVA's impact on regional air quality.

Ramping rates would not increase under any of the alternatives. However, selection of any of the action alternatives would likely result in a minor increase in erosion rates in some

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areas. Based on an analysis of representative areas, TVA believes that similar effects, described in Section 5.16, would be experienced by units of the national park system.

80. In addition, a host of other federal laws, such as the Wild and Scenic Rivers Act, PL 90-542 and the Outdoor Recreation Act, PL 88-29, provide NPS with a mandate to look beyond the boundaries of the national parks in the interest of protecting the public's interests in river and outdoor recreation resources. In general, NPS has an interest in protecting and promoting natural resources, recreational opportunities, aesthetics, and historical and archeological resources. More specific to TVA operations, NPS interests lie in recreational access/facilities, instream flows for recreation and aquatic habitat conservation, riparian corridor protection, and natural streambank stability.

**Response to Comment 80:** Comment noted.

81. The NPS manages wetlands in compliance with Director's Order #77-1 which establishes standards and requirements for implementing E.O. 11990 and in compliance with Section 404 of the Clean Water Act. In following DO #77-1 the NPS is responsible for documenting any adverse impacts to wetland habitats including explanations on the final preferred alternative which will result in wetland losses or degradation. Therefore, the NPS should continue to be an integral part of the Interagency team to develop the final EIS and consideration should be given to direct, indirect and cumulative impacts to wetland habitats within and adjacent to NPS lands.

According to the ROS, approximately 183,000 acres of wetlands are within the projected groundwater influence area of the TVA reservoir system, therefore, there is the strong likelihood that wetlands associated with the operational changes of TVA reservoirs may significantly affect these aquatic habitats found on NPS lands within the Tennessee River system.

The DEIS identifies isolated wetlands as one type which is especially sensitive to groundwater alterations which could occur due to operational changes by TVA. The document also states that these wetlands have lost protection under the CWA due to the recent Supreme Court case decision (SWANCC 2000); however, the SWANCC decision was based on the definition of navigable waters and NPS defines wetlands based on the various parameters of soil, vegetation and hydrology as described in the U.S. Fish and Wildlife Services' "Classification of Wetlands and Deepwater Habitats of the United States" (FWS/OBS-79-31). The NPS guidance (Director's Order #77-1) which establishes requirements for the protection of wetlands, therefore, includes more wetland habitat types than those defined by the Corps including the protection of "isolated" wetland habitats. Wetland delineations on NPS lands must meet the requirements of the CWA, Section 404 and NPS wetland protection policies as required by Director's Order #77-1. The SWANCC decision eliminates many of the wetland types which will, however, continue to receive protection under the National Park Service definition of wetland habitats. Additionally, indirect adverse impacts to wetland habitat can result in increased flood risks and changes in visitor use due to alterations of water levels in upstream reservoirs which are located on adjacent rivers to park lands.

**Response to Comment 81:** National Wetland Inventory maps, which were developed by the USFWS using the Cowardin system (FWS/OBS-79-31), are the source of the wetland acreage data used in the EIS. The reference to the SWANCC decision was intended to identify the resulting loss of federal regulatory protection for certain types of wetlands and the associated increased risk of impacts.

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For additional information on managed areas and ecologically significant sites and recreation, please see Sections 5.14 and 5.24.

82. Since the minimum flow regimes provided at certain tributary reservoir tailwaters were derived using FWS techniques, we point out that the techniques were intended to provide common ground for negotiated flow regimes and are not necessarily the cutting edge of river restoration science. The methodologies have deficiencies which must be understood by users, such as the rudimentary nature of minimum flow calculations, and the vintage of some techniques and curves. We suggest that with some additional refinements, science-based minimum flows within these tailwaters could render additional benefits to the tailwater aquatic and terrestrial communities. Elsewhere within the Tennessee Valley, the FWS has initiated the development of minimum flow regimes which offer seasonally-variable flows reflective of natural run-off characteristics. We also plan to measure aquatic and riparian responses to these events. These minimum flow regimes are more refined in terms of magnitude, duration, and timing of minimum flows, as well as peak flows, so that they may offer periodic pulses for sediment transport, trigger ecological processes, and serve as behavioral cues.

**Response to Comment 82:** In the late 1980s and early 1990s, TVA performed a variety of studies and consulted with several agencies—including USFWS and user groups—during the process of determining appropriate minimum flows downstream from the tributary dams. A concise description of the steps involved in this process was presented in an engineering technical article:

"We selected target minimum flows in a trade-off evaluation that considers four factors: (1) visual observation of flow tests, which shows what actually happens to the river at particular flow rates; (2) computer-modeled incremental physical changes with increased flow; (3) professional judgment of the benefits to aquatic life; and (4) assessment of impacts to recreation, upstream reservoir pools, and annual power production. The resulting minimum flow we chose ranged from 50% to 150% of the unregulated seven-day, 10-year low flow."

TVA worked closely with state water quality and resource management agencies throughout this process. The goal was to select minimum flow levels that would maximize benefits and minimize adverse effects for a wide variety of biological, recreational, water quality, and power production interests.

83. We recommend the development of a process to consider and/or reconsider in detail the minimum flow regime at specific tributary and mainstem tailwaters necessary to enhance aquatic and riparian systems, within system constraints (i.e., navigation, flood control, power generation, and recreation). This process should include the formation of an interdisciplinary team of scientists familiar with the tailwater systems and techniques for developing continuous minimum flow regimes. Key considerations should include timing of flows, magnitude, rate of change, and water quality (e.g., DO, thermal characteristics, etc.).

**Response to Comment 83:** The ROS is a programmatic review of the operations policy and is not intended to examine specific operations at specific facilities. TVA is committed to improving the quality of tailwaters, however, and is open to partnerships and recommendations that advance that goal. TVA would certainly want to participate on any inter-disciplinary team that undertakes a site-specific study of minimum flow needs.

84. We recommend the development and refinement of minimum flow regimes for the specific objective of benefiting tailwater fisheries and aquatic communities at tributary and mainstem

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reservoirs. There are remnants of significant natural communities which would benefit from this process in the tailwaters of Chatuge, Nottely, Cherokee, Douglas, and Blue Ridge Reservoirs. Since many of the existing minimum flow regimes are measured as a daily average, rather than instantaneous flow, we believe that significant benefits would accrue from refinements that provide continuous flows for aquatic and riparian communities. Additionally, we would like to develop a beneficial minimum flow regime for the bypassed reaches of stream at Appalachia and the Ocoee Reservoirs.

**Response to Comment 84:** See Responses to Comments 82 and 83. A minimum flow of 25 cubic feet per second (cfs) below Apalachia Dam was identified as an element of all of the ROS policy alternatives, including TVA's preferred alternative. However, providing continuous flows may not appropriately mimic natural flows. Before deciding to do this, further site-specific evaluations would be needed, as suggested by DOI in preceding comments.

TVA uses modeling to continue to evaluate minimum flow regimes for the benefit of tailwater fisheries and aquatic communities. Tailwater minimum flows are maintained at most TVA projects by routine pulsing. At some point downstream from dams, pulsed flows attenuate into a continuous minimum flow; however, the point of minimum flow attenuation varies by project. For projects with weir dams (like Chatuge), minimum flow is instantaneous at the weir dam; for larger, shallower tailwaters, the attenuation point may be further downstream. In the pulse-affected reaches of Chatuge and Cherokee tailwaters, cold summer-water temperatures are probably the limiting factor for aquatic communities. At Douglas Dam, pulsing proved to be more biologically beneficial for providing a greater minimum flow than releasing a continuous but smaller minimum flow.

85. The FWS has initiated a multi-year study of the effects of stream regulation on freshwater mussels, and we welcome the opportunity to include some of the TVA tributary and mainstem project tailwaters within the experimental design. The objective of this study is to develop methodologies necessary to evaluate the impacts of flow regime changes on these mussel populations. Freshwater mussels are the most critically endangered faunal group in the United States. The construction and operation of TVA dams have and continue to adversely affect many freshwater mussel populations, and in part, these facilities have been responsible for the extinction of several species. Although water quality and temperature of the discharges have and continue to impact some mussel populations, there is a growing body of evidence that altered hydrographs are the primary cause for the decline and endangerment of many species. In order to protect and enhance the remaining populations of mussels in the Tennessee Valley, we believe there is an urgent need to provide adequate flows. The ROS provides a unique opportunity to evaluate flow regimes necessary to sustain healthy mussel populations; however, there is no empirically based method for determining a flow regime suitable for mussels. We suggest a study conducted over a 5-year period which monitors behavioral and physiological attributes might provide the best means of evaluating the effects of changes in flow regimes on mussel populations. There are also opportunities for TVA to assist in an expanded study through funding and aquatic sampling at select TVA tailwaters.

**Response to Comment 85:** TVA has funded and provided sampling data for previous tailwater mussel studies, and would certainly be interested in cooperating in future studies.

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86. It is unclear why hydroturbine ramping rates are not included in a comprehensive study of reservoir operations. Rapid ramping rates cause severe erosion, potentially impacting archeological and ecological resources.

**Response to Comment 86:** Changing ramping rates were included as an element of the Tailwater Habitat Alternative. Under the Preferred Alternative, ramping rates were not changed from the Base Case.

87. The metrics utilized in the DEIS evaluation of aquatic resources focused on DO, temperature, and reservoir hydrodynamics. As concluded in the DEIS, no policy alternative represents a clear benefit to reservoir aquatic resources. Based on water quality modeling performed to date, some degradation of the existing aquatic resources could be expected for several of the alternatives. The DEIS did not make a strong correlation between contiguous, adjacent, and peripheral wetland habitat types and sport fishery productivity. Many of these areas have the potential to change, due to increased water levels, and there could be significant effects to sport fishery spawning and nursery areas. The continued expansion of invasive aquatic emergent vegetation and non-native fish populations is also problematic for spawning and nursery wetland habitats.

**Response to Comment 87:** See Section 4.7.2. The control of invasive species is increasingly challenging to all agencies managing natural resources in this area (see Section 5.11).

88. The alternatives that delay the fall drawdown (Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, Equalized Summer/Winter Flood Risk Alternative, Tailwater Habitat Alternative, and the Tailwater Recreation Alternative) are expected to have significant negative impacts on the scrub/shrub and forested wetlands along Kentucky, Barkley, and Wheeler Reservoirs.

Extending the duration that these habitats are inundated during the growing season will dramatically shrink the willow-buttonbush, water tupelo, and bald-cypress plant communities and alter the plant composition of the bottomland hardwoods. It is expected that the woody plant communities in this zone will be replaced by emergent aquatic plants. In many cases, these emergent aquatic plant communities may be dominated by invasive exotic species such as alligatorweed and *Phragmites*. We believe the final EIS should fully evaluate the potential changes in reservoir wetland habitat type associated with the preferred alternative. Those results should be considered in addition to the metrics evaluated in the DEIS and any refinement to the water quality model(s) once a preferred alternative is selected.

**Response to Comment 88:** Delayed drawdown alternatives are expected to result in impacts on some forested and scrub/shrub wetlands (see Section 5.8).

89. **Investigate additional fish and mussel restoration efforts at tributary and mainstem tailwaters.** There are opportunities to restore native fishes and fisheries through reintroductions at several tailwaters. TVA and the FWS have been involved with several successful reintroduction efforts. We encourage the continued involvement by TVA in these efforts.

**Response to Comment 89:** Comment noted.

90. **Enhance cold/cool-water tailwaters.** We recommend enhancement of aquatic conditions for native aquatic communities by provision of warmer water during summer, with less rapid daily fluctuations, and better oxygenation. Where increased water temperatures are not practical, measures could include cooperation with other agencies and organizations to enhance nearby streams that were fragmented by the construction and operation of TVA

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Reservoirs. These streams have experienced limited colonization and smaller population sizes of their aquatic communities. Although the Fontana and Tims Ford projects provide a significant challenge in this regard, we recognize the significant impairments their deep, cold water releases and drastic fluctuations impose on the Lower Little Tennessee River and Elk River, respectively. The dominating effects of the operation of the Fontana and Tims Ford projects have tremendous implications for our ability to recover several listed species of fish and mussels. We expect TVA to continue to cooperate in the recovery of listed species where it can and to work with us to identify measures to overcome the continued impairment of the Lower Little Tennessee River and Elk River.

**Response to Comment 90:** This programmatic EIS does not address site-specific water temperature issues. Recovery of listed species is addressed in Sections 4.13 and 5.13.

91. Although the scope of the DEIS does not include facilities on the Duck River, we believe significant potential for improvement exists in the Normandy tailwaters. This is due in part to the existing multi-port release mechanism and the questionable condition of the managed trout fishery below Normandy Dam.

**Response to Comment 91:** Comment noted.

92. **Provide fishways.** There are opportunities to allow for upstream and downstream passage of fishes to enhance fish populations at mainstem and tributary reservoirs. The need for fishways for species such as lake sturgeon (*Acipenser fulvescens*), black buffalo (*Ictiobus niger*), smallmouth buffalo (*Ictiobus bubalus*), freshwater drum (*Aplodinotus grunniens*), sauger (*Stizostedion canadense*), walleye (*Stizostedion vitreum*), paddlefish (*Polyodon spathula*), and river herring (*Moxostoma carinatum*) could be estimated from cooperative review of existing and future fish sampling from seasons when species congregate at tailwaters, as well as presence/absence data from historical spawning areas. We recommend a systematic approach to providing efficient and timely fish passage at TVA facilities.

**Response to Comment 92:** The ROS is a programmatic study looking at policy changes on a system-wide basis. This suggestion could require structural modifications that are not being proposed by TVA. The fish species listed do not benefit from traditional fish ladder technology because they do not jump barriers. Moving these species around a dam would require a system without any form of barrier to navigate, which is not currently economically feasible. TVA does monitor technological advances in fish passage and would be willing to revisit this issue if a suitable technology was developed.

93. **Develop an advanced schedule for decommissioning and dam removal.** We recommend that TVA begin to identify and prioritize its dams/reservoirs for eventual removal. It is never too early to project a schedule for removal of these facilities and to plan for restoration of the natural riverine conditions of the Tennessee Valley. Parameters to consider are relative length of reaches potentially restored by dam removal(s), value of and alternate sources of energy provided by the hydroelectric generation capacity, connectivity/fragmentation of the river system, and the benefit to species and natural communities. For TVA developments with the least storage capacity, least generation capacity, and fewest reservoir-dependent neighbors, a tentative time line and plan for removal could be developed. It is important to begin limiting future dependency on these reservoirs sooner than later, reversing trends toward more dependency on their presence, while emphasizing alternate uses of a riverine ecosystem.

**Response to Comment 93:** As discussed in Chapter 3, removal or modification of TVA's dams is considered beyond the scope of the ROS and this EIS, whose purpose is to

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consider operational changes that would increase the public value of TVA's reservoir system. Removing dams, draining reservoirs, and disaggregating the reservoir system would be inconsistent with this purpose and would not increase the overall value of the system.

- 94. Maintain Ecological Staffing.** We recognize the value of TVA's professional staff in guiding and implementing the ROS. We encourage you to maintain adequate staffing and funding in these areas, with a focus on continuity, science, and professionalism.

**Response to Comment 94:** Comment noted.

- 95.** Based on the above considerations, the DOI encourages TVA to maintain its existing policy and conditions within the system by selection of the Base Case alternative presented in the DEIS. TVA has made a substantial investment in improving water quality and habitat conditions within its reservoirs and tailwaters over the years, and we believe that those improvements could be substantially compromised by a majority of the other alternatives.

**Response to Comment 95:** TVA's Preferred Alternative was formulated to address these and other issues.

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### U.S. Environmental Protection Agency Comments

August 20, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

**SUBJ:** EPA Comments on the TVA DPEIS for the "Tennessee Valley Authority Reservoir Operations Study"; Greater Tennessee Valley (AL, GA, KY, MS, NC, TN & VA); CEQ No. 030303

Dear Mr. Nye:

The U.S. Environmental Protection Agency (EPA) has reviewed the referenced Tennessee Valley Authority's (TVA) Draft Programmatic Environmental Impact Statement (DPEIS) in accordance with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. The purpose of the subject document is to determine if any policy changes in TVA's reservoir operations are appropriate for greater public value. Operating objectives considered were navigation, flood control, power generation, water supply, water quality, recreation and other benefits. We appreciate TVA's presentations to EPA regarding this study, introducing it to us in March 2002, presenting water quality modeling conclusions to us and other agencies in April 2003, and presenting the DPEIS to us in July 2003. [1]

Seven river operations policy alternatives were considered by TVA in the DPEIS. The performances of the six action alternatives were designed to enhance certain operational aspects for public benefit and were compared against the *Base Case* (existing operating procedures) alternative. These six action policy alternatives were the Reservoir Recreation A Alternative (*Reservoir Rec A*) which would enhance flatwater (reservoir) recreation by maintaining summer pool levels longer; the Reservoir Recreation B Alternative (*Reservoir Rec B*) which would emphasize recreational benefits more than Reservoir Rec A, the Summer Hydropower Alternative (*Summer Hydro*) which would allow unrestricted drawdowns earlier to concentrate hydropower electric generation in the summer to help accommodate peak power demands; the Equalized Summer/Winter Flood Risk Alternative (*Equalized Flood Risk*) which would equalize the flood risk throughout the year, decreasing risk slightly in summer but increasing it slightly in winter; the Commercial Navigation Alternative (*Commercial Navigation*) which would enhance navigation by elevating water levels to allow greater vessel drafts for heavier cargo; the Tailwater Recreation Alternative (*Tailwater Rec*) which would increase whitewater recreational opportunities below the dam by releasing greater and more predictable volumes downstream; and the Tailwater Habitat Alternative (*Tailwater Habitat*) which would release additional flows at variable rates to simulate more natural, riverine conditions and enhance downstream aquatic habitats. TVA did not identify a preferred alternative in the DPEIS.

EPA has concentrated its review of the DPEIS on water quality and related areas such as wetlands, water supply and hydropower generation, as opposed to recreational, navigational and

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economic aspects. In addition to the enclosed *Detailed Comments*, we offer the following summary comments for TVA's consideration in the development of the Final PEIS (FPEIS) together with its cooperators, the U.S. Army Corps of Engineers (COE) and the U.S. Fish and Wildlife Service (FWS): [2]

### **o ENVIRONMENTAL IMPACTS**

We offer the following summary comments on water quality, wetlands, water supply and hydropower. Our comments are made from a water quality perspective relative to the policy alternatives presented. Additional water quality aspects (assimilative capacity, anoxia, chlorophyll *a*, and soil erosion) are considered in the enclosed *Detailed Comments*. [3]

➤ Water Quality - Overall (Table ES-01), water quality would not be benefited by the performance of most of the policy action alternatives compared to the Base Case. Most policy alternatives would increase reservoir residence (retention) times (pg. 5.4-16). Those alternatives that propose holding water longer than the Base Case (e.g., Reservoir Rec A&B) would store water longer under lake conditions during hot summer days. This would result in longer periods of lake stratification, low DO levels, higher chlorophyll *a* levels (if sufficient nutrients are present), and possibly nuisance or invasive species such as Eurasian milfoil. Reservoir water temperatures may also be warmer on average, which would reduce the DO saturation capability of the impounded waters. Low DO waters have also been associated (pg. 5.4-20) with the mobilization of anoxic products (such as iron, manganese, sulfides and ammonia) from sediments. Once normal drawdowns are allowed for the Reservoir Rec A&B Alternatives, these reservoir releases characterized by low DOs and anoxic products would occur a greater number of days per year than currently and would inundate and adversely affect downstream aquatic habitats. By comparison, those alternatives that increase the release of downstream waters (e.g., Tailwater Rec and Tailwater Habitat) could also have negative water quality effects. That is, the increased flows could result in downstream erosion as well as the release of greater volumes of low DO waters. The performance of most other alternatives also did not favor water quality or would produce no change, although aspects of the Summer Hydro and Commercial Navigation Alternatives would be beneficial. [4]

➤ Wetlands - Based on Table ES-01, the performance of the majority of the policy alternatives would have an overall adverse effect on wetlands, or specifically on wetland type. Wetland losses would tend to occur due to their exposure (lower reservoir pool levels or reduced releases downstream) or inundation (greater pool levels or greater releases). With the implementation of a new policy alternative, it may be assumed that over time a system equilibrium would eventually be reached under the new water regime (if shallow flooded areas were to generate new wetlands to help offset wetlands losses elsewhere). However, since many shorelands are no longer natural due to shoreline development (retainer walls), wetland gains may not equal losses. In addition, the value (function, type and location) of the wetlands lost or gained may be different. For example, the loss of reservoir forested wetlands due to their dessication in low pool reservoirs would be considered a greater loss than the downstream gain of herbaceous wetlands due to greater releases. We note that only the Commercial Navigation Alternative showed no change relative to wetlands, although the Reservoir Rec A&B Alternatives and the Tailwater Rec and Habitat Alternatives would benefit wetland function and location (but not type). [5]

➤ Water Supply - Although water supply delivery would generally be benefited (no cost) by the alternatives (except for an adverse effect by the Summer Hydro Alternative due to intake modification costs), a general decrease in system water quality would have an adverse effect on water supply quality and treatment costs. Based on Table ES-02, only the Summer Hydro and the Commercial Navigation Alternatives would show no change in water supply quality. [6]

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➤ Hydropower - Although not without downstream aquatic impacts, EPA recognizes that hydropower is a renewable form of energy useful for generating peaking and baseload power. Due to operational changes from the Base Case involving pool levels and downstream releases, some of the policy action alternatives would increase hydropower use (i.e., decrease electricity generation by non-hydropower means) and thereby decrease annual air emissions from TVA's electric generation (e.g., NO<sub>x</sub>, SO<sub>x</sub>, PM and mercury emissions). This would be particularly true for the Tailwater Habitat Alternative (Table 5.2-01). Compared to the Base Case, the Summer Hydro Alternative would annually decrease hydropower use, although it would increase its use during summer peaking and periods of ozone formation. [7]

### o CONCLUSIONS & RECOMMENDATIONS

The concept of considering a change from the Base Case in the operation of TVA's reservoir system for public benefit is a sound one. Operational objectives considered included recreation, flood risk, summer hydropower, navigation and tailwater habitat. Upon EIS analysis, however, it appears that such enhancements would have environmental tradeoffs (slightly to substantially adverse impacts, with the exception of the Commercial Navigation Alternative). From a water quality perspective, the presented policy alternatives generally do not favor water quality overall or necessarily related areas such as wetlands. The DPEIS in fact has grouped the alternatives into three categories and concluded (pg. 3-36) that they would either produce water quality impacts, substantial environmental impacts or be somewhat neutral. Accordingly, EPA suggests that one of the following approaches be considered in the FPEIS: [8]

➤ Base Case - Given the overall impacts of the policy action alternatives compared to the Base Case, continuation of the Base Case should be considered. However, environmental and engineering improvements should be continued to further refine TVA's existing operational policy where appropriate. These actions should include elevating reservoir DO levels, increasing downstream releases, water quality monitoring, shoreline management, adaptive management and other upgrades such as the ongoing refurbishing and upgrading of TVA's hydropower turbines (pg. 2-7) to produce more power more efficiently with apparently minimal additional impacts. Similar to the Base Case, the Commercial Navigation Alternative could also be selected since it would not change (have adverse or beneficial environmental impacts) from the Base Case. [9]

➤ Tailwater Habitat Alternative - Although not without impacts, this alternative has some environmental merit. Under this scenario, more water would be released in variable volumes to downstream environments such that the current impounded system would return to a more riverine condition. Hydropower ramping rates would apparently also be changed to modify pulsing flows during periods of generation such as peaking. This change in water volume and in the timing and duration of flows would benefit downstream wetlands (function and location) and aquatic flora and fauna in general, and increase the wetted areas for fish spawning. More riverine conditions would also likely limit the conditions conducive to the eutrophication of chlorophyll *a* and nuisance species in the sense that waters would be more lotic than in the Base Case, as long as water was seasonally available. Since the DPEIS (pg. 3-21) reports that structural changes such as presumed dam removals are not options, the Tailwater Habitat Alternative could be used to nevertheless approach more riverine conditions. From a practical perspective, this alternative would also increase hydropower (reducing air emissions) and whitewater recreation, which are both economically beneficial to TVA. We also assume that basic TVA requirements for flood control and navigation would be satisfied with this alternative. [10]

However, as is generally the case for the policy alternatives, the Tailwater Habitat Alternative is predicted to have an overall adverse effect on water quality. Table ES-02 indicates an adverse effect on anoxic conditions (despite having a beneficial effect on assimilative capacity). The FPEIS should therefore offer

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methods to potentially mitigate these anoxic conditions. For example, additional bottom aeration devices may be needed in the forebays of selected dams or all dams, including aeration devices at Melton, Hill, Guntersville, Pickwick and Kentucky reservoirs which currently do not have any augmentation. Other forms of aeration (damsite aspiration, tailrace aeration, etc.) may also be tried in order to increase the DO levels in downstream releases and inhibit the mobilization of anoxic products. [11] Similar to water quality, the Tailwater Habitat Alternative would also generally have an overall adverse effect on wetlands – specifically on wetland type, since wetland function and location would be benefitted. The FPEIS should offer possible actions to mitigate impacts on wetland type, which may be difficult if the loss (exposure) of forested wetlands results from the implementation of the alternative. Mitigation for shoreline soil erosion downstream should also be explored in the FPEIS since this alternative was predicted to have an adverse effect on reservoir and tailwater shorelines. Mitigation might include rip-rap retainer walls in scour areas or in-stream structures that reduce erosion and dissipate wave energy. [12]

➤ Hybrid Alternative - Potential refinements of one or more DPEIS-presented policy alternatives to form a hybrid alternative may also be possible. Such hybrids should be designed to reduce identified environmental impacts but still have more of a public enhancement benefit than the Base Case. For example, if enhancement of reservoir recreation is targeted by TVA, the water quality lake effects of increased residence times (low DO, anoxia, anoxic products, warmer temperature, higher chlorophyll, invasive/nuisance species, etc.) should be minimized, mitigated or balanced against recreational benefits that are somewhat reduced. For example, if Reservoir Rec A or B is selected in the FPEIS, the document should discuss and recommend mitigative methods to help offset the water quality effects of longer lake storage and/or perhaps not hold reservoir water at a higher pool as long to lessen water quality impacts of the alternative. [13]

### **o SUMMARY**

The enhancement of public benefits relative to the Base Case proposed by the policy alternatives would involve varying environmental tradeoffs. Accordingly, if a policy alternative is selected by TVA, the FPEIS should document how these tradeoffs will be addressed through modifying the alternative and/or mitigating the environmental impacts. In addition to consideration of the Base Case (with further refinements), we recommend consideration of the Tailwater Habitat Alternative (with mitigation) or a hybrid alternative that minimizes impacts but still provides more enhancement than the Base Case. [14]

### **o EPA DEIS RATING**

EPA rates this DEIS as “EC-2” (Environmental Concerns, additional information requested). We primarily base this rating on the potential for water quality impacts of the proposed policy alternatives, and our information requests regarding the further refinement and/or mitigation of the Base Case, Tailwater Habitat Alternative, or a hybrid alternative.

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Thank you for the opportunity to provide comments on the DPEIS. Should you have questions regarding our comments, the staff contact for this project is Chris Hoberg who can be reached directly at 404/562-9619.

Sincerely,

Heinz J. Mueller, Chief  
Office of Environmental Assessment  
Environmental Accountability Division

Enclosure - *Detailed Comments*

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### DETAILED COMMENTS

EPA offers the following detailed comments on water quality, wetlands, hydropower, document quality and other aspects.

#### o ENVIRONMENTAL IMPACTS

➤ **Water Quality** - Overall, water quality would not be benefited by the performance of most of the policy action alternatives compared to the Base Case. The following water quality aspects were reviewed:

\* Water Quality Effects - Table ES-01 summarizes the overall performance of the policy alternatives by public objective. For the water quality objective (*improving water quality in reservoirs and tailwaters*), all action alternatives were rated as having the potential for adverse water quality impacts when compared to the Base Case. Using the impact descriptors in this table, the action alternatives might be ranked (overall impacts – worst to best) as follows: Tailwater Habitat (*adverse*), Reservoir Rec B (*slightly to substantially adverse*), Reservoir Rec A (*slightly adverse to adverse*), Summer Hydro (*adverse to beneficial*), Tailwater Rec (*no change to substantially adverse*), Equalized Flood Risk (*no change to adverse*), and Commercial Navigation Alternative (*no change to slightly beneficial*).

\* Assimilative Capacity & Anoxia - The potential for the assimilative capacity and anoxic conditions was summarized in Tables ES-01 for storage, transitional and mainstem reservoirs. In general, changing the Base Case would generate greater potential for anoxia, although not for every action alternative. In this table, most action alternatives were rated as *adverse, substantially adverse, slightly adverse, variable, or no change to slightly adverse*. Only the Commercial Navigation, Equalized Flood Risk and Summer Hydro Alternatives were predicted to show a more positive *no change, no change to slightly beneficial, variable, slightly beneficial, or substantially beneficial* condition for the three types of reservoirs.

Regarding the assimilative capacity of the three types of reservoir in the TVA system, a change from the Base Case would result in either a benefit, adverse impact or no change (Table ES-02). Specifically, impact descriptors for effects on storage tributaries were *beneficial, slightly beneficial, variable* or show *no change*; for effects on transitional tributaries were *slightly adverse, no change to slightly adverse*, or show *no change*; and for effects on mainstem reservoirs showed *no change*. Benefited storage reservoirs were associated with the implementation of the Reservoir Rec A, Reservoir Rec B, Tailwater Rec and Tailwater Habitat Alternatives.

\* Chlorophyll *a* - Chlorophyll or algal levels in aquatic environments serve as a surrogate or indicator of water quality pollution due to reservoir nutrient levels. Alternatives extending lake residence times can elevate chlorophyll *a* concentrations while those enhancing flows can reduce concentrations. Since most alternatives would increase retention times (pg. 5.4-16), chlorophyll *a* levels would tend to increase with a change from the Base Case. The DPEIS suggests these increases would be generally small "...with a maximum increase less than 10 percent." The FPEIS should discuss the ecological

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significance of such increases with emphasis on any reservoirs with elevated existing levels. In any event, it can be assumed that any increase in chlorophyll *a* concentrations would not indicate water quality maintenance or improvement.

\* Soil Erosion - Since soil erosion also affects water quality through turbidity and downstream siltation, it was also considered in our review. Based on Table ES-01, the overall performance of the action alternatives were related to the soil erosion objective (*minimizing erosion of reservoir shoreline and tailwater banks*). This table predicts that the Reservoir Rec A, Reservoir Rec B, Tailwater Rec and Tailwater Habitat Alternatives would show an erosion potential (*slightly adverse* or *slightly adverse to adverse*) while the Summer Hydro and Equalized Flood Risk Alternatives were to show no change or some benefit (*no change* or *no change to slightly beneficial*). Table ES-02 dissects these data into reservoir versus tailwater shoreline effects. The Summer Hydropower and Equalized Flood Risk Alternatives were predicted to benefit (reduce) shoreline erosion for reservoirs (*slightly beneficial*) and produce *no change* in the erosion of tailwater shorelines.

\* Wetlands - Wetlands also affect water quality by providing a water treatment function. Wetland impacts are further discussed below.

\* Water Quality Modeling - EPA appreciated being invited to the TVA water quality presentation made to several agencies in Knoxville on April 15, 2003, regarding TVA's modeling conclusions on the study (*Preliminary Water Quality Results for Reservoir Operations Study*). Although an extensive amount of water quality work was performed, the DPEIS only summarizes it in general terms without presenting details. The FPEIS should provide sufficient water quality modeling detail to distinguish differences among policy alternatives. [15]

➤ Wetlands - For the public objective involving wetland protection (*protecting and improving wetlands and other ecologically sensitive areas*), Table ES-01 indicates that the potential for adverse impacts exists through implementation of most of the action alternatives, with only the Commercial Navigation Alternative showing *no change* relative to wetlands. Based on Table ES-01, the policy alternatives might be ranked (overall impacts – worst to best) as follows: Summer Hydro (*substantially adverse*), Equalized Flood Risk (*adverse to substantially adverse*), Reservoir Rec B (*adverse to slightly beneficial*), Reservoir Rec A/Tailwater Rec/Tailwater Habitat (*slightly adverse to slightly beneficial*) and Commercial Navigation Alternative (*no change*).

Table ES-02 more specifically considers impacts to the location, type and function of wetlands. In such an analysis, the two recreational enhancement alternatives (Reservoir Rec A&B) and the two Tailwater alternatives (Tailwater Rec and Tailwater Habitat) would benefit (*slightly beneficial* or *slightly beneficial to beneficial*) wetland location and function. Wetland type, however, would not be benefited by these four alternatives (*adverse (variable)* or *slightly adverse (variable)*) which would make the overall wetland impact adverse as presented in Table ES-01 and discussed above. The Commercial Navigation Alternative is the only alternative that would not impact wetland type since it is predicted to show *no change*. [16]

➤ Hydropower - The Summer Hydro Alternative maximizes summer hydropower generation for peaking purposes. On an annual basis, however, it would result in a reduction of hydropower and a

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consequential increase in air emissions from fossil fuel power plants. Although the emissions would increase, it should be noted that emissions (including ozone precursors such as NO<sub>x</sub>) should be less than the Base Case during the summer. This is significant since conditions are ripe for ozone formation during the summer. Although the DPEIS discusses this benefit (pg. 6-3), ozone is not specifically mentioned. The FPEIS should discuss the value of less summertime air emissions relative to ozone formation in the Tennessee Valley. [17]

### o OTHER COMMENTS

➤ **Ramping Rates** - Page 3-20 states that “[c]hanging ramping rates was included as an element of the Tailwater Habitat Alternative” and page 3-8 states that there would be “no turbine peaking allowed.” The FPEIS should further discuss how this would affect downstream aquatics versus hydropower generation during peaking. [18]

➤ **Structural Changes** - Page 3-21 indicates that structural changes, such as the presumed removal or modification of dams and levees, was not carried forward in the DPEIS as a component to any of the policy alternatives. However, all such structures have a finite project life. Are any TVA owned or operated dams nearing the end of their project life? Would TVA refurbish or remove such facilities? The FPEIS should discuss the TVA policy and any candidate sites. [19]

➤ **Document Quality** - Although the DPEIS was well organized, the nature of the subject matter is complex since enhancement of one benefit for a given alternative often resulted in a tradeoff of other benefits. In order to facilitate public readability and review of the FPEIS, we recommend the following modifications: [20]

\* **Designed Enhancements** - Page 1-9 and 1-10 indicate that based on the scoping process, the top three public priorities were recreational benefits, environmental protection and flood control, while the public priorities at the workshops were environmental protection, power production and water supply. Given that environmental protection was the first or second priority for the public, it is somewhat surprising that essentially only one alternative (Tailwater Habitat) was analyzed that would enhance the environment (by comparison, three alternatives would enhance recreation). [21]

\* **Study Objectives** - The study objectives provided by the public during the scoping process are listed on page 1-12. Although most are self explanatory, the FPEIS would be improved if some definitions were provided. For example, the objective for *improving aquatic habitat in reservoirs and tailwaters* might suggest increasing submerged aquatic vegetation in both the downstream tailwater area and in the littoral zone of the reservoir. However, an adverse impact to this objective might not only imply a *reduction* in submerged aquatic vegetation but also an *increase* in invasive species such as Eurasian milfoil or a pollution indicator species such as chlorophyll *a*. Where appropriate, the FPEIS should clarify the objectives through textual discussion or tabular footnotes to better describe the objectives being considered. [22]

\* **Impact Descriptors** - Tables ES-01 and ES-02 present impact descriptors for various identified public study objectives or impact categories by alternative. In general, Table ES-02 is more specific than Table ES-01 since it dissects data (e.g., wetland impacts are divided into wetland location type and

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function), so that the impact descriptors in Table ES-01 seem to be a composite of various components in Table ES-02 (we note that this resulted in some wide-ranging conclusions such as a *slightly adverse to slightly beneficial* effect that appear confusing). However, in the case of the public study objective for water quality (*improving water quality in reservoirs and tailwaters*), the impact descriptors for the various water quality aspects considered in Table ES-02 (assimilative capacity and anoxia in tributary and mainstem reservoirs) do not relate to those descriptors used in Table ES-01 (i.e., are not a composite of the descriptors used in Table ES-01). The FPEIS should discuss this and the basis for the descriptors used in Table ES-01 for water quality.

We also note from Table ES-02 that even though the Tailwater Habitat Alternative (for storage tributaries) was predicted to be *beneficial* for assimilative capacity, its performance was considered *adverse* for anoxia. The FPEIS should discuss why this was predicted. Can the same system be beneficial for one and adverse for the other? [23]

\* **Significance** - In addition to clarifying impact descriptors, the basis of these conclusions should be further discussed. Although Tables ES-01 and ES-02 are intended to be summary tables, the text (Chapter 5) should further explain how these conclusions were reached and summarized in the tables. For example, page 5.4-13 states that "...mainstem reservoirs would experience an increase in volumes of water with low DO concentrations under Reservoir Rec Alternative B relative to the Base Case..." We suggest that such conclusory statements be substantiated, such as "...mainstem reservoirs would experience an increase in volumes of water with low DO concentrations under Reservoir Rec B Alternative relative to the Base Case since reservoir residence times would be longer." Without such discussion, some of the conclusions in tables are not always intuitive and may even seem counterintuitive. [24]

\* **Typographical** - We note that Table 5.2-01 may contain an error. The first column of this table presents an increase (+) of 298,810 MW hours of non-hydro generation for the Tailwater Habitat Alternative. However, given that the emissions are predicted to be decreased (-) for this alternative, the 298,810 MW hour figure should presumably also be negative to indicate a decrease in MW hours of non-hydro generation and to account for the decreased emissions. This should be modified or discussed in the FPEIS. EPA has assumed this value to be a negative 298,810 (-298,810) in our hydropower review. [25]

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### **RESPONSE TO COMMENTS**

1. We appreciate TVA's presentations to EPA regarding this study, introducing it to us in March 2002, presenting water quality modeling conclusions to us and other agencies in April 2003, and presenting the DPEIS to us in July 2003.

**Response to Comment 1:** Comment noted.

2. Seven river operations policy alternatives were considered by TVA in the DPEIS. The performances of the six action alternatives were designed to enhance certain operational aspects for public benefit and were compared against the Base Case (existing operating procedures) alternative. These six action policy alternatives were the Reservoir Recreation A Alternative (Reservoir Rec A) which would enhance flatwater (reservoir) recreation by maintaining summer pool levels longer; the Reservoir Recreation B Alternative (Reservoir Rec B) which would emphasize recreational benefits more than Reservoir Rec A, the Summer Hydropower Alternative (Summer Hydro) which would allow unrestricted drawdowns earlier to concentrate hydropower electric generation in the summer to help accommodate peak power demands; the Equalized Summer/Winter Flood Risk Alternative (Equalized Flood Risk) which would equalize the flood risk throughout the year, decreasing risk slightly in summer but increasing it slightly in winter; the Commercial Navigation Alternative (Commercial Navigation) which would enhance navigation by elevating water levels to allow greater vessel drafts for heavier cargo; the Tailwater Recreation Alternative (Tailwater Rec) which would increase whitewater recreational opportunities below the dam by releasing greater and more predictable volumes downstream; and the Tailwater Habitat Alternative (Tailwater Habitat) which would release additional flows at variable rates to simulate more natural, riverine conditions and enhance downstream aquatic habitats. TVA did not identify a preferred alternative in the DPEIS.

EPA has concentrated its review of the DPEIS on water quality and related areas such as wetlands, water supply and hydropower generation, as opposed to recreational, navigational and economic aspects. In addition to the enclosed Detailed Comments, we offer the following summary comments for TVA's consideration in the development of the Final PEIS (FPEIS) together with its cooperators, the U.S. Army Corps of Engineers (COE) and the U.S. Fish and Wildlife Service (FWS):

**Response to Comment 2:** Comment noted.

3. We offer the following summary comments on water quality, wetlands, water supply and hydropower. Our comments are made from a water quality perspective relative to the policy alternatives presented. Additional water quality aspects (assimilative capacity, anoxia, chlorophyll a, and soil erosion) are considered in the enclosed Detailed Comments.

