



U.S. Fish & Wildlife Service

Ohio River Valley Ecosystem Team

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STRATEGIC PLAN *for* CONSERVATION

of

FISH AND WILDLIFE SERVICE

TRUST RESOURCES

in the

OHIO RIVER VALLEY ECOSYSTEM

U.S. Fish and Wildlife Service Regions 5, 4, and 3

OHIO RIVER VALLEY ECOSYSTEM TEAM

DECEMBER 1999

(Second Revision)

BACKGROUND

The U.S. Fish and Wildlife Service (Service) is undertaking an ecosystem approach to conservation to enable the agency to more efficiently and effectively accomplish its mission, which is:

*...to conserve,
protect, and enhance
the Nation's fish and
wildlife and*

*their habitats for the
continuing benefit of
the American people.*

Protection of the Service's trust resources (endangered species, migratory birds, interjurisdictional fisheries, marine mammals, and Service lands) will require the long-term maintenance of healthy ecosystems which, in turn, will require a holistic view of resource conservation, recognizing that all things are connected. To be effective, an ecosystem approach will not only mean protecting or restoring the function, structure, and species composition of an ecosystem but also factoring in the impacts of and providing for sustainable socioeconomic activity.

The Service has adopted watersheds as the basic unit for ecosystem management. For planning purposes, watersheds have been clustered into ecosystem units, and interdisciplinary teams of Service personnel have been formed to develop strategic plans for the conservation of Service trust resources in these ecosystem units.

The Ohio River Valley Ecosystem (ORVE) includes portions of ten states and straddles three Service administrative regions (Northeast, Southeast, and Northcentral). The Ohio River Valley Ecosystem Team is composed of Service personnel from each region, and is charged with the development and implementation of a strategic plan for conserving Service trust resources in the ORVE.

*The purpose of this
strategic plan is to
outline goals,
objectives, and
strategies to protect
and restore Service
trust resources and
ecological integrity
within the ORVE and to
support compatible and
sustainable uses of the
ecosystem's natural*

resources.

The plan recognizes that ecosystem function, natural community structure, and species composition are integral to the conservation of the Service's trust resources. It also recognizes that the Service is just one of many partners, all of whom share responsibility for ecosystem health. These partners include Federal, State, tribal, and local agencies; communities; organizations; and corporate and private landowners, among others. The Service will enlist the assistance of partners in order to accomplish the goals set forth in this document and will offer support to further the activities of other organizations and individuals with complementary objectives.

PHYSIOGRAPHY

The Ohio River Basin (Figure 1) drains a total area of approximately 141,000 square miles (excluding the Tennessee and Cumberland river watersheds as well as the New River drainage in the western portions of Virginia and North Carolina) and includes portions of Illinois, Indiana, Kentucky, Maryland, New York, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. The Ohio, the ecosystem's primary river, is formed by the confluence of the Allegheny and Monongahela rivers at Pittsburgh, Pennsylvania. Major tributaries flowing into the Ohio, from upstream to downstream, include the Muskingum, Kanawha, Guyandotte, Big Sandy, Scioto, Licking, Great Miami, Kentucky, Green, and Wabash rivers. The Ohio flows 981 miles in a southwesterly direction, joining the Mississippi River at Cairo, Illinois.

The land in the Ohio Basin can be divided into essentially three basic parts, corresponding to the Basin's three major physiographic provinces. The Appalachian Plateau in the eastern portion is characterized by rugged topography resulting largely from the erosion of flat-lying rocks. The permeable sand and gravel deposits in the valleys of the drainage system provide moderate groundwater supplies. The area has extensive forest cover, generally poor quality soils, narrow valleys, steep stream gradients, flash floods during the rainy season, and low stream flows during dry seasons.

The Central Lowlands physiographic province occupies the northwestern third of the Basin and is the result of several glaciations. Glaciers covered most of the area in recent geologic history, and left soil deposits which are now some of the richest agricultural lands in the Basin. The topography is flat to slightly rolling and the drainage pattern has been significantly altered from its original, prior-to-glaciation condition. In some instances, buried preglacial streams provide extensive groundwater resources.

The Interior Low Plateau physiographic province in the southwestern third of the Basin is dominated by limestone rock which covers most of this region. This has resulted in the rolling terrain forming the Lexington Plains and Bluegrass regions where farming dominates. Areas of local rugged relief are forested, their soils thin. Groundwater has the typical variability of limestone areas.

