

Chapter 9

Section 9.3

ADEM 2005 to GDNR 2003

Welcome To The
ALABAMA

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



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ADEM

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Permitting Information

Contact Information Listed Below

Overview of the sections and units within the Engineering Branch:

● Chemical Section

This section regulates larger sources, including chemical companies, pulp and paper facilities, surface coating industry, municipal waste incinerators, printing, landfills, halogenated solvent cleaners, and fiberglass manufacturers.

- **Minerals Section**

This section regulates larger sources, including ferrous and nonferrous metal facilities, gray iron and steel foundries, lead facilities, silicon plants, plating operations, military installations, utilities, oil and gas production, asphalt roofing, rubber tire facilities, textile production, rendering plants, feed and grain facilities, and construction materials production (cement, brick, lime, and tile.)

- **Natural Resource Section**

This section regulates large to small sources, including wood products industry, small furniture coaters, sawmills, wood waste boilers, and wood treating facilities.

- **Agriculture/Gas Unit**

This unit regulates small to medium sources, including feed and grain mills, natural gas compressor stations, storage tanks, marine loading facilities, pipeline breakout stations, dry cleaners, and bakeries.

- **Petroleum Section**

This section regulates small to medium sources, including medical waste incinerators, gasoline dispensing stations, bulk gasoline stations, gasoline terminals, truck companies, and soil and groundwater remediation.

- **Construction Materials Unit**

This unit regulates small to medium sources, including asphalt plants, quarries, cement batch plants, slag operations, refractories, sand/gravel facilities, and marble/calcium carbonate facilities

- **Title V Permit Application Requirements**

Details of what type of sources must get a Title V Operating Permit and the procedures for doing it. (14KB file in Microsoft Word 97 format.)

● **Major Sources Subject to Title V**

List of the major sources in Alabama that must obtain a Major Source Operating Permit (otherwise known as a Title V Operating Permit) and the year that their initial application is due. (78KB file in Microsoft Word 97 format.)

● **Title V Trivial and Insignificant Activities Lists**

Lists of activities at a major source that do not require permit applications or to be listed in the Major Source Operating Permit (otherwise known as a Title V Operating Permit). However, activities that are subject to federal regulations (NSPS, MACT, PSD or NESHAPS) cannot be exempted from the permitting process. Insignificant activities must be listed in the permit applications, while trivial activities do not. (38KB file in Microsoft Word 97 format.)

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Permitting

Permits are perhaps the most essential factor in the environmental regulatory process and are designed to assure that any source complies with the applicable environmental statutes before becoming operational. Any facility planning to construct or modify a potential air pollution source should contact the Air Division to determine if an air permit will be required and, if so, what permitting procedures should be followed.

The permitting decisions that ADEM must make are technical judgments. If the application demonstrates that the project is capable of complying with the regulations, a permit would be issued. Zoning issues, although legitimate concerns, are not within the purview of this Department and, therefore, are not considered when permitting air pollution sources. These issues are within the jurisdiction of local zoning authorities.

Major PSD modifications or construction at a Greenfield site must undergo a public comment period prior to obtaining an Air Permit.

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Title V - Permits

This portion of the Act required the establishment of federally enforceable operating permit programs which would consolidate into one document, all applicable air pollution control requirements to which a "major" source is subject. (A major source is defined as a source emitting 100 tons/year of a criteria pollutant, a major toxic source, an acid rain source, or a source subject to a New Source Performance Standard or a National Emission Standard for Hazardous Air Pollutants.) The issuance of these renewable operating permits would be subject to an increased level of review by EPA, affected states, and the public as compared to current state permit programs. According to the Act, the EPA would have the authority to veto or require revisions to state-issued operating permits. Further, this Title required permitting authorities to collect annual fees from all major sources as necessary to fund the implementation and management of the operating permit programs.

The Alabama operating permit program was submitted to EPA in December 1993 and received interim approval in November 1995. The program became effective December 15, 1995. This interim approval allows Alabama to implement an initial permitting cycle of five years. Major sources within the State were randomly assigned a number, which corresponded to one of the five years of this initial cycle. The sources (approximately 40) in the first year of this permitting "lottery" were required to submit operating permit applications by November 15, 1995. Sources in the second year of the "lottery" were to have submitted a complete permit application within one year of the program's effective date. All other sources must submit an administratively complete application by this same deadline, to be followed by a more detailed application submitted at a later date. EPA adopted for its guidance document on the streamlining of the permit application process, two components of ADEM's permit program: (1) the two-step application system for sources in the latter years of the initial permitting cycle, and (2) the categorization of sources of trivial and insignificant emissions for purposes of the application at major facilities. The Title V fee rate was \$22/ton in 1997.

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There are two Major Source definitions:

1. MAJOR SOURCE (HAP) - A stationary source or group of stationary sources which emit or have the potential to emit 10 tons per year or more of a single HAP or 25 tons per year or more of any combination of HAPs.
2. MAJOR SOURCE (Title V) - A stationary source or group of stationary sources which emit

or have the potential to emit 100 tons per year or more of any regulated air pollutant. In PSD areas the cutoff level may be either 100 or 250 tons, depending upon the type of source.

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There are three types of permits issued by the Air Division:

1. Air permit – a construction permit required by any source prior to building, erecting, modifying, altering, or replacing any equipment that would result in an increase in emissions. In addition, if a control device is to be installed that would cause a decrease in emissions, an air permit should be applied for prior to construction.
2. Synthetic Minor Operating Permit (SMOP) – an operating permit which restricts a sources potential to emit in such a way that a major source threshold is not exceeded.
3. Title V - Part of the 1990 Clean Air Act Amendments that mandated creation of an Operating Permits Program in each State. Since each program created would have to conform to some basic elements, Title V was intended to create consistency in operating permit requirements throughout the country.

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Send mail to webmaster@adem.state.al.us with questions or comments about this web site.
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AHC 2003

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ALABAMA REGISTER OF LANDMARKS & HERITAGE

Properties as of March 2003

NRHP - Property is listed on the National Register of Historic Places.

AUTAUGA COUNTY

Autaugaville Historic District, Autaugaville
Listed 10/7/98

Bell House, 550 Upper Kingston Road, Prattville (NRHP)
1893 Listed 10/7/98

Gin Shop Hill Water Tank
Listed 1/31/78

Johnson, Billy, Place, Deatsville
Listed 7/29/92

Johnson-Rawlinson House, Pine Flat Community
Circa 1867-70 Listed 10/4/96

Lamar Estate Family Home and Statesville School Site, Mulberry vicinity
Circa 1920 Listed 2/4/00

Lassiter-Treadwell House, Autaugaville vicinity (NRHP)
Circa 1820 Listed 7/22/91

Mount Sinai School, Mount Sinai Community, 1820 County Road 57, Prattville (NRHP)
1919 Listed 2/2/01

Posey House, Old Kingston Road, Prattville
Circa 1840 Listed 6/29/76

Pratt, Daniel, Cemetery, Prattville
1849-1886 Listed 9/14/77

Pratt, Daniel, Farm Gin, 101 West Main Street, Prattville
1844 Listed 3/29/77

Rawlinson Grist Mill, US 82 north of Autaugaville
Circa 1875 Listed 10/28/77

Rawlinson Grist Mill Machinery, US 82 north of Autaugaville
Estimated 1900 Listed 3/10/78

BALDWIN COUNTY

Bayside Academy, Drawer 130, Daphne
Circa 1838 Listed 5/27/75

Chambless-Biggs House, 60433 Jack Springs Road, Lottie
Circa 1896 Listed 6/30/95

Church of the Sacred Heart, Scenic Highway 98, Fairhope
1876, 1916 Listed 3/22/91

L & N RR Depot, 200 East Railroad Street, Bay Minette
Circa 1911 Listed 7/7/80

Little Bethel Baptist Church, Main Street, Daphne
Circa 1867 Listed 11/3/86

Malbis Church, Malbis Plantation, CR 27, Daphne
Circa 1965 Listed 11/30/77

McNair House (Sunnyside Hotel), NW Cor Oak & Jessamine Street, Magnolia Springs
(NRHP)
Circa 1897 Listed 5/11/83