**Response to Comment 3:** Comment noted.

4. > Water Quality - Overall (Table ES-01), water quality would not be benefited by the performance of most of the policy action alternatives compared to the Base Case. Most policy alternatives would increase reservoir residence (retention) times (pg. 5.4-16). Those alternatives that propose holding water longer than the Base Case (e.g., Reservoir Rec A&B) would store water longer under lake conditions during hot summer days. This would result in longer periods of lake stratification, low DO levels, higher chlorophyll a levels (if sufficient nutrients are present), and possibly nuisance or invasive species such as Eurasian milfoil. Reservoir water temperatures may also be warmer on average, which would reduce

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the DO saturation capability of the impounded waters. Low DO waters have also been associated (pg. 5.4-20) with the mobilization of anoxic products (such as iron, manganese, sulfides and ammonia) from sediments. Once normal drawdowns are allowed for the Reservoir Rec A&B Alternatives, these reservoir releases characterized by low DOs and anoxic products would occur a greater number of days per year than currently and would inundate and adversely affect downstream aquatic habitats. By comparison, those alternatives that increase the release of downstream waters (e.g., Tailwater Rec and Tailwater Habitat) could also have negative water quality effects. That is, the increased flows could result in downstream erosion as well as the release of greater volumes of low DO waters. The performance of most other alternatives also did not favor water quality or would produce no change, although aspects of the Summer Hydro and Commercial Navigation Alternatives would be beneficial.

**Response to Comment 4:** TVA considered the potential impacts on water quality while formulating its Preferred Alternative to reduce the risk of adverse impacts associated with the alternatives identified in the DEIS.

5. > Wetlands - Based on Table ES-01, the performance of the majority of the policy alternatives would have an overall adverse effect on wetlands, or specifically on wetland type. Wetland losses would tend to occur due to their exposure (lower reservoir pool levels or reduced releases downstream) or inundation (greater pool levels or greater releases). With the implementation of a new policy alternative, it may be assumed that over time a system equilibrium would eventually be reached under the new water regime (if shallow flooded areas were to generate new wetlands to help offset wetlands losses elsewhere). However, since many shorelands are no longer natural due to shoreline development (retainer walls), wetland gains may not equal losses. In addition, the value (function, type and location) of the wetlands lost or gained may be different. For example, the loss of reservoir forested wetlands due to their desiccation in low pool reservoirs would be considered a greater loss than the downstream gain of herbaceous wetlands due to greater releases. We note that only the Commercial Navigation Alternative showed no change relative to wetlands, although the Reservoir Rec A&B Alternatives and the Tailwater Rec and Habitat Alternatives would benefit wetland function and location (but not type).

**Response to Comment 5:** TVA's Preferred Alternative would reduce the potential impacts on wetlands relative to the impacts associated with the action alternatives described in the DEIS. See Section 3.3.9.

6. > Water Supply - Although water supply delivery would generally be benefited (no cost) by the alternatives (except for an adverse effect by the Summer Hydro Alternative due to intake modification costs), a general decrease in system water quality would have an adverse effect on water supply quality and treatment costs. Based on Table ES-02, only the Summer Hydro and the Commercial Navigation Alternatives would show no change in water supply quality.

**Response to Comment 6:** See Response to Comment 4.

7. > Hydropower - Although not without downstream aquatic impacts, EPA recognizes that hydropower is a renewable form of energy useful for generating peaking and baseload power. Due to operational changes from the Base Case involving pool levels and downstream releases, some of the policy action alternatives would increase hydropower use (i.e., decrease electricity generation by non-hydropower means) and thereby decrease annual air emissions from TVA's electric generation (e.g., NO<sub>x</sub>, SO<sub>x</sub>, PM and mercury

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emissions). This would be particularly true for the Tailwater Habitat Alternative (Table 5.2-01). Compared to the Base Case, the Summer Hydro Alternative would annually decrease hydropower use, although it would increase its use during summer peaking and periods of ozone formation.

**Response to Comment 7:** TVA formulated its Preferred Alternative to reduce the potential impact on hydropower generation values, relative to the action alternatives in the DEIS. See Section 3.3.9.

8. The concept of considering a change from the Base Case in the operation of TVA's reservoir system for public benefit is a sound one. Operational objectives considered included recreation, flood risk, summer hydropower, navigation and tailwater habitat. Upon EIS analysis, however, it appears that such enhancements would have environmental tradeoffs (slightly to substantially adverse impacts, with the exception of the Commercial Navigation Alternative). From a water quality perspective, the presented policy alternatives generally do not favor water quality overall or necessarily related areas such as wetlands. The DPEIS in fact has grouped the alternatives into three categories and concluded (pg. 3-36) that they would either produce water quality impacts, substantial environmental impacts or be somewhat neutral. Accordingly, EPA suggests that one of the following approaches be considered in the FPEIS:

**Response to Comment 8:** Comment noted.

9. > Base Case - Given the overall impacts of the policy action alternatives compared to the Base Case, continuation of the Base Case should be considered. However, environmental and engineering improvements should be continued to further refine TVA's existing operational policy where appropriate. These actions should include elevating reservoir DO levels, increasing downstream releases, water quality monitoring, shoreline management, adaptive management and other upgrades such as the ongoing refurbishing and upgrading of TVA's hydropower turbines (pg. 2-7) to produce more power more efficiently with apparently minimal additional impacts. Similar to the Base Case, the Commercial Navigation Alternative could also be selected since it would not change (have adverse or beneficial environmental impacts) from the Base Case.

**Response to Comment 9:** TVA developed the Preferred Alternative in response to these and other issues; and also investigated the kind of adjustments described in the comment that could be made to the Base Case. Unfortunately, TVA was unable to effectively address the general public desire for enhanced recreational opportunities with this approach. TVA believes that the Preferred Alternative identified in the FEIS does appropriately address the concerns expressed in the comment.

10. > Tailwater Habitat Alternative - Although not without impacts, this alternative has some environmental merit. Under this scenario, more water would be released in variable volumes to downstream environments such that the current impounded system would return to a more riverine condition. Hydropower ramping rates would apparently also be changed to modify pulsing flows during periods of generation such as peaking. This change in water volume and in the timing and duration of flows would benefit downstream wetlands (function and location) and aquatic flora and fauna in general, and increase the wetted areas for fish spawning. More riverine conditions would also likely limit the conditions conducive to the eutrophication of chlorophyll a and nuisance species in the sense that waters would be more lotic than in the Base Case, as long as water was seasonally available. Since the DPEIS (pg. 3-21) reports that structural changes such as presumed dam removals are not

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options, the Tailwater Habitat Alternative could be used to nevertheless approach more riverine conditions. From a practical perspective, this alternative would also increase hydropower (reducing air emissions) and whitewater recreation, which are both economically beneficial to TVA. We also assume that basic TVA requirements for flood control and navigation would be satisfied with this alternative.

**Response to Comment 10:** See Response to Comment 9.

11. However, as is generally the case for the policy alternatives, the Tailwater Habitat Alternative is predicted to have an overall adverse effect on water quality. Table ES-02 indicates an adverse effect on anoxic conditions (despite having a beneficial effect on assimilative capacity). The FPEIS should therefore offer methods to potentially mitigate these anoxic conditions. For example, additional bottom aeration devices may be needed in the forebays of selected dams or all dams, including aeration devices at Melton, Hill, Guntersville, Pickwick and Kentucky reservoirs which currently do not have any augmentation. Other forms of aeration (damsite aspiration, tailrace aeration, etc.) may also be tried in order to increase the DO levels in downstream releases and inhibit the mobilization of anoxic products.

**Response to Comment 11:** The particular situation mentioned—adverse effect on anoxic conditions despite a beneficial effect on assimilative capacity under the Tailwater Habitat Alternative (Table ES-02)—would occur only on storage tributary reservoirs. The two representative reservoirs for this category included in the EIS are Douglas and South Holston Reservoirs—both of which already have aeration equipment and target DO concentrations. TVA has committed to maintaining these targets, regardless of which operations alternative is eventually selected.

12. Similar to water quality, the Tailwater Habitat Alternative would also generally have an overall adverse effect on wetlands – specifically on wetland type, since wetland function and location would be benefited. The FPEIS should offer possible actions to mitigate impacts on wetland type, which may be difficult if the loss (exposure) of forested wetlands results from the implementation of the alternative. Mitigation for shoreline soil erosion downstream should also be explored in the FPEIS since this alternative was predicted to have an adverse effect on reservoir and tailwater shorelines. Mitigation might include rip-rap retainer walls in scour areas or in-stream structures that reduce erosion and dissipate wave energy.

**Response to Comment 12:** TVA's Preferred Alternative was designed, in part, to reduce impacts on wetlands relative to the impacts associated with the action alternatives in the DEIS. An ongoing TVA program assesses, prioritizes, and repairs eroding TVA-owned shoreline. In addition, TVA Watershed Teams work with local communities and property owners to address problem areas on tailwater banks. Watershed Teams provide technical support and assist with obtaining funding.

In addition to traditional riprap, TVA supports the use of bioengineering and natural channel design techniques in order to enhance habitat and aesthetics, while stabilizing the shoreline and channels. These efforts will be ongoing and may be expanded if the chosen alternative is shown to increase erosion rates.

13. > Hybrid Alternative - Potential refinements of one or more DPEIS-presented policy alternatives to form a hybrid alternative may also be possible. Such hybrids should be designed to reduce identified environmental impacts but still have more of a public enhancement benefit than the Base Case. For example, if enhancement of reservoir

## **Appendix F4 - Response to Federal and State Agency Comments**

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recreation is targeted by TVA, the water quality lake effects of increased residence times (low DO, anoxia, anoxic products, warmer temperature, higher chlorophyll, invasive/nuisance species, etc.) should be minimized, mitigated or balanced against recreational benefits that are somewhat reduced. For example, if Reservoir Rec A or B is selected in the FPEIS, the document should discuss and recommend mitigative methods to help offset the water quality effects of longer lake storage and/or perhaps not hold reservoir water at a higher pool as long to lessen water quality impacts of the alternative.

**Response to Comment 13:** The alternative identified in the FEIS as TVA's Preferred Alternative is a hybrid or blended alternative. It was formulated to accomplish what is suggested by this comment.

14. The enhancement of public benefits relative to the Base Case proposed by the policy alternatives would involve varying environmental tradeoffs. Accordingly, if a policy alternative is selected by TVA, the FPEIS should document how these tradeoffs will be addressed through modifying the alternative and/or mitigating the environmental impacts. In addition to consideration of the Base Case (with further refinements), we recommend consideration of the Tailwater Habitat Alternative (with mitigation) or a hybrid alternative that minimizes impacts but still provides more enhancement than the Base Case.

**Response to Comment 14:** As suggested, TVA created a hybrid or blended alternative and identified it as TVA's Preferred Alternative. Chapter 3 discusses what the Preferred Alternative would accomplish and how it addresses the comments received on the DEIS.

15. > Water Quality - Overall, water quality would not be benefited by the performance of most of the policy action alternatives compared to the Base Case. The following water quality aspects were reviewed:

\* Water Quality Effects - Table ES-01 summarizes the overall performance of the policy alternatives by public objective. For the water quality objective (improving water quality in reservoirs and tailwaters), all action alternatives were rated as having the potential for adverse water quality impacts when compared to the Base Case. Using the impact descriptors in this table, the action alternatives might be ranked (overall impacts – worst to best) as follows: Tailwater Habitat (adverse), Reservoir Rec B (slightly to substantially adverse), Reservoir Rec A (slightly adverse to adverse), Summer Hydro (adverse to beneficial), Tailwater Rec (no change to substantially adverse), Equalized Flood Risk (no change to adverse), and Commercial Navigation Alternative (no change to slightly beneficial).

\* Assimilative Capacity & Anoxia - The potential for the assimilative capacity and anoxic conditions was summarized in Tables ES-01 for storage, transitional and mainstem reservoirs. In general, changing the Base Case would generate greater potential for anoxia, although not for every action alternative. In this table, most action alternatives were rated as adverse, substantially adverse, slightly adverse, variable, or no change to slightly adverse. Only the Commercial Navigation, Equalized Flood Risk and Summer Hydro Alternatives were predicted to show a more positive no change, no change to slightly beneficial, variable, slightly beneficial, or substantially beneficial condition for the three types of reservoirs.

Regarding the assimilative capacity of the three types of reservoir in the TVA system, a change from the Base Case would result in either a benefit, adverse impact or no change (Table ES-02). Specifically, impact descriptors for effects on storage tributaries were beneficial, slightly beneficial, variable or show no change; for effects on transitional tributaries were slightly adverse, no change to slightly adverse, or show no change; and for

## Appendix F4 Response to Federal and State Agency Comments

effects on mainstem reservoirs showed no change. Benefited storage reservoirs were associated with the implementation of the Reservoir Rec A, Reservoir Rec B, Tailwater Rec and Tailwater Habitat Alternatives.

Chlorophyll a - Chlorophyll or algal levels in aquatic environments serve as a surrogate or indicator of water quality pollution due to reservoir nutrient levels. Alternatives extending lake residence times can elevate chlorophyll a concentrations while those enhancing flows can reduce concentrations. Since most alternatives would increase retention times (pg. 5.4-16), chlorophyll a levels would tend to increase with a change from the Base Case. The DPEIS suggests these increases would be generally small "...with a maximum increase less than 10 percent." The FPEIS should discuss the ecological significance of such increases with emphasis on any reservoirs with elevated existing levels. In any event, it can be assumed that any increase in chlorophyll a concentrations would not indicate water quality maintenance or improvement.

\* Soil Erosion - Since soil erosion also affects water quality through turbidity and downstream siltation, it was also considered in our review. Based on Table ES-01, the overall performance of the action alternatives were related to the soil erosion objective (minimizing erosion of reservoir shoreline and tailwater banks). This table predicts that the Reservoir Rec A, Reservoir Rec B, Tailwater Rec and Tailwater Habitat Alternatives would show an erosion potential (slightly adverse or slightly adverse to adverse) while the Summer Hydro and Equalized Flood Risk Alternatives were to show no change or some benefit (no change or no change to slightly beneficial). Table ES-02 dissects these data into reservoir versus tailwater shoreline effects. The Summer Hydropower and Equalized Flood Risk Alternatives were predicted to benefit (reduce) shoreline erosion for reservoirs (slightly beneficial) and produce no change in the erosion of tailwater shorelines.

\* Wetlands - Wetlands also affect water quality by providing a water treatment function. Wetland impacts are further discussed below.

\* Water Quality Modeling - EPA appreciated being invited to the TVA water quality presentation made to several agencies in Knoxville on April 15, 2003, regarding TVA's modeling conclusions on the study (Preliminary Water Quality Results for Reservoir Operations Study). Although an extensive amount of water quality work was performed, the DPEIS only summarizes it in general terms without presenting details. The FPEIS should provide sufficient water quality modeling detail to distinguish differences among policy alternatives.

**Response to Comment 15:** As the U.S. Environmental Protection Agency (USEPA) notes, an extensive amount of water quality modeling was conducted. From the analyses, TVA concluded that increases in chlorophyll-a—even on reservoirs where levels are already elevated—would not result in substantially adverse impacts. Much of the water quality modeling information was contained in the Water Quality Technical Report prepared to support the EIS, but was not included as a core component because of size limitations. It is always difficult to judge how much technical detail to provide in a document that is supposed to be understandable and usable by the average, non-technical reader. TVA thinks that the balance struck in the EIS is appropriate. If a reviewer would like more detail, the Water Quality Technical Report is available on request.

16. > Wetlands - For the public objective involving wetland protection (protecting and improving wetlands and other ecologically sensitive areas), Table ES-01 indicates that the potential for adverse impacts exists through implementation of most of the action alternatives, with only the Commercial Navigation Alternative showing no change relative to

## **Appendix F4 Response to Federal and State Agency Comments**

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wetlands. Based on Table ES-01, the policy alternatives might be ranked (overall impacts – worst to best) as follows: Summer Hydro (substantially adverse), Equalized Flood Risk (adverse to substantially adverse), Reservoir Rec B (adverse to slightly beneficial), Reservoir Rec A/Tailwater Rec/Tailwater Habitat (slightly adverse to slightly beneficial) and Commercial Navigation Alternative (no change).

Table ES-02 more specifically considers impacts to the location, type and function of wetlands. In such an analysis, the two recreational enhancement alternatives (Reservoir Rec A&B) and the two Tailwater alternatives (Tailwater Rec and Tailwater Habitat) would benefit (slightly beneficial or slightly beneficial to beneficial) wetland location and function. Wetland type, however, would not be benefited by these four alternatives (adverse (variable) or slightly adverse (variable)) which would make the overall wetland impact adverse as presented in Table ES-01 and discussed above. The Commercial Navigation Alternative is the only alternative that would not impact wetland type since it is predicted to show no change.

**Response to Comment 16:** See Response to Comment 5.

17. > **Hydropower** - The Summer Hydro Alternative maximizes summer hydropower generation for peaking purposes. On an annual basis, however, it would result in a reduction of hydropower and a consequential increase in air emissions from fossil fuel power plants. Although the emissions would increase, it should be noted that emissions (including ozone precursors such as NOx) should be less than the Base Case during the summer. This is significant since conditions are ripe for ozone formation during the summer. Although the DPEIS discusses this benefit (pg. 6-3), ozone is not specifically mentioned. The FPEIS should discuss the value of less summertime air emissions relative to ozone formation in the Tennessee Valley.

**Response to Comment 17:** While some alternatives would result in slightly more fossil generation and others less, TVA does not believe that these slight potential emission changes would result in a substantial change in air quality (see Section 5.2). TVA's ongoing emissions control programs for nitrogen oxides and sulfur dioxide would continue to reduce TVA's impact on regional air quality.

18. > **Ramping Rates** - Page 3-20 states that “[c]hanging ramping rates was included as an element of the Tailwater Habitat Alternative” and page 3-8 states that there would be “no turbine peaking allowed.” The FPEIS should further discuss how this would affect downstream aquatics versus hydropower generation during peaking.

**Response to Comment 18:** Ramping rates would not be increased under any of the alternatives, which would provide more stable flows that would contribute to a more diverse aquatic community. The issue is addressed in Section 5.7.2.

19. > **Structural Changes** - Page 3-21 indicates that structural changes, such as the presumed removal or modification of dams and levees, were not carried forward in the DPEIS as a component to any of the policy alternatives. However, all such structures have a finite project life. Are any TVA owned or operated dams nearing the end of their project life? Would TVA refurbish or remove such facilities? The FPEIS should discuss the TVA policy and any candidate sites.

**Response to Comment 19:** As discussed in Chapter 3, removal or modification of TVA's dams is considered beyond the scope of ROS and this EIS, whose purpose is to consider

## Appendix F4 Response to Federal and State Agency Comments

operational changes that would increase the public value of TVA's reservoir system. Removing dams, draining reservoirs, and disaggregating the reservoir system would be inconsistent with this purpose and would not increase the overall value of the system. TVA has an ongoing effort to modernize its hydropower generation facilities.

20. > Document Quality - Although the DPEIS was well organized, the nature of the subject matter is complex since enhancement of one benefit for a given alternative often resulted in a tradeoff of other benefits. In order to facilitate public readability and review of the FPEIS, we recommend the following modifications:

**Response to Comment 20:** Comment noted.

21. \* Designed Enhancements - Page 1-9 and 1-10 indicate that based on the scoping process, the top three public priorities were recreational benefits, environmental protection and flood control, while the public priorities at the workshops were environmental protection, power production and water supply. Given that environmental protection was the first or second priority for the public, it is somewhat surprising that essentially only one alternative (Tailwater Habitat) was analyzed that would enhance the environment (by comparison, three alternatives would enhance recreation).

**Response to Comment 21:** The Tailwater Habitat Alternative was structured to enhance certain environmental features, but all of the alternatives were formulated with environmental protection in mind. As discussed in Chapter 3 of the EIS, one of the first things TVA did in formulating alternatives was to eliminate possible alternatives that would result in substantially adverse environmental impacts. The TVA reservoir system is so large and has such a wide range of different habitats and resource conditions that it is difficult to make any changes to operations that would not result in some adverse impacts somewhere. While formulating the Preferred Alternative, TVA made every effort to reduce adverse impacts to the greatest extent possible, while still achieving or enhancing those aspects of the reservoir system most valued by the public.

22. \* Study Objectives - The study objectives provided by the public during the scoping process are listed on page 1-12. Although most are self explanatory, the FPEIS would be improved if some definitions were provided. For example, the objective for improving aquatic habitat in reservoirs and tailwaters might suggest increasing submerged aquatic vegetation in both the downstream tailwater area and in the littoral zone of the reservoir. However, an adverse impact to this objective might not only imply a reduction in submerged aquatic vegetation but also an increase in invasive species such as Eurasian milfoil or a pollution indicator species such as chlorophyll a. Where appropriate, the FPEIS should clarify the objectives through textual discussion or tabular footnotes to better describe the objectives being considered.

**Response to Comment 22:** As suggested, TVA modified discussions in the FEIS to better define the identified objectives.

23. \* Impact Descriptors - Tables ES-01 and ES-02 present impact descriptors for various identified public study objectives or impact categories by alternative. In general, Table ES-02 is more specific than Table ES-01 since it dissects data (e.g., wetland impacts are divided into wetland location type and function), so that the impact descriptors in Table ES-01 seem to be a composite of various components in Table ES-02 (we note that this resulted in some wide-ranging conclusions such as a slightly adverse to slightly beneficial effect that appear confusing). However, in the case of the public study objective for water quality (improving water quality in reservoirs and tailwaters), the impact descriptors for the

## Appendix F4. Response to Federal and State Agency Comments

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various water quality aspects considered in Table ES-02 (assimilative capacity and anoxia in tributary and mainstem reservoirs) do not relate to those descriptors used in Table ES-01 (i.e., are not a composite of the descriptors used in Table ES-01). The FPEIS should discuss this and the basis for the descriptors used in Table ES-01 for water quality.

We also note from Table ES-02 that even though the Tailwater Habitat Alternative (for storage tributaries) was predicted to be beneficial for assimilative capacity, its performance was considered adverse for anoxia. The FPEIS should discuss why this was predicted. Can the same system be beneficial for one and adverse for the other?

**Response to Comment 23:** The FEIS addresses this issue. Tables ES-01 and ES-02 have been extensively revised.

24. \* Significance - In addition to clarifying impact descriptors, the basis of these conclusions should be further discussed. Although Tables ES-01 and ES-02 are intended to be summary tables, the text (Chapter 5) should further explain how these conclusions were reached and summarized in the tables. For example, page 5.4-13 states that "...mainstem reservoirs would experience an increase in volumes of water with low DO concentrations under Reservoir Rec Alternative B relative to the Base Case..." We suggest that such conclusory statements be substantiated, such as "...mainstem reservoirs would experience an increase in volumes of water with low DO concentrations under Reservoir Rec B Alternative relative to the Base Case since reservoir residence times would be longer." Without such discussion, some of the conclusions in tables are not always intuitive and may even seem counterintuitive.

**Response to Comment 24:** A balance must be struck between concisely summarizing results of analyses and including too much information. TVA believes that the conclusions presented in the EIS are supported and explained by information in the document, either in the text itself or in the appendices. Nevertheless, we have reviewed the document and, as suggested, have provided further explanation of conclusions where appropriate.

The water quality components of Tables ES-01 and ES-02 are summaries of information in Table 5.4-02. Table D1-02 provides the actual model-generated data on which the summaries in Table 5.4-02 were based. The text in Section 5.4 under "Model Results" explains how data in Table D1-02 were evaluated and transformed into the information in Table 5.4-02. A more detailed discussion of results is provided in the Water Quality Technical Report, which was prepared to support the EIS and is available on request.

25. \* Typographical - We note that Table 5.2-01 may contain an error. The first column of this table presents an increase (+) of 298,810 MW hours of non-hydro generation for the Tailwater Habitat Alternative. However, given that the emissions are predicted to be decreased (-) for this alternative, the 298,810 MW hour figure should presumably also be negative to indicate a decrease in MW hours of non-hydro generation and to account for the decreased emissions. This should be modified or discussed in the FPEIS. EPA has assumed this value to be a negative 298,810 (-298,810) in our hydropower review.

**Response to Comment 25:** The number is correct as reported, and the reason for the drop in emissions is discussed in Section 5.2.10.

## Appendix F4 Response to Federal and State Agency Comments

U.S. Geological Survey

United States Geological Survey  
3039 Amwiler Road, Suite 130  
Atlanta, Georgia 30360



**Memo**

**To:** David Nye  
ROS Project Manager, Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

**From:** Edward M Martin  
United States Geological Survey, District Chief  
3039 Amwiler Road, Suite 130  
Atlanta, Georgia 30360

**Date:** 10/19/2003

**Re:** Review of Draft Programmatic Environmental Impact Statement:  
Tennessee Valley Authority Reservoir Operations Study June 2003

Thank you for the opportunity to review the subject draft Environmental Impact Statement. This office has limited its review of this broad-based study to those report components focused on the hydrology and hydraulics of the watersheds and streams in Georgia in the affected basins. [1] The discussions of water-quality effects in Georgia were also reviewed. The largely qualitative discussions are technically sound and well written. Because they are largely qualitative, we have limited ability to evaluate or comment upon them in any detail. [2] Under the Peak Flows and Frequency section (4.22.3), it does not seem reasonable to conclude that "Because the flow frequency analyses were not performed using a methodology consistent with those performed for this EIS as described above, a comparison of the estimated frequencies from this analysis with the flow frequencies used for the Flood Insurance Studies is not meaningful." The FEMA FIS studies typically require a FEMA approved method, and are a valuable base of comparison. It is good engineering practice to compare the results of frequency estimates from different methods; especially when one method is regarded as standard practice (such as the FEMA FIS methods) and the other is less well known. The single paragraph in the appendix on Flood Flow Modeling is somewhat brief. [3]

Again, thank you for the opportunity to review the subject report.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENTS**

1. Thank you for the opportunity to review the subject draft Environmental Impact Statement. This office has limited its review of this broad-based study to those report components focused on the hydrology and hydraulics of the watersheds and streams in Georgia in the affected basins.

**Response to Comment 1:** We appreciate your review and comments on the DEIS.

2. The discussions of water-quality effects in Georgia were also reviewed. The largely qualitative discussions are technically sound and well written. Because they are largely qualitative, we have limited ability to evaluate or comment upon them in any detail.

**Response to Comment 2:** As stated in Chapter 1, the analysis presented in the EIS was conducted at a programmatic level. With respect to water quality effects, a more detailed information is contained in the Water Quality Technical Report, which is available on request.

3. Under the Peak Flows and Frequency section (4.22.3), it does not seem reasonable to conclude that "Because the flow frequency analyses were not performed using a methodology consistent with those performed for this EIS as described above, a comparison of the estimated frequencies from this analysis with the flow frequencies used for the Flood Insurance Studies is not meaningful." The FEMA FIS studies typically require a FEMA approved method, and are a valuable base of comparison. It is good engineering practice to compare the results of frequency estimates from different methods; especially when one method is regarded as standard practice (such as the FEMA FIS methods) and the other is less well known. The single paragraph in the appendix on Flood Flow Modeling is somewhat brief.

**Response to Comment 3:** TVA made changes in Section 4.22.3 in the FEIS to address this issue. Previously published Federal Emergency Management Agency flood insurance studies include regulated flow-frequency curves that were developed using the best information available at the time. At many locations, this meant having 20 to 40 years of observed annual peak flow data, collected over a period during which floodplain development led to fairly large modifications to upstream reservoir operations policy. In TVA's judgment, comparing these data was not meaningful.

## Appendix F4 Response to Federal and State Agency Comments

### U.S. Department of Agriculture Natural Resources Conservation Service

United States Department of Agriculture



Mary K. Combs, State Conservationist  
Phone: (919) 873-2101  
Fax No.: (919) 873-2156  
Email: mary.combs@nc.usda.gov

July 11, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit hill Dr, WT11A  
Knoxville, IN 37902

Dear Mr. Nye:

Thank you for the opportunity to provide comments on Draft Programmatic Environmental Impact Statement as part of TVA Reservoir Operations Study, which covers almost all of the state of Tennessee and parts of Alabama, Kentucky, Georgia, Mississippi, North Carolina and Virginia.

The Natural Resources Conservation Service in the state of North Carolina does not have any comments at this time. [1]

If you need additional information, please feel free to contact Mike Hinton at (919) 873-2134,

Sincerely,

Mary K. Combs  
State Conservationist

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENTS**

1. The Natural Resources Conservation Service in the state of North Carolina does not have any comments at this time.

**Response to Comment 1:** Comment noted.

## **Appendix F4 Response to Federal and State Agency Comments**

### **F4.2 State Agencies**

#### **Alabama Department of Environmental Management Water Division**

August 29, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

Dear Mr. Nye:

The Alabama Department of Environmental Management (ADEM) has reviewed the draft programmatic Environmental Impact Statement prepared as a part of the Tennessee Valley Authority's (TVA) Reservoir Operations Study. We appreciate the opportunity to provide the following comments regarding impacts that the various alternatives may have on water quality in the Tennessee River in Alabama.

The study considers seven alternatives to the current operating plan and provides a clear discussion of how changes in reservoir operations could impact various objectives, including hydropower, navigation, recreation, habitat, and flood risk. As a part of the study, TVA considered how the proposed changes could affect, among other things, water quality and water supply. Since ADEM has regulatory authority regarding these uses, any changes that would have a negative impact on either use is a concern to the Department. [1]

Specifically, alternatives which would result in decreased flows and/or increased retention times in the mainstem reservoirs will likely contribute to eutrophication in these systems. The Department recently (2002) established chlorophyll-*a* criteria for all of the Tennessee River mainstem reservoirs in Alabama. These criteria were established using historic chlorophyll-*a* levels associated with the current operating plan, and an increase in chlorophyll-*a* levels could result in non-attainment of these criteria. In addition, increased reservoir retention times and subsequent elevated chlorophyll-*a* levels may increase water supply treatment costs necessary to meet drinking water standards.

An additional concern related to increased retention time in the reservoirs is the increase in the volume of the anoxic zone and the likely decrease in tailwater dissolved oxygen concentrations downstream of each reservoir. Alabama's water quality standards require a minimum dissolved oxygen concentration of 4.0 mg/l downstream of existing hydroelectric generating turbines. [2]

In light of these concerns, ADEM recommends that TVA not make changes to its current operating plan which may result in unfavorable impacts to water quality. The current plan (basecase alternative), in place since 1990, has provided water quality conditions which support the many varied uses throughout the Tennessee River in Alabama. [3]

## **Appendix F4 Response to Federal and State Agency Comments**

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Page 2

David Nye

August 29, 2003

Again, we appreciate the opportunity to provide comments as a part of TVA's thorough review of its Reservoir Operations Plan. If you have questions about any of the comments or need additional information, please call Lynn Sisk at (334) 271-7826. [4]

Sincerely,

James E. McIndoe, Chief  
Water Division

## **Appendix F4 : Response to Federal and State Agency Comments**

### **RESPONSE TO COMMENTS**

1. The study considers seven alternatives to the current operating plan and provides a clear discussion of how changes in reservoir operations could impact various objectives, including hydropower, navigation, recreation, habitat, and flood risk. As a part of the study, TVA considered how the proposed changes could affect, among other things, water quality and water supply. Since ADEM has regulatory authority regarding these uses, any changes that would have a negative impact on either use is a concern to the Department.

**Response to Comment 1:** Comment noted.

2. Specifically, alternatives which would result in decreased flows and/or increased retention times in the mainstem reservoirs will likely contribute to eutrophication in these systems. The Department recently (2002) established chlorophyll-a criteria for all of the Tennessee River mainstem reservoirs in Alabama. These criteria were established using historic chlorophyll-a levels associated with the current operating plan, and an increase in chlorophyll-a levels could result in non-attainment of these criteria. In addition, increased reservoir retention times and subsequent elevated chlorophyll-a levels may increase water supply treatment costs necessary to meet drinking water standards.

An additional concern related to increased retention time in the reservoirs is the increase in the volume of the anoxic zone and the likely decrease in tailwater DO concentrations downstream of each reservoir. Alabama's water quality standards require a minimum DO concentration of 4.0 mg/l downstream of existing hydroelectric generating turbines.

**Response to Comment 2:** TVA shares your concern about increased eutrophication and anoxia in TVA reservoirs, which arise primarily from nutrient over-enrichment. Alabama Department of Environmental Management (ADEM) recognizes this and has been modifying its existing embayment-watershed approach to monitoring and pollution abatement in the Tennessee Valley region. TVA also recognizes the relationship between algal productivity and reservoir residence time. Reservoir flows should not be viewed as the sole control mechanism for algal productivity. However, TVA concentrated on reservoir flows in its Preferred Alternative rather than reservoir elevations, as it does under its existing operations policy. Minimum system flows in summer that are included in the Preferred Alternative would help alleviate some of the concerns over low flows that would result from several of the action alternatives in the DEIS.

3. In light of these concerns, ADEM recommends that TVA not make changes to its current operating plan which may result in unfavorable impacts to water quality. The current plan (basecase alternative), in place since 1990, has provided water quality conditions which support the many varied uses throughout the Tennessee River in Alabama.

**Response to Comment 3:** TVA formulated the Preferred Alternative to address these and other concerns, and to enhance other system benefits.

4. Again, we appreciate the opportunity to provide comments as a part of TVA's thorough review of its Reservoir Operations Plan. If you have questions about any of the comments or need additional information, please call Lynn Sisk at (334) 271-7826.

**Response to Comment 4:** We appreciate ADEM's review of the DEIS.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Alabama Department of Economic and Community Affairs Office of Water Resources**

September 2, 2003

Mr. David Nye  
TVA ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

RE: TVA ROS Programmatic EIS Comments

Dear Mr. Nye:

The ADECA Office of Water Resources (OWR) has reviewed the draft programmatic Environmental Impact Statement (EIS) prepared as part of TV A's Reservoir Operations Study (ROS). It certainly represents a significant amount of work on the part of the TVA staff and we applaud your efforts to solicit public input and involvement.

We also appreciate your efforts to provide Alabama agencies with a special briefing on August 13, 2003. As a result, staff members from ADEM, ADCNR, and OWR were able to develop a better understanding of the ROS, the technical analysis and tools used in the ROS, and the development of alternatives under evaluation. [1]

The focus of our comments on the ROS concerns the use and management of these water resources. As we discussed while you were here, a key aspect of the successful implementation of any operational changes to the system will be heavily depended upon how water is used and managed in the TVA region. [2]

As a result, we strongly recommend the creation of a committee of state representatives to provide advice and recommendations to TVA on the use and management of these water resources. The convergence of overlapping authorities and responsibilities as well as the wide ranging differences in state laws and regulations require that the states work together with TVA to preserve and share the water resources of the region. Foremost in the effort should be a commitment to address drought planning and management and to understand how the states and TV A will work together in the event of a significant drought. We, along with many other states in the region, are actively working on drought planning and water conservation measures. It will only improve our results if we can work with surrounding states on these issues. [3]

Other issues such as the assessment of groundwater withdrawals, interbasin transfers, shared opportunities for public education and outreach, and the need for more comprehensive gauging and monitoring would also be appropriate issues for discussion. [4]

We appreciate the opportunity to participate in this ROS process and look forward to helping in any way we can as this process moves forward. [5]

Please let us know if we can provide any assistance.

## **Appendix F4 Response to Federal and State Agency Comments**

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Sincerely,

Onis "Trey" Glenn III, Division Director  
Office of Water Resources

cc: Mr. Lynn Sisk, ADEM  
Mr. Stan Cook, ADCNR

## **Appendix F4 Response to Federal and State Agency Comments**

---

### **RESPONSE TO COMMENTS**

1. The ADECA Office of Water Resources (OWR) has reviewed the draft programmatic Environmental Impact Statement (EIS) prepared as part of TVA's Reservoir Operations Study (ROS). It certainly represents a significant amount of work on the part of the TVA staff and we applaud your efforts to solicit public input and involvement.

We also appreciate your efforts to provide Alabama agencies with a special briefing on August 13, 2003. As a result, staff members from ADEM, ADCNR, and OWR were able to develop a better understanding of the ROS, the technical analysis and tools used in the ROS, and the development of alternatives under evaluation.

**Response to Comment 1:** Thank you for your comment.

2. The focus of our comments on the ROS concerns the use and management of these water resources. As we discussed while you were here, a key aspect of the successful implementation of any operational changes to the system will be heavily depended upon how water is used and managed in the TVA region. As a result, we strongly recommend the creation of a committee of state representatives to provide advice and recommendations to TVA on the use and management of these water resources. The convergence of overlapping authorities and responsibilities as well as the wide ranging differences in state laws and regulations require that the states work together with TVA to preserve and share the water resources of the region

**Response to Comment 2:** At the recommendation of TVA's chartered federal advisory committee, the Regional Resource Stewardship Council, TVA is considering formation of such a committee.

3. Foremost in the effort should be a commitment to address drought planning and management and to understand how the states and TVA will work together in the event of a significant drought. We, along with many other states in the region, are actively working on drought planning and water conservation measures. It will only improve our results if we can work with surrounding states on these issues.

**Response to Comment 3:** As stated in Section 3.4.1 and Chapter 7, TVA is considering development of a formal drought management plan that would include other agencies. TVA fully agrees that drought management requires regional planning and is willing to participate in the commenter's state efforts for that.

4. Other issues such as the assessment of groundwater withdrawals, interbasin transfers, shared opportunities for public education and outreach, and the need for more comprehensive gauging and monitoring would also be appropriate issues for discussion.