Three other physiographic provinces are represented over a small areal extent in the Basin. The Valley and Ridge and the Blue Ridge provinces occur in the southeasternmost parts of the Basin, and the Gulf Coastal Plain province occupies the lowermost part of the Basin where the Ohio joins the Mississippi River.

BIOLOGICAL RESOURCES

The Ohio River ecosystem bisects three regions of the Deciduous Forest Formation of eastern North America: the Mixed Mesophytic Forest Region (upper basin, roughly upstream of Portsmouth, Ohio), the Western Mesophytic Forest Region (lower basin from Portsmouth, Ohio, to Paducah, Kentucky), and the Mississippi Alluvial Plain Section of the Southeastern Evergreen Forest Region (lowermost portion of the basin from Paducah, Kentucky, to Cairo, Illinois).

The mixed mesophytic and western mesophytic forests have been classified broadly as a tulip poplar-oak region. The dense, mixed mesophytic forest contains a fair abundance of two indicator species, white basswood and yellow buckeye, in a total group of 15 to 20 dominant species. The western mesophytic forest is marked by a transition from extensive mixed mesophytic communities in the east to extensive oak and oak-hickory communities in the west. The western mesophytic forest is less dense, has few dominants, and usually lacks the two indicator species of the mixed mesophytic forest.

In the lower, downstream portion of the ecosystem, near Paducah, Kentucky, the Ohio River enters the northernmost extension of the Mississippi Alluvial Plain. In this alluvial region, three subdivisions of "bottomland forest" (i.e., palustrine forested wetland) are recognized: swamp forest, hardwood bottoms, and ridge bottoms. The swamp forest, consisting principally of cypress and tupelo gum, occupies land on which water stands throughout the year except during periods of extreme drought. The hardwood bottoms contain a large number of species, frequently flood, and generally remain covered with water through the late winter and spring. Ridge

bottoms contain some of the tree species of hardwood bottoms, but have a larger number of oaks and hickories; occurring at slightly higher elevations than hardwood bottoms, these areas are covered by water only during floods.

The rich flora and fauna of the ecosystem reflect its diverse physiography and unique geologic past. Numerous Service trust resources occur in the ecosystem, including many federally listed endangered/ threatened plants, mussels, fishes, birds and mammals; waterfowl and other migratory water birds; and neotropical migratory land birds.

The unusually rich and diverse fauna found in the ecosystem is the product of a multitude of biotic and abiotic factors which have evolved over time. Throughout geologic time, changes in such factors as topography, climate, and geomorphology have formed, modified, and eliminated habitats and consequently have had a profound effect upon the distribution of the faunal assemblages in the ecosystem. Due to the ecosystem's central geographical location in the eastern United States, some species with northern affinities and others with southern affinities occur in the ecosystem in addition to those common to the central region of the country.

STRESSES

Much of the region's economic activity--agriculture, lumbering, mining, and recreation--is based on the watershed's natural resources. Sustaining most of these activities requires maintenance of a healthy ecosystem. Stress from human activities has adversely affected the ecological integrity of the ORVE, and there are indications that this stress is increasing.

Environmental alteration and degradation are continuing challenges to the maintenance of a productive and healthy ORVE. Resources of the area are threatened by land conversion, poor land-use practices, direct and indirect physical alteration of the area's rivers and streams, acid mine drainage, destruction of wetland habitats, and both point- and nonpoint-source discharges of pollutants. Herbicides, insecticides, nutrients, and sediment are significant components of the agricultural runoff that adversely affect aquatic systems throughout the area. Acid precipitation and other airborne pollutants are having dramatic effects on aquatic and terrestrial communities, particularly at high elevations. Natural resources are further threatened by an expanding human population and its increased demand for renewable and nonrenewable resources. Contamination of both aquatic and

terrestrial systems through acid mine drainage and the accidental release of toxic chemicals is a continuing threat. Operation and maintenance of the inland navigation system and the recent invasion of the nonindigenous zebra mussel are having significant adverse impacts on native flora and fauna of the area's rivers and streams. Other nonindigenous species are threatening native components of aquatic and terrestrial systems throughout the area. The expansion of urban and suburban areas within the ecosystem and the concurrent loss of forest, wetlands, agricultural lands, and other types of open space associated with this expansion have reduced the quantity and quality of natural habitats available to fish and wildlife.