Montrose Historic District, Montrose (NRHP)
Listed 7/30/75

Old English Place (Atkinson-Till Place), Stockton
Circa 1835 Listed 3/14/78

Peoples Supply Co., 21950 Broad Street, Silverhill (NRHP)
1902 Listed 3/13/96

Pinewood Pottery Kiln, 401 Oak Street, Fairhope
Circa 1939 Listed 7/6/76

Rhodes Store, Pine Street, Bay Minette
Circa 1890 Listed 2/10/76

Rosinton School, 2021 County Road 64, Robertsdale (**demolished 2000**)
1919 Listed 5/19/99

St. Luke/St. Francis at the Point Traditional Episcopal Church, Point Clear
1898 Listed 10/1/97

Strong-Meadow House, 805 Captain O'Neal Drive, Daphne
Circa 1858 Listed 6/10/82

Swift-Coles House, northeast of Bon Secour
Circa 1900 Listed 10/6/78

U.S. Post Office, 25 Hand Avenue, Bay Minette
1937-1939 Listed 8/13/87

BARBOUR COUNTY

Clayton Presbyterian Church, Clayton
Circa 1879 Listed 3/20/81

Copeland-Reeves House, 404 West Broad Street, Eufaula

Circa 1886 Listed 4/16/85

Eufaula High School Auditorium, 420 Sanford, Eufaula
Circa 20th century Listed 4/11/84

Fenn-Boyd House, Hwy 30, 3 mi E of Clayton, Clayton
Circa 1840 Listed 4/11/84

Joyce-Copeland-Reeves House, 420 West Broad, Eufaula
Circa 1851 Listed 4/16/85

Kendall-Edmondson-Hallenbeck House, 609 West Broad Street, Eufaula
Circa 1860 Listed 5/25/76

McLeroy-Calton-Hurlbert House, 431 Sanford Avenue, Eufaula
Circa 1882 Listed 4/11/84

McGee Home, 1833 Highway 131, Baker Hill
1873 Listed 10/1/97

Turner-Hightower Farm, Old Glenville Road, 1 mi N of Clayton-Eufaula Rd, Clayton
Circa 1859 Listed 7/6/78

Wallace Home, Eufaula Avenue, Clayton
Circa 1897 Listed 8/14/75

Woodlane, US 431
Listed 12/15/89

BIBB COUNTY

Bibb County Training School, Centreville
Circa 1889 (1960) Listed 11/6/75

Green Pond Presbyterian Church and Cemetery, 65 Presbyterian Church Road, Green Pond
1884 Listed 2/25/99

James Wallace Mason House, AL Highway 5, Brent
Circa 1889 Listed 2/6/98

Old Bibb County High School, 335 Walnut Street, Centreville
Circa 1908-9 Listed: 7/29/77

Sandy Chapel Methodist Church, Church Street (Hwy 82 E), Centreville
Circa 1910 Listed 3/29/77

Vance-Ellison House, 365 Birmingham Road, Centreville
Circa 1899 Listed: 11/16/78

Woodstock United Methodist Church, Woodstock
Circa 1893 Listed: 7/22/91

BLOUNT COUNTY

Bangor United Methodist Church, County Road 9 and Highway 31, Bangor (Garden City vic.)
1930 Listed: 3/20/03

Berry Mountain School, Blount CR 257, Berry Mountain
1921 Listed: 10/7/98

Blount County Activity Building, 108 3rd Ave E, Oneonta
1940 Listed: 7/22/91

Blountsville Methodist Church, Church and College Street, Blountsville
Circa 1886 Listed: 11/13/78

Copeland-Ellis House, 204 4th Avenue West, Oneonta
Circa 1914 Listed: 7/21/78

Crump-Oliver Farm, Route 1, Oneonta
Circa 1841 Listed: 10/11/78

Denton-Hendrix House, 110 2nd Avenue East, Oneonta
Circa 1917 Listed: 1/31/79

Griffith House, 1204 County Highway 25, Guntersville (Arab vcn) (NRHP)
1851 Listed: 6/30/95

Holland Farm, Route One, Horton
Circa 1891 Listed: 7/29/77

Murphree Log Cabin, Palisades Park, Route 1, Oneonta
Circa 1819 Listed: 7/6/78

Nation, Thomas, House, approx. 3 mi NE of Blountsville on US 231, Blountsville
c. 1835 Listed: 5/19/98

Old Easley Covered Bridge, btn Oneonta & Rosa, 1 mi W of US 231, Rosa (NRHP)

Circa 1927 Listed: 3/3/76

Oneonta Community House, 112 Jack Fendley Drive, Oneonta
1934 Listed: 8/3/90

Oneonta Federal Building, 210 2nd Avenue E, Oneonta
1937-38 Listed: 8/25/94

Stracener Bridge, Blount CR 14, Snead
Circa early 1900 Listed: 5/17/77

Warren House Complex, Rt 2, Box 497, Blountsville
Mid-19th century Listed: 11/2/90

Warren Springs Petroglyphs, Warren Farm, Rt 2, Box 303, Blountsville
Listed: 2/20/86

BULLOCK COUNTY

Chunnenugee Ridge, Chunnenugee Public Gardens, North of Union Springs
Listed: 3/5/76

First Baptist Church, Bullock Co Hwy 34, Midway
1912 Listed: 12/4/92

Fitzpatrick United Methodist Church, AL Hwy 110, Fitzpatrick
Circa 1858 Listed: 6/20/78

Foster-Bryan-Brown House, 201 Kennon, Union Springs (NRHP)
Circa 1852-56 Listed: 9/14/77

Hogan, Dr. S.N., House, 117 West Hardaway Avenue, Union Springs
c. 1871-1884 Listed: 5/19/98

Hunter-Anderson House, 109 Hunter Avenue, Union Springs
Circa 1843 Listed: 1/14/80

Hunter House, 416 North Prairie Street, Union Springs
Circa Listed: 3/30/89

Kennon-Paulk-Shanks House, 117 Kennon Street, Union Springs
Circa 1860 Listed: 10/20/77

L.M. Moseley / The Homespun, 208 Chunnenugee Avenue, Union Springs
1910 Listed: 5/10/00

Mt. Hilliard Methodist Church, Chunnenugee Ridge Rd S of Union Springs

Circa 1856 Listed: 8/6/76

Old Merritt School, Bullock CR 34, west of Midway (NRHP)
1921 Listed: 11/2/90

Old Parsonage for the United Methodist Church, Hwy 82; Midway
1888 Listed: 12/19/91

Old Union Church, South of Union Springs
Circa 1835 Listed: 8/14/75

Samuel Sellers Cemetery, Bullock CR 19 2.2 mi SW of Blues Old Stand, Perote
Graves 1856-1931 Listed: 11/23/76

Sardis Baptist Church, Union Springs vcn

1847 Listed: 12/19/91
(Listed on NR: 11/29/01)

St. James C.M.E. Church, Midway
1883 Listed: 12/19/91

The AYellow House, @ 204 Chunnenuggee Ave, Union Springs
Listed: 11/13/96

BUTLER COUNTY

Bartram Trail, AL Hwy 185; Co. #58, Co. #54, Co. #38, West of Greenville
Listed: 5/12/76

Butler Chapel AME Zion Church, Cor. Parmer & Oglesby Sts, Greenville (NRHP)
Circa 1867 Listed: 1/31/79

Carter, William, Home (Pine Flat Plantation), AL Hwy 10, Forest Home vcn
Circa 1825-30 Listed: 3/8/94

Corry-Morton House, 323 Hickory Street, Greenville
Circa mid-1850s Listed: 10/19/79

First Presbyterian Church, 215 East Commerce Street, Greenville (NRHP)
Circa 1886 Listed: 3/29/77

Fort Dale Cemetery, Old Fort Dale Community; AL Hwy 185, N of Greenville
Graves to 1818 Listed: 1/29/80

Fort Dale Street Historic District (32), Fort Dale Street, 109-525 Greenville
1850-1930s Listed: 3/20/80

Gafford-Hartley-Mullins House, CR 45, 3 1/2 mi N of Greenville
 Circa 1865 Listed: 7/18/83

Hawkins' Quarters, Forest Home vic., Rocky Creek community
 1878-1911 Listed: 3/13/96

Henry-Beeland-Stanley House, Greenville
 Listed: 9/20/78

Howard-Raybon House, (John W. Howard House), Rt 2, Greenville (NRHP)
 Listed: 9/2/82

Liberty Chapel Church, Kolb City Road from Hwy 10, West of Greenville
 Circa 1858 Listed: 2/27/78