**Response to Comment 4:** Comment noted.

5. We appreciate the opportunity to participate in this ROS process and look forward to helping in any way we can as this process moves forward

**Response to Comment 5:** We appreciate your review of the DEIS.

## Appendix F4 Response to Federal and State Agency Comments

### Alabama Department of Conservation and Natural Resources Wildlife and Freshwater Fisheries Division

August 27, 2003

Mr. David Ney  
ROS Project Manager  
TVA, WT 11A  
400 West Summit Hill Drive  
Knoxville, TN 37902

Re: TVA Reservoir Operations Study: Draft Environmental Impact Statement Comments

Dear Mr. Ney:

The Alabama Wildlife and Freshwater Fisheries Division (AWFF) has reviewed the Draft Environmental Impact Statement (DEIS) of the TVA Reservoir Operations Study. We support DEIS alternatives which provide the least impact on the aquatic resources of the Tennessee River Watershed in Alabama and significantly improve recreational opportunities available to the public. We submit the following comments concerning our review of the DEIS:

1. Research on Alabama reservoirs has revealed the relationship between reservoir hydrology and variability of year-class strength of fishes. AWFF supports the concept of water level manipulation to enhance crappie and bass sport fisheries and to benefit the overall fish community. A rising or higher than average lake level in the winter months (January-March) before the spawning period may increase crappie year-class strength. Stable or long retention times during the post-winter period will enhance both crappie and largemouth bass recruitment success (stable water levels in April are particularly important for bass recruitment). Operation of the Tennessee River reservoirs to maintain higher winter lake levels should be fully evaluated to determine impacts on fish population dynamics. Priority should be given to storage reservoirs where the lake level may be easier to manipulate; for example, Wheeler and Pickwick Reservoirs in Alabama. [1]
2. AWFF supports mitigation measures that will enhance boating access facilities and increase areas for angler bank access. Boating facility enhancements could include adding floating courtesy boat docks at many of the access areas that now have only fixed docks or none. Adding lighting at many of the facilities would enhance security and increase the opportunities for night angling. Some access areas need the addition of restrooms and increased parking spaces. AWFF would consider partnering with TVA to investigate and upgrade facilities in those areas where feasible. [2]
3. We recommend that a minimum continuous flow from Wilson Dam be considered. One of the most important freshwater mussel beds in the world, with regard to federally endangered species, as well as commercial harvest, lies in the tailwaters of Wilson Dam. A cumulative total of 40 species has been reported from that reach of river since 1990, including five federally endangered species and two species recently elevated to candidates for protection. Wilson tailwaters appear to be home to the only remaining population of White Wartybacks (*Plethobasus cicatricosus*). The riverine habitat and frequent releases from Wilson Dam during hydropower generation provide excellent habitat for these large-river species. However, the discharge of sewage from the Florence wastewater treatment facility has the potential to cause problems. Discharge from the plant is continuous (according to the

## **Appendix F4 Response to Federal and State Agency Comments**

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Alabama Department of Environmental Management), but release of water from Wilson Dam is negligible when power is not being generated or water spilled through floodgates. Our malacologist has observed that on most days, current is not perceptible until late morning, at least during summer and fall months. Thus, treated sewage accumulates in the vicinity of the treatment plant diffuser for at least several hours on most days. Continual release, in quantities adequate to flush the treated sewage, would probably be of great benefit to this globally important mussel community. [3]

4. We recommend that consideration be given to how the reservoir water levels are manipulated in the four reservoirs of the Bear Creek system, particularly in the fall to early winter period. Bear Creek is home to a diverse assemblage of freshwater mussels. However, poor water release practices from the four Bear Creek system dams have caused a drastic reduction in the fauna. A total of 25 species remains in the Bear Creek system, including two federally endangered species. However, most species are limited to a reach of stream less than two miles long, located just upstream of the portion of creek impounded as part of Pickwick Reservoir. In discussions with TVA personnel, our malacologist has found that water is held as long as possible in the fall to satisfy landowners. Then water is quickly released in order to increase holding capacity for winter rains. This quick release of water causes incredible amounts of bank and stream bed erosion, which has resulted in elimination of mussels, and probably some fish, from most of the system. With much of the historic fauna maintaining a foothold in the lower reaches (tenuous though it may be), alteration of flow regime and mitigation of affected habitat would almost certainly allow repopulation of the system. What should be questioned is the need to have these reservoirs empty by mid-December. Is their capacity (compared to that of Pickwick Reservoir) enough to make a significant difference in the ability of TVA to control floods? [4]
5. Other important issues which need to be addressed in TVA's reservoir operation plan include:
  - (a) Water temperature fluctuations and dissolved oxygen levels below generating plants. [5]
  - (b) Lack of fish passage facilities for riverine species. [6]
  - (c) Entrainment and impingement of fishes in generating facilities. [7]
  - (d) Loss of increasing amounts of littoral zone habitat due to bulkheads. [8]
  - (e) Greenway development along riparian habitat and the setting aside of undeveloped properties for future wild, scenic, and natural use. [9]
  - (f) The minimization of risks from aquatic nuisance species. [10]
  - (g) The discharge of heated effluents which exceed Alabama's water quality standard for thermal discharges at fossil fuel or nuclear plants. [11]

These are the primary concerns of AWWF regarding the TVA Reservoir Operations Study and the policy alternatives that have been presented. AWWF urges TVA to consider alternatives which have the least impact on the aquatic resources of the Tennessee Valley system and which significantly increase recreational opportunities. Thank you for the opportunity to provide comments. [12 ] Please contact us if you have questions.

Sincerely,

M. N. Pugh  
Director

### RESPONSE TO COMMENTS

1. Research on Alabama reservoirs has revealed the relationship between reservoir hydrology and variability of year-class strength of fishes. AWFF supports the concept of water level manipulation to enhance crappie and bass sport fisheries and to benefit the overall fish community. A rising or higher than average lake level in the winter months (January-March) before the spawning period may increase crappie year-class strength. Stable or long retention times during the post-winter period will enhance both crappie and largemouth bass recruitment success (stable water levels in April are particularly important for bass recruitment). Operation of the Tennessee River reservoirs to maintain higher winter lake levels should be fully evaluated to determine impacts on fish population dynamics. Priority should be given to storage reservoirs where the lake level may be easier to manipulate; for example, Wheeler and Pickwick Reservoirs in Alabama.

**Response to Comment 1:** As discussed in Section 4.7.2, TVA attempts to stabilize tributary reservoir water levels as the water temperature at a depth of 5 feet reaches 65 °F, by minimizing for a 2-week period water level fluctuations (maintaining level within 1 foot per week, either higher or lower). Beginning as early as spring 2004, TVA proposes to adjust this program so that it stabilizes levels at 60 °F in order to better help crappie, smallmouth bass, and early largemouth and spotted bass spawning. Minimizing water level fluctuations is only one part of the fish spawning issue. Other environmental characteristics are also important in determining larvae and juvenile fish production. For example, the amount of food and cover available for much of the initial growing season are critical to determining the number of catchable fish. Higher winter levels would positively affect aquatic species (see Section 5.7.2). Daily fluctuations on Wheeler Reservoir are not conducive to stabilization during spring spawning. TVA has discussed this issue with the Alabama Department of Conservation and Natural Resources (ADCNR) in the past.

2. AWFF supports mitigation measures that will enhance boating access facilities and increase areas for angler bank access. Boating facility enhancements could include adding floating courtesy boat docks at many of the access areas that now have only fixed docks or none. Adding lighting at many of the facilities would enhance security and increase the opportunities for night angling. Some access areas need the addition of restrooms and increased parking spaces. AWFF would consider partnering with TVA to investigate and upgrade facilities in those areas where feasible.

**Response to Comment 2:** TVA would welcome partnering with the Alabama Wildlife and Freshwater Fisheries Division (AWFF) to investigate and, subject to the availability of resources, upgrade recreational access facilities.

3. We recommend that a minimum continuous flow from Wilson Dam be considered. One of the most important freshwater mussel beds in the world, with regard to federally endangered species, as well as commercial harvest, lies in the tailwaters of Wilson Dam. A cumulative total of 40 species has been reported from that reach of river since 1990, including five federally endangered species and two species recently elevated to candidates for protection. Wilson tailwaters appear to be home to the only remaining population of White Wartybacks (*Plethobasus cicatricosus*).

## **Appendix F4 Response to Federal and State Agency Comments**

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The riverine habitat and frequent releases from Wilson Dam during hydropower generation provide excellent habitat for these large-river species. However, the discharge of sewage from the Florence wastewater treatment facility has the potential to cause problems. Discharge from the plant is continuous (according to the Alabama Department of Environmental Management), but release of water from Wilson Dam is negligible when power is not being generated or water spilled through floodgates. Our malacologist has observed that on most days, current is not perceptible until late morning, at least during summer and fall months. Thus, treated sewage accumulates in the vicinity of the treatment plant diffuser for at least several hours on most days. Continual release, in quantities adequate to flush the treated sewage, would probably be of great benefit to this globally important mussel community.

**Response to Comment 3:** It is our understanding that the sewage treatment plant is in compliance with its permit. TVA realizes that the permit is based on minimum flows from Wilson Dam that would not be decreased under the Preferred Alternative. Under the Preferred Alternative, TVA would begin operating its reservoir system with the goal of achieving certain flows from its dams rather than certain elevations on its reservoirs. This approach should be more environmentally advantageous from a water quality standpoint and would address the concern identified in this comment.

4. We recommend that consideration be given to how the reservoir water levels are manipulated in the four reservoirs of the Bear Creek system, particularly in the fall to early winter period. Bear Creek is home to a diverse assemblage of freshwater mussels. However, poor water release practices from the four Bear Creek system dams have caused a drastic reduction in the fauna. A total of 25 species remains in the Bear Creek system, including two federally endangered species. However, most species are limited to a reach of stream less than two miles long, located just upstream of the portion of creek impounded as part of Pickwick Reservoir. In discussions with TVA personnel, our malacologist has found that water is held as long as possible in the fall to satisfy landowners. Then water is quickly released in order to increase holding capacity for winter rains. This quick release of water causes incredible amounts of bank and stream bed erosion, which has resulted in elimination of mussels, and probably some fish, from most of the system. With much of the historic fauna maintaining a foothold in the lower reaches (tenuous though it may be), alteration of flow regime and mitigation of affected habitat would almost certainly allow repopulation of the system. What should be questioned is the need to have these reservoirs empty by mid-December. Is their capacity (compared to that of Pickwick Reservoir) enough to make a significant difference in the ability of TVA to control floods?

**Response to Comment 4:** As discussed in Section 3.4.1, none of the alternatives evaluated for the ROS would affect operation of the Bear Creek Projects. Changes at the Bear Creek Projects could be analyzed on a case-by-case basis, as the opportunity for habitat improvement is identified.

5. Other important issues which need to be addressed in TVA's reservoir operation plan include:
  - (a) Water temperature fluctuations and dissolved oxygen levels below generating plants.

## Appendix F4 Response to Federal and State Agency Comments

**Response to Comment 5:** Water temperature fluctuations and DO concentrations below hydropower generating facilities were evaluated in the ROS. TVA evaluated each alternative by comparing temperature and oxygen concentrations predicted by water quality models. Numerous metrics were calculated for this comparison, such as the water temperature variation at critical locations during spawning periods and the total number of hours that DO concentrations met a target at a critical location. These metrics were used to evaluate impacts on aquatic resources and on threatened and endangered species.

6. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(b) Lack of fish passage facilities for riverine species.

**Response to Comment 6:** The ROS is a programmatic study looking at policy changes on a system-wide basis. This suggestion could require structural modifications that are not being proposed by TVA. However, the fish species listed do not benefit from traditional fish ladder technology because they do not jump barriers. Moving these species around a dam would require a system without any form of barrier to navigate, which is not currently economically feasible. TVA does monitor technological advances in fish passage and would be willing to revisit this issue if a suitable technology was developed.

7. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(c) Entrainment and impingement of fishes in generating facilities.

**Response to Comment 7:** These activities are normally conducted under Section 316(b) evaluations for TVA facilities. TVA has installed screens on its plant intakes and taken other measures to reduce entrainment and impingement impacts. Previous analyses indicate that such measures are effective, and that entrainment and impingement of fish would be reduced to acceptable levels.

8. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(d) Loss of increasing amounts of littoral zone habitat due to bulkheads.

**Response to Comment 8:** This issue was addressed as part of TVA's Shoreline Management Initiative EIS in 1998, and TVA adopted a policy to manage shoreline development.

9. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(e) Greenway development along riparian habitat and the setting aside of undeveloped properties for future wild, scenic, and natural use.

## **Appendix F4 Response to Federal and State Agency Comments**

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**Response to Comment 9:** The focus of the ROS EIS is the operations policy of the TVA reservoir system, not land use. TVA does address land use in its comprehensive reservoir land use plans and associated NEPA reviews. For example, TVA examined residential access and shoreline uses in its reservoir land management plans for Pickwick, Guntersville, and Bear Creek Reservoirs.

10. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(f) The minimization of risks from aquatic nuisance species.

**Response to Comment 10:** Impacts related to invasive aquatic species are addressed for each policy alternative in Sections 5.9 and 5.11. Minimization of the risks from such species is a high priority for TVA.

11. Other important issues which need to be addressed in TVA's reservoir operation plan include:

(g) The discharge of heated effluents which exceed Alabama's water quality standard for thermal discharges at fossil fuel or nuclear plants.

**Response to Comment 11:** Thermal plant discharges are regulated under Section 316(a) of the Clean Water Act. National Pollutant Discharge Elimination System permits have been issued for TVA facilities. TVA would comply with these permits, regardless of which alternative is chosen. Some alternatives would require more generation reduction and cooling tower use than others. This potential effect was evaluated in Section 5.23.2; Step 3.

12. AWFF urges TVA to consider alternatives which have the least impact on the aquatic resources of the Tennessee Valley system and which significantly increase recreational opportunities.

**Response to Comment 12:** TVA's Preferred Alternative was formulated to enhance recreational opportunities, while reducing potential environmental impacts associated with the alternatives identified in the DEIS that would enhance recreation.

## Appendix F4 Response to Federal and State Agency Comments

### Georgia State Clearinghouse (Georgia Department of Natural Resources Historic Preservation Division, Soil & Water Conservation, EPD/Floodplain Management)

#### EPD/Floodplain Management

TO: Barbara Jackson  
Georgia State Clearinghouse  
270 Washington Street, SW, Eighth Floor  
Atlanta, Georgia 30334

FROM: MR. COLLIS BROWN  
EPD/FLOOD PLAIN MANAGEMENT

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley Authority

STATE ID: GA030703003

DATE: 7—09-2003

- This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

*See attached comments.*

This notice is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).
- The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies).
- This notice does not impact upon the activities of the organization.

## **Appendix F4 Response to Federal and State Agency Comments**

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**PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) - Tennessee Valley Authority**

**STATE IDENTIFICATION: GA030703003**

For floodplain management purposes, any alternative that increases peak discharge and results in adverse damages including slight or substantially adverse damages. appears to be a deviation from Executive Order 11988. Sound floodplain management does not support the alternative reservoir operation policies called Reservoir Recreation A, Reservoir Recreation B, Summer Hydropower. Equalized Summer/Winter Flood Risk, Commercial] Navigation, Tai]water Recreation. and Tailwater Habitat. [1]

Additionally, the proposed project referenced above may alter federally designated Special Flood Hazard Areas (SFHA) and federally designated floodways. It is necessary to notify adjacent communities and the Georgia Department of Natural Resources prior to any alteration or relocation of a watercourse and submit evidence of such notification to the Federal Emergency Management Agency (FEMA), Region IV Office in Atlanta, Georgia. For any altered or relocated watercourse, submit engineering data/analysis within six (6) months to the FEMA, Region IV Office, in Atlanta, Georgia to ensure accuracy of community flood maps through the **Letter or Map Revision** process. Assure flood carrying capacity of any altered or relocated watercourse is maintained. You may obtain federal application forms for map revisions by contacting the Georgia Floodplain Management Office at (404) 656-6382.

Pursuant to Executive Order 11988, (Floodplain Management), direct or indirect federal support of floodplain development should be avoided unless there are no practicable alternatives. If there are no practicable alternatives and development in the floodplain is to be undertaken, the federal agency should document the reasons supporting this finding through the notification procedures outlined in the Executive Order. [2]

## Appendix F4 Response to Federal and State Agency Comments

### RESPONSE TO COMMENTS

1. For floodplain management purposes, any alternative that increases peak discharge and results in adverse damages including slight or substantially adverse damages, appears to be a deviation from Executive Order-11988. Sound floodplain management does not support the alternative reservoir operation policies called Reservoir Recreation A, Reservoir Recreation B, Summer Hydropower, Equalized Summer/Winter Flood Risk, Commercial Navigation, Tailwater Recreation, and Tailwater Habitat.

**Response to Comment 1:** Eliminating unacceptable flood risk effects associated with the alternatives identified in the DEIS was one of the primary drivers in the formulation of TVA's Preferred Alternative.

2. Additionally, the proposed project referenced above may alter federally designated Special Flood Hazard Areas (SFHA) and federally designated floodways. It is necessary to notify adjacent communities and the Georgia Department of Natural Resources prior to any alteration or relocation of a watercourse and submit evidence of such notification to the Federal Emergency Management Agency (FEMA), Region IV Office in Atlanta, Georgia. For any altered or relocated watercourse, submit engineering data/analysis within six (6) months to the FEMA, Region IV Office, in Atlanta, Georgia to ensure accuracy of community flood maps through the Letter of Map Revision process. Assure food carrying capacity of any altered or relocated watercourse is maintained. You may obtain federal application forms for map revisions by contacting the Georgia Floodplain Management Office at (404) 656-6382.

Pursuant to Executive Order 11988, (Floodplain Management), direct or indirect federal support of floodplain development should be avoided unless there are no practicable alternatives. If there are no practicable alternatives and development in the floodplain is to be undertaken, the federal agency should document the reasons supporting this finding through the notification procedures outlined in the Executive Order.

**Response to Comment 2:** See Response to Comment 1. TVA does not propose to alter or relocate any water courses.



## **Office of Planning and Budget**

SONNY PERDUE  
GOVERNOR

TIMOTHY A. CONNELL  
DIRECTOR

### **GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: David Nye  
Tennessee Valley Authority  
400 W. Summit Hill Dr., WT11A  
Knoxville, TN 37902-

FROM: Barbara Jackson  
Georgia State Clearinghouse

DATE: 8/29/2003

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley Authority

STATE ID: GA030703003

CFDA NO:

THE APPLICANT IS ADVISED TO NOTE ADDITIONAL COMMENTS FROM DNR'S HISTORIC PRESERVATION DIVISION.

THE APPLICANT IS ADVISED TO NOTE ADDITIONAL COMMENTS FROM THE SOIL & WATER CONSERVATION COMMISSION.

THE APPLICANT IS ADVISED TO NOTE ADDITIONAL COMMENTS FROM DNR'S EPD/FLOOD PLAIN MANAGEMENT.

THESE REVIEWERS WERE ALSO INCLUDED: DEPARTMENT OF NATURAL RESOURCES' DRINKING WATER PROTECTION, SAFE DAMS PROGRAM, AND WILDLIFE RESOURCES DIVISION. HOWEVER, THEY DID NOT COMMENT WITHIN THE REVIEW PERIOD. SHOULD THEY HAVE COMMENTS, THEY WILL CONTACT YOU DIRECTLY.

/BJ

ENC.: HPD, JULY 25, 2003  
GA GEOLOGIC SURVEY, JULY 8, 2003  
SWCC, JULY 22, 2003  
DNR WATER PROTEC BRANCH, JULY 16, 2003  
DNR WATER RESOURCES, JULY 28, 2003  
EPD/FLOOD PLAIN MGT, JULY 14, 2003

## Appendix F4 Response to Federal and State Agency Comments

### GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson  
Georgia State Clearinghouse  
270 Washington Street, SW, Eighth Floor  
Atlanta, Georgia 30334

FROM: MR. BILL MCLEMORE  
GEORGIA GEOLOGIC SURVEY

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley Authority

STATE ID: GA030703003

DATE: 7/7/03

- This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

*See attached comments.*

This notice is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).
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- This notice does not impact upon the activities of the organization.

## Appendix F4 Response to Federal and State Agency Comments

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### GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson  
Georgia State Clearinghouse  
270 Washington Street, SW, Eighth Floor  
Atlanta, Georgia 30334

FROM: MR. WILLIAM D. BENNETT, ACTING EXECUTIVE DIRECTOR  
SOIL & WATER CONSERVATION COMMISSION

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley  
Authority

STATE ID: GA030703003

DATE: 7/21/03

- This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

*See attached comments.*

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## Appendix F4 Response to Federal and State Agency Comments

### GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson  
Georgia State Clearinghouse  
270 Washington Street, SW, Eighth Floor  
Atlanta, Georgia 30334

FROM: MR. ALAN W. HALLUM, CHIEF  
DNR WATER PROTECTION BRANCH

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley Authority

STATE ID: GA030703003

DATE: 7-10-03

This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

*See attached comments.*

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- This notice does not impact upon the activities of the organization.

## Appendix F4 Response to Federal and State Agency Comments

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### GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson  
Georgia State Clearinghouse  
270 Washington Street, SW, Eighth Floor  
Atlanta, Georgia 30334

FROM: MR. NOLTON JOHNSON  
DNR WATER RESOURCES

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Programmatic EIS: Reservoir Operations Study (ROS) – Tennessee Valley Authority

STATE ID: GA030703003

DATE: 7/24/03

- This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

*See attached comments.*

This notice is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).
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- This notice does not impact upon the activities of the organization.

## Appendix F4 Response to Federal and State Agency Comments

July 23, 2003

Mr. David Nye  
ROS Project Manager  
TVA c/o WT 11A  
400 West Summit Drive  
Knoxville, TN 37902

RE: TVA Reservoir Operations Study (ROS): Draft Programmatic EIS  
Fannin County, et al., Georgia  
GA-030703-003

Dear Mr. Nye:

The Historic Preservation Division (HPD) has received the Draft Environmental Impact Statement (EIS) for the Tennessee Valley Authority Reservoir Operations Study. Our comments are offered to assist the Tennessee Valley Authority (TVA) and its applicants in complying with the provisions of Section 106 of the National Historic Preservation Act.

According to the Draft EIS, the effects to cultural resources of the proposed alternatives range from "adverse" to "slightly beneficial," with "adverse" and "slightly adverse" listed for half of the alternatives. HPD would, of course, prefer that the TVA choose an alternative with no adverse effects to historic resources, but, as the draft EIS points out, no decision has been made concerning preferred alternatives. We look forward to receiving a copy of the revised EIS after you have selected a preferred alternative. At that point, we will be able to offer our comments on the proposed undertaking. [1]

We look forward to working with you on this project. Please refer to the project number referenced above in any future correspondence. [2] If we may be of any further assistance, please do not hesitate to contact me at (404) 651-6777 or Serena Bellew, Environmental Review Coordinator at (404) 651-6624.

Sincerely,

Denise P. Messick

Environmental Review Historian

Enclosure: "Documentation Required for Review of Projects Under Section 106 of the NHPA of 1966"

CC: Barbara Jackson, Georgia State Clearinghouse  
Kevin McAuliff, North Georgia ROC  
Dan Latham, Jr., Coosa Valley RDC  
Bryan Flower, Georgia Mountains ROC

## **Appendix F4 Response to Federal and State Agency Comments**

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### **DOCUMENTATION REQUIRED FOR REVIEW OF PROJECTS UNDER SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966**

At a minimum, the Historic Preservation Division (HPD) requires the following information in order to conduct a review of any proposed undertaking in accordance with Section 106 of the National Historic Preservation Act:

1. A letter describing the proposed undertaking, the federal agency involved (i.e. HUD funding, FDIC insurance, etc.) and language requesting HPD's review of the undertaking in accordance with the appropriate legislation.
2. A USGS topographic map indicating the location and area of potential effect (APE) of the proposed undertaking. Please indicate the "footprint" of the proposed project (i.e. the ground disturbing area). The name of that specific topographic map and its scale should also be included.
3. Original 35mm or high quality digital color photographs of all buildings that appear to be fifty years old or older, which are located on, immediately adjacent to and/or within view of the project area, as well as photographs of the surrounding area to document the "setting" of the proposed undertaking. All photographs must be keyed to a site map indicating their location and direction of view.
  - For projects involving the rehabilitation, alteration, or demolition of buildings, please provide interior and exterior photographs whenever possible (including all facades and significant details). Photographs must be keyed to a floor plan indicating the location and direction of view of each photograph.
4. For projects involving alteration or rehabilitation, include a detailed work write-up, existing floor plans and proposed floor plans.
5. For projects involving the demolition of buildings that appear to be fifty years old or older, include alternatives to demolition that were considered and a discussion of why such alternatives were determined not to be feasible.
6. For projects involving archaeological resources, include any cultural resource surveys or reports conducted on the site.

**All submittals should be addressed to W. Ray Luce, Division Director, at the above address. Please note that there is a thirty (30) day review and comment period for project submittals.**

Prepared by: Historic Preservation Division,  
Georgia Department of Natural Resources  
SGB/April, 2002

## **Appendix F4 Response to Federal and State Agency Comments**

### **RESPONSE TO COMMENTS**

1. According to the Draft EIS, the effects to cultural resources of the proposed alternatives range from "adverse" to "slightly beneficial," with "adverse" and "slightly adverse" listed for half of the alternatives. HPD would, of course, prefer that the TVA choose an alternative with no adverse effects to historic resources, but, as the draft EIS points out, no decision has been made concerning preferred alternatives. We look forward to receiving a copy of the revised EIS after you have selected a preferred alternative. At that point, we will be able to offer our comments on the proposed undertaking.

**Response to Comment 1:** TVA is executing an agreement with the seven Tennessee Valley region State Historic Preservation Officers, including Georgia and other consulting parties. The agreement outlines the actions that TVA will take to address potential adverse effects on historic properties associated with the Preferred Alternative.

2. We look forward to working with you on this project. Please refer to the project number referenced above in any future correspondence.

**Response to Comment 2:** Thank you for your comment.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Georgia Department of Natural Resources Wildlife Resources Division**

August 25, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Drive, WT11A  
Knoxville, TN 37902

Dear Mr. Nye:

Thank you for the opportunity to comment on the draft programmatic environmental impact statement (EIS) for your agency's Reservoir Operations Study (ROS). Fish and wildlife resources in north Georgia have benefited from prior TVA initiatives, such as the Reservoir Release Improvement Program, to improve habitat conditions, and we believe that additional improvements can be achieved as a result of this study. We have also appreciated the opportunity to provide input into the ROS process via Regional Fisheries Supervisor Jeff Duniak's participation on your Public Review Group. We commend your agency on an open and objective process that, most importantly, has maintained its efficiency and is on schedule to meet an ambitious two-year deadline for study completion. The inclusion of north Georgia destinations in your public meeting tour was also appreciated. [1]

There are three TVA tributary reservoir projects (Blue Ridge, Chatuge, Nottely) and two associated tailwaters (Blue Ridge, Nottely) located in north Georgia. My agency is keenly interested in the aquatic and terrestrial communities and the associated public uses that are supported by these three TVA projects. [2] Staffs from our Fisheries Management, Game Management, and Nongame Wildlife/Natural Heritage sections have reviewed your document. The following comments are provided to help your agency strengthen your final EIS and to decide which operational changes may provide the greatest benefit to the natural resources and citizens of the Tennessee Valley, including north Georgia.

We certainly understand the programmatic nature of the ROS and the intense balancing act among competing water uses in the Tennessee Valley. In simple terms, we have two primary interests in the three Georgia TVA projects as they relate to this study. The first is a desire to maintain and hopefully enhance the aquatic habitat conditions for fish species of concern in the Blue Ridge tailwater. The second is a goal to maintain higher water levels in these tributary reservoirs, which currently suffer from extreme water level fluctuations, to benefit resident fish communities and their associated recreational uses. Any operational changes that can improve these two conditions over those currently existing under the Base Case Alternative would be highly desirable. To that end, we support, in declining order of preference, the Tailwater Habitat, Reservoir Recreation A, and Reservoir Recreation B operating alternatives. Conversely, we do not support the Summer Hydropower and Equalized Flood Risk alternatives due to predicted adverse impacts to our stated interests. [3]

Although our three reservoirs comprise a very small segment of TVA's overall system, they are very representative of your basinwide issue of the management of tributary reservoirs. There seems to be some opportunity to closely examine your needs for flood storage and possibly increase tributary reservoir water levels where appropriate. [4] We commend you on the proposal in the draft EIS to extend

## **Appendix F4 : Response to Federal and State Agency Comments**

the duration of spring water level stabilization, when climatic conditions permit, to enhance fish spawning and recruitment. That is a significant step toward the improvement of our reservoir fish communities. [5] Attached are more specific comments on your draft EIS that should help your staff to finalize that document. A boldfaced page marker indicates significant issues.

The Georgia Wildlife Resources Division has enjoyed our longstanding partnership with TVA in the management of fish and Wildlife resources at the Blue Ridge, Chatuge, and Nottely projects. We look forward to continuing this relationship and taking it to a new level as a result of the Reservoir Operations Study. [6] If you have any questions regarding these comments, feel free to contact Regional Fisheries Supervisor Jeff Durniak at 770-535-5498.

Sincerely,

David Waller

DW/jd

Attachment

cc: Section Chiefs

## **Appendix F4 Response to Federal and State Agency Comments**

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Georgia Wildlife Resources Division (GAWRD)  
Specific Comments on TVA Reservoir Operations Study-  
Proposed draft Programmatic Environmental Impact Statement  
August 2003

- \* Page 2-25; Section 2.3.6: The last sentence in the second paragraph should read: "This lower level of DO stresses aquatic life in tailwaters and *coolwater species in reservoirs*, and limits the water's capacity for assimilating waste." [7]
- \* Page 3-9; Table 3.3-01: Water level stabilization during fish spawning is mentioned several times (Table 3.3-01 and Page 3.20) and is being considered under all alternatives. The temperature criterion for initiation of the stabilization period (60°F) and the duration (4-6 weeks) should be explicitly stated together in the text. [8]
- \* Page 3-20; Fish Spawning: Need to insert in the text the new temperature criterion of 60°F. Both the water temperature (60°F) when stabilization will begin and the duration of the period should appear together in the "Fish Spawning" text. [9]
- \* Page 4.7-21; Table 4.7-08: Omit the SFI score for striped bass in Lake Chatuge because they have not been stocked in Lake Chatuge. [10]
- \* Page 4.7-23; 1st paragraph, lines 7-8: Need to include "stocking success" as a major factor influencing striped bass populations. [11]
- \* Page 4.7-23; Line 13: states, "present walleye populations in tributary reservoirs have been maintained by stocking." The Blue Ridge walleye population is self-sustaining and is not maintained by stocking. It was last stocked by GAWRD in 1961. [12]
- \* Page 4.7-24; Future Trends, Line 6: Replace "while recruitment of young fish is expected to be poor in dry years" with "while lower recruitment rates of a number of littoral spawners are expected in dry years." [13]
- \* Page 4.7-24; Future Trends, Lines 9-12: The text, "However, dry years would decrease reservoir conditions for cool-water species due to increased stratification causing summer/fall water quality problems" is not true, based on our data. The DEIS used 1990, 1993, and 1994 to represent normal, dry, and wet climatic years, respectively in modeling the effects of TVA alternatives on water quality (DO and temperature). Our September oxygen profiles documented higher DO levels (2-6 ppm) in 1993 (dry year) compared to anoxic to low concentrations (0-0.5 ppm) in 1994 (wet year) at Lake Nottely. The case is similar in Lake Lanier, where we have documented generally higher DO levels and lower water temperatures in coolwater habitat during summers of dry years in the Lanier watershed. [14]
- \* Page 4.8-3; Table 4.8-01: Total acreage (4,551) for wetland types appears to be in error. Total lake acreage is 4,180 at normal full pool. [15]
- \* Page 4.11-3; Section 4.11.4: The blueback herring, an invasive aquatic species illegally introduced to the TVA system during the early 1990s, should be included in this section. Negative impacts of

## Appendix F4 Response to Federal and State Agency Comments

bluebacks on largemouth bass populations have been documented in these two TVA Tributary impoundments (*Lake Nottely Annual Report 2002 GAWRD, unpublished*). [16]

\* Page 4.24-4 Section 4.24.3: Hunting should be listed as a non-water activity (waterfowl hunting would be water-based) on this page. Hunting is included on the list of activities on Page 4.24-7. [17]

\* Page 5.4.3: Douglas and South Holston reservoirs were selected as the "representatives" for modeling the different alternatives in tributary reservoirs. Model results were occasionally contrasting and varied in magnitude between the two impoundments. There was insufficient information (i.e. fisheries, existing water quality) describing both "representative" reservoirs so it was difficult to determine which impoundment would best represent the impact potential for reservoirs not specifically modeled. The same argument could be made for the "representative" tailwaters modeled and extrapolating their applicability to the Blue Ridge tailwater. [18]

\* Page 5.4-5; Line 14: Error in Table 4.4-02. Should read Table 5.4-02. [19]

\* Page 5.4-5; Lines 16-21: We do not agree with the statement that impacts related to DO and high water temperatures would be less during cool, wet years and greater during hot, dry years. See previous comments for Page 4.7-24. [20]

\* Page 5.4-13; Section 5.4.5 (3rd paragraph): The word "cold" should replace the word "cool" on line 23, using your defined coldwater temperature criteria ( $\leq 10^{\circ}\text{C}$ ) in Tables 5.4-02 and 5.4-01. [21]

\* Page 5.7-3; Table 5.7-01: Word error for Condition Indicator under Tributary Type for "mean volume of suitable cool-water habitat (temperature  $< 20^{\circ}\text{C}$  and DO  $> 5$  mg/L)". It should read "mean volume of suitable cold-water habitat..." [22]

\* Page 5.7-18; Table 5.7-07: The DEIS does not effectively address the effects of the alternatives on coolwater and coldwater habitats in reservoirs. For example, there is no analysis on volume of critical and preferable coolwater habitat for representative reservoirs and the effects on coolwater species. Table 5.7-07 does not give enough detail for our interpretation of effects. [23]

\* Pages 5.7-22 and 5.7-23; Sport Fisheries-Reservoirs: We suggest adding the word "may" before "adversely influencing cool-water species..." (Line 15, Page 5.7-22) and insert in parenthesis "(DO levels)" between "coolwater habitat" and "would be more important..." (Line 25, Page 5.7-23). Increasing the volume of low DO water in the thermocline/hypolimnion layers would not necessarily be more stressful for coolwater species. [24]

\* Pages 5.7-22–5.7-28; Sport Fisheries-Reservoirs: Even though this is a programmatic EIS, localized reservoir effects (water quality problems) by reservoir alternatives should be mentioned and considered in the overall metrics rating. For example, four localized September fish kills of coolwater species (trophy striped bass and walleye) have occurred on Lake Nottely between 1980 and 1996. These apparently resulted from low dissolved oxygen conditions deep (22-28 m) in the reservoir in the vicinity of the dam. Temperature/oxygen data collected by GAWRD fishery biologists before and following the 1996 kill document a rapid loss of a deep-water layer with sufficient oxygen to support fish. The kill probably resulted from oxygen depletion in the deep layer and fish stress when the fish were forced to undergo a rapid pressure change as they tried to get to the epilimnion. The available evidence suggests that this kill and previous kills of this nature at Lake Nottely may be related to power generation and water withdrawals in late summer. The DEIS did not address this problem. [25]

## **Appendix F4 Response to Federal and State Agency Comments**

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Pages 5.11-2—5.11-4; Invasive Plants and Animals: Include blueback herring as invasive aquatic pests where appropriate. [26] End

## **Appendix F4 Response to Federal and State Agency Comments**

### **RESPONSE TO COMMENTS**

1. Fish and wildlife resources in north Georgia have benefited from prior TVA initiatives, such as the Reservoir Release Improvement Program, to improve habitat conditions, and we believe that additional improvements can be achieved as a result of this study. We have also appreciated the opportunity to provide input into the ROS process via Regional Fisheries Supervisor Jeff Durniak's participation on your Public Review Group. We commend your agency on all open and objective process that, most importantly, has maintained its efficiency and is on schedule to meet an ambitious two-year deadline for study completion. The inclusion of north Georgia destinations in your public meeting tour was also appreciated.

**Response to Comment 1:** Thank you for your comment regarding TVA undertaking the ROS. TVA appreciates Georgia Wildlife Resources Division's input—especially the contributions the Regional Fisheries Supervisor, Jeff Durniak, has made as a member of the Public Review Group.

2. There are three TVA tributary reservoir projects (Blue Ridge, Chatuge, Nottely) and two associated tailwaters (Blue Ridge, Nottely) located in north Georgia. My agency is keenly interested in the aquatic and terrestrial communities and the associated public uses that are supported by these three TVA projects.

**Response to Comment 2:** Comment noted.

3. In simple terms, we have two primary interests in the three Georgia TVA projects as they relate to this study. The first is a desire to maintain and hopefully enhance the aquatic habitat conditions for fish species of concern in the Blue Ridge tailwater. The second is a goal to maintain higher water levels in these tributary reservoirs, which currently suffer from extreme water level fluctuations, to benefit resident fish communities and their associated recreational uses.

Any operational changes that can improve these two conditions over those currently existing under the Base Case Alternative would be highly desirable. To that end, we support, in declining order of preference, the Tailwater Habitat, Reservoir Recreation A, and Reservoir Recreation B operating alternatives. Conversely we do not support the Summer Hydropower and Equalized flood risk alternatives due to predicted adverse impacts to our stated interests.

**Response to Comment 3:** TVA's Preferred Alternative was formulated to enhance recreational opportunities, while reducing potential environmental impacts associated with the alternatives identified in the DEIS that would enhance recreation.

4. Although our three reservoirs comprise a very small segment of TVA's overall system, they are very representative of your basinwide issue of the management of tributary reservoirs. There seems to be some opportunity to closely examine your needs for flood storage and possibly increase tributary reservoir water levels where appropriate.

**Response to Comment 4:** TVA's Preferred Alternative does this.

## **Appendix F4 - Response to Federal and State Agency Comments**

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5. We commend you on the proposal in the draft EIS to extend the duration of spring water level stabilization, when climatic conditions permit, to enhance fish spawning and recruitment. That is a significant step toward the improvement of our reservoir fish communities.

**Response to Comment 5:** Unfortunately, TVA's analysis of flood risks indicates that risks would become unacceptable if the length of the stabilization was longer than 2 weeks.

6. The Georgia Wildlife Resources Division has enjoyed our longstanding partnership with TVA in the management of fish and wildlife resources at the Blue Ridge, Chatuge, and Nottely projects. We look forward to continuing this relationship and taking it to a new level as a result of the Reservoir Operations Study.

**Response to Comment 6:** Comment noted.

7. \* Page 2-25; Section 2.3.6: The last sentence in the second paragraph should read: "This lower level of DO stresses aquatic life in tailwaters and coolwater species in reservoirs, and limits the water's capacity for assimilating waste."

**Response to Comment 7:** This change has been made in the FEIS.

8. \* Page 3-9; Table 3.3-01: Water level stabilization during fish spawning is mentioned several times (Table 3.3-01 and Page 3.20) and is being considered under all alternatives. The temperature criterion for initiation of the stabilization period (60°F) and the duration (4-6 weeks) should be explicitly stated together in the text.

**Response to Comment 8:** The water temperature used as the trigger point for the 2-week fish spawning stabilization in individual tributary reservoirs will be reduced to 60 °F beginning in spring 2004. See Response to Comment 5.

9. \* Page 3-20; Fish Spawning: Need to insert in the text the new temperature criterion of 60°F. Both the water temperature (60°F) when stabilization will begin and the duration of the period should appear together in the "Fish Spawning" text.

**Response to Comment 9:** The suggested changes were made in the FEIS.

10. \* Page 4.7-21; Table 4.7-08: Omit the SFI score for striped bass in Lake Chatuge because they have not been stocked in Lake Chatuge.

**Response to Comment 10:** The table was adjusted in the FEIS.

11. \* Page 4.7-23; 1st paragraph, lines 7-8: Need to include "stocking success" as a major factor influencing striped bass populations.

**Response to Comment 11:** The text was changed in the FEIS.

12. \* Page 4.7-23; Line 13: states, "present walleye populations in tributary reservoirs have been maintained by stocking." The Blue Ridge walleye population is self-sustaining and is not maintained by stocking. It was last stocked by GAWRD in 1961.

**Response to Comment 12:** Additional text was added in the FEIS to clarify that walleye populations are naturally sustained in many tributary reservoirs.

## Appendix F4 Response to Federal and State Agency Comments

13. \* Page 4.7-24; Future Trends, Line 6: Replace "while recruitment of young fish is expected to be poor in dry years" with "while lower recruitment rates of a number of littoral spawners are expected in dry years."

**Response to Comment 13:** The text was changed in the FEIS.

14. \* Page 4.7-24; Future Trends, Lines 9-12: The text, "However, dry years would decrease reservoir conditions for cool-water species due to increased stratification causing summer/fall water quality problems" is not true, based on our data. The DEIS used 1990, 1993, and 1994 to represent normal, dry, and wet climatic years, respectively in modeling the effects of TVA alternatives on water quality (DO and temperature). Our September oxygen profiles documented higher DO levels (2-6 ppm) in 1993 (dry year) compared to anoxic to low concentrations (0-0.5 ppm) in 1994 (wet year) at Lake Nottely. The case is similar in Lake Lanier, where we have documented generally higher DO levels and lower water temperatures in coolwater habitat during summers of dry years in the Lanier watershed.

**Response to Comment 14:** The statement was intended to be applied to mainstem reservoirs and some, but not all, tributary reservoirs. The statement has been rewritten in the FEIS.

15. \* Page 4.8-3; Table 4.8-01: Total acreage (4,551) for wetland types appears to be in error. Total lake acreage is 4,180 at normal full pool.