CONCLUSION

Given the abundance of ecosystem-altering influences past and present, a coordinated landscape-scale effort is necessary to reverse and prevent further declines in biological resources. A healthy ecosystem will provide much more diverse flora and fauna. It will provide clean air and water; healthy soil; sustainable harvests from forests and fields; and abundant outdoor recreational opportunities for this and future generations. Through the efforts of the Service and other partners, the ORVE can become a healthier ecosystem and a model of how socioeconomic objectives can be accomplished without sacrificing the environment.

OHIO RIVER VALLEY ECOSYSTEM PLAN

A. Mission Statement

Work cooperatively with other government agencies and the private sector for the conservation of the Ohio River Valley Ecosystem's native animal and plant diversity through perpetuation of a dynamic, healthy ecosystem.

B. Broad Ohio River Valley Ecosystem Goals:

- 1. Protect, restore and enhance habitats and essential processes necessary to maintain healthy native animal and plant populations.**
- 2. Protect, restore and enhance diversity of native flora and fauna.**
- 3. Promote and support compatible and sustainable uses of the ecosystem's resources and utilize existing laws, regulations, and influence to control incompatible and unsustainable uses of these resources.**
- 4. Develop public awareness and support for ecosystem resource issues.**

c. Ohio River Valley Ecosystem Resource Priorities

RESOURCE PRIORITY #1

In cooperation with partners, reverse the decline of native aquatic mollusks within the Ohio River Valley Ecosystem with emphasis on endangered, threatened and candidate species and species of concern.

Action Strategy A: Obtain baseline inventory and develop a standardized data management system (that includes a Geographic Information System) for and continue monitoring of mussel populations and habitat with emphasis on 4 or more focus areas by FY 2000 and continue to support acquisition of life history data.

Action Strategy B: Conduct analyses of existing and potential threats (e.g., acid mine drainage, point and non-point source pollution, exotics, habitat loss, illegal take, etc.) for mussel resources with emphasis on 4 or more focus areas by FY 2000. Action Strategy C: Continue to implement plans, and update, as needed, to protect mussels and remediate conditions identified in threat analyses that are adversely impacting mussels.

Action Strategy D: Continue to develop and disseminate education and outreach materials to increase public awareness and support for conservation of mussel resources.

RESOURCE PRIORITY #2

In cooperation with partners, reverse the decline and achieve stable, viable populations of migratory landbirds and other bird species of concern.¹

Action Strategy A: Obtain information on the distribution, abundance, trends, and habitat associations of migratory landbirds and other bird species of concern occurring in the ORVE, and consolidate this information into systems (reports, databases, or GIS) useful to resource managers.

Action Strategy B: Using information obtained in "Action Strategy A" and other information, conduct analyses of existing and potential threats to migratory landbirds and other bird species of concern in the ORVE

Action Strategy C: Protect, restore, and enhance habitat to stabilize declining populations and achieve viable populations of migratory landbirds and other bird species of concern whose breeding range occupies a significant portion of the ORVE.

Action Strategy D: Disseminate educational and outreach information in cooperation with Partners in Flight and using other delivery mechanisms.

Action Strategy E: Work within the FWS and with Partners in Flight to monitor and influence the situation of migratory landbirds and other bird species of concern where they winter outside the ORVE.

RESOURCE PRIORITY #3

In cooperation with partners, reverse the decline of native fishes with emphasis on interjurisdictional listed and candidate species and species of concern.¹

Action Strategy A: Obtain baseline information and develop and maintain a standardized data management system (that includes a Geographic Information System) for, and continue monitoring of high priority fish species (e.g., paddlefish; blue sucker; crystal darter; lake sturgeon and shovelnose sturgeon, etc.); identify focus areas for these species.

Action Strategy B: Conduct analyses of existing and potential threats (e.g., acid mine drainage; point and non-point source pollution; exotics; habitat loss; illegal take, etc.) for fish resources with emphasis on species and focus areas identified in Action Strategy A by FY 2000.

Action Strategy C: Prepare and implement plans to protect fishery resources and to remediate conditions identified in threat analyses that are adversely impacting fish.

Action Strategy D: Develop and disseminate education and outreach materials to increase public awareness and support for conservation of fish resources with emphasis on species and focus areas identified in Action Strategy A.