Lomax-Hannon Junior College, Conecuh Street, Greenville (NRHP)
 Circa 1911 Listed: 3/29/77

Magnolia Manor, 303 Bolling Street, Greenville
 Circa 1870 Listed: 10/26/78

McGowin, Julian and Betty, House 12303 Mobile Road, Chapman
 1950 Listed: 3/7/02

Milner-Speir-Moody Home, 310 Dunklin Street, Greenville
 Circa 1848 Listed: 1/25/77

Mount Zion School, Mount Zion Road, Greenville
 c. 1934 Listed: 3/24/95

Oak Grove Methodist Church, Hwy 185, 5 mi N of Greenville, Greenville
 Circa 1872 Listed: 1/29/80

Oakey Streak Methodist Church, CR 59 inters. Hwy 23, 20 mi S of Butler Co.
 Courthouse, Greenville Vicinity (NRHP) Late 19th century Listed: 6/9/77

Old Abrams Place, 201 Herbert Street, Greenville
 Circa 1859-60 Listed: 5/12/76

Old Fort Dale Site, Hwy 185, North of Greenville, 5 miles
 Circa 1818 Listed: 1/29/80

Old Log Barn, Hwy 185, North of Greenville
 Circa 1825 Listed: 1/29/80

Pine Flat Methodist Church, Hwy 10, 16 mi West of Greenville, Forest Home
 Circa 1858 Listed: 7/6/78

Pioneer Cemetery, South Park Street, Greenville

Listed: 11/23/76

Steiner House, 214 Fort Dale Road, Greenville

Circa 1886 Listed: 7/28/78

Thaggard-Poole House, AL Hwy 10 East, Luverne Road, Greenville

Circa 1860s Listed: 10/19/79

J.C. Watson House/Watson Hospital, 101 Miranda Street, Georgiana

Circa 1913 Listed: 11/5/84

Williams, Hank Sr. Boyhood Home, Rose Street, Georgiana

1910 Listed: 7/22/91

CALHOUN COUNTY

Antebella, Greensport Road, Alexandria

Circa 1822 Listed: 4/11/84

Blue Spring Mill, SW intersection of I-20 & AL 21 @ Exit 185, Oxford

1885 Listed: 12/15/97

Borders House, 426 Old Choccolocco Road, Anniston

c. 1840 Listed: 5/19/98

Caldwell House, 719 Alexandria Road, SW, Jacksonville

1860 Listed: 3/13/96

Calhoun County / Oxford High School Football Stadium, 312 East 2nd Street, Oxford

1935 Listed: 5/10/00

Dr. Calhoun-Barnwell-Cole House, 1180 White Plains Road, Anniston

1837-42 Listed: 3/24/95

Choccolocco School, 21 Prospect Lane, Choccolocco

1876 Listed: 3/13/96

Friendship Missionary Baptist Church, 1130 West 14th Street, Anniston

c. 1923 Listed: 2/6/98

Gaines Chapel African Methodist Episcopal Church, 404 A Street, Anniston

1895 Listed: 2/25/99

Greenwood, Old Jacksonville Hwy, Alexandria (NRHP)

Circa 1842-1850 Listed: 4/23/87

Gunnells-Wingo House, 225 East Oak Street, Oxford
Circa 1860-1870 Listed: 8/22/85

Henry, C.B., Barn, Jacksonville (NRHP)
c. 1910 Listed: 3/24/95

Jackson House (Haven Church Parsonage), 1631 Pine Avenue, Anniston
1909-10 Listed: 10/7/98

Lyric Theatre, 1302 Noble Street, Anniston (NRHP)
Circa 1918 Listed: 8/6/76

Mallory-Scarborough-Prather House, CR 55, 1.2 mi SW of Choccolocco Community,
Anniston Circa mid 1840s Listed: 7/5/83

Parker Memorial Baptist Church, 1205 Quintard Avenue, Anniston (NRHP)
Circa 1888 Listed: 9/24/81

Patillo House, 112 Gray Street, Oxford
Circa 1864 Listed: 9/7/84

Pelham-Bush Cemetery, Alexandria vcn.
1853 Listed: 10/1/97

Quintard Avenue Median, between 5th and 18th streets, Anniston
Listed: 4/14/92

Rhodes Place (Amity's Place), 110 Choccolocco Road, Anniston
Circa 1906 Listed: 3/23/90

Saint Luke's Episcopal Church, 103 South Chinabee Street, Jacksonville
Circa 1856 Listed: 3/4/76

Saint Michael & All Angels Episcopal Church, 18th & Cobb, Anniston (NRHP)
Circa 1888 Listed: 11/23/76

Smith-Mallory-Cater Hse. (Lansing T. Smith), 531 Keith Ave, Anniston (NRHP)
Circa 1891 Listed: 4/29/83

Southern Railroad Depot, 200 North Centre Avenue, Piedmont (NRHP)
Circa 1868 Listed: 5/27/83

Union Grove Cemetery, Greenbrier Road, Anniston
Circa 1865 Listed: 7/18/89

Woodruff, Margaret, Library, Alexandria, 10 mi N of Anniston, E of US 431
Listed: 2/20/86

Woods-Crook-Treadaway House, 517 North Pelham Road, Jacksonville (NRHP)
Circa 1836 Listed: 1/14/82

CHAMBERS COUNTY

Chambers County Courthouse Square (20,) LaFayette (NRHP)
Circa 1899 Listed: 6/9/76

County Line Baptist Church, 6/10 mi E of Dudleyville, paved road (NRHP)
Circa 1899 Listed: 1/14/80

Fairfax Mill Village Historic District, Valley (NRHP)
1915 Listed: 12/19/91

Fuller-Crowder House, 302 S LaFayette Street, LaFayette
Circa 1910 Listed: 4/28/83

Griggs-Simmons House, 204 North 18th Street, Lanett
Circa 1858 Listed: 6/16/76

Harmony Methodist Church, County Road 51, Lafayette vic.
Mid-late 19th century Listed 2/2/01

Heflin-Callahan House, LaFayette Street, LaFayette
Circa 1912 Listed: 6/9/76

Homeland (Boykin Place), Rt 4, Box 752, Lanett
1840 Listed: 2/19/88

Langdale Mill Village Historic District, Valley (NRHP)
1866 - Listed: 7/22/91 Expanded: 12/19/91

Louis, Joe, Birthplace, 1158 CR 488, Lafayette vicinity
1914 Listed: 8/6/93

Mitchell-Wilkerson-Gaines House, 307 S. LaFayette Street, LaFayette
Circa 1845-50 (1900) Listed: 1/10/83

Old Lanett High School, North 6th Avenue, Lanett
Circa 1923-1924 Listed: 10/11/78

Rabbit, Joe, House, 1.5 miles off AL 50, LaFayette
Circa 1829 Listed: 7/6/76

Rea-Schuessler-Fuller House, 308 LaFayette Street South, LaFayette

Circa 1850-55 Listed: 4/11/84

River View Mill Village Historic District, Valley (NRHP)
c. 1865-1980 Listed: 12/19/91

Sharpe Pioneer Homestead, Hwy 431, 6 mi N of LaFayette, 1/2 mi W of White Plains,
LaFayette
Circa 1870 Listed: 2/27/78

Shawmut Mill Village Historic District, Valley (NRHP)
c. 1907-08 Listed: 12/19/91

Temple Beth-El, Lanett
Circa 1908 Listed: 3/3/76

CHEROKEE COUNTY

Bradford-West House, 402 Cherokee Avenue, Centre
Circa 1863 Listed: 10/17/80

Jordan's Old Place, Rt 2, Centre North East
Circa 1880 Listed: 5/9/78

Pleasant Gap County Store, CR #8, Pleasant Gap, Piedmont
Circa 1896 Listed: 4/11/84

Pratt Park, Old U.S. Hwy 411, Centre
Circa 1905 Listed: 1/14/80

Rock Run Village (10), Rock Run
Circa 1874 Listed: 7/15/76

Savage-Campbell House, 440 West Main Street, Centre
Circa 1908-10 Listed: 5/19/81

CHILTON COUNTY

Confederate Memorial Cemetery, Mountain Creek
Circa 1903-1933 Listed: 3/5/76

Lay Dam, Coosa River, near Clanton
Circa 1910-1914 Listed: 2/19/76

Maplesville Depot, Main Street, Maplesville

Circa 1912 Listed: 11/23/76

Maplesville Methodist Episcopal Church, South, Railroad St, Maplesville
c. 1870-1890 Listed: 12/4/92