**Response to Comment 15:** All wetland acreage was derived from National Wetland Inventory (NWI) data that was prepared by USFWS. NWI maps are based on aerial photographs taken in the mid-1980s. The numbers that were used included data not only for the reservoir but also for any NWI wetlands within the shoreline fringe and isolated wetlands within the groundwater influence zone. On Nottely Reservoir, this zone was estimated to extend 1,250 feet beyond the maximum pool elevation.

16. \* Page 4.11-3; Section 4.11.4: The blueback herring, an invasive aquatic species illegally introduced to the TVA system during the early 1990s, should be included in this section. Negative impacts of bluebacks on largemouth bass populations have been documented in these two TVA Tributary impoundments (Lake Nottely Annual Report 2002 GAWRD, unpublished).

**Response to Comment 16:** TVA agrees that, if not already an actual problem, blueback herring is a potential problem for sport fish, and added the species to the FEIS as an invasive species in some of the Hiwassee River reservoirs in North Carolina, Georgia, and Tennessee. TVA believes that expansion of blueback herring, as well as alewives, in TVA reservoirs would be limited by low DO concentrations and warm temperatures.

17. \* Page 4.24-4 Section 4.24.3: Hunting should be listed as a non-water activity (waterfowl hunting would be water-based) on this page. Hunting is included on the list of activities on Page 4.24-7.

**Response to Comment 17:** The change was made in the FEIS.

18. \* Page 5.4.3: Douglas and South Holston reservoirs were selected as the "representatives" for modeling the different alternatives in tributary reservoirs. Model results were occasionally contrasting and varied in magnitude between the two impoundments. There was insufficient

## **Appendix F4 Response to Federal and State Agency Comments**

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information (i.e. fisheries, existing water quality) describing both "representative" reservoirs so it was difficult to determine which impoundment would best represent the impact potential for reservoirs not specifically modeled. The same argument could be made for the "representative" tailwaters modeled and extrapolating their applicability to the Blue Ridge tailwater.

**Response to Comment 18:** Representative storage tributary reservoirs responded differently for certain water quality metrics. However, detailed information was provided in Appendix D of the FEIS under "Base Case" in order to allow reviewers to become familiar with the water quality characteristics of all representative reservoirs.

An additional representative storage tributary reservoir (Hiwassee Reservoir) was included in the FEIS. This reservoir was added in response to a comment that the initial evaluation did not include a reservoir representative of the upper-elevation, oligotrophic reservoirs in the Blue Ridge ecoregion.

19. \* Page 5.4-5; Line 14: Error in Table 4.4-02. Should read Table 5.4-02.

**Response to Comment 19:** This was corrected in the FEIS.

20. \* Page 5.4-5; Lines 16-21: We do not agree with the statement that impacts related to DO and high water temperatures would be less during cool, wet years and greater during hot, dry years. See previous comments for Page 4.7-24.

**Response to Comment 20:** The statement was intended to be applied to mainstem reservoirs and some, but not all tributary reservoirs. The statement was rewritten in the FEIS.

21. \* Page 5.4-13; Section 5.4.5 (3rd paragraph): The word "cold" should replace the word "cool" on line 23, using your defined coldwater temperature criteria ( $\leq 10^{\circ}\text{C}$ ) in Tables 5.4-02 and 5.4-01.

**Response to Comment 21:** This was revised in the FEIS.

22. \* Page 5.7-3; Table 5.7-01: Word error for Condition Indicator under Tributary Type for "mean volume of suitable cool-water habitat (temperature  $< 20^{\circ}\text{C}$  and DO  $> 5$  mg/L)". It should read "mean volume of suitable cold-water habitat..."

**Response to Comment 22:** This change was made in the FEIS.

23. \* Page 5.7-18; Table 5.7-07: The DEIS does not effectively address the effects of the alternatives on coolwater and coldwater habitats in reservoirs. For example, there is no analysis on volume of critical and preferable coolwater habitat for representative reservoirs and the effects on coolwater species. Table 5.7-07 does not give enough detail for our interpretation of effects.

**Response to Comment 23:** Section 5.7.2 describes the methods used to assess the impacts of the alternatives. The FEIS has been revised to include additional information on this subject. The volume of preferred or critical cool-water fish habitat is not expected to change under the Preferred Alternative.

24. \* Pages 5.7-22 and 5.7-23; Sport Fisheries-Reservoirs: We suggest adding the word "may" before "adversely influencing cool-water species..." (Line 15, Page 5.7-22) and insert in parenthesis "(DO levels)" between "coolwater habitat" and "would be more important..."

## **Appendix F4 : Response to Federal and State Agency Comments**

(Line 25, Page 5.7-23). Increasing the volume of low DO water in the thermocline/hypolimnion layers would not necessarily be more stressful for coolwater species.

**Response to Comment 24:** The changes were made in the FEIS.

25. \* Pages 5.7-22–5.7-28; Sport Fisheries-Reservoirs: Even though this is a programmatic EIS, localized reservoir effects (water quality problems) by reservoir alternatives should be mentioned and considered in the overall metrics rating. For example, four localized September fish kills of coolwater species (trophy striped bass and walleye) have occurred on Lake Nottely between 1980 and 1996. These apparently resulted from low dissolved oxygen conditions deep (22-28 m) in the reservoir in the vicinity of the dam. Temperature/oxygen data collected by GAWRD fishery biologists before and following the 1996 kill document a rapid loss of a deep-water layer with sufficient oxygen to support fish. The kill probably resulted from oxygen depletion in the deep layer and fish stress when the fish were forced to undergo a rapid pressure change as they tried to get to the epilimnion. The available evidence suggests that this kill and previous kills of this nature at Lake Nottely may be related to power generation and water withdrawals in late summer. The DEIS did not address this problem.

**Response to Comment 25:** This issue was considered in the analysis of the volume of water with low DO concentrations.

- 26.. \* Pages 5.11-2—5.11-4; Invasive Plants and Animals: Include blueback herring as invasive aquatic pests where appropriate.

**Response to Comment 26:** See Response to Comment 16.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Kentucky Department of Fish and Wildlife Resources**

September 23, 2004

Mr. David Nye, ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WTIIA  
Knoxville, TN 37902

Dear Mr. Nye:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has reviewed the Draft Programmatic Environmental Impact Statement (EIS) for the Reservoir Operations Study. KDFWR staff has also participated in the meetings that have been held by the Tennessee Valley Authority (TVA) on this study. Accordingly, we offer the following comments and recommendations. [1]

The purpose of the study was to identify and evaluate the environmental and socioeconomic impacts of TVA's existing reservoir operations policy and develop options that might produce greater public value. As a result of this study, 8 options were identified (including the Base Case) for further evaluation and study. All of these options, excluding the Base Case, looked at changes in the timing of filling and emptying the reservoirs in the TVA system and how those changes might impact the environment and socioeconomics around each reservoir.

After reviewing the document, KDFWR recommends the Base Case option should become the Preferred Alternative for the Final EIS. We believe the other options could have impacts on fish spawning activity, reduce water quality, result in lost shoreline and shoreline habitat, and negatively impact adjacent wetlands. By delaying reservoir filling later, this could result in crappie and bass spawns being very low which would impact sport-fishing opportunities. By keeping water levels higher through the summer, there could be a loss of shoreline through increased erosion and a loss of habitat since mudflats won't have time to become vegetated. [2]

Additionally, since Kentucky Lake is connected to Lake Barkley by a canal, any change in the operation of Kentucky Lake will have a similar change on Lake Barkley. Therefore, any EIS should not only consider impacts to Kentucky Lake but should evaluate impacts on Lake Barkley. [3]

If you or any of your staff should have any questions regarding our comments, please contact Mr. Wayne L. Davis, Environmental Section Chief, at 502/564-7109, ext. 365.

We appreciate the opportunity to comment.

Sincerely,

## **Appendix F4 Response to Federal and State Agency Comments**

**C. Tom Bennett  
Commissioner**

**cc: Benjamin T. Kinman, Director, Division of Fisheries**  
**Edwin F. Crowell, Asst. Director, Division of Fisheries**  
**Paul W. Rister, Western Fishery District Biologist**  
**Pat Brandon, Purchase Wildlife Region Supervisor**  
**Boyce Wells, KY Dept. for Environmental Protection**  
**Lee Andrews, USFWS, Frankfort, KY**  
**Environmental Section Files**

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENTS**

1. The Kentucky Department of Fish and Wildlife Resources (KDFWR) has reviewed the Draft Programmatic Environmental Impact Statement (EIS) for the Reservoir Operations Study. KDFWR staff has also participated in the meetings that have been held by the Tennessee Valley Authority (TVA) on this study. Accordingly, we offer the following comments and recommendations.

**Response to Comment 1:** Thank you for your comments and continued participation in the ROS as a member of the Interagency Team.

2. After reviewing the document, KDFWR recommends the Base Case option should become the Preferred Alternative for the Final EIS. We believe the other options could have impacts on fish spawning activity, reduce water quality, result in lost shoreline and shoreline habitat, and negatively impact adjacent wetlands. By delaying reservoir filling later, this could result in crappie and bass spawns being very low which would impact sport-fishing opportunities. By keeping water levels higher through the summer, there could be a loss of shoreline through increased erosion and a loss of habitat since mudflats won't have time to become vegetated.

**Response to Comment 2:** Thank you for supporting the Base Case Alternative. Many of the concerns addressed in your comments were considered during the development of TVA's Preferred Alternative that is now identified in the FEIS.

3. Additionally, since Kentucky Lake is connected to Lake Barkley by a canal, any change in the operation of Kentucky Lake will have a similar change on Lake Barkley. Therefore, any EIS should not only consider impacts to Kentucky Lake but should evaluate impacts on Lake Barkley.

**Response to Comment 3:** Under the Preferred Alternative, Kentucky and Barkley Reservoirs would be operated similar to the Base Case.

## **Appendix F4 Response to Federal and State Agency Comments**

### **North Carolina Wildlife Resources Commission**

September 3, 2003

Mr. David T. Nye  
Project Manager  
Reservoir Operations Study  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

Subject: Draft Programmatic Environmental Impact Statement, Reservoir Operations Study

Dear Mr. Nye:

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the Draft Programmatic Environmental Impact Statement (DPEIS). The DPEIS has been prepared by Tennessee Valley Authority (TVA) staff and consultants to report on the outcome of a basin-wide Reservoir Operations Study (ROS). Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332 (2) (C)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

We commend TVA for initiating a study of this magnitude to re-evaluate the potential of the greater Tennessee Valley's hydropower projects to serve multiple resource interests. We are optimistic that the ROS development process will identify important issues regarding the reservoirs, tailraces and other resources associated with these projects, and lead to better management of these resources. [1] Pursuant to that goal, the following comments are offered:

In our scoping comments on the ROS (C. Goudreau, April 26, 2002), NCWRC staff outlined specific concerns regarding current TVA operating policies, including: conservation and management of shoreline habitat; magnitude of winter drawdown on large reservoirs; duration/timing of reservoir elevation changes; reservoir habitat development opportunities and a variety of reservoir-specific issues. A copy of our scoping letter is attached for your reference. In reviewing the DPEIS, we found no record of agency scoping comments, nor any specific responses to the concerns expressed in our letter or by any other resource agency. We recommend that the final Environmental Impact Statement (EIS) document include a section devoted to TVA responses to resource agency comments, providing detailed information on how each comment was incorporated into the ROS or why it was not incorporated.

Because the DPEIS has not addressed many of the concerns detailed in our scoping letter of April 26, 2002, and because neither our recommended operational alternatives nor any alternatives that would target benefits to natural resources associated with reservoirs have been developed in the document, we cannot support any of the alternatives presented. While strengths and weaknesses of several alternatives are discussed herein, we caution the document preparers that such discussions should not be used to categorize the NCWRC as favoring those alternatives in any simplification or summarization of public or agency comment. Our specific concerns are discussed below. [2]

In general, the scope of the ROS document is too geographically broad or operationally narrow to address many long-standing project-specific issues. In our scoping comments, we listed a variety of such issues,

## **Appendix F4 Response to Federal and State Agency Comments**

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including: houseboat permitting on Fontana and other reservoirs; the shortage of low-water access on Chatuge Reservoir; the five-year “maintenance” drawdown of Fontana Reservoir; opportunities for creating small subimpoundments to improve fish habitat and recreational access, particularly at Siles Branch on Fontana Reservoir; improved boating access on Appalachia reservoir; impact of peaking flows from Nottely Reservoir on the Nottely River, and from Chatuge Reservoir on the Hiwassee River; and improved flows in the bypass reach below Appalachia Dam. As part of the agency response section recommended above, TVA should identify those agency comments and requests that are outside the intended scope of the ROS, and propose alternative processes by which those concerns might be addressed. In some cases, particularly regarding reservoir levels and tailrace flows, opportunity still exists to address these issues through a more detailed alternatives analysis within the ROS development process. Where applicable, we recommend that discussion of operational alternatives include references to specific agency concerns expressed during the scoping process. For example, would an operational shift toward more stable lake levels eliminate the current five-year drawdown practice on Fontana, or would alternatives intended to improve tailrace conditions affect the frequency or amplitude of peaking flows in the Nottely River? While we recognize that it would be impractical to consider all possible scenarios for all projects in the TVA system, the final EIS should address those reservoirs or river reaches identified by resource agencies as areas of particular concern. [3]

The broad scope of the ROS document also confounds any meaningful interpretation of the alternatives summaries presented in public hearings, handouts and newsletters by TVA. Concepts such as recreation and water quality are too diverse and variable across the project area to be depicted as having unilaterally good or bad responses to any of the operational alternatives. Such simplistic depiction of study results precludes any opportunity to address these issues by project, region or type of water body (reservoir versus tailrace), and may mislead the public into choosing an operational alternative that is not the most beneficial to their local resources and associated economies. [4]

The analysis of operational alternatives in the ROS is based mainly on basin-wide predictive models. Based on our review of the DPEIS document and materials presented at the public meetings, the sources of data used for model input appear in some cases to be vague, arbitrary, inappropriate or incomplete. Where applicable, we have outlined our concerns about questionable model input in our comments on specific alternatives and document sections below. We encourage TVA to carefully review input data for all models used for alternatives analysis, and expand or balance these data sets as needed. This will ensure that the potential of available water resources, not the limits of predictive models, determines the amount of public benefit that is derived from the costly and difficult ROS development process.

In addition to concerns regarding input data, the calibration of the models appears to be biased. Benefits of operational changes are presented in document and handout graphics on the same four-point scale as adverse results, but benefits are rarely measured above one-half of the available scale, while adverse results employ the entire scale. While this is intended to show the relative importance, from TVA’s perspective, of the beneficial and adverse effects of each alternative, the resulting graphs are of little use in comparing benefits of similar alternatives to a particular resource category. For example, the estimated benefit to recreation is shown as “slightly beneficial” for all three alternatives for which recreational benefits are projected. Because most of the benefit scale is unused, it is difficult or impossible to compare relative degrees of benefit among alternatives. Also, the unused portion of the benefit scale presumably represents outcomes that are impossible under any operational scenario. Because arbitrary values or composite index scores are used for all scaling of impacts, it would be more useful and informative to rate the maximum possible benefits at the top of the four-point scale, just as maximum adverse impacts are calibrated. This would allow a more insightful review of alternatives by members of the public who are unlikely to read the text of the document. [5]

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The DPEIS describes a process by which TVA staff condensed 65 preliminary alternatives into a refined list of 25, of which eight were developed in the document. While details on the 25 refined alternatives are provided in Appendix B, information on the initial screening is limited to a single page of text in Chapter 3 of the DPEIS, describing a process of consolidating and scoring preliminary alternatives by TVA staff to eliminate those that directly conflicted with operational capabilities. Although an overview of the public input process is provided in Section 1.6, operating options considered are described only in general terms. The final EIS document should describe the initial screening process in detail, including information on scoring criteria used to screen alternatives and a complete list of alternatives with justification for their selection or elimination. Without this information, it is impossible to determine whether our recommended alternative involving filling of reservoirs by April 1, which did not appear in the DPEIS, was eliminated in the preliminary screening, inappropriately consolidated with other operating options or omitted entirely from the alternatives review process. [6]

Although two alternatives involving longer retention of summer reservoir levels are presented in the DPEIS, neither alternative considers reaching summer lake levels earlier in the season. In our scoping comments, we specifically requested consideration of operational alternatives that produce higher and more stable reservoir water levels during the period from April through June, with a target date of April 1 for full pool. We reiterate that such an alternative should be considered, and request that it be included in the final EIS. While we recognize that flood control potential of reservoirs would be compromised during this period, water quality impacts attributed to the two existing full pool alternatives should be alleviated, because water level management during the late summer would be similar to existing conditions. By achieving full pool in April, the fisheries resources of tributary reservoirs would be enhanced through improved fish spawning success and reservoir primary productivity, with resulting benefits to recreation and associated local economies. [7]

We also requested that extent of winter drawdown be reduced in at least one alternative, particularly on Fontana and Hiwassee reservoirs, where significant portions of the reservoirs are completely dewatered annually. While the "Equalized Winter/Summer Flood Risk" alternative would partially achieve this objective, the alternative as considered in the DPEIS produces significant impacts to other resource categories, largely due to its basin-wide scope. We recommend that a similar alternative be evaluated that equalizes winter and summer water levels in the tributary reservoirs only, similar to the full pool models used in the recreational alternatives. It is likely that substantial improvements in winter and early spring water levels of tributary reservoirs could be compensated by slight modifications in water levels of larger downstream impoundments. This is particularly true of Fontana Reservoir, where extensive dewatering continues in spite of the more recent development of Tellico Reservoir downstream. [8]

Comparisons of reservoir elevations projected under the different operational alternatives are presented in the document using numeric data and box plots that show predicted elevations at one point during each season. Of greater concern to us is the rate and timing of reservoir filling during the critical spawning period from April through June. At the public meeting, TVA computer specialists were able to model continuous curves depicting daily water levels for specific reservoirs. For all alternatives developed in the final EIS, such curves should be included in the document for representative reservoirs, showing mean, minimum and maximum predicted water levels projected by each operational model. [9]

The following comments apply to specific document sections, primarily those in Chapters 4 through 7 that relate to natural resources and associated recreation and economics:

**Section 4.7.8:** In the discussion of existing sport fisheries, the document should clarify that in contrast to striped bass and striped bass hybrid fisheries, walleye populations in many tributary reservoirs have become naturalized and are now sustained by natural reproduction, not by stocking. We would also

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contend that in reservoir environments, the stability of water levels may be more important than the amount of annual rainfall for many centrarchid species. While these two phenomena may be difficult to distinguish under current operational conditions in tributary reservoirs, future conditions will likely depend on the operational regime selected through the ROS process. [10]

Section 5.4: Water quality modeling is based on levels of dissolved oxygen, temperature and algal activity in two “representative” tributary storage reservoirs. While the development of this water quality model is useful for predicting overall conditions in the entire volume of water in a reservoir, it is a poor predictor of water quality aspects that directly affect fish populations, especially when used to evaluate different levels of reservoir filling. While we concede that a reservoir at full pond may potentially have a higher volume of anoxic water at certain times of the year, it also has a substantially greater amount of oxygenated littoral habitat, due to the inundation of coves. It is also unfortunate that the only full pool alternatives developed in the document involve late summer filling, when anoxic conditions would be most widespread. The extrapolation of water quality parameters from lower-elevation Tennessee reservoirs to North Carolina’s mountain reservoirs is probably tenuous as well. Algal activity in Fontana or Hiwassee would likely be low compared to other tributary storage reservoirs, and in any case would represent much-needed primary productivity rather than any kind of harmful eutrophication. Because water quality is one of the resource categories presented to the public in the alternatives analysis process, it is unfortunate that the indices used for model input have so little relevance to quality of sport fisheries in mountain reservoirs. [11]

Section 5.7: Again as in section 5.4, availability of habitat, including modeled oxygen levels, is related to total reservoir volume, limiting the model’s ability to predict fishery resource benefits of higher lake levels, which inundate greater amounts of littoral habitat but also increase the relative volume of anoxic water in the reservoir. Biodiversity is also applied to both tailrace and reservoir habitats as an indicator of quality. As with dissolved oxygen, this is more relevant to tailrace habitats than reservoir systems. Species diversity in reservoirs is determined as much by species introductions as by habitat quality; in oligotrophic systems like our mountain reservoirs, the addition of species over time has not necessarily benefited the quality of fishery resources. White bass and other temperate basses overlap and compete with walleye for prey resources, spotted bass compete for reproductive habitat and readily hybridize with other black basses, and river herring adversely impact walleye recruitment. While Fontana Reservoir may have a less diverse fish community than downstream reservoirs, we view the absence of alewife and yellow bass as a benefit, rather than an impairment, to fishery resources. The difficulties of incorporating biodiversity indices into reservoir quality assessment are acknowledged in the text, but it is not clear how much these indices affected relative scoring of operational alternatives. As indicated in our opening comments, we requested that TVA develop a full summer pool alternative incorporating stable water levels from April through June. While the document text discusses the adverse impacts of rapid spring water level changes on fish spawning, and describes existing TVA measures to briefly limit fluctuations during times of critical bass spawning temperatures, no operational alternative is proposed in the document that would both inundate cove areas and stabilize water levels in the April-June period. None of the alternatives presented in the DPEIS has a substantial projected benefit to sport fisheries. At least one such alternative should be developed and evaluated in the final EIS. [12]

Section 5.8: The wetlands section of the document deals primarily with wetland losses associated with various alternatives. It is likely that wetland areas will be created or enhanced under some alternatives, particularly those associated with water margins. The wetlands analysis used in the document is admitted by the preparers to be limited in predicting changes in wetland extents; as a result, any alternatives analysis based on wetlands impacts is likely to be tenuous at best. The information in this section would be clarified by including tables similar to the table in Section 4.8, comparing projected wetlands for each alternative. In the wetlands section as in other places in the DPEIS document, sweeping predictions about

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impacts of alternatives on large geographic scales, such as “tributary reservoirs” or “mainstem tailwaters”, seem not to be supported by data, and reflect the difficulty of modeling localized natural resource impacts on such scales. The associated appendix (D4b) provides details on wetlands analysis, but does not explain the theoretical basis or literature sources for reservoir-specific coefficients used to predict wetland impacts. Differences in impacts of alternatives listed in the appended analyses do not appear to be reflected in the document, where alternatives with dissimilar coefficient scores have similar statements evaluating wetland impacts. [13]

Section 5.11: Blueback herring is an invasive non-native aquatic species that potentially affects sport fisheries. While some species or life stages of species of game fish appear to benefit from blueback herring as a forage resource, other species or life stages may be adversely affected. Blueback herring should be included in the list and discussion of invasive animals. [14]

Section 5.13: The document attempts to predict threatened and endangered species impacts at the scope of the ROS. However, project-specific evaluations would be required for any change in operations that would adversely impact threatened or endangered species or their habitats. Because these species are typically limited in range or habitat requirements, it is likely that under any alternative chosen, projects with significant threatened and endangered species concerns would have to be treated differently than other projects of that type. Therefore, threatened and endangered species impacts may not be the best tool for evaluating alternatives on a basin-wide scale. We appreciate that flow improvements in the Appalachia bypass reach, mentioned in our scoping letter as a concern, are discussed in the DPEIS document and will be implemented under all operational alternatives. [15]

Section 5.24: Models used to predict recreational use of reservoirs under different operational alternatives assume reservoir level to be the only variable that would change. However, access area use information used for model input (Section 4.24) does not appear to distinguish between angling and non-angling boating use. Because quality of recreational fisheries may be affected by operational alternatives, the recreational model should include a modifier to reflect improved or impaired recreational boat fishing. Breakdowns of recreational users in the model should include separate seasonal estimates of angling and non-angling boaters based on or extrapolated from creel survey information on reservoirs in the region. Our recent surveys from reservoirs in the upper Little Tennessee Basin indicate that 70 to 95 percent of annual boating use and nearly all cool-season boating is associated with recreational fishing. Failure to incorporate impacts of alternatives on fishery resource quality therefore limits the utility of the existing recreational model on mountain reservoirs, and it should be revised accordingly. [16]

Section 5.25: Based on discussions between our staff and TVA representatives at the recent informational meeting, economic models include only recreation-associated jobs that occurred entirely within the Tennessee Valley, omitting those jobs associated with outfitters or fishing/hunting guide services based in adjacent areas. It is likely that the economic benefits of alternatives enhancing reservoir or tailrace recreation are therefore underestimated, particularly when compared to economic benefits of navigation, which are presumably confined to the mainstem region. All known economic impacts of each alternative should be included in comparative analysis for the final EIS. [17]

Chapter 6: Discussion of cumulative impacts of the ROS alternatives is brief, typically in the form of a summary paragraph for each of the affected resources. No comprehensive, multi-resource assessment of cumulative impacts is attempted. As the list of alternatives should be narrowed in the final document, the EIS should include a more detailed projection of overall cumulative impacts associated with the recommended operational changes. The DPEIS does not provide enough information on the methods used to evaluate cumulative impacts to allow us to comment on their validity; these should also be described in detail in the EIS. [18]

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Chapter 7: As with the cumulative impacts chapter, the discussion of mitigation is generic in nature and does not outline specific areas where mitigation opportunities might be reduced or enhanced under different operational alternatives. Again we refer to our scoping comments, and suggest that our project-specific issues, and those of other resource agencies, form the basis of a list of mitigation opportunities for any resource impacts associated with the operational alternative recommended in the final EIS. [19]

As always, our field staff will be available to clarify any of the comments provided, or to cooperate as needed with development of the final EIS document. If you have questions regarding the information in this letter, please contact me at (919) 733-3633. [20]

Sincerely,

Fred A. Harris, Chief  
Division of Inland Fisheries

Attachment

## Appendix F4 Response to Federal and State Agency Comments

### RESPONSE TO COMMENTS

1. We commend TVA for initiating a study of this magnitude to re-evaluate the potential of the greater Tennessee Valley's hydropower projects to serve multiple resource interests. We are optimistic that the ROS development process will identify important issues regarding the reservoirs, tailraces and other resources associated with these projects, and lead to better management of these resources.

**Response to Comment 1:** Comment noted.

2. In our scoping comments on the ROS (C. Goudreau, April 26, 2002), NCWRC staff outlined specific concerns regarding current TVA operating policies, including: conservation and management of shoreline habitat; magnitude of winter drawdown on large reservoirs; duration/timing of reservoir elevation changes; reservoir habitat development opportunities and a variety of reservoir-specific issues. A copy of our scoping letter is attached for your reference. In reviewing the DPEIS, we found no record of agency scoping comments, nor any specific responses to the concerns expressed in our letter or by any other resource agency. We recommend that the final Environmental Impact Statement (EIS) document include a section devoted to TVA responses to resource agency comments, providing detailed information on how each comment was incorporated into the ROS or why it was not incorporated.

Because the DPEIS has not addressed many of the concerns detailed in our scoping letter of April 26, 2002, and because neither our recommended operational alternatives nor any alternatives that would target benefits to natural resources associated with reservoirs have been developed in the document, we cannot support any of the alternatives presented. While strengths and weaknesses of several alternatives are discussed herein, we caution the document preparers that such discussions should not be used to categorize the NCWRC as favoring those alternatives in any simplification or summarization of public or agency comment. Our specific concerns are discussed below.

**Response to Comment 2:** As suggested, TVA is responding separately to federal and state agencies that submitted comments on the DEIS. TVA issued a 15-page document that summarized its evaluation of all of the comments received during the scoping period. This document also described how TVA intended to use those comments to establish the contents of the FEIS and better define the analyses that would be conducted to support this effort. The Scoping Document was widely distributed and made available on TVA's public web site. The reservoir system issues identified in this comment and in the earlier referenced scoping comments have been analyzed in this EIS to the extent that they relate to a system-wide operations policy. Although potential impacts on shoreline resources were analyzed as part of the ROS, possible changes to TVA's shoreline management policies and practices were not included. Those policies and practices were the subject of TVA's 1998 Shoreline Management Initiative EIS.

The focus of this programmatic EIS was to conduct detailed analysis on system-wide issues, not the kind of reservoir-specific issues that are the dominant focus of this and other comments from the North Carolina Wildlife Resources Commission. However, reservoir-specific recommendations that were received from scoping through the DEIS were considered in constructing all of the policy alternatives evaluated in this EIS, including the Preferred Alternative. Due to the infinite number of policy alternatives that could be developed from combinations of these recommendations, not all of the suggestions could

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be specifically included in the detailed analysis, but the nature of the suggestions was addressed within the context of broader programmatic issues. For example, under TVA's Preferred Alternative, winter flood guides would be raised on Boone, Chatuge, Cherokee, Douglas, Norris, Nottely, South Holston, and Watauga Reservoirs. Also, the duration of the restricted summer drawdown would be extended on Blue Ridge, Chatuge, Cherokee, Douglas, Great Falls, Norris, Nottely, South Holston, Watauga, and Wheeler Reservoirs under the Preferred Alternative. During the implementation of any ROS decision, or in the context of other actions that may be proposed on reservoirs of specific interest to the Commission, reservoir-specific issues and concerns would be addressed, as appropriate. TVA encourages the Commission to raise any such concerns in that context.

3. In general, the scope of the ROS document is too geographically broad or operationally narrow to address many long-standing project-specific issues. In our scoping comments, we listed a variety of such issues, including: houseboat permitting on Fontana and other reservoirs; the shortage of low-water access on Chatuge Reservoir; the five-year "maintenance" drawdown of Fontana Reservoir; opportunities for creating small subimpoundments to improve fish habitat and recreational access, particularly at Siles Branch on Fontana Reservoir; improved boating access on Appalachia reservoir; impact of peaking flows from Nottely Reservoir on the Nottely River, and from Chatuge Reservoir on the Hiwassee River; and improved flows in the bypass reach below Appalachia Dam. As part of the agency response section recommended above, TVA should identify those agency comments and requests that are outside the intended scope of the ROS, and propose alternative processes by which those concerns might be addressed. In some cases, particularly regarding reservoir levels and tailrace flows, opportunity still exists to address these issues through a more detailed alternatives analysis within the ROS development process. Where applicable, we recommend that discussion of operational alternatives include references to specific agency concerns expressed during the scoping process. For example, would an operational shift toward more stable lake levels eliminate the current five-year drawdown practice on Fontana, or would alternatives intended to improve tailrace conditions affect the frequency or amplitude of peaking flows in the Nottely River? While we recognize that it would be impractical to consider all possible scenarios for all projects in the TVA system, the final EIS should address those reservoirs or river reaches identified by resource agencies as areas of particular concern.

**Response to Comment 3:** See Response to Comment 2. TVA agrees that the ROS EIS is too broad to appropriately address the kind of reservoir-specific concerns identified in this comment. As a programmatic level of review, the ROS EIS is purposefully structured for a broader level of analysis. However, the impact analyses, as well as Appendix C, do provide a great deal of information about individual reservoirs and tailwaters. TVA explained in some detail how alternative operations policies could affect the operation of specific reservoirs, including the reservoirs identified in this comment. Under the Preferred Alternative, a number of reservoirs would be maintained at higher levels for longer durations, including Fontana, Chatuge, Nottely, and Hiwassee. However, deep drawdowns on the reservoirs would still be periodically required for mandated dam safety inspections and maintenance.

4. The broad scope of the ROS document also confounds any meaningful interpretation of the alternatives summaries presented in public hearings, handouts and newsletters by TVA. Concepts such as recreation and water quality are too diverse and variable across the project area to be depicted as having unilaterally good or bad responses to any of the

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operational alternatives. Such simplistic depiction of study results precludes any opportunity to address these issues by project, region or type of water body (reservoir versus tailrace), and may mislead the public into choosing an operational alternative that is not the most beneficial to their local resources and associated economies.

**Response to Comment 4:** By their nature, programmatic reviews have broad scopes and purposefully analyze issues and alternatives in broad ways. Indeed, if we allowed this programmatic review to be dominated by reservoir-specific concerns, 'decision makers' and the public's ability to understand the system-wide ramifications of proposed actions could easily be impaired. We do agree that generalizing the results of impact analyses could obscure unique effects on specific reservoirs. Based on our knowledge of TVA's reservoirs, the kinds of analyses and analytical methods used for the ROS, and TVA's extensive monitoring of various reservoir parameters, we do not think this has occurred to any material extent. We have provided detailed information about the potential ramifications of alternative operations policies on each of the reservoirs studied for the ROS. Additional details have now been provided about TVA's Preferred Alternative. We hope and anticipate that this will enable the public (and commenting agencies with reservoir-specific interests) to discern how their interests could be affected.

5. The analysis of operational alternatives in the ROS is based mainly on basin-wide predictive models. Based on our review of the DPEIS document and materials presented at the public meetings, the sources of data used for model input appear in some cases to be vague, arbitrary, inappropriate or incomplete. Where applicable, we have outlined our concerns about questionable model input in our comments on specific alternatives and document sections below. We encourage TVA to carefully review input data for all models used for alternatives analysis, and expand or balance these data sets as needed. This will ensure that the potential of available water resources, not the limits of predictive models, determines the amount of public benefit that is derived from the costly and difficult ROS development process.

In addition to concerns regarding input data, the calibration of the models appears to be biased. Benefits of operational changes are presented in document and handout graphics on the same four-point scale as adverse results, but benefits are rarely measured above one-half of the available scale, while adverse results employ the entire scale. While this is intended to show the relative importance, from TVA's perspective, of the beneficial and adverse effects of each alternative, the resulting graphs are of little use in comparing benefits of similar alternatives to a particular resource category. For example, the estimated benefit to recreation is shown as "slightly beneficial" for all three alternatives for which recreational benefits are projected. Because most of the benefit scale is unused, it is difficult or impossible to compare relative degrees of benefit among alternatives. Also, the unused portion of the benefit scale presumably represents outcomes that are impossible under any operational scenario. Because arbitrary values or composite index scores are used for all scaling of impacts, it would be more useful and informative to rate the maximum possible benefits at the top of the four-point scale, just as maximum adverse impacts are calibrated. This would allow a more insightful review of alternatives by members of the public who are unlikely to read the text of the document.

**Response to Comment 5:** As the comment suggested, TVA has carefully reviewed its modeling efforts associated with the ROS and has determined they were comprehensive, driven by valid data, tested extensively, and adequate to demonstrate real changes between the Base Case and any simulated alternative operations policy. Additional

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information regarding the models is provided in Appendix C, and detailed results are contained in technical reports and other information that is part of the ROS administrative record. Some of the details about the models are as follows:

The flood risk analysis was driven primarily by continuous simulations of the Tennessee River basin over the 99-year period between 1903 and 2001. The watershed was conceptually subdivided into 55 sub-basins, and a continuous hydrologic inflow time series was developed for each sub-basin. This effort was supported by comprehensive hydrologic data records, including U.S. Geological Survey (USGS) stream gage records and TVA reservoir operations data. Where necessary, gaps in the hydrologic data record were filled using standard hydrologic techniques in such a way that mass balance was preserved throughout the basin, and—to the extent practical for a study of this nature—that the dynamic response of each sub-basin was quantified for a wide range of spatially and temporally varying flood events.

The reservoir simulation model used in the flood risk analysis was RiverWare. This software has been routinely used by TVA for several years. The model captures all of the physical processes that are important to effective flood analysis. Operational rules were developed to reflect existing and alternative operations policies, and significant effort was made to test them.

Given the scope of the project, it was not possible to perform typical model calibration. The model was never intended to reproduce every water release decision made over a period during which the extent of flood-regulating capability, operations policy and staffing levels, forecasting technology, and basin development were continuously evolving. The intent of the simulation effort was to be able to demonstrate any real, defensible changes between existing and proposed operations policies.

Model verification was performed by comparing simulated elevation and discharge hydrographs at key points throughout the system with observed data for 1991 to 2001. This period encompasses the time frame that most closely reflects TVA's existing operations policy (that is, the time since the implementation of the policy modifications associated with the Lake Improvement Plan in 1991).

Water quality model input varied between bodies of water. Any available data from the extensive TVA monitoring program and USGS gages were used. Geometry was obtained from the most recent sediment surveys. Meteorology was obtained from the nearest National Weather Service airport stations. Where available, inflow water quality was obtained from monitoring data on tributary streams. Where inflow water quality data were not available, values were used that represented similar streams.

Each waterbody (reservoir or tailwater) was calibrated individually by comparing at least 1 year of water temperature and DO data with model results. The calibration year was chosen for each waterbody based on the year for which the most data were available. The models were then linked together to create the system-wide model. After linkage, the system-wide model was calibrated by comparing model results with 8 years of measured data for water temperatures and DO concentrations. In most cases, computed water temperature matched measured data within 1 °F, and DO concentrations matched measured data within 1 milligram per liter.

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Using water quality model results, numerous metrics were computed for Water Quality, Aquatic Resources, Water Supply, Threatened and Endangered Species, and other resource areas. These metrics included, for example, the seasonal volume of suitable habitat, the volume of water with suitable assimilative capacity, and the hours per year that a DO target was met at a critical location.

These numerous metrics were then summarized by the resource specialists to form the four-point scale mentioned in the comment. The alternatives were judged based on the weight of evidence in the various metrics.

Additional information has been added to the FEIS to better define the four-point performance scale that was used to document the impacts of each alternative.

6. The DPEIS describes a process by which TVA staff condensed 65 preliminary alternatives into a refined list of 25, of which eight were developed in the document. While details on the 25 refined alternatives are provided in Appendix B, information on the initial screening is limited to a single page of text in Chapter 3 of the DPEIS, describing a process of consolidating and scoring preliminary alternatives by TVA staff to eliminate those that directly conflicted with operational capabilities. Although an overview of the public input process is provided in Section 1.6, operating options considered are described only in general terms. The final EIS document should describe the initial screening process in detail, including information on scoring criteria used to screen alternatives and a complete list of alternatives with justification for their selection or elimination. Without this information, it is impossible to determine whether our recommended alternative involving filling of reservoirs by April 1, which did not appear in the DPEIS, was eliminated in the preliminary screening, inappropriately consolidated with other operating options or omitted entirely from the alternatives review process.

**Response to Comment 6:** Additional information about the alternative screening process has been provided in Section 3.2 of the FEIS. Results of the flood risk analysis showed that changing reservoir operations to achieve full pool on April 1 would result in unacceptable increases in flood risk.

7. Although two alternatives involving longer retention of summer reservoir levels are presented in the DPEIS, neither alternative considers reaching summer lake levels earlier in the season. In our scoping comments, we specifically requested consideration of operational alternatives that produce higher and more stable reservoir water levels during the period from April through June, with a target date of April 1 for full pool. We reiterate that such an alternative should be considered, and request that it be included in the final EIS. While we recognize that flood control potential of reservoirs would be compromised during this period, water quality impacts attributed to the two existing full pool alternatives should be alleviated, because water level management during the late summer would be similar to existing conditions. By achieving full pool in April, the fisheries resources of tributary reservoirs would be enhanced through improved fish spawning success and reservoir primary productivity, with resulting benefits to recreation and associated local economies.

**Response to Comment 7:** See Response to Comment 6.

8. We also requested that extent of winter drawdown be reduced in at least one alternative, particularly on Fontana and Hiwassee reservoirs, where significant portions of the reservoirs are completely dewatered annually. While the "Equalized Winter/Summer Flood

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Risk" alternative would partially achieve this objective, the alternative as considered in the DPEIS produces significant impacts to other resource categories, largely due to its basin-wide scope. We recommend that a similar alternative be evaluated that equalizes winter and summer water levels in the tributary reservoirs only, similar to the full pool models used in the recreational alternatives. It is likely that substantial improvements in winter and early spring water levels of tributary reservoirs could be compensated by slight modifications in water levels of larger downstream impoundments. This is particularly true of Fontana Reservoir, where extensive dewatering continues in spite of the more recent development of Tellico Reservoir downstream.

**Response to Comment 8:** TVA's Preferred Alternative was formulated partially in response to this comment. One of its features is reduced winter drawdowns at several reservoirs, including Chatuge, Fontana, Nottely, and Hiwassee.