RESOURCE PRIORITY #4

In cooperation with partners, protect and restore karst/cave habitat supporting listed and candidate species and species of concern.¹

Action Strategy A: Obtain baseline inventory and develop a standardized data management system (that includes a Geographic Information System) for, and continue the monitoring of, cave/karst habitat and dependent flora and fauna (e.g., bats, cave fish, cave invertebrates); identify focus areas.

Action Strategy B: Conduct analyses of existing and potential threats (e.g., water quality degradation, human disturbance, mining) for karst/cave habitats and dependent flora and fauna, with emphasis on specific focus areas.

Action Strategy C: Prepare and implement plans to protect karst/cave habitats and to remediate conditions identified in threat analysis that are adversely impacting karst

cave habitat and dependent flora and fauna.

Action Strategy D: Develop and disseminate education and outreach materials to increase public awareness of and support for conservation of karst/cave habitat and dependent flora and fauna.

RESOURCE PRIORITY #5

In cooperation with partners, protect and restore wetland, riverine and riparian habitat in the Ohio River watershed for the protection and enhancement of migratory waterbirds and other wetland dependant species of concern.

Action Strategy A: Update baseline inventory data, develop and maintain a standardized data management system (that includes a Geographic Information System), and continue monitoring wetland, riverine and riparian habitat.

Action Strategy B: Conduct analyses of existing and potential threats (e.g., habitat loss, acid mine drainage, point and non-point pollution, exotics) to wetland, riverine and riparian resources.

Action Strategy C: Address declines in quantity and/or quality of wetland, riverine and riparian habitats and migratory waterbirds and other wetland dependant species habitats through increased Service efforts in (1) use of existing authorities; (2) acquisitions, easements, and other means; and (3) restorations.

Action Strategy D: Develop and disseminate education and outreach materials to increase public awareness of, and support for, the conservation of wetland, riverine and riparian habitat, as appropriate.

RESOURCE PRIORITY #6

In cooperation with partners, reduce the decline and promote the recovery of rare resources identified as listed/proposed threatened and endangered species, candidate species and species of concern¹ not otherwise addressed in Resource Priorities 1- 5 (e.g. plants, reptiles, amphibians, etc.).

Action Strategy A: Obtain baseline information and develop a standardized data management system (that includes a Geographic Information System) for rare resources and their habitats, and consolidate into a format useful to resource managers. Ongoing. Update as new information is obtained.

Action Strategy B: Conduct analyses of existing and potential threats.

Action Strategy C: Prepare and implement plans to protect rare resources and to remediate conditions identified in threat analyses that are adversely impacting rare resources.

Action Strategy D: Develop and disseminate education and outreach materials to increase public awareness and support for rare resources.

RESOURCE PRIORITY #7

In cooperation with partners, achieve the necessary level of protection for those high priority areas within the Ohio River Valley Ecosystem that would help meet the goals of the ORVE Team. In particular, emphasis will be placed on the objectives of Resource Priorities #'s 1 through 6 and Public Use Priority #1.

Action Strategy #1: Working with partners, consolidate existing ecosystem- and landscape-level natural resource land protection strategies into a comprehensive strategy for the Ohio River Valley Ecosystem.

Action Strategy #2: Working with partners, assist in the development and maintenance of GIS database layers necessary to predict and display important fish and wildlife habitats and their conservation status within the Ohio River Valley Ecosystem.

Action Strategy #3: Working with the State Fish and Wildlife Agencies and other partners,

develop landscape-level Preliminary Project Proposals for submittal to the appropriate Regional Office(s) to recommend development of new refuges and/or the expansion of existing refuges.

Action Strategy #4: Develop land protection criteria for prioritizing FWS land/acquisition/protection needs.

Action Strategy #5: Working with partners and with other ORVET sub-groups, assist in the development and implementation of projects that will protect and enhance identified high priority fish and wildlife habitats within the ORVE.

PUBLIC USE PRIORITY #1

In cooperation with partners, promote and support sustainable fish and wildlife-oriented recreational uses while maintaining the long-term health of the ecosystem and the Service's trust resources.

Action Strategy A: Within existing authorities and in cooperation with our partners, evaluate fish and wildlife-oriented recreational needs and associated impacts, and develop and implement plans to address those needs and impacts.