Matthews-Reynolds Home, 2nd Avenue North, Clanton
Circa 1908-09 Listed: 12/29/75

Mims Ferry, Coosa River, Chilton County/Coosa County
Circa 1895; 1957 Listed: 9/5/75

Norman Smith Pottery, 5031 AL Hwy. 183 West, Lawley
1932 Listed: 9/30/99

Old Stage Coach Inn, Old Plantersville Road 1.4 mi N of Plantersville
Circa 1835 Listed: 8/13/87

Tomlinson House, Rt 3, Box 630, Jemison
Circa 1893 Listed: 11/3/86

CHOCTAW COUNTY

Bladon Springs Historic District (5), Bladon Springs
Circa 1838-1910 Listed: 4/1/76

Choctaw County Courthouse, 117 S. Mulberry Avenue, Butler
1906-07 Listed: 6/19/97

Log Cabin School House, Toxey
c. 1850 Listed: 2/6/98

Rogers, Zack, House, 238 East Smith Street, Butler
Circa 1880 Listed: 3/30/89

CLARKE COUNTY

Alston-Cobb-Postma House, 120 Cobb Street, Grove Hill (NRHP)
Circa 1854 Listed: 9/1/78

Armistead Home, 1 Block West on US 84 from US 43, Grove Hill
Circa 1843 Listed: 1/29/80

Campbell Historic District, AL Hwy. 69 and Clarke CR 44, Campbell
1870-1950 Listed: 9/30/99

Cobb-Waite Home, 2 mi W on US 84, Grove Hill (NRHP)
Circa late 1860s Listed: 1/29/80

Courthouse Historic District, Grove Hill
1832 Listed: 3/24/95

Dickinson House, 120 Dickinson Avenue, Grove Hill (NRHP)
Circa 1845 Listed: 1/1/78

Finlay House, Gainestown
Circa 1846 Listed: 9/17/76

Grant-Carleton House, Grove Hill
Circa Listed: 1/29/80

Johnson House, HC-67 Box 30-C, Jackson (Rockville Community)
Circa 1900 Listed: 8/3/90

Kimbell-Rivers-Woodson House, Mayton Drive, Jackson
Circa 1848 Listed: 9/17/76

The Lodge (Cleveland Home) Line Rd. 4 1/2 mi S of US 84, Suggsville (NRHP)
Circa 1860c Listed: 6/9/77

Loranz-McCrary House, 500 Commerce St, Jackson
c. 1900 Listed: 3/19/93

Orange Hill Road Historic District, Grove Hill
ca. 1845 Listed: 3/24/95

Thomasville High School, 527 West Front Street, Thomasville
1929 Listed: 8/25/94

Upper Confederate Salt Works, Store Creek, 4 mi N of Jackson
Circa 1861-1865 Listed: 7/9/76

Wilson-Finch-Mason Log House, Old Line Road, Manila
Circa 1822 Listed: 4/4/78

Wilson's Mill, 2 mi N US 84 between Grove Hill & Coffeeville
Late 1800s Listed: 1/25/77

Wing-Hudley House, 104 Skipper Drive, Jackson
Circa 1879 Listed: 10/20/77

Woodlands, Gosport vcn (NRHP)
Circa 1840 Listed: 1/29/80

CLAY COUNTY

Carmichael Place, 4310 East Mill Road, Goodwater
1887 Listed: 6/23/94

Gay House, Hwy 9 North, Ashland
Circa 1914 Listed: 4/11/84
Hatchett Creek Presbyterian Church & Brownville Cemetery
Circa 1901-02 (church) Listed: 5/3/01

Lineville Water Tower, Lineville
Circa 1917 Listed: 4/1/76

Midway School, 2907 East Mill Road, Hollins
1917 Listed: 3/13/96

Partridge House Complex, 4631 County Road 7, Goodwater vcn.
1913 Listed: 2/6/98

CLEBURNE COUNTY

Arbacoochee Site (2), Arbacoochee
Antebellum Listed: 7/15/76

Cheaha Observation Tower (Bunker Tower), Cheaha State Park
Circa 1934 Listed: 12/15/89

Colonial Cottage, (John Morgan House) 321 Ross Street, Heflin (NRHP)
1880 Listed: 12/19/91

Edwardsville Cemetery, Edwardsville
1837 Listed: 10/1/97

Heflin Depot, 1001 Ross Street, Heflin
Circa 1886 Listed: 12/21/77

Owen Residence, Burnes & Evans Streets, Heflin
Listed: 3/13/96

COFFEE COUNTY

Enterprise Methodist Church (First United Methodist Church) 217 South Main Street,
Enterprise
Circa 1903-04 Listed: 9/6/84

Folsom Home, 18 mi out of Elba
Circa late 1800s Listed: 9/17/76

Prestwood Grist Mill, CR 82, W of Roeton Community
Circa 1848 Listed: 10/11/78

Rawl's House, 301 W College Street, Enterprise
 Circa Listed: 3/30/89

COLBERT COUNTY

Church of Christ Site & Cemetery, CR 61 off Hwy 157 at foot of LaGrange Mtn
 Listed: 2/19/88

Cooke, Samuel, House (Chambers/Robinson) 910 Montgomery Ave, Sheffield -- NRHP
 Listed: 4/14/92

FAME Recording Studio
 1963 Listed: 12/15/97

Glencoe Plantation Cemetery, 4 mi W on US 72 at Vulcan Materials, Tuscumbia
 Circa 1818-1854 Listed: 5/26/86

Hodge-Blackburn-Twitty House, Rt 2, Box 125, Cherokee (Allsboro)
 Circa 1844 Listed: 11/30/77

Howell and Graves Junior High School, 3300 Wilson Dam Road, Muscle Shoals
 1927 Listed: 6/19/97

Johnson, John, House, Leighton Vicinity (NRHP)
 Circa 1830 Listed: 4/16/85

LaGrange Cemetery, Rt 3 LaGrange College Rd, Leighton
 1852 Listed: 6/23/94

LaGrange College Site, 4 mi SW of Leighton
 Circa 1830 Listed: 7/16/76

Leighton Training School/Leighton Middle School, 2255 North Washington Street, Leighton
 1928-29 Listed: 6/19/97

Locust Hill (John Daniel Rather House), 209 S Cave St, Tuscumbia (NRHP)
 Circa 1823 Listed: 10/4/78

Melrose, West Side of Cook's Lane approx. 1 mi W of US 43, Tuscumbia
 Circa 1830 Listed: 2/20/86

"Nation" House, Sheffield Vicinity
 Circa 1830 Listed: 4/16/85

Norfolk-Southern Railroad Bridge, Tennessee River, Florence vcn(Lauderdale/Colbert
 Co)

1870s Listed: 8/16/91

Old Brick Presbyterian Church, Old Brick Road, 5 mi N of Leighton (NRHP)
Circa 1830s Listed: 11/13/78

Preuit Oaks, 3 mi S of Leighton (NRHP)
Circa 1847 Listed: 11/26/78

Sheffield Railroad Depot, Shop Pike, Sheffield
1948 Listed: 6/23/94

CONECUH COUNTY

Arkadelphia Church, CR 20, Loree vcn
1886 Listed: 10/4/93
Belleville Baptist Church, CR 15, Belleville
1841 Listed: 4/21/81 10/4/93

Betts-Nash House, CR 5, Burnt Corn
c. 1835 Listed: 10/4/93

Brooklyn Baptist Church, Hwy 6, 1/2 mi W of Brooklyn (also included in Brooklyn Historic
District listed 10/4/93)
Circa 1861 Listed: 3/24/83

Brooklyn Historic District, Brooklyn (19 structures)
1826-1865 Listed: 10/4/93

Brooks-King House, CR 5, Skinnerton vcn
1891 Listed: 10/4/93

Brushy Creek United Methodist Church, Lenox vcn
ca. 1850s Listed: 10/4/93

Burnett House, 316 Liberty Hill Drive, Evergreen
ca. 1880s Listed: 1/12/94

Burnt Corn Historic District, CR 5, Burnt Corn
1866- Listed: 10/4/93

Carey Street Historic District, Evergreen
Listed: 10/4/93

Castleberry Commercial District, Castleberry
Listed: 10/4/93

Castleberry Residential District, Castleberry
Listed: 10/4/93

Cohasset Historic District, Cohasset vcn
ca. 1906 Listed: 10/4/93

Evergreen Baptist Church, 214 Park Street, Evergreen
ca. 1906 Listed: 10/4/93

Flat Rock Saints Church (RLDS), CR 26 approx. 2 mi. N of junction with US31, Evergreen vcn.