9. Comparisons of reservoir elevations projected under the different operational alternatives are presented in the document using numeric data and box plots that show predicted elevations at one point during each season. Of greater concern to us is the rate and timing of reservoir filling during the critical spawning period from April through June. At the public meeting, TVA computer specialists were able to model continuous curves depicting daily water levels for specific reservoirs. For all alternatives developed in the final EIS, such curves should be included in the document for representative reservoirs, showing mean, minimum and maximum predicted water levels projected by each operational model.

**Response to Comment 9:** Appropriate plots for the Base Case and Preferred Alternative are provided in the FEIS (see Appendix C).

10. Section 4.7.8: In the discussion of existing sport fisheries, the document should clarify that in contrast to striped bass and striped bass hybrid fisheries, walleye populations in many tributary reservoirs have become naturalized and are now sustained by natural reproduction, not by stocking. We would also contend that in reservoir environments, the stability of water levels may be more important than the amount of annual rainfall for many centrarchid species. While these two phenomena may be difficult to distinguish under current operational conditions in tributary reservoirs, future conditions will likely depend on the operational regime selected through the ROS process.

**Response to Comment 10:** The FEIS was changed to clarify that walleye populations are naturally sustained in many tributary reservoirs. Stable water for centrarchid species are considered, along with other concerns, in Section 4.7.2 of the FEIS.

11. Section 5.4: Water quality modeling is based on levels of dissolved oxygen, temperature and algal activity in two "representative" tributary storage reservoirs. While the development of this water quality model is useful for predicting overall conditions in the entire volume of water in a reservoir, it is a poor predictor of water quality aspects that directly affect fish populations, especially when used to evaluate different levels of reservoir filling. While we concede that a reservoir at full pond may potentially have a higher volume of anoxic water at certain times of the year, it also has a substantially greater amount of oxygenated littoral habitat, due to the inundation of coves. It is also unfortunate that the only full pool alternatives developed in the document involve late summer filling, when anoxic conditions would be most widespread. The extrapolation of water quality parameters from lower-elevation Tennessee reservoirs to North Carolina's mountain reservoirs is probably tenuous as well. Algal activity in Fontana or Hiwassee would likely be low compared to other tributary storage reservoirs, and in any case would represent much-

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needed primary productivity rather than any kind of harmful eutrophication. Because water quality is one of the resource categories presented to the public in the alternatives analysis process, it is unfortunate that the indices used for model input have so little relevance to quality of sport fisheries in mountain reservoirs.

**Response to Comment 11:** Indices that were used focused on the availability of suitable cool-water species habitat. This habitat was considered the most vulnerable habitat in reservoirs, even in oligotrophic mountain reservoirs. To respond to this comment, Hiwassee Reservoir was added to the representative reservoirs used for analysis in the FEIS.

12. Section 5.7: Again as in section 5.4, availability of habitat, including modeled oxygen levels, is related to total reservoir volume, limiting the model's ability to predict fishery resource benefits of higher lake levels, which inundate greater amounts of littoral habitat but also increase the relative volume of anoxic water in the reservoir. Biodiversity is also applied to both tailrace and reservoir habitats as an indicator of quality. As with dissolved oxygen, this is more relevant to tailrace habitats than reservoir systems. Species diversity in reservoirs is determined as much by species introductions as by habitat quality; in oligotrophic systems like our mountain reservoirs, the addition of species over time has not necessarily benefited the quality of fishery resources. White bass and other temperate basses overlap and compete with walleye for prey resources, spotted bass compete for reproductive habitat and readily hybridize with other black basses, and river herring adversely impact walleye recruitment. While Fontana Reservoir may have a less diverse fish community than downstream reservoirs, we view the absence of alewife and yellow bass as a benefit, rather than an impairment, to fishery resources. The difficulties of incorporating biodiversity indices into reservoir quality assessment are acknowledged in the text, but it is not clear how much these indices affected relative scoring of operational alternatives. As indicated in our opening comments, we requested that TVA develop a full summer pool alternative incorporating stable water levels from April through June. While the document text discusses the adverse impacts of rapid spring water level changes on fish spawning, and describes existing TVA measures to briefly limit fluctuations during times of critical bass spawning temperatures, no operational alternative is proposed in the document that would both inundate cove areas and stabilize water levels in the April-June period. None of the alternatives presented in the DPEIS has a substantial projected benefit to sport fisheries. At least one such alternative should be developed and evaluated in the final EIS.

**Response to Comment 12:** While it is true that reservoirs and some tailwaters are heavily managed for sport fisheries and that management actions can affect biodiversity, biodiversity is still an important measure of environmental quality. Non-native species stocked are not counted in biodiversity metrics for reservoirs. TVA's assessment of preliminary alternatives did include earlier and more stable fills of the reservoir system. Unfortunately, the increase in flood risks made an alternative with early fill or extended stabilization periods beyond the current 2-week period unreasonable at most tributary reservoirs.

As discussed in Section 4.7.2, TVA attempts to stabilize tributary reservoir water levels as the water temperature at a depth of 5 feet reaches 65 °F, by minimizing for a 2-week period water level fluctuations (maintaining level within 1 foot per week, either higher or lower). Beginning as early as spring 2004, TVA proposes to adjust this program so that it stabilizes levels at 60 °F in order to better help crappie, smallmouth bass, and early largemouth and

## **Appendix F4 Response to Federal and State Agency Comments**

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spotted bass spawning. Minimizing water level fluctuations is only one part of the fish spawning issue. Other environmental characteristics are important in determining larvae and juvenile fish production. For example, the amount of food and cover available for much of the initial growing season are critical to determining the number of catchable fish. Different aspects of the alternatives benefit different sport fisheries.

13. Section 5.8: The wetlands section of the document deals primarily with wetland losses associated with various alternatives. It is likely that wetland areas will be created or enhanced under some alternatives, particularly those associated with water margins. The wetlands analysis used in the document is admitted by the preparers to be limited in predicting changes in wetland extents; as a result, any alternatives analysis based on wetlands impacts is likely to be tenuous at best. The information in this section would be clarified by including tables similar to the table in Section 4.8, comparing projected wetlands for each alternative. In the wetlands section as in other places in the DPEIS document, sweeping predictions about impacts of alternatives on large geographic scales, such as "tributary reservoirs" or "mainstem tailwaters", seem not to be supported by data, and reflect the difficulty of modeling localized natural resource impacts on such scales. The associated appendix (D4b) provides details on wetlands analysis, but does not explain the theoretical basis or literature sources for reservoir-specific coefficients used to predict wetland impacts. Differences in impacts of alternatives listed in the appended analyses do not appear to be reflected in the document, where alternatives with dissimilar coefficient scores have similar statements evaluating wetland impacts.

**Response to Comment 13:** As stated in Section 5.8, five policy alternatives would increase the duration of summer pool (Reservoir Recreation Alternatives A and B, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative). These five alternatives could result in some conversion of wetland habitat on affected reservoirs. Forested and scrub/shrub wetlands could be affected most by lengthened summer pools. Therefore, the primary effect of these five alternatives could be loss of forested wetlands and specific types of scrub/shrub wetlands (i.e., buttonbush swamps).

The metrics chosen to evaluate changes in wetland habitat were the best available, considering the programmatic nature of the analysis. The rationale for their selection is described in Sections 5.8.1 and 5.8.2, and in Appendix D4b.2. Coefficient scores vary widely because the proposed changes in summer and winter pool conditions associated with each alternative would affect each reservoir differently, particularly tributary reservoirs.

14. Section 5.11: Blueback herring is an invasive non-native aquatic species that potentially affects sport fisheries. While some species or life stages of species of game fish appear to benefit from blueback herring as a forage resource, other species or life stages may be adversely affected. Blueback herring should be included in the list and discussion of invasive animals.

**Response to Comment 14:** Discussions of blueback herring were added to Sections 4.11 and 5.11 of the FEIS.

15. Section 5.13: The document attempts to predict threatened and endangered species impacts at the scope of the ROS. However, project-specific evaluations would be required for any change in operations that would adversely impact threatened or endangered species or their habitats. Because these species are typically limited in range or habitat requirements, it is likely that under any alternative chosen, projects with significant

## Appendix F4 Response to Federal and State Agency Comments

threatened and endangered species concerns would have to be treated differently than other projects of that type. Therefore, threatened and endangered species impacts may not be the best tool for evaluating alternatives on a basin-wide scale. We appreciate that flow improvements in the Appalachia bypass reach, mentioned in our scoping letter as a concern, are discussed in the DPEIS document and will be implemented under all operational alternatives.

**Response to Comment 15:** Threatened and endangered species have been addressed in the Biological Assessment. The Biological Opinion is included in Appendix G of the FEIS.

16. **Section 5.24:** Models used to predict recreational use of reservoirs under different operational alternatives assume reservoir level to be the only variable that would change. However, access area use information used for model input (Section 4.24) does not appear to distinguish between angling and non-angling boating use. Because quality of recreational fisheries may be affected by operational alternatives, the recreational model should include a modifier to reflect improved or impaired recreational boat fishing. Breakdowns of recreational users in the model should include separate seasonal estimates of angling and non-angling boaters based on or extrapolated from creel survey information on reservoirs in the region. Our recent surveys from reservoirs in the upper Little Tennessee Basin indicate that 70 to 95 percent of annual boating use and nearly all cool-season boating is associated with recreational fishing. Failure to incorporate impacts of alternatives on fishery resource quality therefore limits the utility of the existing recreational model on mountain reservoirs, and it should be revised accordingly.

**Response to Comment 16:** Two separate response models were developed: a "Trip Response Model" and a "Property Owners Model." The Trip Response Model was based on survey data collected at access points (public and commercial) on TVA lakes and tailwaters. The Property Owners Model was based on survey data collected from shoreline homeowners. The models were used to predict recreational use of reservoirs under different operations alternatives. For public and commercial access site users, the trip response model included variables to indicate primary activity (e.g., pleasure boating or fishing). The model used to predict recreational use by shoreline property owners was developed differently to address residency and does not include activity as a variable.

*Trip Response Model:* The recreational use estimates provided in Section 4.24 for public access sites were developed through on-site monitoring efforts at various TVA access points. On-site monitoring efforts did not distinguish between angling and non-angling boaters (boaters were counted as they exited the water but were not approached to determine the primary purpose of the activity). Recreationists were, however, surveyed as they exited each access point; the survey asked individuals to indicate the primary purpose of their trip. The Trip Response Model that was used to predict recreational use of reservoirs was developed with survey data, which is presented in Section 5.24.

For the Trip Response Model, a two-stage modeling approach was used. During the first stage, site and region characteristics were used to model the probability that any given lake would be visited on any one occasion. Site characteristics included distance from the respondent's home, the number of boat ramps and campgrounds at any given site, and measures of pool elevation on particular dates. Regional characteristics included measures of precipitation and temperature, and the percentage of the region covered by water. The information from this model was accumulated into an index of the "utility" associated with reservoir and tailwater recreation. The index was then used during the

## Appendix F4 Response to Federal and State Agency Comments

second stage of the model, which related the utility index and individual characteristics to describe the total number of trips taken to all lakes and tailwaters during the 3-month period of interest.

The second-stage model included two binary variables, one for boating (BOATER) and one for angling (ANGLER), whose values were based on the respondent's self-reported primary activity. The data were structured in the following way:

	BOATER	ANGLER
Pleasure boater:	1	0
Fish from boat:	1	1
Fish from shore:	0	1

The statistical model estimated parameters  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\eta$  for the following specification,  
$$\text{TRIPS} = \exp(\alpha + \beta \text{ OTHER VARIABLES} + \gamma \text{ BOATER} + \eta \text{ ANGLER})$$

Trips will differ between the three kinds of users, depending on the values for BOATER and ANGLER (reservoir-level information is contained in other variables).

The variable for boating was statistically significant; the variable for angling was not. Following standard econometric practice, however, all variables included in the statistical model were used to estimate the change in total trips. Thus, changes in total trips for each management scenario do differentiate between pleasure boaters, anglers who fish from boats, and anglers who fish from shore.

The potential differences between anglers and boaters suggested by the reviewer are incorporated into the Trip Response Model for public and commercial reservoir and tailwater access sites.

*Property Owners Model:* Primary recreation activity was not included as an explanatory variable in the Property Owners Model. Property owners typically access water from their properties and use the water for multiple activities. As a result, we could not relate a single primary purpose to the volume of activity. Estimated changes in use for property owners under various operations alternatives were based on the total change in recreation use, in trips by activity.

*Summary:* A distinction was made between angling and non-angling boating use for people accessing reservoirs and tailwaters at public and commercial access sites. This distinction was not made for shoreline property owners. Attention to anglers and their individual characteristics and needs are appropriately accounted for in the models. See Section 5.7 for a discussion of impacts on recreation fishery resources.

17. Section 5.25: Based on discussions between our staff and TVA representatives at the recent informational meeting, economic models include only recreation-associated jobs that occurred entirely within the Tennessee Valley, omitting those jobs associated with outfitters or fishing/hunting guide services based in adjacent areas. It is likely that the economic benefits of alternatives enhancing reservoir or tailrace recreation are therefore underestimated, particularly when compared to economic benefits of navigation, which are presumably confined to the mainstem region. All known economic impacts of each alternative should be included in comparative analysis for the final EIS.

## **Appendix F4 Response to Federal and State Agency Comments**

**Response to Comment 17:** The regional economic model that was used, REMI, was custom-designed for the Tennessee Valley region, including the TVA Power Service Area and the watershed counties in North Carolina and Virginia. The model contains Bureau of Economic Analysis data for those counties, including jobs, demographics, and industries.

The economic analysis for recreation was based on surveys of recreationists and shoreline property owners that focused on net effects of changes in alternative reservoir operations policies. The surveys from customers outside the region were included in the economic analysis because they represented a net gain to the Tennessee Valley region.

TVA's random surveys of reservoir users should have captured some number of these out-of-region outfitters and guides, particularly since these surveys were conducted throughout the primary recreation season. Therefore, while it is possible that some of these outfitters and guides were left out using this analytical approach, the effect of this omission on the conclusions reached is likely to be minor.

18. **Chapter 6:** Discussion of cumulative impacts of the ROS alternatives is brief, typically in the form of a summary paragraph for each of the affected resources. No comprehensive, multi-resource assessment of cumulative impacts is attempted. As the list of alternatives should be narrowed in the final document, the EIS should include a more detailed projection of overall cumulative impacts associated with the recommended operational changes. The DPEIS does not provide enough information on the methods used to evaluate cumulative impacts to allow us to comment on their validity; these should also be described in detail in the EIS.

**Response to Comment 18:** The discussion of cumulative impacts was expanded in the FEIS.

19. **Chapter 7:** As with the cumulative impacts chapter, the discussion of mitigation is generic in nature and does not outline specific areas where mitigation opportunities might be reduced or enhanced under different operational alternatives. Again we refer to our scoping comments, and suggest that our project-specific issues, and those of other resource agencies, form the basis of a list of mitigation opportunities for any resource impacts associated with the operational alternative recommended in the final EIS.

**Response to Comment 19:** The discussion of possible mitigation measures in Chapter 7 was expanded in the FEIS, in light of the identification of a Preferred Alternative by TVA. Because this is a programmatic level of review, the identified mitigation measures are generally programmatic in nature.

20. As always, our field staff will be available to clarify any of the comments provided, or to cooperate as needed with development of the final EIS document. If you have questions regarding the information in this letter, please contact me at (919) 733-3633.

**Response to Comment 20:** Comment noted.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control**

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, TN 37902

Dear Mr. Nye:

This will transmit the comments of the Tennessee Department of Environment and Conservation on the Draft Programmatic Environmental Impact Statement for the TVA Reservoir Operations Study. TDEC very much appreciates TVA's commitment to a full and thorough review of all aspects of reservoir operations and to implementation of the alternative that will yield the greatest overall public benefit to citizens in the TVA area. We recognize that this has been a tremendous effort, and we believe that both the process and the product will be of lasting value in guiding TVA's resource management decisions for years to come. [1]

We agree with TVA that the preferred alternative should be that which yields the greatest overall public benefit while carefully valuing the importance of environmental quality. Among the options evaluated, we believe the base case best serves that objective. The commercial navigation alternative is close to the base case in most regards and also has merit. By comparison, the other alternatives present less overall benefit and involve unwarranted compromise in environmental objectives. [2]

We agree that where the study does identify minor or site-specific operational changes that will benefit some users without offsetting harm to others, those changes should be adopted. For example, TVA proposes under all alternatives to hold reservoir levels steady for a longer period to improve fish spawning. We certainly support that. [3]

Wherever possible, water quality standards should be attained and impairments resolved. We agree that ongoing programs and planned efforts to improve tailwater quality and control shoreline erosion should go forward. And we agree that TVA should work with appropriate agencies to develop a formal drought plan. [4]

Thank you for your work on this study and your consideration of these comments. [5]

Paul E. Davis, P.E. Director  
Division of Water Pollution Control  
Tennessee Department of Environment and Conservation

Paul Davis  
Paul.Estill.Davis@state.tn.us  
615/532-0632

## **Appendix F4 : Response to Federal and State Agency Comments**

### **RESPONSE TO COMMENTS**

1. TDEC very much appreciates TVA's commitment to a full and thorough review of all aspects of reservoir operations and to implementation of the alternative that will yield the greatest overall public benefit to citizens in the TVA area. We recognize that this has been a tremendous effort, and we believe that both the process and the product will be of lasting value in guiding TVA's resource management decisions for years to come.

**Response to Comment 1:** We appreciate the Tennessee Department of Environment and Conservation's (TDEC's) participation on the Interagency Team that provided oversight for this effort.

2. We agree with TVA that the preferred alternative should be that which yields the greatest overall public benefit while carefully valuing the importance of environmental quality. Among the options evaluated, we believe the base case best serves that objective. The commercial navigation alternative is close to the base case in most regards and also has merit. By comparison, the other alternatives present less overall benefit and involve unwarranted compromise in environmental objectives.

**Response to Comment 2:** After extensive public review of the DEIS and additional analyses, TVA has formulated the Preferred Alternative, which would enhance recreation opportunities while lessening impacts on the environment and other operating objectives. The Preferred Alternative combines and adjusts desirable features of the alternatives identified in the DEIS to create a more feasible, publicly responsive alternative.

3. We agree that where the study does identify minor or site-specific operational changes that will benefit some users without offsetting harm to others, those changes should be adopted. For example, TVA proposes under all alternatives to hold reservoir levels steady for a longer period to improve fish spawning. We certainly support that.

**Response to Comment 3:** Unfortunately, TVA's analysis of flood risks indicates that risks become unacceptable if the length of the stabilization is longer than 2 weeks.

4. Wherever possible, water quality standards should be attained and impairments resolved. We agree that ongoing programs and planned efforts to improve tailwater quality and control shoreline erosion should go forward. And we agree that TVA should work with appropriate agencies to develop a formal drought plan.

**Response to Comment 4:** TVA plans to meet DO concentration and minimum flow targets established in the 1990 Lake Improvement Plan. Furthermore, TVA is available to work with the Tennessee Valley region states to develop a formal drought plan.

5. Thank you for your work on this study and your consideration of these comments.

**Response to Comment 5:** We appreciate TDEC's continued involvement in the study as part of the Interagency Team.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Tennessee Historical Commission**

July 8, 2003

Mr. David Nye  
Tennessee Valley Authority  
400 West Summit Hill Drive/WT11A  
Knoxville, Tennessee, 37902

RE: TVA, RESERVOIR OPERATIONS STUDY, UNINCORPORATED, MULTI  
COUNTY

Dear Mr. Nye:

In response to your request, received on Thursday, July 3, 2003, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process. [1]

Considering available information, we find that the project as currently proposed MAY ADVERSELY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. You should now begin immediate consultation with our office. [2] Please direct question and comments to Joe Garrison (615) 532-1550-103. We appreciate your cooperation.

Sincerely,

Herbert L. Harper  
Executive Director and  
Deputy State Historic  
Preservation Officer

HLH/jyg

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENTS**

1. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

**Response to Comment 1:** Comment noted.

2. Project as currently proposed **MAY ADVERSELY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES.** You should now begin immediate consultation with our office.

**Response to Comment 2:** TVA is executing an agreement with the seven Tennessee Valley region State Historic Preservation Officers, including Tennessee and other consulting parties, which outlines the actions TVA would take to avoid or mitigate adverse effects on historic properties associated with TVA's Preferred Alternative.

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Tennessee Wildlife Resources Agency**

September 2, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, TN 37902

Re: Reservoir Operations Draft EIS

Dear Mr. Nye:

The Tennessee Wildlife Resources Agency (TWRA) appreciates the opportunity to provide comments and recommendations on the Draft Reservoir Operations Study (ROS). Please find attached the Agency's recommendations for inclusion in a final EIS. We appreciate TVA's effort to consider the impact of changes in the reservoir operations on reservoir users and TVA ratepayers. Likewise, we appreciate TVA's effort to assess impacts on natural resources including wildlife, fish and aquatic life, and habitat. [1] In general, we find the least damaging alternative to be the "base case" and elements of the "navigation" operation. We are concerned that the recreation options will result in unacceptable adverse impact to wildlife resources, water quality, and habitat. [2]

We look forward to continued discussions with TVA technical staff regarding preparation of the final EIS and identification of preferred alternatives. If you have any questions or need additional information related to the attached TWRA comments and recommendations, please contact David McKinney, Division of Environmental Services, at (615) 781-6643. [3]

Sincerely

Gary T. Myers

Executive Director

DM:bg  
attachment

## **Appendix F4 Response to Federal and State Agency Comments**

### **Recreational Benefit Projects:**

We find the economic analysis upon which the recreational option benefit projections are based to be suspect. Tennessee has approximately 270,000 registered boats; this number of watercraft does not include canoes, kayaks, or various inflatables. Unregistered boats and boats registered in other states routinely utilize Tennessee reservoirs. Assuming full, year-round occupancy of all available commercial boat slips, fewer than thirteen percent of Tennessee's registered watercraft are associated contractually with commercial marinas. The economic data utilized here are unverified. The in-state economic value of boat sales, fuel purchases, boat maintenance, lodging, fishing gear, and travel cost associated with public access boating should be fully and fairly assessed. The majority of boat owners, including those who trailer their boats in pursuit of seasonal sport fishing opportunity, have been given limited consideration. TVA's assumption that the majority of all economic benefit from boating is from or through commercial operations should be verified by an independent economic analysis conducted by an unbiased expert, such as the University of Tennessee. An independent economic evaluation would give TVA a much-needed credible basis for decision-making. [4]

### **Adverse Impacts:**

Consideration of the adverse impacts of higher, longer duration reservoir levels on near shore and riparian habitat is inadequate. The adverse impacts on habitat and water quality from higher, longer duration reservoir levels adopted in the 1990's should be addressed as separate components of the current base case. Vegetation required for successful spawning and recruitment of sport fish and as essential riparian habitat has retreated to incrementally higher elevation contours and is unavailable as aquatic habitat for spawning, nursery areas, or as suitable habitat for riparian species such as migratory shore birds. Higher, longer duration reservoir levels above the base case will cause incrementally greater destruction of shoreline habitat. The Draft EIS appears to significantly underestimate the adverse impact of higher, longer summer pool levels, especially on main-stem reservoirs. TWRA is engaged in an innovative agency-citizen project to restore near-shore and shoreline habitat on Kentucky Lake. It is likely this effort will be negated if TVA initiates higher, longer duration summer pools. [5]

TVA should, as part of the Draft EIS, contract with independent habitat analysis expertise, such as the Oak Ridge National Laboratory (ORNL), to develop a comprehensive habitat behavior model relative to reservoir pool elevation and duration. This model should include analysis of the natural resource and economic impact of lost near-shore and shoreline habitat on fish and aquatic life, migratory shorebirds, and waterfowl. This analysis should also consider the impact of extended higher pool levels on shoreline erosion. Exposed mud-flats are essential habitat for wildlife resources. [6]

### **Stable Spring Spawning Levels:**

Fish and aquatic life resources in Tennessee would benefit from stable reservoir surface elevations for spring spawning. Given the variability of spring reservoir inflow and power demands, TVA's commitment to providing stable spring spawning conditions is no stronger than the base case. TWRA request that TVA prepare an option which provides that each tributary and each main-stem reservoir be provided a minimum of one year of stable spring conditions in each four-year cycle. Such a rotation in non-average spring inflow years would greatly assist to prevent the loss of or greatly diminished sport fish opportunity on a given reservoir. [7]

### **Tailwater Restoration:**

## **Appendix F4 Response to Federal and State Agency Comments**

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TVA's agreement with the State of Tennessee as found in the Phased Approach to Tailwater Restoration, later advanced and expanded in the TVA Reservoir Improvement Program, has resulted in TVA becoming the global leader in tailwater management and restoration. TVA's decision to maintain and improve this program is the most significant commitment and outcome of the ROS review. In general terms, TWRA is opposed to options, or elements of options, the consequences of which are not supportive of or in harmony with tailwater restoration and improvement. If anything, we believe that public support, interest, and enthusiasm for successful restoration projects such as Watauga, South Holton, Douglas, and Cherokee tail waters is under appreciated in the Draft EIS from both a natural resource and economic impact perspective. We recommend to you the recent report by Tennessee Tech University (TTU) entitled "Net Value of Trout Fishing Opportunities in Tennessee Tailwaters", by Williams and Bettoli. [8]

### **Navigation Option:**

Fewer than 8% of TVA reservoir users are lakefront property owners. As Tennessee's population grows, this percentage will rapidly diminish at the same time demand for reservoir use increases. Of the options considered, the navigation option provides economic, public safety, and societal benefits for all TVA ratepayers and reservoir users. Although the navigation option appears to have little adverse impact on natural resources, TWRA would prefer to see an independent evaluation of the impact of this option on near-shore and shoreline habitat on both tributary and main-stem reservoirs. If TVA's no adverse impact projections are verified, TWRA would be supportive of adoption of the navigation option. [9]

### **Kentucky Lake:**

Kentucky Lake is considered by many to be the crown jewel of the TVA reservoir system. The tremendous biological diversity and productivity found in Kentucky Lake is due largely to continuing riverine characteristics. Kentucky Lake's diverse freshwater mussel fauna includes both federally protected species and commercially harvested mussels that are the foundation of the global cultured pearl industry. Commercial harvest of fish, including paddlefish and their roe, is economically significant. Important sport fish include crappie, sauger, black bass, and catfish.

In the latter half of the 1980's, Kentucky Lake experienced significant problems, including diseased and blemished fish and a sustained die-off of freshwater mussels. These problems were related to drought-induced reductions in flow, elevated water temperatures, lower dissolved oxygen levels, and reduced assimilative capacity. These problems were related to a shift from riverine conditions to typical reservoir conditions. To address this issue, TVA made a commitment in the early 1990's to maintain a 12,000 cubic feet per second (CFS) flow through Kentucky Lake to maintain both water quality and riverine character. [10]

Keeping Kentucky Lake at full summer pool into late summer and/or early fall, particularly in years of low to normal inflow, will result in a return of the unacceptable occurrences of the mid to late 1980's. The best scenario for maintaining the biological health of this highly important resource is begin draw down from summer pool earlier than the existing base case and operate Pickwick and Kentucky dams in tandem to maximize Kentucky Lake's riverine character. [11]

Should TVA propose an ill-advised extension of summer pool conditions beyond the base case, TWRA will request the U.S. Fish and Wildlife Service (USFWS) to require formal consultation regarding the potential impact on special status species, the preparation of low to normal inflow contingency plan, an extensive biological monitoring program for fish, benthic organisms and freshwater mussels, and extensive mitigation for lost shorebird habitat in the form of artificially flooded shorebird habitat. [12]

## Appendix F4 Response to Federal and State Agency Comments

### RESPONSE TO COMMENTS

1. We appreciate TVA's effort to consider the impact of changes in the reservoir operations on reservoir users and TVA ratepayers. Likewise, we appreciate TVA's effort to assess impacts on natural resources including wildlife, fish and aquatic life, and habitat.

**Response to Comment 1:** Comment noted.

2. In general, we find the least damaging alternative to be the "base case" and elements of the "navigation" operation. We are concerned that the recreation options will result in unacceptable adverse impact to wildlife resources, water quality, and habitat.

**Response to Comment 2:** Comment noted.

3. We look forward to continued discussions with TVA technical staff regarding preparation of the final EIS and identification of preferred alternatives.

**Response to Comment 3:** Comment noted.

4. **Recreational Benefit Projects:** We find the economic analysis upon which the recreational option benefit projections are based to be suspect. Tennessee has approximately 270,000 registered boats; this number of watercraft does not include canoes, kayaks, or various inflatables. Unregistered boats and boats registered in other states routinely utilize Tennessee reservoirs. Assuming full, year-round occupancy of all available commercial boat slips, fewer than thirteen percent of Tennessee's registered watercraft are associated contractually with commercial marinas. The economic data utilized here are unverified. The in-state economic value of boat sales, fuel purchases, boat maintenance, lodging, fishing gear, and travel cost associated with public access boating should be fully and fairly assessed. The majority of boat owners, including those who trailer their boats in pursuit of seasonal sport fishing opportunity, have been given limited consideration. TVA's assumption that the majority of all economic benefit from boating is from or through commercial operations should be verified by an independent economic analysis conducted by an unbiased expert, such as the University of Tennessee. An independent economic evaluation would give TVA a much-needed credible basis for decision-making.

**Response to Comment 4:** Recreational economic benefits were estimated based on survey data of customers at facilities located on reservoirs (recreationists at locations where water-based recreation is the primary activity), marina operator customers, and reservoir property owners. The study measured changes in recreation value to the Tennessee Valley region that corresponded to changes in reservoir operations; this change would occur primarily through water-based recreation.

The numbers shown for commercial use facilities included boats on trailers that were launching from those facilities, in addition to watercraft moored at the facility.

The EIS recreation analysis and results are consistent with a 2003 recreation study in six counties of East Tennessee conducted by the University of Tennessee's Center for Business and Economic Research, which is available at their web site at

## **Appendix F4 Response to Federal and State Agency Comments**

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<http://bus.utk.edu/cber/lakeres.htm>. TVA retained nationally recognized recreation experts to lead the analysis of recreation effects.

5. **Adverse Impacts:** Consideration of the adverse impacts of higher, longer duration reservoir levels on near shore and riparian habitat is inadequate. The adverse impacts on habitat and water quality from higher, longer duration reservoir levels adopted in the 1990's should be addressed as separate components of the current base case. Vegetation required for successful spawning and recruitment of sport fish and as essential riparian habitat has retreated to incrementally higher elevation contours and is unavailable as aquatic habitat for spawning, nursery areas, or as suitable habitat for riparian species such as migratory shore birds. Higher, longer duration reservoir levels above the base case will cause incrementally greater destruction of shoreline habitat. The Draft EIS appears to significantly underestimate the adverse impact of higher, longer summer pool levels, especially on main-stem reservoirs. TWRA is engaged in an innovative agency-citizen project to restore near-shore and shoreline habitat on Kentucky Lake. It is likely this effort will be negated if TVA initiates higher, longer duration summer pools.

**Response to Comment 5:** TVA recognizes that higher water levels for longer durations are likely to increase shoreline erosion. Aquatic vegetation along the shoreline is an important factor in the survival of many species and requires a period of regrowth each year to continue its benefits. TVA's Preferred Alternative does not include any operating guide changes for Kentucky Reservoir.

6. TVA should, as part of the Draft EIS, contract with independent habitat analysis expertise, such as the Oak Ridge National Laboratory (ORNL), to develop a comprehensive habitat behavior model relative to reservoir pool elevation and duration. This model should include analysis of the natural resource and economic impact of lost near-shore and shoreline habitat on fish and aquatic life, migratory shorebirds, and waterfowl. This analysis should also consider the impact of extended higher pool levels on shoreline erosion. Exposed mud-flats are essential habitat for wildlife resources.

**Response to Comment 6:** The effects of the alternatives on flats and other shoreline habitats are an important component of the terrestrial ecology evaluation. The FEIS has been modified to better address these habitats. In addition to the USFWS, a number of other federal and state agencies have worked closely with TVA during the preparation of the ROS and its EIS. These agencies have provided an appropriate level of independent oversight of this effort.

7. **Stable Spring Spawning Levels:** Fish and aquatic life resources in Tennessee would benefit from stable reservoir surface elevations for spring spawning. Given the variability of spring reservoir inflow and power demands, TVA's commitment to providing stable spring spawning conditions is no stronger than the base case. TWRA request that TVA prepare an option which provides that each tributary and each main-stem reservoir be provided a minimum of one year of stable spring conditions in each four-year cycle. Such a rotation in non-average spring inflow years would greatly assist to prevent the loss of or greatly diminished sport fish opportunity on a given reservoir.

**Response to Comment 7:** TVA would attempt to stabilize tributary reservoir levels for 2 weeks after the water temperature at 5 feet has reached 60 °F. Unfortunately,

## Appendix F4 Response to Federal and State Agency Comments

TVA's analysis of flood risks indicates that risks become unacceptable, if the length of the stabilization is longer than 2 weeks—even on a rotational basis.

8. Tailwater Restoration: TVA's agreement with the State of Tennessee as found in the Phased Approach to Tailwater Restoration, later advanced and expanded in the TVA Reservoir Improvement Program, has resulted in TVA becoming the global leader in tailwater management and restoration. TVA's decision to maintain and improve this program is the most significant commitment and outcome of the ROS review. In general terms, TWRA is opposed to options, or elements of options, the consequences of which are not supportive of or in harmony with tailwater restoration and improvement. If anything, we believe that public support, interest, and enthusiasm for successful restoration projects such as Watauga, South Holton, Douglas, and Cherokee tail waters is under appreciated in the Draft EIS from both a natural resource and economic impact perspective. We recommend to you the recent report by Tennessee Tech University (TTU) entitled "Net Value of Trout Fishing Opportunities in Tennessee Tailwaters" by Williams and Bettoli.

**Response to Comment 8:** TVA plans to meet DO concentrations and minimum flow targets established in the 1990 Lake Improvement Plan. In addition, TVA proposes to commit to minimum flows in the Apalachia Dam Bypass reach (as described in Chapter 3 and Appendix B of the EIS) in order to help restore that tailwater. The independent contractor considered the Williams and Bettoli data in the analysis.

9. Navigation Option: Fewer than 8% of TVA reservoir users are lakefront property owners. As Tennessee's population grows, this percentage will rapidly diminish at the same time demand for reservoir use increases. Of the options considered, the navigation option provides economic, public safety and societal benefits for all TVA ratepayers and reservoir users. Although the navigation option appears to have little adverse impact on natural resources, TWRA would prefer to see an independent evaluation of the impact of this option on near-shore and shoreline habitat on both tributary and mainstem reservoirs. If TVA's no adverse impact projections are verified, TWRA would be supportive of adoption of the navigation option.

**Response to Comment 9:** TVA retained a number of outside experts in various disciplines to assist in ROS analyses. TVA also worked closely with individuals representing various public stakeholders and federal and state agencies during the preparation of the ROS EIS. These activities ensured an appropriate level of independent oversight of the ROS EIS. TVA's Preferred Alternative now has been identified in the FEIS.

10. Kentucky Lake: Kentucky Lake is considered by many to be the crown jewel of the TVA reservoir system. The tremendous biological diversity and productivity found in Kentucky Lake is due largely to continuing riverine characteristics. Kentucky Lake's diverse freshwater mussel fauna includes both federally protected species and commercially harvested mussels that are the foundation of the global cultured pearl industry. Commercial harvest of fish, including paddlefish and their roe, is economically significant. Important sport fish include crappie, sauger, black bass, and catfish.

In the latter half of the 1980's, Kentucky Lake experienced significant problems, including diseased and blemished fish and a sustained die-off of freshwater

## **Appendix F4 Response to Federal and State Agency Comments**

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mussels. These problems were related to drought-induced reductions in flow, elevated water temperatures, lower dissolved oxygen levels, and reduced assimilative capacity. These problems were related to a shift from riverine conditions to typical reservoir conditions. To address this issue, TVA made a commitment in the early 1990's to maintain a 12,000 cubic feet per second (CFS) flow through Kentucky Lake to maintain both water quality and riverine character.

**Response to Comment 10:** TVA plans to meet DO concentrations and minimum flow targets established in the 1990 Lake Improvement Plan.

11. Keeping Kentucky Lake at full summer pool into late summer and/or early fall, particularly in years of low to normal inflow, will result in a return of the unacceptable occurrences of the mid to late 1980's. The best scenario for maintaining the biological health of this highly important resource is begin draw down from summer pool earlier than the existing base case and operate Pickwick and Kentucky dams in tandem to maximize Kentucky Lake's riverine character.

**Response to Comment 11:** As discussed in TVA's responses to the comments from the Corps and others, TVA is not proposing to alter the operating guide curve for Kentucky Reservoir as an element of its Preferred Alternative.

12. Should TVA propose an ill-advised extension of summer pool conditions beyond the base case, TWRA will request the U.S. Fish and Wildlife Service (USFWS) to require formal consultation regarding the potential impact on special status species, the preparation of low to normal inflow contingency plan, an extensive biological monitoring program for fish, benthic organisms and freshwater mussels, and extensive mitigation for lost shorebird habitat in the form of artificially flooded shorebird habitat.

**Response to Comment 12:** TVA has consulted with USFWS on the potential impacts of the Preferred Alternative on threatened and endangered species. The results of this consultation are incorporated into Section 5.13 and Appendix G of the FEIS. Projected loss of important shoreline habitat, such as flats, has been substantially reduced by the decision to not include operating guide curve changes on Kentucky Reservoir as part of the Preferred Alternative.

## Appendix F4: Response to Federal and State Agency Comments

### Commonwealth of Virginia Department of Environmental Quality, Department of Conservation and Recreation, and Department of Transportation

September 2, 2003

Mr. David Nye  
Reservoir Operations Study Project Manager  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11A  
Knoxville, Tennessee 37902

RE: Draft Programmatic Environmental Impact Statement, Reservoir Operations Study  
DEQ-03-130F

Dear Mr. Nye:

The Commonwealth of Virginia has completed its review of the above document (hereinafter Draft PEIS). The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. The following agencies took part in this review:

Department of Environmental Quality (hereinafter "DEQ")  
Department of Conservation and Recreation  
Department of Transportation.

In addition, the Department of Game and Inland Fisheries and the Department of Historic Resources were invited to comment.

#### Project Description

TVA is evaluating its reservoir operations in order to determine whether they can be improved throughout the Tennessee Valley (Draft PEIS, page ES-3). The watershed includes portions of western Virginia (Draft PEIS, page 1-2, Figure 1.1-01). The document examines the "Base Case" (present operational scheme) and seven alternative schemes, focused on hydropower, recreation, flood control, habitat, and navigation (Draft PEIS, page ES-5; see pages 3-10 through 3-19). TVA has not indicated a preferred alternative; it will make a selection following the receipt of additional public input and articulate that selection in the Final PEIS (Draft PEIS, page ES-24).

## **Appendix F4 Response to Federal and State Agency Comments**

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### Environmental Impacts and Mitigation

1. *General Comment.* Environmental issues addressed in this document include aquatic habitat, water quality, water quantity, erosion control, protection of threatened or endangered species, wetlands, and other ecologically sensitive areas. The information appears accurate and addresses the complex nature of accommodating the many concerns associated with dam operations. [1]

2. *Natural Heritage Resources.* The Department of Conservation and Recreation (DCR) has searched its Biotics Data System for occurrences of natural heritage resources in the areas covered by the Study. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations. According to DCR, natural heritage resources are documented in the Study area, but the scope of the schemes under study and the distance to the resources indicate to DCR that the schemes are unlikely to give rise to adverse effects upon the resources.