Action Strategy B: With our partners, increase education outreach to promote consumptive and non-consumptive fish and wildlife-oriented recreation as a means of fostering appreciation for, and support of, a healthy ecosystem.

TEAM ORGANIZATION

The Service's ORVE Team has grown into several important roles. Primary among them is serving as an advocate at the field level for Federal trust fish and wildlife resources within the Ohio River watershed. This includes reviewing the Team's resource priorities and charting a direction for the Team to ensure it addresses the highest priority resource needs. To facilitate accomplishment of the Team's on-the-ground efforts, the Team actively seeks funding, explores expansion of existing partnerships and establishment of new ones, and seeks ways to involve all interested stakeholders.

The Team has established an organizational structure that maximizes efficient functioning and minimizes unnecessary administrative process. The overall Team is comprised of representatives of each of the Service's field offices located within the Region 3 (Midwest), 4 (Southeast), and 5 (Northeast) portions of the Ohio River Valley watershed. In addition, representatives from the respective Service regional offices, as well as several state fish and wildlife agencies, participate as Team members. Typically, the Team meets three times per year at various locations within the ecosystem. The Team is chaired by an individual selected annually by the Team.

The Team's seven Sub-groups are the primary mechanisms for conducting activities on the ground. The Sub-groups were formed on the basis of the Team's resource priorities, i.e., fish and wildlife and associated habitats, and its public use priority. They are, in no priority order: native aquatic mollusks; migratory land birds and other bird species of concern; native fishes; karst/cave habitat; wetland, riverine, and riparian habitat; declining and rare species; and fish and wildlife-oriented recreational use. The Sub-groups are comprised of Team members, other field office staff, and stakeholders beyond the Service who have expertise and/or share an interest in the particular resource issue. It is at the Sub-group level that partners have become major collaborators in identifying and addressing the Team's resource priorities.

In addition to the Sub-groups, the Team has established four Standing Committees to conduct activities that generally cut across all priority resources. The Standing Committees address GIS needs and activities, outreach, acid mine drainage and valley fills, and land protection.

Finally, the Team recognized the need for a subset of Team members to address short-term issues, respond to information requests of the Team, and to develop recommended courses of action on issues assigned to it by the Team. Accordingly, the Team established an Executive Committee consisting of the current Team Leader, past Team Leaders, and several other Team members.

This draft ecosystem plan involves the following facilities/stations:

Region 5

- West Virginia Field Office

- **Law Enforcement - Morgantown, WV**
- **White Sulphur Springs National Fish Hatchery**
- **Pennsylvania Field Office**
- **New York Field Office**
- **Bowden National Fish Hatchery**
- **Erie National Wildlife Refuge**
- **Ohio River Islands National Wildlife Refuge**
- **Northeast Fishery Center**
- **Chesapeake Bay Field Office**
- **Canaan Valley National Wildlife Refuge**
- **Lamar Fish Health Unit**
- **Law Enforcement, Mercer, PA**

Region 4

- **Asheville Ecological Services**
- **Cookeville Ecological Services**
- **Dale Hollow National Fish Hatchery**
- **Law Enforcement - Louisville, Kentucky**
- **Law Enforcement - Nashville, Tennessee**
- **Wolf Creek National Fish Hatchery**
- **Memphis Wildlife Habitat Management**

- **Clemson Ecological Services**
- **Pri. John Allen National Fish Hatchery**
- **Erwin National Fish Hatchery**
- **Warm Springs Fish Health Center**
- **Mammoth Springs National Fish Hatchery**
- **Warm Springs Regional Fisheries Center**

Region 3

- **Carterville, IL Fishery Resources Office**
- **Reynoldsburg, OH Ecological Services Office**
- **LaCrosse, WI Fish Health Center**
- **Marion, IL Ecological Services Sub-Office**
- **Muscatatuck National Wildlife Refuge**

Region 3 - Continued

- **Bloomington, IN Ecological Services Field Office**
- **Patoka River National Wildlife Refuge and Management Area**
- **Law Enforcement - Columbus, Ohio**
- **Law Enforcement - Indianapolis, Indiana**
- **Rock Island Ecological Services Office**

1. Species of concern = those species not Federally-listed or candidates for listing, that are sufficiently vulnerable to one or more threats that future classification pursuant to the Endangered Species Act might be necessary. When state authority is pre-eminent, the Service will support the role of the state in conservation actions (note that this language may no longer be current with policy).