1890 Listed: 5/10/00

Hawkins, Rev. Dr. Hillary James, House, Brown Hawkins Road from Highway 83,
Evergreen
Circa 1945 Listed: 3/20/03

Hawthorne House, CO 15, Belleville
ca. 1830s Listed: 10/4/93

Horton House and Store
Listed: 10/4/93

Ivey, Robert, House, Loree
ca. 1850 Listed: 10/4/93

Jayvilla Commissary, Haygood Road, Jayvilla vcn
ca. 1860 Listed: 10/4/93

Jayvilla Plantation Site, Rt D, Jayvilla vcn, Evergreen
Circa 1820 Listed: 4/1/76 10/4/93

Johnston, Asa, House, Johnstonville vcn
1842 Listed: 10/4/93

Johnston, Caleb, House, Johnstonville vcn
1840s Listed: 10/4/93

Maxwell-Johnson House, 120 South Main Street, Evergreen
Listed: 5/19/99

Mt. Union Community Church & Center, 1/4 mi E CR 39, Evergreen vcn
Listed: 11/13/96

New Evergreen Historic District, Evergreen (NRHP)
Listed: 10/4/93

Old Beulah Cemetery, Jayvilla vcn
1820s-1890s Listed: 10/4/93

Old Evergreen Historic District, Evergreen
Listed: 10/4/93

Range Historic District, Range (10 structures)
1886- Listed: 10/4/93

Repton Historic District, Repton (35 structures)
1886- Listed: 10/4/93

Skinner, Dr. H.S., House, US 84, 4 mi E of jct with CR 15, Belleville
1821 Listed: 10/4/93

Sparta Site, Jayvilla vcn
Listed: 10/4/93

St. Mary's Episcopal Church, E. Front Street, Evergreen
ca. 1880 Listed: 10/4/93

Sunnyside Farm / Witherington House, Hwy 83 North, Evergreen
Circa 1856 Listed: 7/6/78 10/4/93

COOSA COUNTY

Lay Dam, Coosa River near Clanton
Circa 1910-1914 Listed: 2/19/76

Mims Ferry, Coosa River, Chilton County/Coosa County
Circa 1895, 1957 Listed: 9/5/75

Oakachoy Covered Bridge, 1 1/2 mi off Hwy 259, near Nixburg (NRHP)
Circa 1915 Listed: 10/28/77

Old Rockford Elementary School, Intersection of Nixburg Rd. & Davis St., Rockford
1927 Listed: 9/30/99

Old Shiloh Cemetery, Hwy 63 3 mi from Nixburg
1836 Listed: 3/24/95

Powell, James, House, Hwy 231 South, Rockford
Listed: 11/13/96

Rockford Women's Club House, Intersection of Hwys. 231 and 22, Rockford
1932 Listed: 3/13/96

Weogufka State Park, 8.6 mi from CR 29, vcn. Kelley's Cross Roads
Circa 1930 Listed: 7/18/89

COVINGTON COUNTY

Carter, W.O., Log House, 1.25 mi E of Sanford on Hwy 84; Rt 3, Andalusia
 Circa 1830s Listed: 2/27/78

Givens House, 401 College Street, Andalusia
 c. 1900 Listed: 6/30/95

Hart, Alex, House, Corner of E Stewart Avenue and Spurlin Street, Opp
 Circa 1901 Listed: 10/1/76

Lloyd's, M.N., Water Mill, 6 1/2 mi N of Red Level, inters. AL 55 & Pigeon Creek
 Circa 1930 Listed: 8/19/76

Macon General Store Museum Collection, 501 Sixth Avenue, Andalusia
 Listed: 1/19/78

River Falls Post Office
 US 84, 1/3 mi W of intersection of US 84 and AL Hwy 55, River Falls
 Circa 1898 Listed: 10/28/77

Stanley School, Hwy 55 S to Florala, Stanley community
 1937 Listed: 5/19/99

CRENSHAW COUNTY

Bricken Building, 509 East 1st Street, Luverne
 Circa 1893 Listed: 1/14/82

Douglass House (Douglass-Hayden House) 350 South Forest Avenue, Luverne
 1904-1907 Listed: 6/30/95
 Ivy Creek School/Community Center, Rt. 1 Highway 77, Rutledge
 1927 Listed: 3/12/97

Jordan House, US Hwy 231, Highland Home
 Circa 1889 Listed: 10/1/76

CULLMAN COUNTY

Arnold House, 404 Arnold Street NE, Cullman
 Circa 1916 Listed: 2/15/77

Ave Marie Grotto, US 278 and 69; 1 mi E of Cullman, St. Bernard (NRHP)
 Circa 1918 Listed: 2/24/76

Betz Addition Historic District
 Turn-of-the-century and early 20th century houses

Listed: 3/12/97

Bogue-Herrell House, 706 First Avenue SE, Cullman
Circa 1875 Listed: 2/28/79

Burkart-Wilson Home, 409 Commercial Street, Hanceville
1949 Listed 6/23/94

Carothers-Brown-Warren House (Perry Warren House), 306 Seventh St, SE, Cullman
Circa 1887 Listed: 10-20-77

Christ Lutheran Church, 424 2nd Ave SE, Cullman
1924 Listed: 11/17/95

Corbin Farmstead, 1214 County Road 1809, Joppa
1894 Listed: 5/19/99

Crane Hill Masonic Lodge #554, 14538 County Road 222, Crane Hill
1904 Listed: 2/25/99
(Listed on NR: 11/29/01)

Cottingham-Benson House, 605 5th Street SE, Cullman
Circa 1905 Listed: 5/10/78

Cullman Ice Factory, 414 First Avenue SE, Cullman
Circa 1894 Listed: 2/27/78

Cullman, Colonel John G., Home, Cullman
Circa 1870 Listed: 8/29/75

Deep South Creamery, Cullman
Circa 1900 Listed: 10/28/85

Deerr, John B., House, 400 7th Avenue SE, Cullman
1938 Listed: 6/23/94

Evangelical Lutheran Trinity Church/Burkart Memorial Hall
505 Commercial St SE, Hanceville
Circa 1885-86 Listed: 9/6/84

First United Methodist Church, 324 3rd Avenue SE, Cullman
Circa 1924 Listed: 6/16/81

Fuller-St. John-Edwards House, 506 5th Avenue SE, Cullman
Circa 1914 Listed: 10/17/80

Garden City School, 226 Third Street West, Garden City

1898

Listed: 5/19/99

Green-Owens House, 105 6th Avenue SE, Cullman (NRHP)
Circa 1913-1914 Listed: 2/20/86

Green-Jennings House, 509 7th Street SE, Cullman (burned)
Circa 1890-1893 Listed: 2/27/78

Hancock House, Cullman vcn
1898 Listed: 11/17/95

Heitmuller Farm, 1228 County Road 1301, Vinemont
1873 Listed: 3/8/94

Joppa Collegiate Normal Institute, Highway 69, Joppa
Circa 1900, Reconstructed 2001 Listed: 3/20/03

Kleibacher-Wachter House, 206 6th Ave SE, Cullman
1909 Listed: 11/17/95

Mace Thomas Payne Brindley Cemetery, North of Simcoe
Circa 1853 Listed: 9/29/75

McDonald House, 806 5th Avenue SE, Cullman
Circa 1890 Listed: 11/26/78

Mullins-Young-Rigsby House, 612 7th Ave SE, Cullman
1911-12 Listed: 11/17/95

Old Wagner Studio, 300 9th Ave SE, Cullman
1903 Listed: 8/6/93

Parker-Hutchens House, 602 3rd Street, SE, Cullman
Circa 1877 Listed: 3/20/81

Rambow-Abt House, 502 8th Street SE, Cullman
Circa 1907 Listed: 1/31/79

Sacred Heart Catholic Church, 217 2nd Street, SE, Cullman
Circa 1900 Listed: 11/5/76

Saint John's United Church, 508 2nd Avenue SE, Cullman
Circa 1924 Listed: 12/21/77