Under a Memorandum of Agreement between DCR and the Department of Agriculture and Consumer Services (VDACS), DCR has the authority to report for VDACS on state-listed endangered and threatened plant and insect species. According to DCR, the activities undertaken pursuant to the Study would not affect any such species. [2]

3. *Exotic Species Concern.* The Draft PEIS indicates that the commercial navigation alternative would increase shipper savings (by way of raised winter reservoir elevations in the mainstem reservoirs, see page ES-22 and also page 5.11-3, section 5.11.6). The Department of Conservation and Recreation is concerned that increased commercial navigation in the Tennessee River system may facilitate exotic species transmission, especially with larger vessels retaining foreign ballast water. Such species may adversely affect natural heritage resources. The Draft PEIS mentions that colonization of shoreline habitats by red fire ants might result from raised reservoir levels under this alternative; but it states that increased winter reservoir elevations could reduce the spread of some invasive terrestrial plant species (page 5.11-3, section 5.11.6). The Department of Conservation and Recreation recommends that TVA investigate ways to avoid the transmission of invasive species. [3]

4. *Water Resources and Wetlands.* According to DEQ's Water Division, only one of the reservoirs in the TVA system is in Virginia. The northern portion of South Holston Lake is just north of the Tennessee-Virginia border in Washington County, Virginia; the dam which is responsible for the reservoir is in Tennessee.

Fringe wetlands around the South Holston Lake and along other bodies of surface water will be affected by water level adjustments in that lake under any of the alternatives. Some fringe wetlands will re-colonize an area from which they have been removed through either flooding from raised water levels or drying out from lowered water levels. [4]

According to DEQ's Water Division, the Washington County Public Service Authority (WCSA) plans to install a water supply intake in the upper reaches of South Holston Lake. Under the current operational scheme, unrestricted drawdown of the lake beginning in August lowers the lake level at the same time that this new intake would be most in demand. The alternative for WCSA would be to take water from the Middle Fork of the Holston River during this low-flow season; that course of action would be harmful to minimum in-stream flow objectives. DEQ's

## Appendix F4 Response to Federal and State Agency Comments

Water Division recommends that TVA select the preferred alternative with this WCSA project in mind. [5]

Of the alternatives presented, it appears that "Reservoir Recreation A" and "Commercial Navigation" alternatives will result in the least impacts to water resources. The Commonwealth would support either of these as the preferred alternative. We would not recommend selection of any of the following alternatives because they would give rise to adverse effects to wetlands and water quality: [6]

"Reservoir Recreation B"  
"Summer Hydropower"  
"Equalized Summer/Winter Flood Risk"  
"Tailwater Recreation" or  
"Tailwater Habitat."

5. *Natural Areas.* The Department of Conservation and Recreation indicates that there are no State Natural Area Preserves in the Study area. [7]

6. *Transportation Impacts.* The operational schemes are unlikely to have long-term, negative impacts on traffic, according to the Virginia Department of Transportation (VDOT). Any operational work with the potential to affect roads or other transportation facilities should be coordinated with VDOT's Bristol District Office (Ken Brittle, telephone (276) 669-9903, extension 203). [8]

Thank you for the opportunity to review this document. We look forward to reviewing the Final Programmatic EIS for the Reservoir Operations Study. [9]

Sincerely,

Ellie L. Irons  
Program Manager  
Office of Environmental Impact Review

Enclosures

cc: Brian D. Moyer, DGIF  
Derral Jones, DCR  
Ellen Gilinsky, DEQ-Water  
Allen J. Newman, DEQ-SWRO  
David V. Grimes, VDOT  
Ethel R. Eaton, DHR

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENTS**

1. *General Comment.* Environmental issues addressed in this document include aquatic habitat, water quality, water quantity, erosion control, protection of threatened or endangered species, wetlands, and other ecologically sensitive areas. The information appears accurate and addresses the complex nature of accommodating the many concerns associated with dam operations.

**Response to Comment 1:** Comment noted.

2. *Natural Heritage Resources.* The Department of Conservation and Recreation (DCR) has searched its Biotics Data System for occurrences of natural heritage resources in the areas covered by the Study. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations. According to DCR, natural heritage resources are documented in the Study area, but the scope of the schemes under study and the distance to the resources indicate to DCR that the schemes are unlikely to give rise to adverse effects upon the resources.

Under a Memorandum of Agreement between DCR and the Department of Agriculture and Consumer Services (VDACS), DCR has the authority to report for VDACS on state-listed endangered and threatened plant and insect species. According to DCR, the activities undertaken pursuant to the Study would not affect any such species.

**Response to Comment 2:** As indicated in Section 4.13 and in Appendix D6a, Heritage Database records available to TVA indicated that five federal- and/or state-listed species have been encountered within 1-mile buffers around the TVA reservoirs and regulated stream reaches in Virginia. This relatively large initial search area was used to identify reported occurrences of any listed species that might be affected by changes in the reservoir operations policy. Potential impacts of the alternatives on these species, which are listed in Appendix D, Table D6a-01, are addressed in Section 5.13.

3. *Exotic Species Concern.* The Draft PEIS indicates that the commercial navigation alternative would increase shipper savings (by way of raised winter reservoir elevations in the mainstem reservoirs, see page ES-22 and also page 5.11-3, section 5.11.6). The Department of Conservation and Recreation is concerned that increased commercial navigation in the Tennessee River system may facilitate exotic species transmission, especially with larger vessels retaining foreign ballast water. Such species may adversely affect natural heritage resources. The Draft PEIS mentions that colonization of shoreline habitats by red fire ants might result from raised reservoir levels under this alternative; but it states that increased winter reservoir elevations could reduce the spread of some invasive terrestrial plant species (page 5.11-3, section 5.11.6). The Department of Conservation and Recreation recommends that TVA investigate ways to avoid the transmission of invasive species.

**Response to Comment 3:** Larger vessels with the capability of holding ballast water do not typically navigate the Tennessee River system, where barge traffic is the primary means of transport. TVA is working with several groups—locally and regionally—to address these invasive species issues.

4. *Water Resources and Wetlands.* According to DEQ's Water Division, only one of the reservoirs in the TVA system is in Virginia. The northern portion of South Holston Lake is

just north of the Tennessee-Virginia border in Washington County, Virginia; the dam which is responsible for the reservoir is in Tennessee.

Fringe wetlands around the South Holston Lake and along other bodies of surface water will be affected by water level adjustments in that lake under any of the alternatives. Some fringe wetlands will re-colonize an area from which they have been removed through either flooding from raised water levels or drying out from lowered water levels.

**Response to Comment 4:** Comment noted.

5. According to DEQ's Water Division, the Washington County Public Service Authority (WCSA) plans to install a water supply intake in the upper reaches of South Holston Lake. Under the current operational scheme, unrestricted drawdown of the lake beginning in August lowers the lake level at the same time that this new intake would be most in demand. The alternative for WCSA would be to take water from the Middle Fork of the Holston River during this low-flow season; that course of action would be harmful to minimum in-stream flow objectives. DEQ's Water Division recommends that TVA select the preferred alternative with this WCSA project in mind.

**Response to Comment 5:** This is a reservoir-specific issue that should be addressed in a context other than this programmatic EIS, which considers system-wide operations policy changes. However, TVA understands that the proposed intake for WCSA has generated debate, and TVA is committed to working with other state and federal agencies to arrive at the best solution. Maintaining higher levels at South Holston Reservoir may appear to be an option but, under dry hydrologic conditions, that might not be possible because there might not be enough water to accomplish that objective. Other alternatives should be explored. For example, because the low flow in the South Fork Holston River appears to be similar to the low flow in the Middle Fork, splitting the withdrawal between the two rivers would lessen the impact on the Middle Fork. An additional alternative would be to move the WCSA intake further down into the South Holston Reservoir, so that it would not be influenced by normal reservoir drawdown.

6. Of the alternatives presented, it appears that "Reservoir Recreation A" and "Commercial Navigation" alternatives will result in the least impacts to water resources. The Commonwealth would support either of these as the preferred alternative. We would not recommend selection of any of the following alternatives because they would give rise to adverse effects to wetlands and water quality:

"Reservoir Recreation B"  
"Summer Hydropower"  
"Equalized Summer/Winter Flood Risk"  
"Tailwater Recreation" or  
"Tailwater Habitat."

**Response to Comment 6:** TVA formulated its Preferred Alternative with the intent of capturing the beneficial elements of the identified alternatives, while lessening adverse impacts—particularly those related to flood control and water quality.

7. *Natural Areas.* The Department of Conservation and Recreation indicates that there are no State Natural Area Preserves in the Study area.

**Response to Comment 7:** Comment noted.

8. *Transportation Impacts.* The operational schemes are unlikely to have long-term, negative impacts on traffic, according to the Virginia Department of Transportation (VDOT). Any

## **Appendix F4 Response to Federal and State Agency Comments**

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operational work with the potential to affect roads or other transportation facilities should be coordinated with VDOT's Bristol District Office (Ken Brittle, telephone (276) 669-9903, extension 203).

**Response to Comment 8:** Comment noted.

9. Thank you for the opportunity to review this document. We look forward to reviewing the Final Programmatic EIS for the Reservoir Operations Study.

**Response to Comment 9:** We appreciate Virginia's continued involvement in the ROS as a member of the Interagency Team.

## Appendix F4 Response to Federal and State Agency Comments

### Tribal Comments (Eastern Band of Cherokee Indians)

September 24<sup>th</sup> 2003

Mr. David Nye  
ROS Project Manager Tennessee Valley Authority  
WT 11A  
400 West Summit Drive  
Knoxville  
TN 37902

Re: ROS Comments

Dear Mr. Nye,

I attended the Murphy, NC Workshop and have subsequently obtained hardcopy study documents from your staff. The Tribal Environmental Office is most certainly interested in providing you with our comments on the study, however due to my commitments to the Duke Power FERC re-licensing negotiations I have been unable to formulate our comments in time for your deadline.

I hereby request a sixty day extension past the deadline for our written response. I also understand a similar request has been made by the Tribal Cultural Resources Office to the TVA Cultural Resources Office. [1] The Tribal Environmental and Cultural Resources Offices will work together to produce comments on the study that will endeavor to take a holistic approach towards protection of natural and cultural resources.

Sincerely,



Michael Bolt

Cc. Cannen McIntyre,  
TEO Lora K.O. Taylor, THPO  
Michelle Hamilton, THPO



### RESPONSE TO COMMENT

1. The Tribal Environmental Office is most certainly interested in providing you with our comments on the study, however due to my commitments to the Duke Power FERC re-licensing negotiations I have been unable to formulate our comments in time for your deadline.

## **Appendix F4 Response to Federal and State Agency Comments**

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I hereby request a sixty day extension past the deadline for our written response. I also understand a similar request has been made by the Tribal Cultural Resources Office to the TVA Cultural Resources Office.

**Response to Comment 1:** TVA continued to accept comments (through mid-October) from tribes and persons who informed the agency that their comments would be late.

## Appendix F4 Response to Federal and State Agency Comments

**Tribes of the Eastern Oklahoma Region**

AUG 29, 2003

Mr. David Nye  
ROS Project Manager  
Tennessee Valley Authority, WT 11A  
400 West Summit Drive  
Knoxville, Tennessee 37902

Dear Mr Nye:

On July 14, 2003, the Eastern Oklahoma Regional Office (EORO), Bureau of Indian Affairs (BIA), received a copy of an Environmental Impact Statement (EIS) from the Tennessee Valley Authority, Knoxville, Tennessee, regarding changes in the operating policies for the Tennessee Valley (TV) reservoir. The EIS identified seven alternative operating policies and a "no-action" alternative.

The TV reservoir may be within the aboriginal lands of the following Tribes of the Eastern Oklahoma Region: Muscogee (Creek) Nation, Cherokee Nation of Oklahoma, United Keetoowah Band of Cherokees of Oklahoma, Kialegee Tribal Town, Thlopthlocco Tribal Town and the Alabama-Quassarte Tribal Town. The policy changes may impact cultural and/or religious properties that are significant to these tribes. Your letter will be forwarded to the BIA Agencies/Field Stations, Eastern Oklahoma Region, for distribution to these tribes for review and comments. For your information, a list is enclosed of the formal contact person and the mailing address for each Tribe referenced above. [1]

If additional information is needed, please contact Mr. Jimmy Gibson, Acting Branch Chief, Branch of Natural Resources, Eastern Oklahoma Regional Office, at (918) 781-4642.

Respectively,

*J. Mannis*

Regional Director  
U.S. Bureau of Indian Affairs  
Eastern Oklahoma Regional Office

## **Appendix F4 Response to Federal and State Agency Comments**

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### **Eastern Oklahoma Region Tribes**

Honorable Chadwick Smith  
Principal Chief, Cherokee Nation  
P.O. Box 948  
Tahlequah, Oklahoma 74465

Honorable Dallas Proctor  
Chief, United Keetoowah Band of Cherokees  
P.O. Box 746  
Tahlequah, Oklahoma 74465

Honorable Tarpie Yargee  
Chief, Alabama-Quassarte Tribal Town  
P.O. Box 187  
Wetumka, Oklahoma 74883

Honorable Lowell Wesley  
Town King, Kialegee Tribal Town  
P.O. Box 332  
Wetumka, Oklahoma 74883

Honorable R. Perry Beaver  
Principal Chief, Muscogee (Creek) Nation  
P.O. Box 580  
Okmulgee, Oklahoma 74447

Honorable Bryan McGrett  
Town King, Thlopthlocco Tribal Town  
P.O. Box 188  
Okemah, Oklahoma 74859

## Appendix F4 : Response to Federal and State Agency Comments

### RESPONSE TO COMMENT

1. The TVA reservoir may be within the aboriginal lands of the following Tribes of the Eastern Oklahoma Region: Muscogee (Creek) Nation, Cherokee Nation of Oklahoma, United Keetoowah Band of Cherokees of Oklahoma, Kialegee Tribal Town, Thlopthlocco Tribal Town and the Alabama-Quassarte Tribal Town. The policy changes may impact cultural and/or religious properties that are significant to these tribes. Your letter will be forwarded to the BIA Agencies/Field Stations, Eastern Oklahoma Region, for distribution to these tribes for review and comments. For your information, a list is enclosed of the formal contact person and the mailing address for each Tribe referenced above.

**Response to Comment 1:** TVA invited 17 federally recognized Indian tribes to be consulting parties in the process that addressed effects on historic properties, consistent with Section 106 of the National Historic Preservation Act.

## **Appendix F4 Response to Federal and State Agency Comments**

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From: Lee Clauss [<mailto:leerainsclauss@yahoo.com>]  
Sent: Saturday, August 09, 2003 2:56 PM

THPO's comments/concerns:

Reservoir Operations Study: The EBCI THPO is very interested in this study and has previously requested consulting party status. Just recently, we were provided with the NEPA documents related to this study. We understand that comments are due in early September, but do to the staffing changes, it is highly improbable that such a review will be completed by that date. Furthermore, it is our understanding that the current submission is incomplete, as it lacks the archaeological study. If that study can be provided prior to our commenting, that would make the process much more efficient. Also, because of the EBCI's great interest in the reservoirs included in this study, especially Fontana Reservoir, I think it would be beneficial to TVA to arrange a meeting with the EBCI about the ROS. This meeting should include, at the very least, a representative from Cultural Resources (Russ), Environmental (Carmen McIntyre or Tommy Cabe), and Wastewater (Mike Bolt). Perhaps someone from Fish and Wildlife could also attend. Anyway, I would discuss this suggestion with Russell and have him provide you with the appropriate contact information for the other tribal employees. [1]

### **RESPONSE TO COMMENT**

1. Reservoir Operations Study: The EBCI THPO is very interested in this study and has previously requested consulting party status. Just recently, we were provided with the NEPA documents related to this study. We understand that comments are due in early September, but do to the staffing changes, it is highly improbable that such a review will be completed by that date. Furthermore, it is our understanding that the current submission is incomplete, as it lacks the archaeological study. If that study can be provided prior to our commenting, that would make the process much more efficient. Also, because of the EBCI's great interest in the reservoirs included in this study, especially Fontana Reservoir, I think it would be beneficial to TVA to arrange a meeting with the EBCI about the ROS. This meeting should include, at the very least, a representative from Cultural Resources (Russ), Environmental (Carmen McIntyre or Tommy Cabe), and Wastewater (Mike Bolt). Perhaps someone from Fish and Wildlife could also attend. Anyway, I would discuss this suggestion with Russell and have him provide you with the appropriate contact information for the other tribal employees.

**Response to Comment 1:** TVA Cultural Resources staff met with the Deputy Tribal Historic Preservation Officer of the Eastern Band of Cherokee Indians (EBCI) to discuss EBCI's concerns regarding impacts on historic properties from reservoir operations. Consistent with the National Historic Preservation Act, TVA is executing a programmatic memorandum with the State Historic Preservation Offices of the seven Tennessee Valley region states and other consulting parties.

## Appendix F4 Response to Federal and State Agency Comments



### The Eastern Band of Cherokee Indians

Tribal Historic Preservation Office  
P.O. Box 455, Cherokee, NC 28719  
(828) 488-5637 / Fax (828) 488- 5648

October 15, 2003

Danny Olinger  
Archaeologist  
TVA Cultural Resources  
P.O. Box 1589  
Norris, TN 37828-1589

**RE: DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT: TENNESSEE VALLEY  
AUTHORITY RESERVOIR OPERATIONS STUDY, VOLUMES I AND II.**

Dear Mr. Olinger,

The Eastern Band of Cherokee Indians THPO is in receipt of the above-referenced document and has reviewed the reservoir operations alternatives for their impacts to cultural resources. Obviously, we are in favor of those alternatives which lessen adverse impacts to archaeological resources and historic properties. After reviewing all considered alternatives, we would like to offer the following comments regarding each policy alternative and the Base Case.

**Base Case:** Current operating policy. Levels of erosion, exposure, development, and visual impact remain the same, and both direct and indirect effects to cultural remain unchanged. Under this option the largest number of known NRHP-eligible sites are exposed during drawdown between summer and winter pools, and the drive and pace of development along the shorelines remains the same because water elevations and drawdown schedules see no change.

**Reservoir Recreation A:** Summer levels extended through August 1 and Labor Day for 16 specific tributary and mainstem reservoirs, while winter levels on 15 tributary and mainstem reservoirs would be increased. Under this option, the potential for both direct and indirect adverse effects to historic properties and archaeological resources is increased due to increased erosion levels, increased boating and recreational use, and encouragement and acceleration in pace of shoreline development. ***Although fewer archaeological sites would be exposed during drawdown between summer and winter***

## **Appendix F4 Response to Federal and State Agency Comments**

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*pools, the Eastern Band of Cherokee Indians does not support this alternative because of its accumulated and overall negative impact to cultural resources.*

**Reservoir Recreation B:** Summer levels extended through Labor Day for 17 specific tributary and mainstem reservoirs, while winter levels on 15 tributary and mainstem reservoirs would be increased. Under this option, the potential for both direct and indirect adverse effects to historic properties and archaeological resources is increased due to increased erosion levels, increased boating and recreational use, and encouragement and acceleration in pace of shoreline development. *Although fewer archaeological sites would be exposed during drawdown between summer and winter pools, the Eastern Band of Cherokee Indians does not support this alternative because of its accumulated and overall negative impact to cultural resources.*

**Summer Hydropower:** On June 1, reservoir releases unrestricted during summer and into fall for hydropower production. Winter levels increased on 10 tributary reservoirs. Under this option, the potential for beneficial impacts to cultural resources is increased. Erosion is decreased due to shorter periods of full summer pool levels, fewer archaeological sites are exposed during drawdowns, and the pace and acceleration of shoreline development may slow due to changes in scenic integrity. *The Eastern Band of Cherokee Indians supports this option as the first preferred alternative.*

**Equalized Summer/Winter Flood Risk:** Pool levels lower during the summer and higher during the winter. Under this option, the potential for beneficial impacts to cultural resources is slightly increased. Erosion is decreased due to shorter periods of full summer pool levels (but increased levels during the winter may increase erosion during that period), fewer archaeological sites are exposed during drawdowns, and shoreline development may slow due to changes in scenic integrity. *The Eastern Band of Cherokee Indians supports this option as the second preferred alternative.*

**Commercial Navigation:** Increases navigation channel depth by 2 feet and creates a 13 foot channel for heavier barges. Under this option, the potential for both direct and indirect adverse effects to historic properties and archaeological resources is increased due to continued levels of erosion, increased boating and use, and continuance of acceleration and pace of shoreline development. Like the Base Case, the largest number of known NRHP-eligible sites are exposed during drawdown between summer and winter pools under this alternative. *The Eastern Band of Cherokee Indians does not support this alternative because of its accumulated and overall negative impact to cultural resources.*

**Tailwater Recreation:** Similar to Recreation Alternative B, with adjusted tailwater recreational flows.

Under this option, the potential for both direct and indirect adverse effects to historic properties and archaeological resources is increased due to increased erosion levels, increased boating and recreational use, and encouragement and acceleration in pace of shoreline development. *Although fewer archaeological sites would be exposed during drawdown between summer and winter pools, the Eastern Band of Cherokee Indians does not support this alternative because of its accumulated and overall negative impact to cultural resources.*

**Tailwater Habitat:** Seventy-five percent of inflows retained to maintain reservoir elevations, while the remaining portion released through the system as continuous flows with no turbine peaking. Under this

## Appendix F4 Response to Federal and State Agency Comments

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option, the potential for both direct and indirect adverse effects to historic properties and archaeological resources is increased due to increased erosion levels, increased boating and recreational use, and encouragement and acceleration in pace of shoreline development. ***Although fewer archaeological sites would be exposed during drawdown between summer and winter pools, the Eastern Band of Cherokee Indians does not support this alternative because of its accumulated and overall negative impact to cultural resources.***

The Eastern Band of Cherokee Indians THPO has reviewed the alternatives offered and has concluded that while the majority of alternatives will impact cultural resources in a significant and negative manner, the **Summer Hydropower and Equalized Summer/Winter Flood Risk** alternatives results in a beneficial-to-slightly beneficial impact to cultural resources, and these are the options that we support. In addition, the Tribal Environmental Office has reviewed the ROS and concurs with our position as well. [1]

We thank you for the opportunity to review and comment on this document, and we look forward to working with you on this project. [2] If we can be of further service, or if you have any comments or questions, please direct them to me at (828) 479-1589.

Sincerely,

Michelle Hamilton  
Tribal Historic Preservation Specialist  
Eastern Band of Cherokee Indians

## **Appendix F4 Response to Federal and State Agency Comments**

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### **RESPONSE TO COMMENT**

1. The Eastern Band of Cherokee Indians THPO has reviewed the alternatives offered and has concluded that while the majority of alternatives will impact cultural resources in a significant and negative manner, the **Summer Hydropower and Equalized Summer/Winter Flood Risk** alternatives results in a beneficial-to-slightly beneficial impact to cultural resources, and these are the options that we support. In addition, the Tribal Environmental Office has reviewed the ROS and concurs with our position as well.

**Response to Comment 1:** TVA is executing a programmatic memorandum with the State Historic Preservation Offices of the seven Tennessee Valley region states and other consulting parties, which will guide how TVA further assesses and mitigates potential impacts on cultural resources.

2. We thank you for the opportunity to review and comment on this document, and we look forward to working with you on this project.

**Response to Comment 2:** Comment noted.

## **Appendix F4 Response to Federal and State Agency Comments**

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# **Appendix G**

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## **Results of Consultation Performed under Section 7 of the Endangered Species Act**

**Tennessee Valley Authority  
Reservoir Operations Study – Final Programmatic EIS**



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February 9, 2004

Mr. Jon M. Loney, Manager  
NEPA Administration  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, Tennessee 37902

Re: FWS #04-0198

Dear Mr. Loney:

This document is the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Reservoir Operations Study (ROS) located in the Tennessee River Valley in Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia, and its effects on the federally threatened snail darter (*Percina tanasi*), pink mucket (*Lampsilis abrupta*), and green pitcher plant (*Sarracenia oreophila*) per section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your October 24, 2003, request for formal consultation was received on October 24, 2003. The Tennessee Valley Authority (TVA) has made findings for 59 species (Table 1); "likely to adversely affect" the snail darter and "not likely to adversely affect" 58 species, including the pink mucket and green pitcher plant and three Federal candidate species.

FWS Log No:

Application No: (Action Agency)

Date Started: October 24, 2003

Ecosystem: Lower Tennessee/Cumberland;  
Southern Appalachian

Applicant: N/A

Action Agency: Tennessee Valley Authority

Project Title: Reservoir Operations Study

County: All counties in the Tennessee River drainage (Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, Virginia)

Table 1. Species and critical habitat evaluated for effects and those where “not likely to be adversely affected” determinations were made.

SPECIES	EVALUATED FOR DIRECT, INDIRECT, AND/OR CUMULATIVE EFFECTS	LIKELY TO ADVERSELY AFFECT	CRITICAL HABITAT DESIGNATED/AFFECTED
Gray bat	YES	NO	NO / NO
Indiana bat	YES	NO	YES / NO
Least tern	YES	NO	NO / NO
Whooping crane	YES	NO	YES / NO
Red-cockaded woodpecker	YES	NO	NO / NO
Wood stork	YES	NO	NO / NO
Bald eagle	YES	NO	NO / NO
Piping plover	YES	NO	YES / NO
Alabama cavefish	YES	NO	YES / NO
Snail darter	YES	YES	NO / NO
Pygmy madtom	YES	NO	NO / NO
Yellowfin madtom	YES	NO	YES / NO
Smoky madtom	YES	NO	YES / NO
Boulder darter	YES	NO	NO / NO
Bluemask darter	YES	NO	NO / NO
Duskytail darter	YES	NO	NO / NO
Slackwater darter	YES	NO	YES / NO
Slender chub	YES	NO	YES / NO

SPECIES	EVALUATED FOR DIRECT, INDIRECT, AND/OR CUMULATIVE EFFECTS	LIKELY TO ADVERSELY AFFECT	CRITICAL HABITAT DESIGNATED/AFFECTED
Spotfin chub	YES	NO	YES / NO
Cumberland bean pearlymussel	YES	NO	NO / NO
Purple bean	YES	NO	NO / NO
Pale lilliput	YES	NO	NO / NO
Cumberland monkeyface	YES	NO	NO / NO
Rough rabbitsfoot	YES	NO	NO* / NO
Fat pocketbook	YES	NO	NO / NO
Rough pigtoe	YES	NO	NO / NO
Cumberland pigtoe	YES	NO	NO / NO
Clubshell	YES	NO	NO / NO
Orangefoot pimpleback	YES	NO	NO / NO
White wartyback	YES	NO	NO / NO
Little-wing pearlymussel	YES	NO	NO / NO
Ring pink	YES	NO	NO / NO
Birdwing pearlymussel	YES	NO	NO / NO
Pink mucket	YES	NO	NO / NO
Cracking pearlymussel	YES	NO	NO / NO
Fine-rayed pigtoe	YES	NO	NO / NO
Shiny pigtoe	YES	NO	NO / NO

SPECIES	EVALUATED FOR DIRECT, INDIRECT, AND/OR CUMULATIVE EFFECTS	LIKELY TO ADVERSELY AFFECT	CRITICAL HABITAT DESIGNATED/AFFECTED
Tan riffleshell	YES	NO	NO / NO
Oyster mussel	YES	NO	NO* / NO
Cumberlandian combshell	YES	NO	NO* / NO
Dromedary pearl mussel	YES	NO	NO / NO
Fanshell	YES	NO	NO / NO
Appalachian elktoe	YES	NO	YES / NO
Armored snail	YES	NO	NO / NO
Noonday globe	YES	NO	NO / NO
Slender campeloma	YES	NO	NO / NO
Anthony's river snail	YES	NO	NO / NO
Tennessee yellow-eyed grass	YES	NO	NO / NO
Virginia spiraea	YES	NO	NO / NO
Mountain skullcap	YES	NO	NO / NO
Green pitcher plant	YES	NO	NO / NO
Ruth's golden aster	YES	NO	NO / NO
Small-whorled pogonia	YES	NO	NO / NO
Leafy prairie clover	YES	NO	NO / NO
Cumberland rosemary	YES	NO	NO / NO
Price's potato bean	YES	NO	NO / NO

\*Critical habitat has been proposed, but has not been officially designated. Proposed designation is currently under review.

We concur with TVA's finding of "not likely to adversely affect" for 53 of the above-listed species and critical habitat indicated in Table 1. Those species will not be discussed further in this biological opinion. Upon review of the biological assessment, we concur with the "likely to adversely affect" finding for the snail darter; however, we do not concur with the "not likely to adversely affect" findings for the pink mucket (*Lampsilis abrupta*) and green pitcher plant (*Sarracenia oreophila*). Consequently, those three species will be addressed in this biological opinion. Three Federal candidate species: white fringeless orchid (*Platanthera integrilabia*), slabside pearly mussel (*Lexingtonia dolabelloides*), and the fluted kidneyshell (*Ptychobranchus subtentum*); were also evaluated. We concur that these three species will not be adversely affected by implementation of the preferred alternative. Furthermore, we appreciate that these species were included in the biological assessment, but they currently have no legal protection under the Act and they will not be considered further in this biological opinion.

Although construction of many of the facilities in the TVA water control system pre-dates the consultation requirements of the Act, current operations of those facilities (i.e., the Base Case) have had, and continue to have, adverse effects on a number of federally listed species. However, this biological opinion only addresses the effects to listed species that will occur as a result of implementation of the preferred alternative. Effects of operation and maintenance of the TVA water control system on federally listed species should be addressed in a separate consultation. A recommendation that TVA initiate consultation on operation and maintenance of its water control system was made by the Service in a letter dated December 8, 2003. A response to our letter was received via facsimile from Kathryn J. Jackson, TVA's Executive Vice President for River System Operations and Environment, on February 6, 2004, indicating a willingness to meet as soon as possible to discuss scope for such a consultation. A meeting will be held in the near future between Service and TVA representatives to determine the scope of the consultation.

This biological opinion is based on information provided in the October 24, 2003, project proposal and biological assessment, the June 2003 draft environmental impact statement, and other sources of information. A complete administrative record of this consultation is on file at the Tennessee Ecological Services Field Office, 446 Neal Street, Cookeville, Tennessee 38501; telephone, 931/528-6481.

## Consultation History

October 30, 2001 - Wayne Poppe (TVA) met with Lee Barclay, Doug Winford, and Jim Widlak at the Cookeville Office. The purpose of the meeting was to inform Service personnel that TVA was initiating the Reservoir Operations Study, and that the timeline for completing the study, including environmental compliance, was going to be much shorter than that for the Tennessee/Cumberland drainage portion of the broader consultation on operations and maintenance on the Ohio River and its tributaries.

April 25, 2002 - The Endangered Species Working Group met for the first time. The group consisted of the following representatives from TVA and various Service field stations within the Tennessee River drainage:

### TVA

John Jenkinson  
Peggy Shute  
Bo Baxter  
Bill Redmond  
Carolyn Wells  
Hill Henry  
Chuck Nicholson

### Service

Steve Alexander  
Rob Hurt  
Alice Palmer  
Mark Cantrell  
Bruce Porter  
Jim Widlak

TVA presented information about the proposed ROS and how Endangered Species Act compliance would be approached. The group discussed section 7 issues.

July 10, 2002 - Endangered Species Working Group met to discuss the list of species that would be evaluated in the consultation and the approach that would be used to conduct the assessment.

December 9, 2002 - The Endangered Species Working Group met to discuss progress on the biological assessment.

- June 25, 2003 - The Endangered Species Working Group met to discuss progress on the biological assessment.
- August 7, 2003 - John Jenkinson and Peggy Shute met with Jim Widlak in Cookeville to discuss ways to facilitate the ROS consultation. The biological assessment would address 59 species, three of which are candidate species. Additionally, the scope of the proposed action would likely require lengthy discussion of the baseline condition if baseline conditions were included. It was agreed that the language used in the environmental setting section of the draft environmental impact statement could be used largely verbatim for the baseline section of the biological opinion.
- October 20, 2003 - The Endangered Species Working Group met to discuss the draft biological assessment. Joining this meeting from TVA were David Nye, the project manager, Gary Hickman, and Robin Kirsch.
- October 24, 2003 - TVA submitted the biological assessment to the Service, along with a request for initiation of formal consultation.
- October 28, 2003 - The Service submitted a request to TVA, by letter, for further information.
- November 7, 2003 - John Jenkinson, Peggy Shute, Chuck Bach, Morgan Goranflo, Gary Hickman, and Robin Kirsch met with Lee Barclay, Steve Alexander, Jim Widlak, Mark Cantrell (via telephone), and Rob Hurt (via telephone) in Cookeville to discuss the Service's request for more information concerning the formal consultation. TVA representatives agreed to provide further information.
- November 12, 2003 - The Service sent a letter to TVA acknowledging receipt of the consultation package.
- November 20, 2003 - TVA provided additional information in response to Service requests made on October 28, 2003, and during the meeting on November 7, 2003.

## BIOLOGICAL OPINION

*(NOTE: Text contained in the "Description of Proposed Action" and "Baseline" sections of this biological opinion came largely from TVA's draft environmental impact statement and subsequent biological assessment)*

### DESCRIPTION OF PROPOSED ACTION

In response to changes in public values since completion of the water control system, TVA has periodically evaluated its reservoir operations policy. Currently, TVA is conducting a comprehensive study of its reservoir operations policy-the Reservoir Operations Study-to determine whether changes in operations policy would produce greater overall public benefits. A wide range of policy alternatives for its water control system were analyzed and reviewed, and recommendations for appropriate changes in the reservoir operations policy may be made (Note: this biological opinion will, however, only address the preferred alternative). A decision by TVA to change the reservoir operations policy would affect the operation of TVA's water control system and adjust the balance of operating objectives, subject to meeting the purposes of navigation, flood control, and power production.

For the purposes of the ROS, individual water control facilities within the water control system were classified. Each TVA reservoir falls into one of four general categories that are closely related to its characteristics, primary function, and operation in the reservoir system: (1) mainstem storage, (2) mainstem run-of-river, (3) tributary storage, and (4) tributary run-of-river. Because the ecological and geographic characteristics of waterbodies were found to be important to describe the affected environment for the specific resource areas and evaluate potential impacts from changes in the existing reservoir operations policy, an additional waterbody classification was developed. The ROS waterbody classification identifies eight types of waterbodies, ranging from pooled mainstem reaches to warm tributary tailwaters. Each waterbody in the TVA system was defined as a "reach", extending from an upstream boundary to a downstream boundary, and was classified into one of the eight waterbody types. The eight categories reflect several important differences among the waterbodies, including geographic location (physiographic regions), whether the reaches were pooled or flowing, and thermal characteristics (warm, cool, or cold water).

The Tennessee Valley drainage waterbodies, with approximate length of each reach, were classified in each of the following categories:

#### Flowing Mainstem Reaches (11 Reaches)

- |                       |   |            |
|-----------------------|---|------------|
| 1. Kentucky tailwater | - | 22.4 miles |
| 2. Pickwick tailwater | - | 95.9 miles |

3. Wilson tailwater	-	14.4 miles
4. Guntersville tailwater	-	38.3 miles
5. Nickajack tailwater	-	22.7 miles
6. Chickamauga tailwater	-	39.9 miles
7. Watts Bar tailwater	-	23.9 miles
8. Fort Loudoun tailwater	-	26.3 miles
9. Fort Loudoun [Inflow]	-	11.2 miles
10. Clinch River to Melton Hill Dam	-	8.6 miles
11. Cumberland R.: Barkley Dam tailwater	-	30.6 miles
		<b>Total miles</b>
		<b>344.2 miles</b>

**Pooled Mainstem Reaches (12 Reaches)**

1. Kentucky Reservoir to Duck River	-	88.4 miles
2. Pickwick Reservoir to Colbert	-	38.3 miles
3. Wilson Reservoir	-	15.5 miles
4. Wheeler Reservoir to Limestone Creek	-	35.8 miles
5. Guntersville Reservoir to Scottsboro	-	53.0 miles
6. Nickajack Reservoir to Raccoon Mountain	-	21.3 miles
7. Chickamauga Reservoir to Gillespie Bend	-	35.0 miles
8. Watts Bar Reservoir to Paint Rock Creek	-	46.1 miles
9. Fort Loudoun Reservoir to Peter Blow Bend	-	38.7 miles
10. Melton Hill Reservoir to Clinton (Route 61)	-	43.2 miles
11. Tellico Reservoir to Chilhowee Dam	-	33.2 miles
12. Barkley Reservoir to Cumberland City	-	73.4 miles
		<b>Total miles</b>
		<b>521.9 miles</b>

**Blue Ridge-Type Tributary Reservoirs (12 Reaches)**

1. Appalachia Reservoir	-	9.8 miles
2. Hiwassee Reservoir to 19/64 bridge	-	21.0 miles
3. Chatuge Reservoir	-	12.6 miles
4. Parksville Reservoir to Ocoee #2 Dam	-	12.3 miles
5. Ocoee #3 Reservoir	-	6.4 miles
6. Blue Ridge Reservoir	-	12.0 miles
7. Nottley Reservoir	-	17.5 miles
8. Chilhowee to Calderwood Powerhouse	-	8.8 miles

9. Calderwood Dam to Cheoah Dam	-	7.8 miles
10. Cheoah Dam to Fontana Dam	-	9.6 miles
11. Fontana Reservoir	-	28.8 miles
12. Watauga Reservoir	-	16.3 miles
		<b>Total miles</b>
		<b>162.9 miles</b>
<b>Ridge and Valley-Type Tributary Reservoirs (6 Reaches)</b>		
1. Norris Reservoir	-	72.2 miles
2. Cherokee Reservoir to John Sevier	-	54.4 miles
3. Fort Patrick Henry Reservoir	-	10.4 miles
4. Boone Reservoir	-	17.4 miles
5. South Fork Holston Reservoir	-	24.8 miles
6. Douglas Reservoir	-	44.2 miles
		<b>Total miles</b>
		<b>223.4 miles</b>
<b>Interior Plateau-Type Tributary Reservoirs (7 Reaches)</b>		
1. Normandy Reservoir	-	17.8 miles
2. Bear Creek Reservoir	-	15.9 miles
3. Upper Bear Reservoir	-	16.4 miles
4. Cedar Creek Reservoir	-	16.0 miles
5. Little Bear Creek Reservoir	-	11.1 miles
6. Tims Ford Reservoir	-	35.2 miles
7. Great Falls Reservoir	-	19.4 miles
		<b>Total miles</b>
		<b>131.8 miles</b>
<b>Cool/Cold Tributary Tailwaters (6 Reaches)</b>		
1. Mission Dam to Chatuge Dam	-	14.9 miles
2. Norris Dam tailwater	-	13.5 miles
3. Calderwood powerhouse to dam	-	1.2 miles
4. South Fork Holston Dam tailwater	-	13.8 miles
5. Watauga River: Boone to Wilbur	-	18.2 miles
6. Wilbur Reservoir	-	2.7 miles
		<b>Total miles</b>
		<b>64.3 miles</b>

#### Cool-to-Warm Tributary Tailwaters (7 Reaches)

1. Duck River:Shelbyville to Normandy	-	27.2 miles
2. Elk River:Fayetteville to Tims Ford	-	43.5 miles
3. Hiwassee River: Ocoee River to Powerhouse	-	18.4 miles
4. Blue Ridge tailwater	-	17.4 miles
5. Nottely River to Nottely Dam	-	14.6 miles
6. Holston River Nance Ferry: Cherokee Dam	-	19.0 miles
7. Fort Patrick Henry Dam tailwater	-	8.2 miles
Total miles		148.3 miles

#### Warm Tributary Tailwaters (17 Reaches)

1. Duck River to Columbia	-	123.5 miles
2. Duck River: Columbia to Shelbyville	-	87.9 miles
3. Bear Creek to Bear Creek Dam	-	60.4 miles
4. Upper Bear tailwater	-	24.0 miles
5. Cedar Creek to Little Bear Creek	-	14.9 miles
6. Cedar Creek Reservoir tailwater	-	8.3 miles
7. Little Bear Creek to dam	-	11.5 miles
8. Elk River: to Fayetteville	-	73.8 miles
9. Hiwassee River to Ocoee River mouth	-	15.9 miles
10. Hiwassee River: Appalachia cut-off reach	-	13.2 miles
11. Mission Dam tailwater	-	14.3 miles
12. Ocoee River: mouth to Parksville Dam	-	11.9 miles
13. Ocoee #2 Reservoir to Ocoee #3 Dam	-	5.0 miles
14. Holston River to Nance Ferry	-	33.3 miles
15. Holston River: John Sevier to North Fork	-	35.5 miles
16. French Broad River to Douglas Dam	-	32.3 miles
17. Caney Fork: Great Falls Dam tailwater	-	0.8 mile
Total miles		566.5 miles

Within and adjacent to the designated waterbody types, the following habitat types were identified: (1) Big rivers; (2) Small rivers/Large creeks; (3) Small creeks; (4) Underground aquifers; (5) Riparian areas along streams/ponds; (6) Gravel bars or boulders in large creeks or rivers; (7) Non-forested seeps, Wetlands, or Meadows; (8) Forested seeps or wetlands; (9) Moist woodlands Xeric hardwood/Coniferous forest/Mountain woods; (10) Prairies, Fields,

Roadsides/Early successional woodlands; (11) Limestone, Sandstone, Granite outcrops/Cedar glades, Caves, Sinkholes, Rockhouses, Boulders, Bluffs, Cliff faces.

The following is a summary of the description of the preferred alternative presented in TVA's biological assessment. Under the preferred alternative, drawdown of tributary reservoirs would be restricted from June 1 through Labor Day and summer operating zones would be maintained through Labor Day at four mainstem facilities. Higher winter pool operating ranges would be established at 10 tributary reservoirs. Existing (i.e., Base Case) minimum flows and dissolved oxygen targets adopted under the Lake Improvement Program would continue to be met. Scheduled releases would be provided at five tributary facilities to increase tailwater recreational opportunities; recreational releases are presently not scheduled at these facilities. These releases will be subject to flood control operations and/or extreme drought conditions in the basin.

Elevations at 10 tributary reservoirs would be maintained as close as possible to the flood guides from June 1 through Labor Day subject to each individual facility meeting its own minimum flow requirements and a proportionate share of the system minimum flow requirements. When the volume of stored water is greater than the minimum operations guide curve, weekly average system minimum flow requirement at Chickamauga Dam would be increased each week from 14,000 cubic feet per second during the first week of June to 25,000 cubic feet per second during the last week of July. Beginning on August 1 and continuing through Labor Day, the weekly average flow would be 29,000 cubic feet per second. If the volume of stored water were less than the minimum operations guide curve, weekly average minimum flows at Chickamauga Dam between June 1 and July 31 would be 13,000 cubic feet per second; flows between August 1 and Labor Day would be 25,000 cubic feet per second. Continuous minimum flows would be provided in the Appalachia bypass reach from June 1 through November 30.

Winter flood guide levels under the preferred alternative would be raised at 10 tributary reservoirs based on flood risk analysis. One-half foot to maintain an 11-foot navigation channel would raise minimum winter elevation on Wheeler Reservoir. Steady water releases up to 25,000 cubic feet per second would be provided, as necessary, at Kentucky Dam to maintain tailwater elevation of 301 feet. Great Falls Reservoir would be filled earlier to reach full summer pool level by Memorial Day. The fill period at Fort Loudon, Watts Bar, and Chickamauga reservoirs would follow the existing fill schedule during the first week of April. Filling at these facilities would then be delayed to reach summer operating zone by mid-May.

During critical power system situations such as Power System Alerts or implementation of the Emergency Load Curtailment Plan, reservoir operations would temporarily deviate from preferred alternative operations to meet power system needs. In such situations, stored water would be used to preserve power system reliability.

Under the preferred alternative, TVA would preserve the primary reservoir operating objectives of flood control, navigation, and power generation. It will increase tailwater recreational opportunities, increase the minimum depth of the Tennessee River navigation channel at two locations, maintain power system reliability, maintain minimum tailwater flows and dissolved oxygen content. It would not increase annual average flood damages at any critical location within the Tennessee River Valley, and minimize adverse impacts on reservoir water quality.

### Conservation Measures

The Tennessee Valley Authority has committed to maintain established minimum flows and minimum dissolved oxygen levels in tailwaters as part of the Reservoir Operations Study. Over the years, reservoir operations have been changed to reflect an adaptive response that has included substantial monitoring of environmental parameters, evaluation of ongoing environmental impacts, and systematic mitigation for large-scale impacts. An example is the Reservoir Release Improvement Program (RRIP). The RRIP was initiated to improve water quality and aquatic habitat in tributary tailwaters by providing minimum flows and increasing dissolved oxygen content. Under this program, TVA has restored levels of dissolved oxygen in over 300 miles downstream of 16 projects. Implementation of this program was completed in 1996, but ongoing operational activities could be used to mitigate any increases in problems with low dissolved oxygen in project releases. The Tennessee Valley Authority has implemented a variety of programs to improve conditions for aquatic resources.

Another TVA activity attempts to stabilize reservoir levels for a 2-week period when water temperatures reach 65°F at a depth of 5 feet. This fish spawning operation minimizes water level fluctuations during the peak spawning period to avoid more than a 1-foot-per-week change (either lowering or rising) in pool levels. Stabilizing reservoir levels aids fish spawning success. TVA conducts regular ecological monitoring of reservoirs and tailwater fauna.

The Vital Signs Monitoring Program rates environmental conditions in reservoirs using a fish and benthic Index of Biotic Integrity (IBI). TVA also monitors sport fish populations using the Sport Fish Index (SFI), which incorporates the status of population quantity and quality along with available angler catch information. Within a reservoir, SFI scores monitor positive or negative trends in population status, relative to fishing experience. Beyond the SFI monitoring program, TVA operates certain hydropower operations in a manner that provides important flow levels for spring spawning grounds of certain fishes. For example, below Watts Bar reservoir, prescribed spring flows are provided to enhance sauger spawning. These programs may benefit mussel resources in the Tennessee River, including federally listed species because fish play a vital role in the life cycles of mussels.

As part of the ROS, TVA will participate with personnel from the Nature Conservancy in monitoring the green pitcher plant population at Lake Chatuge. Monitoring will be done to determine the hydrology of the site and to determine what effects, if any, implementation of the preferred alternative is having on the plants and their habitat. If declines in numbers of green pitcher plants or degradation of the habitat attributable to implementation of the preferred alternative are observed, TVA will coordinate with the Service to develop means to halt or reverse such declines and or degradation of habitat.

The Service has described the action area to include the waters in the Tennessee River drainage that are part of the TVA water control system (i.e., the main stem of the Tennessee River and its tributaries) (Figure 1). Lands adjacent to and within one mile of those waters are also included for reasons that will be explained and discussed in the "EFFECTS OF THE ACTION" section of this consultation.

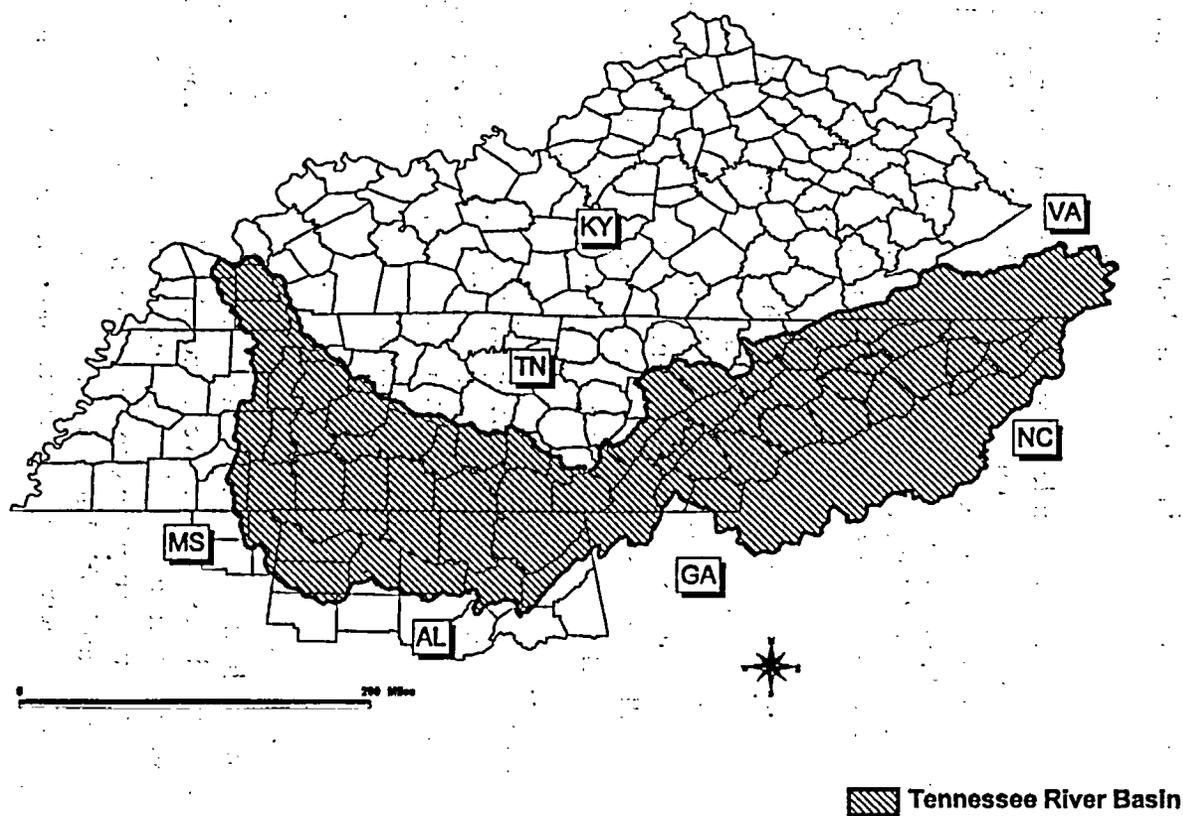
## STATUS OF THE SPECIES/CRITICAL HABITAT

### Snail darter

The snail darter, *Percina tanasi*, was officially listed on October 12, 1975. Because it was known to occur only in the Little Tennessee River in the vicinity of Tellico Dam, which was under construction, the original listing designated the snail darter as an endangered species. Critical habitat for the species was designated on April 1, 1976, to include the Little Tennessee River from River Mile 0.5 to River Mile 17. Subsequent to listing of the species, additional snail darter populations were discovered and, on July 5, 1984, the snail darter was re-designated as a threatened species. At the same time the critical habitat designation was eliminated because the reach of the Little Tennessee River that was designated as critical habitat was impounded when the Tellico Dam project was completed (Service 1983).

Prior to construction of impoundments in the Tennessee River drainage, the snail darter is thought to have occurred in the mainstem of the Tennessee River and the lower reaches of its major tributaries from Fort Loudon downriver to the confluence of the Paint Rock River in Alabama (Service 1983). Populations likely existed in the Tennessee River and in the lower reaches of the Hiwassee, Clinch, Little Tennessee, French Broad, and Holston Rivers (Service 1983). Surveys conducted by TVA biologists at 120 sites during 1974 and 1975 failed to reveal additional snail darter populations, however, snail darter populations were subsequently found in the Tennessee River and four large tributaries during surveys since 1980. Naturally occurring populations were discovered in the Tennessee River below Watts Bar Dam, Nickajack Dam, and

**Figure 1. Reservoir Operations Study Action Area**



Chickamauga Dam; Sewee Creek; South Chickamauga Creek (Tennessee and Georgia); Sequatchie River; and Paint Rock River (Alabama) (Service 1983). In 1975 and 1978, snail darters were transplanted from the Little Tennessee River into the lower Hiwassee River and lower Holston River, respectively. Currently, snail darters are relatively abundant in the lower French Broad River, Holston River, Hiwassee River, and Little River. Although the Service considers the status of the snail darter to be uncertain (Service 2003), recent status surveys indicate that the species appears to be increasing in distribution and population size (TVA 2003[a]).

In an effort to offset the loss of the Little Tennessee River population, snail darters were transplanted to several streams prior to completion of Tellico Dam. Populations were re-introduced in the Elk River (Tennessee), Holston River (Tennessee), Hiwassee River (Tennessee), and Nolichucky River (Tennessee); low numbers of snail darters have subsequently been found in the Nolichucky, and Elk, but populations may have become established in the Holston and French Broad Rivers as a result of the transplant into the Holston River.

The snail darter is described as a robust member of the subgenus *Imostoma*, growing to a maximum total length of 85 millimeters. Coloration above the lateral line is generally brown with occasional traces of green. Four prominent dark brown saddles cross the area behind the origin of the dorsal fin. Body color below the lateral line is lighter and is interspersed with dark blotches. The belly is usually white and the dorsal area of the head is dark brown. Cheeks are mottled brown with traces of yellow (Service 1983).

The snail darter inhabits shoal areas having relatively swift flow over mixed substrate of sand, gravel, cobble, and rock ledges. The species inhabits shallow water areas, but may also occur in areas with water depths of 12 to 20 feet (Service 1983). Snails comprise approximately 60 percent of the diet of the species, but caddisfly and black fly larvae are also consumed seasonally (Service 1983).

Approximately 25 percent of snail darter populations reach maturity at one year of age. Mature males migrate to spawning shoals from November through late January. Spawning occurs through mid-March. Eggs are deposited on gravel or cobble substrate and hatch within 20 days. Newly hatched larval snail darters drift with river currents to pool habitats, which serve as nursery areas. Juvenile darters may spend five to seven months in the nursery areas, after which they migrate upstream to shoal and riffle habitats where they spend the remainder of their lives (Service 1983). The action area encompasses the entire known range of the snail darter.

There is currently no designated critical habitat for the snail darter. A recovery plan for the species was approved on May 5, 1983. Recovery criteria are:

### Alternative A

Suitable habitat areas of the Tennessee River within the area from the backwaters of Wheeler Reservoir upstream to the headwaters of Watts Bar Reservoir are inhabited by snail darter populations that can survive and reproduce independently of tributary rivers as evidenced by documented reproduction in Watts Bar Reservoir or some other Tennessee River reservoir.

### Alternative B

More Tennessee River tributary populations of the species are discovered and existing populations are not lost. The number of additional populations needed to meet this criterion would vary depending on the status of the new populations, but two populations similar to the Sewee Creek, South Chickamauga Creek, or Sequatchie River populations or one comparable to the Hiwassee River population would denote recovery.

### Alternative C

Through maintenance of existing populations and/or by expansion of these populations, there exist viable populations of snail darters in five separate streams such as Sewee Creek, Hiwassee River, South Chickamauga Creek, Sequatchie River, and Paint Rock River.

### Pink mucket

The pink mucket, *Lampsilis abrupta*, was listed as an endangered species on June 14, 1976. It is an Ohioan species with possibly the widest range known for a listed mussel. Historical records indicate that this species once occurred in large rivers in 12 states. Presently, known populations occur only in the Barren River, Big River, Black River, Clinch River, Cumberland River, Current River, Gasconade River, Green River, Kanawha River, Little Black River, Meramec River, Ohio River, Osage River, Paint Rock River, and Tennessee River (Service 1985, 1992; Parmalee and Bogan 1998). Of these extant populations, only a few have shown recent evidence of recruitment. Some taxonomists have recently postulated that the reproducing populations west of the Mississippi River are not *Lampsilis abrupta*, but rather are more closely related to another endangered species, the Higgins eye pearlymussel (*Lampsilis higginsii*). If this is true, then there are fewer known reproducing populations of *L. abrupta* than originally thought. Although it has a relatively wide distribution and is apparently more tolerant of reservoir-type habitat conditions than other listed mussel species, the pink mucket is reported to occur in low numbers where it occurs.

This species inhabits areas in large rivers with swift currents, depths of 0.5 to 8.0 meters (1.6 feet to 26.2 feet), and mixed sand/gravel/cobble substrate. Notwithstanding this, the pink mucket appears to have adapted to reservoir-type conditions in the upper reaches of some impoundments. Life history aspects of this species are presently unknown, although it is probably a long-term breeder, as are other *Lampsilis* species. The glochidia are undescribed and the fish host is unknown (Service 1985, 1992; Parmalee and Bogan 1998).

In the Tennessee River drainage, live pink muckets have been recently collected from below the following TVA facilities: Wilson Dam, Pickwick Landing Dam (from the dam to the headwaters of Kentucky Lake), Kentucky Dam, Guntersville Dam, Nickajack Dam, Chickamauga Dam, Fort Loudon Dam, and Watts Bar Dam. Individuals were also found recently in the Holston River below Cherokee Dam, French Broad River below Douglas Dam, in the Clinch River below Melton Hill Dam and in Claiborne County, and below Bear Creek Dam and Wheeler Dam in Alabama (TVA 2003[a]).

There is no designated critical habitat for this species. A recovery plan was approved for the pink mucket on January 24, 1985. This species will be considered recovered when:

1. Two additional viable populations are found in any two rivers other than the Tennessee River, Cumberland River, and Meramec River. Populations in those two rivers will be distributed such that a single catastrophic event would likely not result in elimination of the population. Survey data must show at least five viable populations with each having a minimum of two year classes between four and 10 years of age.
2. Additional mussel sanctuaries must be established or expanded in river systems containing known populations of the pink mucket.
3. An education program must be established for the public with major emphasis toward commercial mussel harvesters.
4. The species and its habitat are protected from present and foreseeable human-related and natural threats that might interfere with survival of any of the populations.

### Green pitcher plant

The green pitcher plant, *Sarracenia oreophila*, was listed as an endangered species on September 21, 1979. It is currently restricted in range to areas of the Cumberland Plateau in Alabama; and Blue Ridge and Valley and Ridge areas in Georgia and North Carolina (Service 1994). Green pitcher plant populations historically existed in the Coastal Plain and Piedmont areas in Alabama and Georgia, and in the Cumberland Plateau in eastern Tennessee. Extant populations occur at an estimated 35 sites in northeastern Alabama, northeastern Georgia, and southwestern North Carolina; population sizes range from one to several thousand plants (Service 1994). No critical habitat was designated for this species.

The green pitcher plant occurs in various types of habitat. Some populations occur in moist upland sites and seepage bogs, while others exist in boggy, sandy streambanks. Soils are acidic and consist of sandy clays and loams in upland sites or nearly pure sand along streams. Suitable habitat, consisting of relatively open canopy, is maintained by the saturated acidic, or poor nutrient, soils and periodic moderate fire that maintains which prevents encroachment of competitive species. Flood events are thought to maintain or create streambank sites. Predominant plants associated with green pitcher plant include alder, mountain laurel, red maple, and rhododendron on streambank sites. Various oak and pine species, which provide sparse canopy, occur on upland sites (Service 1994). Sphagnum and cinnamon fern are typically associated with this species at all sites. The herbaceous layer is typically diverse, with a mixture of grasses, sedges, and forbs. The more diverse sites are those that are frequently burned.

Green pitcher plants reproduce by seed and by rhizomes. The plants are pollinated by bumblebees, but at some sites having low numbers of plants, pollinator success was found to be low (Service 1994). Weather, particularly rainfall is considered to be an important limiting factor in flowering and vegetative growth. Flower buds are formed in fall, gradually enlarging throughout winter; bud enlargement is dependent on temperature. The plants flower from late April through late May and is affected by elevation and local climatic conditions. Fruit maturation typically occurs by late August, and seeds are released in mid to late September through early spring (Service 1994). Seedlings require high soil moisture, open mineral soil, and high light intensity for first year growth.

Green pitcher plant populations have been lost, and continue to be threatened by loss of suitable habitat. Clearing and degradation of habitat are thought to be the primary threats. Populations are thought to have been lost due to inundation at Lake Weiss and Lake Chatuge. Road construction, coal mining, intensive grazing and trampling by livestock, fire suppression resulting in encroachment by competitive plant species, and use of fertilizers and pesticides have had adverse effects on other green pitcher plant populations. Over-collecting by commercial

dealers has resulted in complete elimination of many populations, and continues to be a major threat to the species (Service 1994).

A recovery plan was approved for the green pitcher plant on May 11, 1983; revised plans were approved on April 5, 1985 and on December 12, 1994. The species will be considered recovered when:

1. A minimum of 18 viable populations, representing the diversity of habitats and the geographic range of the species, are protected and managed as necessary to ensure their continued existence. Colonies should also include the wide spectrum of current genetic variation found in the species, which will be investigated as a recovery task. Of the 18 populations, at least three colonies should be located within each of the following four geographic areas: Coosa Valley, Lookout Mountain, East Sand Mountain, West Sand Mountain, and Lake Chatuge.
2. A population will be considered protected when it is legally protected from any present or foreseeable threats and is actively managed. A population will be considered viable if it is successfully sexually reproducing and the population's size is stable or increasing. A successfully sexually reproducing population is one which has consistent seed production followed by seedling establishment. Population viability should be confirmed through long-term monitoring (20 to 30 year period) before a final assessment of its eligibility for delisting is made.

A list of formal consultations completed for the species addressed in this biological opinion is attached (Appendix 1).

TVA evaluated a total of 59 species in its biological assessment for the Reservoir Operations Study. Three of those species: slabside pearlymussel, fluted kidneyshell, and white fringeless orchid: are Federal candidate species. They have no Federal protection and the consultation requirements of the Act do not apply to them. Consequently, those three species will not be addressed further in this biological opinion. All of the remaining 56 listed species are known to occur in the action area, however, implementation of the proposed alternative is not likely to result in changes that are likely to adversely affect 53 of those species (see Table 1) or their habitats. We will therefore not address those species further in this biological opinion. The snail darter, pink mucket, and green pitcher plant are likely to be adversely affected by implementation of the proposed action. Changes resulting from implementation of the preferred alternative (Blend 8) will alter water temperatures, water levels, and/or flows in some reservoirs and /or tailwater reaches that could potentially alter suitable habitat, affect reproduction, or have adverse effects on normal behavioral activities of populations of those three species in the

affected areas. Therefore, these three species will be addressed in subsequent sections of this biological opinion.

## **ENVIRONMENTAL BASELINE**

The TVA is a multipurpose federal corporation responsible for managing a range of programs in the Tennessee River Valley for the use, conservation, and development of the water resources related to the Tennessee River. In carrying out this mission, TVA operates a system of dams and reservoirs with associated facilities-its water control system-to manage the storage and flow of water within the system. This system is used to manage the water resources of the Tennessee River for the purposes of navigation, flood control, power production, and a wide range of other public benefits.

The water control system provides the cooling water supply for TVA's fossil and nuclear power plants located adjacent to TVA reservoirs. Additionally, TVA owns and manages approximately 293,000 acres of land in the Tennessee River Valley, much of which is along the shorelines of the reservoirs. Policies have been established for the development of reservoir shorelines and adjacent TVA lands, and reservoir levels influence development and management of these lands and activities and river flows. Reservoir operations policy for the water control system - i.e., the dams, reservoirs, and regulated river segments-guides the day-to-day operation of the Tennessee River system.

The Tennessee River drainage covers approximately 41,000 square miles. This area includes 125 counties within much of Tennessee and parts of Alabama, Kentucky, Georgia, Mississippi, North Carolina, and Virginia. The larger TVA Power Service Area covers 80,000 square miles and includes 201 counties in the same seven states. The TVA watershed includes 42,000 miles of streams that drain to the Tennessee River, 480,000 acres of reservoirs, and 300,000 acres of TVA-managed land.

The Tennessee River drainage begins with headwaters in the mountains of western Virginia and North Carolina, eastern Tennessee, and northern Georgia. At Knoxville, Tennessee, the Holston and French Broad Rivers join to form the Tennessee River, which then flows southwest through the state, gaining water from three other large tributaries: the Little Tennessee River, Clinch River, and Hiwassee River. The Tennessee River eventually flows into Alabama, where it picks up another large tributary, the Elk River. At the northeast corner of Mississippi, the river turns north, re-enters Tennessee, picking up the Duck River, and continues flowing north to Paducah, Kentucky, where it enters the Ohio River at Ohio River Mile 932.

The total river elevation change from the maximum reservoir surface elevation at Watauga Dam (highest elevation on the system) to the minimum tailwater surface elevation at Kentucky Dam (lowest elevation on the system) is 1,675 feet in 828.6 river miles. The mainstem of the Tennessee River, has a fall of 515 feet in 579.9 river miles from the top of the Fort Loudoun Dam gates to the minimum tailwater elevation at Kentucky Dam. The mainstem fall is gradual except in the Muscle Shoals area of Alabama, where a drop of 100 feet is found in a stretch of less than 20 miles.

The eastern half of the Tennessee Valley includes the slopes of the Blue Ridge and Great Smoky Mountains, where an abundant growth of timber covers the ground. The western half of the Valley is less rugged, with substantial areas of flat or rolling land occurring in middle Tennessee and along the western edge. Reservoirs and the associated tailwaters of the Tennessee River Valley span six physiographic regions, including the Highland Rim, Coastal Plain, Cumberland Plateau, Blue Ridge, Central Basin, and Valley and Ridge. Thirty-nine percent of the TVA region is in the Highland Rim, and 40 percent in the Coastal Plain.

The eastern portion of the Tennessee River watershed is located in the Blue Ridge Physiographic Region (Unaka Mountains) and the Valley and Ridge Physiographic Region. The headwaters of the Tennessee River originate in the rugged Unaka Mountains in North Carolina and eastern Tennessee. This region has undergone multiple mountain-building events and is underlain by folded and faulted complexes of igneous, metamorphic or sedimentary rocks dating from the Precambrian and Paleozoic Eras. The soils of the Blue Ridge Physiographic Region consist of highly weatherable material. The depth of soil varies from 1 to 3 feet at higher elevations and from 3 to 7 feet on the lower side slopes. The valleys contain a variety of soils and are generally productive. Soil depths of the Valley and Ridge Physiographic Region range from shallow over shales and sandstones to very deep over the dolomitic limestone. The upland soils are primarily highly leached, and strongly acidic with low fertility. Because of the variable landscape, soils properties vary over short distances, resulting in small patches of productive land intermixed with average land or large tracts of rough land.

The Tennessee River flows southwest from the Valley and Ridge Physiographic Region into the Cumberland Plateau Physiographic Region. This region consists of a high tableland that is underlain by nearly flat-lying sedimentary rocks of Paleozoic age. The Plateau is highly dissected by streams and rivers, forming valleys with moderate to high relief. Because limestone underlies portions of this region, karst (an irregular limestone region with sinks, underground streams, and caverns) landscapes and extensive cave systems have developed. The Cumberland Plateau is bounded on the west and east by escarpments. The terrain is gently rolling to hilly highland with deeply cut gorges.

From the Cumberland Plateau, the Tennessee River flows northwest through the Highland Rim Physiographic Region. This region consists of a highly dissected flat-lying tableland that is underlain by nearly flat-lying Paleozoic age limestone. Due to the presence of limestone, an extensive karst plain has developed, with numerous sinkholes, disappearing streams, and cave systems. The hill slope soils were formed from limestone and have clayey and cherty subsoils. The more level areas and hill caps have soils formed from thin loess (windblown material) and limestone residuum. The soils are highly leached and strongly acid with low fertility, except near the Kentucky/Tennessee border.

The Central Basin Physiographic Region is within the Highland Rim. The Central Basin is one of the smaller physiographic regions of the Tennessee Valley watershed and includes parts of the Duck River and Cumberland River drainages. The Basin is underlain by up-warped Paleozoic age limestone that has been eroded to form a basin surrounded by the Highland Rim. The inner portion of the Basin is relatively flat lying with low relief, and is bordered by large hills and ridges along its outer edge. Due to the weathering and erosion of the underlying limestone, karst topography is present in this region.

From the Highland Rim, the Tennessee River flows north through the Coastal Plain Physiographic Region. The portion of this region that lies within the Tennessee Valley is almost entirely west or southwest of the Tennessee River and includes the drainages of the Beech River and Bear Creek. The relief within this area is generally low; consequently, stream gradients are very low. Their valleys are broad and flat and filled with thick accumulations of alluvium. The rocks exposed in the Gulf Coastal Plain are all unconsolidated sediments, with Paleozoic rocks underlying the whole area at great depth. The soils of the Coastal Plain Physiographic Region are highly leached, low in fertility, and strongly acid. Control of erosion is of major concern, as evidenced by deep gullies that are common on some hillsides.

Aquatic resources occurring in the Tennessee Valley region are important from local, national, and global perspectives and add value to the lives of citizens of the Tennessee River basin. Tennessee has approximately 319 fish species, including native and introduced species, and 129 freshwater mussels. The Tennessee-Cumberland River eco-regions have the highest number of fish, mussels, crayfish, and endemic species in North America. This is the most diverse temperate freshwater ecosystem in the world.

Prior to construction of the TVA reservoir system, aquatic communities were structured by water quality and physical habitat condition, which were driven by physiographic region and climate. Stream flow was proportional to rainfall, and flow regime (pattern) followed the same trends as the annual rainfall pattern. Flow established physical habitat conditions (e.g., depth, velocity) within a stream and maintained stream shape and other habitat conditions (substrate). Relatively infrequent high-flow events (i.e., flows that only occur every 1 to 2 years) were responsible for

maintaining large-scale habitat patterns such as the number of riffles or pools. High flows clean substrate by flushing out fine sediments, which may suffocate fish eggs or mussels and fill in the spaces between rocks needed by aquatic insects. Because historical flow was proportional to rainfall, over short time intervals, such as days, flow was relatively predictable meaning that yesterday's flow was likely to be similar to today's flow and from hour to hour there was little change, except during storm events.

Floods were common during spring, and flows decreased throughout the year with the lowest flows typically occurring August through October, the warmest part of the year. Spring flooding was an important component in the life cycles of some fish species that use flooded overbank areas for spawning or nursery areas. The Tennessee River was shallow, with expansive areas of rocky or gravel shoals critical features contributing to the great diversity of aquatic life. Two of the purposes of TVA system dams and reservoirs were to provide year-round navigation on the river and control flooding. Achieving these objectives required modifying the river environment described above to which the pre-impoundment aquatic community was adapted. For example, most of the shoal habitat was eliminated by impoundments, and seasonal flow patterns were greatly modified by capturing high spring flows in upstream impoundments and increased late summer/fall flows with drawdown releases from those reservoirs.

The construction of the TVA reservoir system significantly altered both the water quality and physical environment of the Tennessee River, with little regard at the time for aquatic resources. Aquatic resources were generally not a consideration for many types of river projects then because flood control, navigation, and cheap hydroelectric power for economic stimulation were more highly valued.

The primary impact of the reservoir system was to convert free-flowing river habitat into reservoir pools. Virtually all of the mainstem Tennessee River was impounded to maintain navigation channel depth. The dams became obstacles to migratory species. Differences in goals and, consequently, operation of reservoirs became important factors in determining water quality and associated impacts on resident aquatic communities in tributary and mainstem reservoirs and downstream tailwaters. Low levels of dissolved oxygen in summer and fall virtually eliminated aquatic communities from the pool area in the lowest layer of the reservoir that is characterized by relatively cool water. Before the RRI Program, similar impacts occurred in downstream tailwaters because water was released from the lower layer of the upstream reservoir.

The large differences between summer and winter pool levels of some tributary reservoirs also created environmental hardships for aquatic resources in these reservoirs. Benthic organisms requiring re-colonization each summer cannot survive in bottom areas exposed to drying during winter. This exposure, in association with dissolved oxygen stratification impacts, severely

limits benthic communities in many tributary reservoirs. Aquatic communities in and downstream of mainstem reservoirs are also affected by poor water quality conditions, but impacts are less severe. Taking advantage of modified habitat conditions (i.e., reservoir pools and dam tailwaters), state agencies introduced numerous sport and some prey fishes, including rainbow trout, brown trout, lake trout, cutthroat trout, kokanee, striped bass, striped bass hybrids, muskellunge, northern pike, cisco, rainbow smelt, alewife, yellow perch, and walleye (northern strains). Not all introductions have led to self-sustaining populations; state agencies continue stocking many popular fishes. Stocking has in itself led to changes to aquatic communities or created new community types in areas they did not exist (e.g., trout in tailwater river reaches).

Completion of TVA's water control system resulted in the following impacts to the aquatic system: (1) Conversion of riverine habitat to reservoir pool habitat; (2) Loss of riverine habitat and associated species; (3) Conversion of floodplain to reservoir pool; (4) Loss of seasonal floodplain habitat and associated species; (5) Fragmentation of riverine sections; (6) Disruption of fish migrations; (7) Seasonal fluctuations of pool levels; seasonal drying of habitat reduces abundance and diversity of species; (8) Strong stratification (layering) of temperature for certain dam types; (9) Stress or mortality of organisms or sensitive life stages; (10) Seasonal dissolved oxygen depletion in temperature stratified water; (11) Ammonia release created by presence of dissolved oxygen-depleted water; (12) Disruption of stream transport of sediment; (13) Trapping of sediment; (14) Capture of toxic substances associated with substrate; (15) Toxic substances release created by presence of dissolved oxygen-depleted water; (16) Enrichment of nutrients (eutrophication) with consequent increases in productivity, plant and algae growth, and changes in habitat quality and associated species.

#### **Status of the species within the action area**

The action area encompasses the entire range of the snail darter. Populations of snail darters persist despite construction of the water control facilities on the mainstem of the Tennessee River and its large tributaries.

Snail darter populations have expanded since the species was listed. New populations have been found or reported in the Holston River, French Broad River, Hiwassee River, Tennessee River below Watts Bar Dam and Nickajack Dam, Paint Rock River, Sewee Creek, Sequatchie River, Ocoee River, and South Chickamauga Creek. These populations were either newly discovered natural populations or the successful result of transplant efforts. Efforts to establish self-sustaining populations by transplants failed to succeed in the Nolichucky River and the Elk River.

In the action area, the pink mucket is known to occur in the Tennessee River below Kentucky Dam, Pickwick Landing Dam, and Wilson Dam; in the French Broad River below Douglas Dam; and in the Holston River below Cherokee Dam. Smaller populations or scattered individuals may still persist below other dams on the mainstem of the Tennessee River and in the Clinch River above Knoxville. Historical records from within the action area indicate that the pink mucket occurred in the Flint River, Limestone Creek, and the Duck River.

Green pitcher plant populations currently exist within the action area only in Towns County, Georgia, and Clay County, North Carolina. The Nature Conservancy owns two sites on which this species occurs.

#### **Factors affecting species environment within the action area**

Stream and river reaches within the action area containing snail darter populations are being affected by a variety of activities. Dams block spawning migrations of fish, including snail darters; these structures may also be a barrier to newly hatched fry, which drift downstream to nursery habitats. Erosion of streambanks resulting from poor land use practices and water level fluctuations from hydropower releases has likely increased the sediment input into the streams. Sediment compacting the substrate can affect reproductive success by smothering eggs deposited in the gravel or on rocks. Runoff from agricultural areas may contain pesticides, fertilizers, and other agricultural chemicals that degrade water quality. Runoff from coal mining activities may be affecting the species in the Sequatchie River drainage as a result of sediment and acidic discharges. Dredging and construction of barge facilities could potentially have adverse effects to snail darter populations in the Tennessee River. Sand and gravel dredging could affect the species by removing or disturbing important spawning shoals.

Impoundment of the Tennessee River and its tributaries has likely had the most extensive adverse impacts on populations of the pink mucket. Construction of dams converted large reaches of free-flowing riverine habitat to lake-like conditions. Along with alteration of the physical habitat, this change also resulted in changes in the fish fauna. Fish species adapted to lake habitats replaced native riverine fishes that served as fish hosts for the mussels.

Many of the activities that affected snail darter populations have also adversely affected populations of the pink mucket. Streambank erosion, poor land use practices, dredging, municipal and industrial discharges, and development along the river have disturbed, altered, or destroyed habitat used by the pink mucket.

The greatest adverse effect to the green pitcher plant within the action area has resulted from loss of habitat resulting from clearing for agricultural, residential, industrial, and silvicultural purposes. Trampling by grazing cattle and use of herbicides has affected some populations. Suppression of natural fire has resulted in encroachment by competitive plant species. Alteration of natural hydrological conditions has also resulted in loss or significant reductions of some populations. In addition, the carnivorous nature of the green pitcher plant has made it attractive to plant enthusiasts. Collection of plants has resulted in complete loss or significant reduction of some populations.

## **EFFECTS OF THE ACTION**

### **Factors to be considered**

Implementation of the preferred alternative, throughout most of the action area, is not anticipated to result in significant changes in conditions from those occurring under current operations. The Tennessee Valley Authority is committed to maintaining minimum flows and dissolved oxygen levels established under the Reservoir Release Improvement Program and the Lake Improvement Program. If implementation of the preferred alternative results in changes in flows or dissolved oxygen in tailwater reaches below TVA dams included in the RRI program, appropriate actions will be taken to restore and maintain minimum flow and dissolved oxygen levels.

One anticipated change in conditions from current operations is a decrease in water temperatures in the Holston River below Cherokee Dam. During years of normal climatic conditions, temperatures are expected to decrease during the latter part of August and will be from one to six degrees (Celsius) lower than those under current operations and will extend an undetermined distance downriver.

Another change will occur as a result of maintaining summer pool levels in reservoirs later in the season during normal years. Under the preferred alternative, median reservoir pool elevations in Chatuge Lake will be approximately 1.5 feet higher than those under current operations from July through Labor Day; median elevations will be one-half foot lower than current conditions from April through June.

### **Analyses for effects of the action**

Implementation of the preferred alternative may directly affect populations of the snail darter and pink mucket in the Holston River. The pink mucket is a long-term breeder; eggs are fertilized and larvae develop during spring and summer; females retain larvae for release the following spring. Decreases in water temperature during late summer could potentially effect the development of larval mussels or attachment of larval mussels to suitable fish hosts. Such a change could indirectly affect the mussels if changes in water temperature changed the activity or presence of the species' fish host.

The snail darter is a winter spawner. Eggs are laid in mid to late winter and the fry hatch during early spring. Lower water temperatures during late summer could possibly affect the species if such changes altered the feeding activity of reproductive individuals. Changes in water temperature may also affect gamete production, thus affecting spawning success and recruitment.

The green pitcher plant population at Chatuge Lake could potentially be affected by the anticipated change in summer pool level that will result from implementation of the preferred alternative. There appears to be some uncertainty about the hydrologic conditions of the site at which the plants exist. If lake levels drive the hydrology of the site, the site will be exposed to water levels 1.5 feet higher than presently occurs during the summer. What effect this might have on flowering, fruit formation, and seed dispersal are unknown at this time.

### **Species' response to a proposed action**

Subsequent to inundation of the Little Tennessee River site, snail darters were stocked, or new populations were subsequently found in the Holston River; French Broad River; Sequatchie River; Tennessee River below Watts Bar Dam, Chickamauga Dam, and Nickajack Dam; Sewee Creek; Nolichucky River; Hiwassee River; Ocoee River; Elk River; and South Chickamauga Creek. Some of these populations appear to be reproducing and increasing in numbers while others have declined. Current estimates of population size are not available.

The snail darter has demonstrated a certain degree of resilience to changes in its habitat, evidently having adapted to current conditions within the action area. Construction of reservoirs has isolated some populations, but many of the extant populations continue to thrive.

Pink mucket populations currently exist in the action area below Kentucky Dam, Pickwick Landing Dam, Wilson Dam, Cherokee Dam, and Douglas Dam. Population estimates are not available, but individuals likely are scattered at low densities throughout the tailwaters below

those dams in areas containing suitable habitat. This species has low resilience to changes in its habitat. Although it has adapted to lake-like conditions (individuals have been found in the upper reaches of some reservoirs), construction of impoundments has destroyed miles of its riverine habitat. Additionally, coldwater releases from some dams has resulted in elimination of some populations. Even if the action area was restored to pre-impoundment conditions, it is unlikely that the pink mucket would re-colonize those disturbed areas in the foreseeable future.