Sandlin Chapel, AL Hwy 69 S, 11 mi off I-65, S of Jasper, Rt 1, Bremen

Circa 1882 Listed: 8/22/85

Shady Grove Methodist Church, Ruby Community 2.7 miles West of Logan
1892-93 Listed: 2/25/99

Sparks-Kinney-Hartwig House, 713 Second Avenue SE, Cullman
Circa 1903 Listed: 4/11/78

Steindorff-Glasscock House, 801 Second Avenue SE, Cullman
Circa 1899-1900 Listed: 5/10/78

Stiefelmeyer-Allred House, 410 Fourth Avenue SE, Cullman
Circa 1886 Listed: 2/27/78

Stiefelmeyer Home, 1407 Stadium Drive, Cullman
Circa 1880 Listed: 4/14/78

Stiefelmeyer's, Inc., 202 First Avenue, SE, Cullman (NRHP)
Circa 1892 Listed: 1/19/78

Vogel-Peinhardt House, 1411 Second Avenue, Cullman
Circa 1929 Listed: 7/7/80

Wagner-Abbott House, 304 10th Avenue SE, Cullman
1889 Listed: 2/4/00

Weiss House, 402 First Avenue, SE, Cullman
Circa 1873 Listed: 1/25/77

DALE COUNTY

Ariton Universalist Church, Atlantic Street, Ariton
Circa 1913 Listed: 3/23/90

Clopton Methodist Episcopal Church, South & Cemetery (Clopton UMC)
1924 Listed: 9/28/00

Kolb-Chesser Home (Leonidas William Kolb House), 417 Board Street, Ozark
Circa 1908 Listed: 4/14/78

Ozark Racetrack, Ozark
Circa 1893-1908 Listed: 5/8/75

Pleasant Grove Primitive Baptist Church, 1201 Eufaula Street, Ozark
c. 1841 Listed: 6/19/97

Spring Hill Methodist Church
6 mi S of Ozark on AL 123 to inter. Ewell Rd, 1/2 mi NW of intersection
Circa 1876 Listed: 8/13/87

Veterans Memorial Bridge, US 231, across Pea River, North of Ariton
Circa 1921 Listed: 5/17/77

DALLAS COUNTY

Alabama Baptist Normal and Theological School of Selma University, Selma
c. 1878-1948 Listed: 6/19/97

Bailey-Mayo Store, Pleasant Hill
Listed: 11/2/90

Bakke Hall and the Dormitory, Alabama Lutheran Academy, 1804 Green St., Selma
c. 1928 Listed: 6/19/97

Beloit Industrial Institute (Dallas County Training School), 8491 Hwy 22 W, Beloit
Community, Orrville
1929-30 Listed: 8/6/93

Belvoir (Saffold Plantation), Pleasant Hill
Listed: 11/2/90

Belvoir Superintendent's House, Pleasant Hill
Listed: 11/2/90

Bragg, J.R., House, Pleasant Hill
Listed: 11/2/90

Brown Chapel AME Church, 410 Martin Luther King Jr St, Selma (NRHP) (NHL)
Circa 1906 Listed: 6/16/76

Browning House, Pleasant Hill
Listed: 11/2/90

Butler-Rives House, Pleasant Hill
Listed: 11/2/90

Cedar Acres (Maxwell-Carter House), Pleasant Hill
Listed: 11/2/90

Cedar Creek Bridge, Pleasant Hill

Listed: 11/2/90

Dunaway-Meyer House, south side of Academy Street, Orville

Circa Listed: 4/14/78

Eden, off Hwy 41, 30 mi from Selma, 10 mi from Camden, Tilden

Circa 1840 Listed: 7/21/78

Fuller Home (The Homestead), 440 Broad Street, Selma

Circa 1898-1913 Listed: 10/19/79

Girl Scout Hut, 110-D West Dallas Ave, Selma

Circa 1929 Listed: 2/27/78

Good Hope Baptist Church, Browns

1905 Listed: 2/6/98

Green Street Baptist Church, 1220 Green Street, Selma

1892 Listed: 3/13/96

Green Underwood House, Pleasant Hill

Listed: 11/2/90

Harrell, W.C., Store, Pleasant Hill

Listed: 11/2/90

House at 601 Washington (Kirkpatrick/Plattensburg House, Sudie Felder Apts.), Selma
(NRHP) 20th Century Listed: 3/22/91

Howorth Home, 2612 Summerfield Road, Selma

Circa 1928 Listed: 1/14/80

Hurricane Creek Bridge, Pleasant Hill

Listed: 11/2/90

Kenan's Mill (7), Lover's Lane Rd, 2 mi N of Selma, off Summerfield Rd

Circa 1835 Listed: 4/28/78

Martin Luther King Jr. Street Church of God, 1535 Martin Luther King Jr. Street, Selma

Circa 1900 Listed: 7/7/80

Lewis, Frank, House, Pleasant Hill

Listed: 11/2/90

Live Oak Cemetery, West Dallas Ave, Selma

c. Antebellum 1828 Listed: 3/25/76

Magnolias (Crumpton House), Pleasant Hill
Listed: 11/2/90

Maxwell-Fail House, Pleasant Hill
Listed: 11/2/90

McMillan-Oxford Home, CR 31, 10 mi south of Orville
Circa 1858 Listed: 1/29/80

Old Methodist Church, Pleasant Hill
Listed 11-2-90

Pleasant Hill Baptist Church, Pleasant Hill
Listed: 11/2/90

Pleasant Hill Presbyterian Church, Pleasant Hill (NRHP)
Listed: 11/2/90

Saffold-Middleton-Moore House, Pleasant Hill
Listed: 11/2/90

Sinclair-Harrell House, Pleasant Hill
Listed: 11/2/90

Stoutenborough, Anthony, Hall, E of Hwy. 41, Shepherdville vicinity
Circa 1850 Listed: 7/18/89

Street Manual Training School, 263 CR 38, Richmond-Minter (NRHP)
1904-1947 Listed: 3/12/97

Tabernacle Baptist Church
1922 Listed: 6/19/96

Ulmer House, Pleasant Hill
Listed: 11/2/90

United Methodist Childrens Home, Administration Building (Selma Military Institute),
1712 Broad Street, Selma
Circa 1906 Listed: 7/7/80

Vasser-Ellis House, Pleasant Hill
Listed: 11/2/90

DEKALB COUNTY

Anderson-Porter House, 808 Forest Avenue N, Fort Payne
 Circa 1889 Listed: 7/28/78

Buell-Green House, 501 Curry Drive NW, Fort Payne
 Circa 1889 Listed: 7/28/78

Cochran-Wilson-Owen Estate, 208 Alabama Avenue SW, Fort Payne
 Circa 1890 Listed: 4/4/86

Cherokee (Ross-Godfrey-Kershaw-Brewer House), 4 1/2 mi NE of Ft. Payne
 Circa 1790 Listed: 7/16/76

Collinsville Presbyterian Church, Collinsville
 Circa 1908 Listed: 7/27/76

Council Bluff School, N on I-59 to Hammondville Exit, 117 to left; turn up Sand Mt., first dirt road to left, first bldg. on right; Rt 2, Valley Head
 Circa 1903 Listed: 8/5/76

Davenport House (A.C.Spaulding Residence), 700 Forrest Ave, NW Fort Payne
 Circa 1890 Listed: 7/6/78

Davis, W.B., Hosiery Mill, 204 Northeast 8th, Fort Payne (NRHP)
 Circa 1889 Listed: 7/19/76

Deer Head Cove Church (Deer Head Cove School), Hwy 75 (Cove Road) 5 mi E of Cartersville
 Circa 1908 Listed: 4/16/85

First Presbyterian Church, 300 Grand Avenue N, Fort Payne
 Circa 1888 Listed: 8/14/75

Fort Payne City Park, 400 Block E of Gault Avenue North, Fort Payne
 Circa 1889 Listed: 1/13/78

Hawkins Place, West Main Street, State Hwy 40, Henagar
 Circa 1873 Listed: 4/11/84

Edna Hill Methodist Church, off AL Hwy. 35, DeSoto State Park
 Circa 1907 Listed: 8/4/78

Howard's Chapel (Salley Howard Memorial Baptist Ch), Lookout Mtn, Mentone

Circa 1934 Listed: 7/9/76

Isbell-Beck House, 206 NW Second, Fort Payne

Circa 1924 Listed: 8/2/79

Killian-Appleton-Cochran House, 500 Forest Avenue SW, Fort Payne

Circa 1914 Listed: 9/6/84

Killian Residence, 408 Gault Avenue South, Fort Payne

Circa 1927 Listed: 7/28/78

Landstreet Home, 700 Alabama Avenue SW, Fort Payne

Circa 1850 Listed: 8/4/78

Larmore, J.C., Home (T.J. Larmore Home), US 11, 3 mi S of Hammondville, Valley Head

Circa 1880 Listed: 7/28/78

Larmore, V.C., Home, Rt 2, Valley Head

Circa 1836 Listed: 1/31/79

Leath House, 405 SW Third, Fort Payne

Circa 1889 Listed: 7/29/76

Magnolia Hall, 702 Forest Avenue NW, Fort Payne

Circa 1890 Listed: 2/6/78

Malone-Leath House, 200 Alabama Avenue SW, Fort Payne

Circa 1890 Listed: 8/4/78

Manitou Cave, 1000 Manitou Avenue, Fort Payne

Circa Listed: 8/6/76

McNew Cemetery, 1652 County Rd. 153, Ft. Payne

c. 1867 Listed: 6/19/97

Mentone (4), Mentone

Circa 1870 Listed: 7/23/76

Mentone Inn (Hal's Hotel/DeSoto Lodge), P.O. Box 284, Hwy 117, Mentone

Circa 1927 Listed: 9/4/84

McCurdy House, Intersection of Hwy 35 and Hwy 75, NW corner, Rainsville

Circa 1931 Listed: 7/28/78

McWhorter-Killian House, Lackey Gap Road, 2 mi N of Collinsville

Circa 1904 Listed: 8/4/78

Powell, D.W. "Dock", Place, .5 mi N of Powell's Crossroads, Rt 2, Fyffe

Circa 1903 Listed: 8/4/78

Rockymount Cemetery, Collinsville

Listed: 10/7/98

Sawyer Building, 324 North Gault Avenue, Fort Payne

Circa 1878 Listed: 5/9/78

Sawyer House, 404 Alabama Avenue NW, Fort Payne

Circa 1878 Listed: 4/14/78

Taff-Borders Cabin (Taft House), Rt 7, Scenic Road, Fort Payne

Circa 1837 Listed: 7/21/78

Taylor House, 458 Elm Street, Fort Payne

Circa 1895 Listed: 7/21/78

Taylor's Emporium (Horton and Bryant General Store), Hwy 227, Geraldine

Circa 1923 Listed: 8/28/81

The Oaks, 250 Forrest Avenue North, Fort Payne

Circa 1884 Listed: 7/21/76

Ward-Elrod Home, South Valley Street and First Avenue, Collinsville

Circa 1918 Listed: 8/28/81

Willbanks-McReynolds House, Cor. S Valley St & W End Ave, Collinsville

Circa 1908 Listed: 8/4/78

Windward Inn, Brown Road, DeSoto Parkway, Rt 1, Mentone

Circa 1900 Listed: 8/28/81

Winston Place, Valley Head (NRHP)

Circa 1835 Listed: 8/3/76

Woodland Cemetery, 22nd Street & Cedar Avenue, Fort Payne

1890 Listed: 2/25/99

ELMORE COUNTY

Bateman, Florence, House, 311 Government St., Wetumpka

Circa 1842 Listed: 6/15/77

Beaulieu, Francis, House, cor. Blue Ridge and Old Jasmine Rds, Wetumpka
Circa 1816 Listed: 3/30/77

Bibb-Graves Bridge, over Coosa River, Wetumpka
Circa 1931 Listed: 2/25/77

Bibb's, William Wyatt, Grave, One block off Elmore County 23, Coosada
Circa Listed: 11/5/76

Billingsley Home and Windmill (2), .1 mi N on Asberry Rd, near Tallassee
Circa 1930 Listed: 11/4/77

Busch Log Cabin, 1301 Jasmine Hill Road, Wetumpka
1935 Listed: 3/22/91

Confederate Arsenal House (Elliott House), 305 King Street, Tallassee
Circa 1864 Listed: 8/1/77

Corn Dance Farm, Cedar Dr, off Cook Rd, N of inter. Cook & Coosada Rds, 2 mi, Coosada
Circa 1820 Listed: 11/30/77

Crommelin's Landing, behind Wetumpka City Hall on the Coosa River, Wetumpka
Circa 1820 Listed: 3/27/77

Edward Rock Dogtrot House, 13 mi N of Wetumpka on Westside of US 231
Circa 1830 Listed: 3/1/77

Ellerslie (Bowling Hall House), 2650 Edgewood Rd, Millbrook
1820 Listed: 6/30/95

Elmore County Courthouse, Commerce Street, Wetumpka
Circa 1931 Listed: 5/2/77

Elmore County Training School, 1 Lancaster Street, Wetumpka
1924 Listed: 3/7/02

First Baptist Church, 205 W Bridge Street, Wetumpka
Circa 1846 Listed: 6/3/77

Gantt Dogtrot House, Elmore CR 29, Titus
Listed: 4/8/77

Hagerty-Turner-Yung House (ABlue Hills@); 4690 Jasmine Hill Road, Wetumpka
Between 1840 & 1860 Listed: 9/30/99

Harrogate Springs/Crommelin House, 1 mi S of Wetumpka
Circa 1905 Listed: 3/30/77

Herron Hill, turn on Herron Rd at light in front of Tallassee Hospital, Tallassee
 Circa 1855 Listed: 7/25/77

Hickory Knoll, E side of Hwy 143, .3 mi N of Hwy 14, Elmore
 Circa 1892 Listed: 10/24/77

Holtville School (Holtville High School), Rt 2, Hwy 111, Deatsville
 Circa 1929 Listed: 5/18/77

Hotel Talisi, Corner of Sistrunk and James Sts, Tallassee
 Circa 1929 Listed: 7/28/77

Howle, John, House, 300 N Bridge Street, Wetumpka
 Circa 1904-05 Listed: 5/26/86

Jasmine Hill Gardens, Jasmine Hill Rd between Wetumpka & Montgomery, off US 231
 Circa 1820, Gardens 1930 Listed: 7/21/77

Jordan Dam, Coosa River, 8 mi upstream from Wetumpka
 Circa 1927 Listed: 11/5/76

Lanark Plantation (Spring Hill), 2 mi E of Millbrook off Edgewood Rd
 Circa 1820 Listed: 9/20/77

Martin Dam, Tallapoosa River, N of Tallassee (portion in Tallapoosa Co.)
 Listed: 1/5/76

McCowen House (Thomas Home), 306 E Bridge Street, Wetumpka
 Circa 1904-05 Listed: 11/30/77

Museum of Music, Hwy 231 S of Wetumpka
 Circa Listed: 1/25/77

Old Calaboose, E bank Coosa River 100 ft N of Bibb Graves Bridge, Wetumpka
 Circa 1840 Listed: 1/27/76

Old Wetumpka Post Office, 206 South East Main Street, Wetumpka
 1937 Listed: 5/19/99

Peterson and Peterson Store (2) (Cowling General Store) .1 mi W of intersection of
 Hwy 14 W & 14 S across RR tracks S Elmore
 Circa 1900 Listed: 11/3/77

Robinson Springs Methodist Church, AL 14, 143 int., Robinson Springs (NRHP)
 Circa 1845 Listed: 7/21/77

Robinson Springs Methodist Parsonage Lot, AL 143, SE of AL 14, Millbrook
Circa 1850 Listed: 7/21/77

Swayback Bridge, on US 231 across Sofkahatchee Creek, Wetumpka vcn
Circa 1931 Listed: 4/14/77

Tallassee Mill, off AL 14 East of Tallassee
Circa 1841 Listed: 1/18/78

The Elms, 4721 Lindsey Road, Coosada (Millbrook)
Circa 1836 Listed: 8/15/83

Titus Historic District (10), 15 mi N of Wetumpka on CR 29, Titus
Circa 1800 Listed: 4/12/78

Tukabahchi, E of Airport, 3 1/2 mi S of Tallassee, E off AL Hwy 229; SW bank of
Tallapoosa River in big loop to East, Tallassee
Circa Listed: 7/21/77

Tuskeena Street District (15), 200-900 Blks, Tuskeena St, 200-600 Blks Coosa and
Tallapoosa Sts; connecting portions of Government, Ala. and West Main Sts,
Wetumpka
Circa Listed: 7/29/77