The green pitcher plant currently occurs in the action area only at sites around Lake Chatuge in southwestern North Carolina and northern Georgia. Population estimates range from one plant to more than 2,000 plants. This species is not resilient to changes in habitat. Disturbance, or lack thereof, generally results in declines in numbers or elimination of entire populations. Depending on the type and degree of habitat disturbance, the green pitcher plant may or may not recover in a restored habitat.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local and/or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation under section 7 of the Act.

The area in which the proposed action will be conducted is currently being affected by a variety of actions and activities. Major urban areas exist throughout the action area; those areas are likely affecting the species and habitats within the mainstem of the Tennessee River and its tributaries. Large recreational boats and barge traffic that move upriver and downriver through the action area likely have some effect on aquatic species and habitats; propeller wash creates waves that erode the riverbanks, resulting in sediment deposit on the river bottom. Runoff from adjacent agricultural fields may contain fertilizers and/or pesticides that can affect aquatic organisms. Residential, commercial, and industrial development around some of the reservoirs, particularly those located near major urban centers, have increased over time and is likely to continue; resulting in destruction or alteration of aquatic and terrestrial habitats. These effects have occurred over many years and are likely to continue.

### **CONCLUSION**

After reviewing the current status of the snail darter, pink mucket, and green pitcher plant, the environmental baseline for the action area, the effects of the proposed ROS, and the cumulative

effects, it is the Service's biological opinion that implementation of the preferred alternative (Blend 8), as proposed, is not likely to jeopardize the continued existence of the snail darter, pink mucket, or green pitcher plant, and is not likely to destroy or adversely modify designated critical habitat. No critical habitat is currently designated for these species, therefore, none will be affected.

### INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations under section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. *Take* is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. *Harm* is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. *Harass* is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by TVA so that they become binding conditions of the Reservoir Operations Study for the exemption in section 7(o)(2) to apply. The Tennessee Valley Authority has a continuing duty to regulate the activity covered by this incidental take statement. If TVA fails to accept and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, TVA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(I)(3)]

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

## AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service expects incidental take of the snail darter and the pink mucket will be difficult to detect for the following reasons: (1) the snail darter is a small, secretive fish that typically occurs under rocks or other cover on the bottom of rivers or large streams. If a snail darter dies, it likely would remain under cover, be quickly swept downstream, or consumed by scavengers. Finding a dead individual would thus be highly unlikely; (2) in the event that a dead or impaired individual snail darter is found, attributing death or impairment to implementation of the preferred alternative would be extremely difficult; (3) the pink mucket spends its entire lifetime burrowed into the substrate in large rivers; when an individual dies, it likely remains in place, thus finding a dead individual would be unlikely unless the river was periodically monitored by divers; (4) attributing death of an individual pink mucket to operations under the preferred alternative would be difficult; (5) the pink mucket is rare; individuals are generally scattered randomly over the river bottom in areas containing suitable habitat; finding an individual, live or dead, typically requires intensive searching. However, the following level of incidental take of these species can be expected by loss, alteration, or degradation of their habitats resulting from implementation of the preferred alternative. Changes in water temperature below Cherokee Dam during the latter part of August could disrupt normal reproductive behavior and result in take of all or portions of the following season's year class. Cooler water could also result in take by affecting feeding and thus inhibiting the development of juveniles.

The snail darter currently occurs in the Hiwassee River. The population in that river appears to be stable and reproducing. Late summer temperatures in the Hiwassee River below Appalachia Dam are currently similar to those projected during late summer in the Holston River under the preferred alternative. Thus, it appears that the snail darter is tolerant of water temperatures that may occur (i.e., four to five degrees Celsius cooler than current temperatures) from implementation of the preferred alternative. Consequently, incidental take of snail darters is not anticipated unless more severe water temperature decreases occur.

Based on available records, the pink mucket currently occurs in the Holston River upriver to approximately River Mile 30. We assume that this is presently the upstream limit of the distribution of this species in the Holston River. Temperature tolerance of the pink mucket is not known, therefore it is assumed that there could be incidental take of the species resulting from decreases in water temperature. We assume that take would occur downriver from River Mile 30, and that all pink muckets in the lower thirty miles of the river would be susceptible to take.

Table 2. The incidental take estimated and critical habitat destroyed for the proposed project.

SPECIES	INDIVIDUALS	TAKE TYPE	CH DESTROYED
Snail darter	Cannot be Determined	Harm, Harass	N/A
Pink mucket	Cannot be Determined	Harm, Harass	N/A

Table 3. How the incidental take will be monitored if the specific number of individuals cannot be determined.

SPECIES	CRITICAL HABITAT	HABITAT	OTHER
Snail darter	N/A	Change (decrease) in water temperature downriver from HRM 30.0	
Pink mucket	N/A	Change (decrease) in water temperature downriver from HRM 30.0	

### EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of expected take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

## **REASONABLE AND PRUDENT MEASURES**

The Service believes the following reasonable and prudent measures are necessary to minimize impacts of incidental take of the snail darter and/or pink mucket:

1. Water temperature in the Holston River below Cherokee Dam will be monitored to ensure that temperature variations do not exceed those modeled for the ROS.
2. The snail darter population in the Holston River below Cherokee Dam will be monitored. Surrogate species will be selected for monitoring in place of the pink mucket due to its rarity in the Holston River.

## **TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, the Tennessee Valley Authority must comply with the following terms and conditions, which carry out the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Annually between August 15 and September 30, TVA personnel will collect water temperature data from the Holston River below Cherokee Dam. Temperature data will be collected at approximately River Mile 48.0, River Mile 30.0, River Mile 20.0, and River Mile 5.0. Instream data loggers will be placed at each site prior to August 15 to record temperature data over the entire 45-day period. Readings will be taken continuously to provide daily average temperature with variation. If water temperatures at any of the sites decrease by more than two degrees (Celsius) beyond those predicted by the model (e.g., if the model predicted that water temperature would be 18 degrees Celsius during late August at River Mile 30, and the actual temperature at that site is 16 degrees, or lower), the Cookeville Field Office will be contacted. Data will be provided to the Cookeville Field Office supervisor each year at the middle and at the end of this 45-day period. Water temperature monitoring will be conducted for a minimum of four years.
2. TVA personnel will monitor the snail darter population in the Holston River. If declines in numbers, recruitment, or general health of the snail darter population are observed and are attributable to the changes in water temperature beyond

those predicted by the model, the Cookeville Field Office will be notified immediately. Monitoring of the snail darter population will be conducted for a minimum of four years.

3. Because of its rarity in the lower Holston River, it would be difficult to monitor the pink mucket population specifically. Therefore, benthic invertebrates will be monitored as surrogates for the pink mucket. If declines in numbers, recruitment, or general health of the populations are observed and are attributable to changes in water temperature beyond those predicted by the model, the Cookeville Field Office will be notified immediately. Benthic invertebrate monitoring will be conducted for a minimum of four years.

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Fish and Wildlife Service Law Enforcement Office at (Mr. Steve Middleton, Senior Resident Agent; 220 Great Circle Road, Nashville, TN 37228; telephone 615/736-5532). Additional notification must be made to the Fish and Wildlife Service Ecological Services Field Office in Cookeville, Tennessee. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. Loss of or declines in numbers of populations of temperature-sensitive invertebrates will be assumed to be comparable to loss of or declines in numbers (i.e., incidental take) of pink muckets. If, during the course of the action, populations of monitored invertebrates or snail darters decline by more than 25 percent, and the declines are attributable to changes in water temperature as a result of implementation of the preferred alternative, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Table 4. The incidental take reduced, based on the best available commercial and scientific information, as a result of the implementation of the RPMs.

SPECIES	INDIVIDUALS	
	Project Take	RPM Lowered**
Snail darter	None anticipated	N/A
Pink mucket	All individuals in the Holston River from HRM 30.0 to HRM 0.0	All individuals in the Holston River from HRM 30.0 to HRM 0.0

\*\* The number that the project takes will be reduced as a result of implementation of the RPMs.

Table 5. The index to monitor the level of take and how much the RPMs reduced, based on the best available commercial and scientific information, that level of take.

SPECIES	HABITAT			OTHER	
	Amount Present on Project Site	Amount Project Destroyed or Impacted	Amount that RPM's Lowered the Level of Impact**	Amount Project Impacted	RPM Lowered**
Snail darter	Populations present in Holston, French Broad, Hiwassee, Tennessee rivers; Sewee Creek, South Chickamauga Creek	None anticipated	N/A	None anticipated	N/A
Pink mucket	Populations in the Tennessee R., Clinch R., Holston R., French Broad R., Nolichucky R.	30 river miles in the Holston River	Impact not lowered	Holston River below Cherokee Dam	Impact not lowered

\*\* The amount of habitat or other measurement, used to monitor the level of take for this opinion and species that will be reduced as a result of implementation of the RPMs.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

We offer the following conservation recommendations for consideration:

1. The Tennessee Valley Authority should continue to maintain its existing database regarding the 59 species evaluated in the biological assessment. Changes in the species' status and distribution should be monitored and recorded. Data should be collected on the status and distribution of other rare, but currently unlisted, species in the Tennessee River drainage as well.
2. The Tennessee Valley Authority should continue to collect data regarding the populations of endangered and threatened species throughout the area under its jurisdiction. Periodic surveys should be conducted to maintain up-to-date information regarding the status of populations of those species. Data collection and surveys should be initiated for other species as they are added to the Service's list of endangered and threatened species.
3. The Tennessee Valley Authority should continue existing programs initiated for the protection of endangered and threatened species and their habitats throughout the area under its jurisdiction. The agency should adopt or maintain an adaptive management approach to management of the Tennessee River Valley system. This will allow for changes to be made as new species are listed or as new information becomes available concerning species already on the Service's list.
4. The Tennessee Valley Authority should begin outreach programs or continue existing outreach programs to educate the public about the importance of, and protection and recovery of, endangered and threatened species in the Tennessee River drainage. These programs should be presented or distributed to schools, civic groups, and local governments in the drainage.

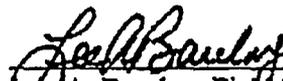
5. The Tennessee Valley Authority should continue to work closely with personnel from the Service, state fish and wildlife agencies, and other conservation organizations to ensure that operation of the Tennessee River Valley system is conducted in a way that will protect terrestrial and aquatic species and their habitats in the Tennessee River drainage.
6. Nutrient enrichment has been identified as a potential problem in the river reach from Guntersville Dam downriver to Decatur, Alabama. TVA should initiate monitoring within that river reach to determine if eutrophication is adversely affecting federally listed mussel species. If this is identified as a problem, TVA should investigate means to reduce enrichment within this reach of the river.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the conservation recommendations carried out.

#### REINITIATION NOTICE

This concludes formal consultation on the action outlined in the consultation request. As written in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary TVA involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the TVA action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the TVA action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease until reinitiation.

For this biological opinion the incidental take would be exceeded when the take exceeds more than 25 percent of the snail darter population or more than 25 percent of the surrogate invertebrates in the lower 30 miles of the Holston River, which is what has been exempted from the prohibitions of section 9 by this opinion. The Service appreciates the cooperation of TVA personnel during this consultation. We would like to continue working with you and your staff regarding the Reservoir Operations Study. For further coordination please contact Mr. Steve Alexander or Jim Widlak of this office at 931/528-6481, ext. 210 or 202, respectively.

  
\_\_\_\_\_  
Lee A. Barclay, Field Supervisor

2/09/04  
Date

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- U.S. Fish and Wildlife Service. 2003. Summary report to congress on the recovery program for threatened and endangered species, 1998 and 2000. Washington, D.C.
- U.S. Fish and Wildlife Service. 1994. Recovery plan for the green pitcher plant (*Sarracenia oreophila*). Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1992. Endangered and Threatened Species of the Southeast United States (The Red Book). Prepared by Ecological Services, Division of Endangered Species, Southeast Region. Government Printing Office, Washington, D.C. (two volumes).
- U.S. Fish and Wildlife Service. 1985. Recovery plan for the pink mucket pearly mussel (*Lampsilis orbiculata*). Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1983. Snail darter recovery plan. Atlanta, Georgia.

APPENDIX 1: Previous Biological Opinions Completed by Fish and Wildlife Service Biologists for the Endangered and Threatened Species Addressed in the Biological Opinion for the TVA Proposed Reservoir Operations Study.

SPECIES	YEAR	INCIDENTAL TAKE NUMBER
Pink mucket	1987	Take not anticipated
Pink mucket	1990	2 individuals
Pink mucket	1991	7 individuals
Pink mucket	1991	Not able to determine
Pink mucket	1992	Incidental take not anticipated with implementation of RPA
Pink mucket	1993	No take authorized
Pink mucket	1993	Not able to determine
Pink mucket	1994	Not able to determine
Pink mucket	1994	Not able to determine
Pink mucket	1994	Not able to determine
Snail darter	1995	One individual
Pink mucket	1996	Six individuals each species over and above 30 allowed for "rescue"
Pink mucket	1999	Not able to determine
Pink mucket	2000	Not able to determine
Pink mucket	2001	Two individuals
Snail darter	2002	No take anticipated
Pink mucket	2002	No take anticipated
Pink mucket	1994	One individual
Pink mucket	1998	One individual
Pink mucket	2000	17 individuals

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## **Appendix H**

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### **Results of Consultation Performed under the National Historic Preservation Act**

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**DRAFT**  
**PROGRAMMATIC AGREEMENT**  
**AMONG THE TENNESSEE VALLEY AUTHORITY AND THE ALABAMA,**  
**GEORGIA, MISSISSIPPI, NORTH CAROLINA, TENNESSEE, AND VIRGINIA**  
**STATE HISTORIC PRESERVATION OFFICERS**  
**Revised 2/11/2004**

WHEREAS, the Tennessee Valley Authority (TVA) operates a system of dams and reservoirs on the Tennessee River and its tributaries; and

WHEREAS, TVA proposes to revise its reservoir operating policy ("Undertaking") to provide greater overall public benefit as more fully described in Appendix A to this agreement; and

WHEREAS, the reservoirs affected by the undertaking are Watauga, South Holston, Boone, Cherokee, Douglas, Norris, and Pickwick in the state of Tennessee; Fontana, Chatuge and Hiwassee in the state of North Carolina; Chatuge, Nottely, and Blue Ridge in the state of Georgia; Wheeler and Pickwick in the State of Alabama; Pickwick in the state of Mississippi; and South Holston in the state of Virginia; and

WHEREAS, TVA has consulted with the State Historic Preservation Officers (SHPO) for the states of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia, and has determined the Area of Potential Effect (APE) for the Undertaking which consists of two parts, the shoreline erosion zone (direct APE) and the private development zone (indirect APE); and

WHEREAS, TVA has performed historic property identification surveys of portions (Appendix B) of the APE and has identified numerous historic properties eligible for listing in the National Register of Historic Places (Historic Properties); and

WHEREAS, TVA has determined that the revised reservoir operating policy could have an adverse effect on Historic Properties pursuant to 36 CFR Part 800, regulations effective January 11, 2001, implementing Section 106 of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, TVA has invited the Cherokee Nation, Eastern Band of Cherokee Indians, United Keetoowah Band, Muscogee (Creek) Nation of Oklahoma, Kialegee Tribal Town, Thlopthlocco Tribal Town, Alabama Quassarte Tribal Town, Alabama-Coushatta Tribe, Chickasaw Nation, Poarch Band of Creek Indians, Choctaw Nation of Oklahoma, Jena Band of Choctaw Indians, Seminole Nation of Oklahoma, Seminole Indian Tribe, the Shawnee Tribe, and the Eastern Shawnee Tribe of Oklahoma to be consulting parties; and

WHEREAS, the Eastern Band of Cherokee Indians has requested to be a concurring party to this agreement;

NOW THEREFORE, TVA and the Alabama, Georgia, Mississippi, North Carolina, Tennessee and Virginia SHPOs agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on National Register listed or eligible historic properties, and that these stipulations shall govern the Undertaking and all of its parts until this Programmatic Agreement expires or is terminated.

## STIPULATIONS

TVA will ensure that the following measures are carried out:

### I. Identification of Historic Properties

**A. Identification Plan.** In consultation with the SHPOs, TVA will develop and implement a Historic Property identification plan ("Identification Plan") for evaluating TVA-managed shoreline property within the APE not yet investigated for the presence of historic properties. The Identification Plan shall specify a schedule for investigation of affected reservoirs in consultation with the appropriate SHPOs and other signatories. Contingent upon availability of funds, TVA will seek to complete the survey of affected reservoir shorelines within five years after execution of this agreement. TVA shall submit the Identification Plan to the signatories for review and comment within six (6) months of execution of this agreement or implementation of the undertaking, whichever occurs later.

**B. Identification Reports.** Reports documenting the results of identification surveys will be submitted to the appropriate SHPOs and other signatories annually along with an annual assessment of erosion activity (see Stipulation II).

### II. Erosion Monitoring and Assessment

**A. Monitoring Plan.** In consultation with the SHPOs, TVA will develop and implement a plan ("Monitoring Plan") to monitor the rate of shoreline erosion at sites on affected TVA reservoirs where historic properties are located. This plan would help monitor any increased rate of erosion resulting from this undertaking's incremental operational changes. The Monitoring Plan shall specify a schedule for inspecting affected reservoirs at an interval of no greater than five years to determine the condition of Historic Properties within the APE. The Monitoring Plan will specify criteria for assessing the incremental erosion impacts on historic properties. TVA shall submit the Monitoring Plan to the signatories for review and comment within six (6) months of execution of this agreement or implementation of the undertaking, whichever occurs later.

**B. Erosion Assessment.** Under the Monitoring Plan, TVA will conduct an inspection of Historic Properties on the affected reservoirs to further assess the impacts of the

incremental changes in reservoir operations. Sites determined to be adversely affected by increased erosion will be evaluated to determine an appropriate treatment measure. A report of these investigations will be prepared and sent to all signatories for review. Erosion assessments will be made in consultation with the appropriate SHPO and other consulting parties.

## **II. Erosion Treatment**

**A. Treatment Criteria.** Historic Properties identified as being adversely affected by erosion will be evaluated to determine an appropriate treatment measure. Site-specific treatment measures will be reviewed and commented upon by the appropriate SHPO and other signatories. TVA will take these comments into account as it addresses appropriate treatment.

**B. Treatment Alternatives.** In consultation with the appropriate SHPO and other signatories, TVA will determine the appropriate treatment measure to be applied to Historic Properties found to be adversely affected by reservoir shoreline erosion. Treatment alternatives include but are not limited to:

1. Shoreline stabilization using riprap, bio-engineering, or other methods as determined appropriate
2. Data recovery excavations

## **III. Treatment of Human Remains:**

TVA shall ensure that the treatment of any human remains and associated funerary objects discovered within the project area complies with all applicable state and federal laws, including the Native American Graves Protection and Repatriation Act (NAGPRA), concerning treatment of human remains. Should human remains be encountered on federal land during monitoring investigations, TVA shall immediately notify federally recognized Indian tribes that may have a cultural affiliation with the remains pursuant to the provisions of NAGPRA. TVA will consult with these tribes regarding the appropriate disposition of these remains.

## **IV. Historic Properties on Private lands**

Although TVA has no control over adjacent private lands where reservoir-related development may occur, TVA has authority under Section 26a of the TVA Act to regulate activities that could affect flood control, navigation or public lands. To the extent allowable under this authority, TVA will seek to assist private developers to avoid adversely affecting historic properties within the indirect APE of the ROS.

## **V. Reports**

TVA shall prepare an annual report on its Historic Property identification and shoreline erosion monitoring activity, and shall submit this report to the SHPOs and other signatories for review and comments. This report will include a description of all shorelines surveyed and monitored, and of any assessments conducted of the conditions of historic sites existing within these areas. The assessment will compare site condition to previously reported assessments of site condition, and will include a rating of treatment need according to criteria established in the monitoring plan. All parties shall be afforded thirty (30) days to review and comment on these reports.

## **VI. Administrative Conditions**

1. If the commencement of implementation of Stipulations I-IV has not occurred within one (1) year from the date of this agreement's execution or implementation of the undertaking, whichever occurs later, TVA, the SHPOs, and other signatories shall review the agreement to determine whether the agreement should be extended. If an extension is deemed necessary, TVA, the SHPOs, and other signatories will consult to make appropriate revisions to the agreement in accordance with 36 CFR § 800.6(c).
2. If the commencement of implementation of Stipulations I-IV has not occurred within three (3) years from the date of this agreement's execution or implementation of the undertaking, whichever occurs later, this agreement shall be considered null and void, unless the signatories have agreed in writing as provided in Paragraph VI (1) above to an extension for carrying out its terms. Upon the agreement's becoming null and void, TVA, the SHPOs, and the consulting parties will resume consultation pursuant to 36 CFR § 800.
3. The signatories to this agreement may agree to amend the terms of the agreement. Such amendment shall be effective upon the signatures of all signatories to this agreement, and the amendment shall be appended to the agreement as an attachment.
4. Should any signatory object within thirty (30) days after receipt of any plans, specifications, contracts, or other documents provided for review pursuant to this agreement, TVA shall consult with the objecting party to resolve the objection.
5. If any signatory to this agreement determines that the terms of the agreement cannot be or are not being carried out, the signatories shall consult to seek an amendment to the agreement. If the agreement is not amended, TVA or any individual SHPO may terminate the agreement, except that termination by an individual SHPO shall only terminate the application of the agreement within the jurisdiction of that SHPO.

**EXECUTION** of this Programmatic Agreement by the Tennessee Valley Authority and the Alabama, Georgia, Mississippi, North Carolina, Tennessee and Virginia State Historic Preservation Officers, the submission of documentation and filing of this Agreement with the Advisory Council, and implementation of its terms evidence that TVA has, in accordance with Section 106 of the National Historic Preservation Act, taken into account the effects of this undertaking on historic properties and afforded the Advisory Council an opportunity to comment.

**SIGNATORY PARTIES:**

**TENNESSEE VALLEY AUTHORITY**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Kathryn J. Jackson, Executive Vice President, River System Operations and Environment

**ALABAMA STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**GEORGIA STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**MISSISSIPPI STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**TENNESSEE STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**VIRGINIA STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**CONCURRING PARTIES:**

**EASTERN BAND OF CHEROKEE INDIANS**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Title: \_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Title: \_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Title: \_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Title: \_\_\_\_\_

## Appendix A

### Preferred Reservoir Operating Policy Alternative

**Purpose:** The purpose of the Preferred Alternative is to capture the balance of public benefits that would result if the reservoir system is operated to increase both reservoir and tailwater recreational opportunities. This alternative was created after extensive public review of the Draft Environmental Impact Statement (DEIS) and additional analyses. The goal was to enhance public value while minimizing impacts to the environment and to other operating objectives. The alternative combines and adjusts desirable features of the alternatives identified in the DEIS to create a more feasible, publicly responsive alternative.

A central component in formulating the Preferred Alternative was flood risk. With the exception of the No Action Alternative (Base Case), detailed analyses indicated that all of the alternatives evaluated in the DEIS would result in unacceptable increases in the risk of flooding at one or more critical locations in the Tennessee Valley. Addressing flood risk was the first step in creating the Preferred Alternative.

DEIS Reservoir Recreation A Alternative was used as a baseline for developing the first in a series of eight Preferred alternatives. TVA used this series of alternatives to eliminate increases in average annual flood damages at critical locations. TVA also used this series of alternatives to develop a more equitable way of balancing pool levels among the tributary reservoirs. Each successive alternative included modifications to individual project flood guides and/or regulating zones that were intended to address problem areas while providing changes in reservoir pool levels that would enhance a range of benefits. Changes to individual project guide curves were made both to resolve flood damage issues immediately downstream from that project, as well as downstream at damage centers such as Chattanooga and Savannah, Tennessee. As the flood risk issues were addressed, TVA included enhancements to reservoir and tailwater recreation and navigation, while considering impacts to low-cost/reliable electricity, water quality, and water supply. As part of these simulations, TVA investigated using both flow constraints and target reservoir elevation constraints as the mechanism for restricting drawdown from June through Labor Day. Based on the results of these simulations, TVA has determined that operating objectives could best be met by using flow constraints that reduce impacts to water quality and power system costs. Flood risk

considerations indicated that earlier fill of tributary and main river projects was not feasible. No changes in seasonal water levels on Kentucky Reservoir were included as part of this alternative, responding to concerns expressed by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, state agencies, and some members of the public.

**Changes in Operations.** Under the Preferred Alternative, tributary reservoir drawdown would be restricted June 1 through Labor Day, summer operating zones would be maintained through Labor Day at four additional main river projects, and higher winter pool operating ranges would be established at 10 tributary reservoirs. Base Case minimum flows, except for the increases noted below, and the dissolved oxygen (DO) targets adopted following completion of the 1990 Lake Improvement Plan would continue to be met.

Subject to flood control operations or extreme drought conditions, scheduled releases would be provided at five additional tributary projects to increase tailwater recreational opportunities. (Under the No Action Alternative, recreational releases are not formally scheduled at these five projects and are made only after other operating requirements have been met.)

Subject to each project meeting its own minimum flow requirements and a proportionate share of the system minimum flow requirements, elevations on 10 tributary reservoirs would be maintained as close as possible to the flood guides from June 1 through Labor Day. When the volume of water in storage is more than the system minimum operations guide curve, the weekly average system minimum flow requirement measured at Chickamauga Dam would be increased each week from 14,000 cubic feet per second (cfs) the first week of June to 25,000 cfs the last week of July. Beginning August 1 and continuing through Labor Day, the weekly average flow requirement would be 29,000 cfs. If the volume of water in storage is less than the system minimum operations guide (MOG) curve, only 13,000 cfs weekly average minimum flows would be released from Chickamauga Dam between June 1 and July 31, and only 25,000 cfs weekly average minimum flows would be released from August 1 through Labor Day. Continuous minimum flows would be provided in the Apalachia bypass reach from June 1 through November 30.

Under the Preferred Alternative, the winter flood guide levels would be raised on 10 tributary reservoirs based on flood risk analysis. On Wheeler Reservoir, the minimum winter elevation would be raised by 0.5 foot to better ensure an 11-foot minimum depth in the navigation channel. Steady water releases up to 25,000 cfs of flow would be

provided as necessary at Kentucky Dam to maintain a tailwater elevation of 301. Great Falls Reservoir would be filled earlier to reach full summer pool by Memorial Day. On Fort Loudoun, Watts Bar, and Chickamauga reservoirs, the fill period would follow the Base Case fill schedule during the first week in April. The fill schedule on these three reservoirs then would be delayed to reach summer operating zone by mid-May. Specific details of the Preferred Alternative are presented in Tables 1 and 2.

During critical power system situations, reservoir operations may temporarily deviate from these operating guidelines to meet power system needs. In such situations, water stored in the reservoirs would be used to preserve the reliability of the power system.

**Achievement of Objectives.** The Preferred Alternative was developed to combine the desirable features of the alternatives identified in the DEIS. Responding to the values and objectives expressed by the public during the EIS review process, this alternative was designed to re-balance operating system priorities to achieve TVA's goal of increasing the overall public value of the reservoir system consistent with, but not limited to, the operating priorities established by the TVA Act.

Under the Preferred Alternative, TVA would preserve the primary reservoir system operating objectives of flood control, navigation, and power generation. It would increase reservoir and tailwater recreation opportunities. This alternative would not increase annual average flood damages at any critical location within the Tennessee Valley, including Chattanooga. Adoption of the Preferred Alternative would increase the minimum depth of the Tennessee River navigation channel at two locations and would maintain power system reliability while lessening impacts to delivered cost of power compared to other alternatives. This alternative also would maintain tailwater minimum flows and dissolved oxygen targets while minimizing impacts on reservoir water quality, and would provide for more balanced tributary reservoir levels across the system.

Table 1. General description of operations under the Preferred Alternative. [to be incorporated into EIS Table 3.3-01]

Policy Alternative	Changes to Reservoir Operating Guidelines (Guide Curves)	Changes to Water Release Guidelines
Preferred Alternative	<ul style="list-style-type: none"> <li>• Subject to each project meeting its minimum flow requirements and a proportionate share of the system minimum flow requirements, maintain tributary reservoir elevations as close as possible to the flood guides during the summer (June 1 through Labor Day)</li> <li>• Begin unrestricted tributary reservoir drawdown after Labor Day</li> <li>• Maintain Base Case summer operating zone through Labor Day for Chickamauga, Guntersville, Pickwick, and Wheeler</li> <li>• Raise winter flood guide to elevations based on flood risk analysis for 10 tributary reservoir projects</li> <li>• Great Falls—Fill reservoir to summer pool by Memorial Day</li> <li>• Raise minimum winter pool elevation by 0.5 foot at Wheeler</li> <li>• Follow the Base Case fill schedule during the first week in April for Fort Loudoun, Watts Bar, and Chickamauga. Then, delay the fill to reach summer operating zone by mid-May</li> </ul>	<ul style="list-style-type: none"> <li>• If above system MOG curve, increase weekly average minimum flow from Chickamauga each week during June and July (beginning with 14,000 cfs the 1<sup>st</sup> week in June increasing to 25,000 the last week in July)</li> <li>• If below system MOG curve, release 13,000 cfs weekly average minimum flow from Chickamauga during June and July</li> <li>• Release 29,000 cfs weekly average minimum flow from Chickamauga from August 1 through Labor Day if above system MOG or 25,000 cfs if below system MOG curve</li> <li>• Provide continuous minimum flows up to 25,000 cfs at Kentucky, as needed, to maintain minimum tailwater elevation of 301</li> <li>• Maintain Base Case minimum flow commitments with additional scheduled tailwater recreation releases</li> <li>• Provide 25 cfs in Apalachia bypass reach from June 1 through November 1</li> </ul>

Table 2. Components of the Preferred Alternative. [to be incorporated into EIS Appendix B]

Alternative Characteristics	Tributary Reservoirs	Mainstem Reservoirs
<p>Modify summer reservoir elevations and/or drawdown dates</p>	<ul style="list-style-type: none"> <li>• Subject to each project meeting its minimum flow requirements and a proportionate share of the system minimum flow requirements, maintain elevations as close as possible to the flood guides during the summer (June 1 through Labor Day) for Blue Ridge, Chatuge, Cherokee, Douglas, Fontana, Nottely, Hiwassee, Norris, South Holston, and Watauga</li> <li>• No changes to the following reservoirs for the reasons described:               <ul style="list-style-type: none"> <li>• Apalachia—run-of-river project</li> <li>• Bear Creek—maintains summer elevations to mid-November</li> <li>• Boone—maintains summer elevations through Labor Day.</li> <li>• Cedar Creek—maintains summer elevations through October 31</li> <li>• Fort Patrick Henry—run-of-river project</li> <li>• Great Falls—maintains summer elevations through September 30</li> <li>• Little Bear Creek—maintains summer elevations through October 31</li> <li>• Melton Hill—run-of-river project</li> <li>• Normandy—subject to meeting downstream minimum flows summer elevations are maintained through mid-October</li> <li>• Ocoee #1—maintains summer elevations through October 31</li> <li>• Tims Ford—maintains summer elevations through mid-October</li> <li>• Upper Bear Creek—maintains the same fluctuation range year round</li> <li>• Wilbur—run-of-river project</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Maintain Base Case summer operating zone through Labor Day for Chickamauga, Guntersville, Pickwick, and Wheeler</li> <li>• Eliminate 1 foot drawdown from August 1 to November 1 for Watts Bar.</li> <li>• No changes to the following reservoirs for the reasons described:               <ul style="list-style-type: none"> <li>• Fort Loudoun—maintains summer operating zone through October 31</li> <li>• Nickajack—run-of-river project</li> <li>• Wilson—maintains summer operating zone through November 30</li> <li>• Kentucky – potential resource and flood risk impacts</li> </ul> </li> </ul>

Table 2. (Continued)

Alternative Characteristics	• Tributary Reservoirs	Mainstem Reservoirs
Modify winter reservoir elevations and/or fill dates	<ul style="list-style-type: none"> <li>• Raise winter flood guide to elevations based on flood risk analysis for Boone, Chatuge, Cherokee, Douglas, Fontana, Hiwassee, Norris, Nottely, South Holston, and Watauga</li> <li>• Great Falls—Fill reservoir to summer pool by Memorial Day</li> </ul>	<ul style="list-style-type: none"> <li>• Raise minimum winter pool elevation by 0.5 foot at Wheeler</li> <li>• Follow the Base Case fill schedule during the first week in April for Fort Loudoun, Watts Bar, and Chickamauga. Then, delay the fill to reach summer operating zone by mid-May</li> </ul>
Modify drawdown restrictions	<ul style="list-style-type: none"> <li>• Restrict drawdown June 1 through Labor Day and proportion withdrawals to meet system minimum flows to keep tributary reservoir pool elevations as close as possible to the flood guides</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain Base Case summer operating zone at Chickamauga, Guntersville, Wheeler and Pickwick through Labor Day</li> </ul>
Modify water releases	<ul style="list-style-type: none"> <li>• Same as Base Case minimum flow commitments except for additional scheduled tailwater recreation releases as shown below</li> <li>• Apalachia -- provide 25 cfs continuous minimum flow in bypass reach from June 1 through November 30</li> </ul>	<ul style="list-style-type: none"> <li>• If above system MOG curve, increase weekly average minimum flow from Chickamauga each week during June and July (beginning with 14,000 cfs the 1<sup>st</sup> week in June increasing 1,000 cfs each week for the next 3 weeks, then increasing 2,000 cfs each week for the next 4 weeks and ending with 25,000 the last week in July)</li> <li>• If below system MOG curve, release 13,000 cfs weekly average minimum flow from Chickamauga during June and July</li> <li>• Release 29,000 cfs weekly average minimum flow from Chickamauga from August 1 through Labor Day if above system MOG or 25,000 cfs if below system MOG curve</li> <li>• Provide continuous minimum flows up to 25,000 cfs at Kentucky, as needed, to maintain minimum tailwater elevation of 301</li> </ul>

Table 2. (Continued)

Alternative Characteristics	Tributary Reservoirs	Mainstem Reservoirs
<p>Modify tailwater recreation releases</p>	<ul style="list-style-type: none"> <li>• No change in tailwater recreation releases below Great Falls, Ocoee #2, Ocoee #3, Tims Ford, and Upper Bear Creek reservoirs</li> <li>• Provide tailwater recreation flows for the projects as described below:               <ul style="list-style-type: none"> <li>• Apalachia                   <ul style="list-style-type: none"> <li>May 1 through October 31 (Saturdays and Sundays only)</li> <li>Minimum flow only prior to 10 a.m.</li> <li>Memorial Day through Labor Day (7 days per week)                       <ul style="list-style-type: none"> <li>1 unit use from 10 a.m. – 11 a.m.</li> <li>2 unit use from 11 a.m. – 7 p.m. (8 hours)</li> </ul> </li> <li>Labor Day through October 31 (Saturdays only)                       <ul style="list-style-type: none"> <li>1 unit use from 10 a.m. – 11 a.m.</li> <li>2 unit use from 11 a.m. – 3 p.m. (4 hours)</li> </ul> </li> </ul> </li> <li>• Norris                   <ul style="list-style-type: none"> <li>May 1 through October 31 (Saturdays and Sundays only)</li> <li>Minimum flow only prior to 10 a.m.</li> <li>Memorial Day through Labor Day (Saturdays and Sundays only)                       <ul style="list-style-type: none"> <li>1 unit use from 10 a.m. – 2 p.m. (4 hours)</li> <li>2 unit use from 2 p.m. – 6 p.m. (4 hours)</li> </ul> </li> <li>Labor Day through October 31 (Saturday only)                       <ul style="list-style-type: none"> <li>1 unit use from 10 a.m. – 1 p.m. (3 hours)</li> <li>2 unit use from 1 p.m. – 4 p.m. (3 hours)</li> </ul> </li> </ul> </li> <li>• Ocoee #1                   <ul style="list-style-type: none"> <li>June 1 through August 31 (Tuesdays and Wednesdays only)</li> <li>Minimum flow only until 11 a.m.</li> <li>Minimum 2 unit use from 11 a.m. to 5 p.m. (6 hours)</li> </ul> </li> <li>• South Holston                   <ul style="list-style-type: none"> <li>April 1 through October 31</li> <li>Increase minimum flow below the weir to 150 cfs</li> </ul> </li> <li>• Watauga operation for recreation flows below Wilbur                   <ul style="list-style-type: none"> <li>Memorial Day through Labor Day                       <ul style="list-style-type: none"> <li>Mondays – Fridays - 1 unit use from 1 p.m. – 6 p.m. (5 hours)</li> <li>Saturdays – 1 unit use from 12 p.m. – 1 p.m.</li> <li>2 unit use from 1 p.m. – 5 p.m. (4 hours)</li> <li>1 unit use from 5 p.m. – 6 p.m.</li> </ul> </li> <li>Labor Day through October 31                       <ul style="list-style-type: none"> <li>Saturdays only - 1 unit use from 1 p.m. – 6 p.m. (5 hours)</li> </ul> </li> </ul> </li> </ul> </li> </ul>	<p>No change</p>

**Appendix B**  
**Status of Archaeological Survey of the Area of Potential Effect**

**Status of Affected Reservoir Shoreline Survey.**

<b>Reservoir</b>	<b>Surveyed*</b>	<b>Unsurveyed**</b>	<b>Total***</b>	<b>% Surveyed</b>
<i>Blue Ridge</i>	51.2	16.9 (1)	68.1	75.2%
<i>Chatuge</i>	39.9	88.1	128	31.2%
<i>Cherokee</i>	199.4	195.1	394.5	50.5%
<i>Fontana</i>	26.8	211	237.8	11.3%
<i>Hiwassee</i>	126.1	55.4 (1)	181.5	69.5%
<i>Norris</i>	223	585.4	808.4	27.6%
<i>Nottley</i>	49.3	52.8	102.1	48.3%
<i>Pickwick</i>	293.9	196.7	490.6	59.9%
<i>South Holston</i>	48.6	133.3	181.9	26.7%
<i>Watuaga</i>	41.7	63.3	105	39.7%
<i>Wheeler</i>	566.9	470.3	1027.2	55.2%
<b>Total</b>	<b>1756.1</b>	<b>2105.6</b>	<b>3851.7</b>	<b>45.6%</b>

Numbers reflect mileage along shoreline per reservoir

\*This survey data was based on the shoreline information coded 1, 2 and 3 in the database. This data includes buffers for protection/reliability of original recordation. Therefore includes some areas that have not been considered surveyed, but should not be of an amount that would dramatically effect these numbers.

\*\*This data was obtained by subtracting Surveyed from Total.

\*\*\*Shoreline mileage obtained from Shoreline Management Initiative Table.

(1) Approximately 90% of the unsurveyed shorelines on these two reservoirs consist of slopes greater than 20% and are therefore regarded to have a very low potential to contain archaeological resources.

**Status of Shoreline Survey on Multi-State Reservoirs**

<b>Reservoir</b>	<b>Total Miles</b>	<b>Surveyed</b>	<b>Unsurveyed</b>	<b>% Surveyed</b>
<b>Chatuge</b>	<b>GA</b>	<b>GA</b>	<b>GA</b>	<b>GA</b>
	70.6	35.5	35.1	50.3%
	<b>NC</b>	<b>NC</b>	<b>NC</b>	<b>NC</b>
	57.4	4.8	52.6	8.4%
<b>Pickwick</b>	<b>TN</b>	<b>TN</b>	<b>TN</b>	<b>TN</b>
	48.8	41.8	6.9	85.8%
	<b>MS</b>	<b>MS</b>	<b>MS</b>	<b>MS</b>
	71.7	48.7	22.9	68.0%
	<b>AL</b>	<b>AL</b>	<b>AL</b>	<b>AL</b>
	370.1	203.4	166.9	55.0%
<b>South Holston</b>	<b>TN</b>	<b>TN</b>	<b>TN</b>	<b>TN</b>
	134.2	10.9	123.3	8.1%
	<b>VA</b>	<b>VA</b>	<b>VA</b>	<b>VA</b>
	47.7	37.7	10	79.0%

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