Wall, Tom, House (Taylor-Wall-Ingram House) (George Taylor House)
Rt 1 Box 280, US Hwy 231 N 1 1/2 mi N of Tutwiler Womens Prison, Wetumpka
Circa 1830 Listed: 1/14/80

Wetumpka Lock (Lock 31), Coosa River under Bibb Graves Bridge, Wetumpka
Circa 1896 Listed: 8/3/77

Wingard, Christian, Home Place, 608 Company Street, Wetumpka
1937 Listed: 6/30/95

ESCAMBIA COUNTY

Dooley Hall, North Rabb (Kirkland Road), Brewton
Circa 1911 Listed: 11/13/78

Elmore Building, 105-107-109 St. Joseph Street, Brewton
1886-1915 Listed: 8/25/94

Flomaton Hotel, (Commercial Hotel) 120 Palafox Street, Flomaton (NRHP)
Circa 1906 Listed: 4/11/84

Fort Crawford, Snowden Street, East Brewton
 Circa 1816 Listed: 1/18/78

Horn-Eichold House, 1/4 mi w intersection James & Nokomis Rds, Atmore
 1912 Listed: 11/17/95

Leigh House, Belleview, Brewton
 Circa 1885 Listed: 3/11/76

Moore, Charles Lawrence, House and Cemetery, 7077 Jack Springs Rd, Atmore
 c. 1883-84 Listed: 5/19/99

Owen-Lufkin House, 309 S Main Street, Atmore
 Circa 1906 Listed: 8/22/85

Porter-McLaren Home, 500 Franklin Avenue, Brewton
 Circa 1880 Listed: 7/7/80

Southern Normal and Industrial Institute, 1742 Kirkland Road, Brewton
 Listed: 3/12/97

ETOWAH COUNTY

Allenstein's, Myron K., Law Office (Phillips-Action Home), 141 S 9th St, Gadsden
 Circa 1893-9 Listed: 3/20/81

Argyle Historic District, Gadsden
 1913-1960s Listed: 6/19/96

Attalla Elementary School, 812 4th St NW, Attalla
 1935, 1942 Listed: 8/6/93

Bellenger Home, (Charles Gunn House) 872 Chestnut Street, Gadsden (NRHP)
 Circa 1887 Listed: 4/11/84

Elks Building, 922 Tuscaloosa Ave, Gadsden
 Circa 1930 Listed: 12/20/84
 Forrest Cemetery Chapel, 1100 S 15th Street, Gadsden (NRHP)
 Listed: 5/23/88

Gadsden Times-News Building, N corner Fourth & Chestnut St, Gadsden (NRHP)
 Listed: 2/11/82

Garner Cemetery, Eastern end of Washington Street, Gadsden
 Circa 1840 Listed: 2/27/78

Goodyear Tire and Rubber Company, 464 Goodyear Avenue, Gadsden
 Listed: 11/26/75

Haralson Historic District, Gadsden
1890s-1960s Listed 6/19/96

Hood, Colonel, Home (Gadsden Woman's Club), 862 Chestnut St, Gadsden (NRHP)
Circa 1902-04 Listed: 4/16/85

L & N Railroad Freight Depot, N 4th Street, Gadsden (demolished)
Circa 1871 Listed: 5/5/78

Macedonia Methodist Church, Broad Street, Ridgeville
Circa 1906 Listed: 10/19/79

Pioneer Homestead-Noccalula Falls Park(20), Noccalula Rd (Hwy 227), Gadsden
Circa 1777 Listed: 5/12/76

Seven Cedars, 532 4th Street NW, Attalla
Circa 1870 Listed: 4/11/84

Tumlin Gap Tunnel and Trestle, Tumlin Gap Road, Altoona
late 1880s Listed: 5/10/00

Turrentine Historic District, 300-633 Turrentine Avenue, Gadsden
1900-1916 Listed: 3/8/94

White-Erwin Farm (Three Oaks), Hwy 411, 7 mi N Meighan Blvd Bridge, Rt 6 Box 63,
Gadsden
Circa 1900 Listed: 9/6/84

FAYETTE COUNTY

Fayette Courthouse Historic District (25), Fayette (NRHP)
Listed: 11/26/75

McConnel, Thomas Posey, Home, Hwy 43, Fayette
Circa 1888 Listed: 5/12/76

FRANKLIN COUNTY

Bonds, A.T., House, past Guinn crossroads 4 mi, turn R (N) on 1st paved road, follow
road past Bonds Cem. for 1 mi, house on hill, Pleasant Grove
Circa pre-Civil War Listed: 8/28/75

Clayton-Hester House, from Frankfort go E 3.1 mi on F-58, turn right (S) on paved road,
go 4 mi, house sits on E side of road, near Frankfort
Circa 1888 Listed: 12/29/75

Counts, Major Jesse, House, CR 78; go E on CR 48, turn R on CR 78, located about 6

mi E of Russellville, New Boston
 Circa 1835 Listed: 4/11/84

Duncan House, turn S in front of school, go 1/2 mi down dirt road to house, which is
 situated at end of the road, Rockwood
 Circa 1900 Listed: 11/23/76

Five-Oaks Springs (Spring of the Five Oaks), blocks bounded by South Washington,
 Gaines Avenues and Montgomery and town Branch, Russellville
 Circa 1817 Listed: 4/29/77

Hulsey-South House, CR 48, Tharptown (Tharp Springs), 5 mi E Russellville
 Circa 1876 Listed: 4/11/84

Kirkwood, 1102 Daily Lane, Russellville
 c. 1830 Listed: 9/30/99

Malone House, turn E on F-41, go 1.5 mi, turn right (W), follow old dirt road for .1 mi,
 house sits on S side of road near Frankfort
 Circa 1820 Listed: 1/27/76

McIntosh House, 601 N Jackson Avenue, Russellville
 Listed: 7/29/92

Mount Pleasant Church, St Rt 24 near Newburg, 7 1/2 mi E of Russellville
 Circa 1900 Listed: 4/11/84

Newburg Masonic Lodge, Off Hwy 24 approx. 8 mi E of Russellville off Hwy 43
 1878 Listed: 11/17/95

Russell, Major William, Gravesite (Hurley Cemetery), Russellville vcn
 1825 Listed: 3/19/93

GENEVA COUNTY

Emma Knox Kenan Library, 312 South Commerce Street, Geneva
 Circa 1931 Listed: 2/25/85

Finks Mill, 8 mi E of Florala
 Circa 1932 Listed: 11/26/75

Geneva Depot (AL and FL L&N RR Depot), 604 East Magnolia Street, Geneva
 Circa 1901 Listed: 4/29/77

Geneva Public Library, Corner of Commerce and East Church, Geneva
 Circa 1932 Listed: 9/9/77

GREENE COUNTY

Banks, Wilkes, House, 500 Springfield Rd, Eutaw
1848 Listed: 11/5/76

Bethsalem Presbyterian Church, Boligee
Circa 1835 Listed: 8/12/76

Braune-Inge-Beeker House, 236 Prairie Avenue, Eutaw (NRHP)
Circa 1860 Listed: 10/12/76

Brugh House, Wilson Street, Eutaw
Circa 1900 Listed: 10/17/80

Carpenter-Rudd House, AL 14, E of Clinton (NRHP)
Circa 1853 Listed: 12/21/77

Concord/Clinton Baptist Church, Clinton
1857 Listed: 6/19/96

Hale-Jarvis-Trotter House, 223 Wilson Avenue, Eutaw (NRHP)
1842 Listed: 11/30/77

Malloy, Dr. M.L., House (Rosemont), 248 Wilson Avenue, Eutaw
Listed: 9/30/99

Murphy Dunlap House, 237 Wilson, Eutaw
1844 Listed: 11/5/76

Owens-Hutton Home, Hwy 14, 17 mi N of Eutaw, Pleasant Ridge
Circa late 1940s Listed: 10/12/76

Perkins-Browder House, 89 Spencer St, Eutaw (NRHP)
1850s Listed: 10/17/80

Pippen Plantation, 431 Springfield, Eutaw (NRHP)
1850s Listed: 10/11/78

Reese-Phillips House, 244 Wilson Ave, Eutaw (NRHP)
1856 Listed: 10/17/80

St. Mark's Episcopal Church and Cemetery, 2 mi. west of Highway 11, Boligee
Circa 1852, Moved 1880 Listed: 3/20/03

Sipsey
Listed: 10/19/79

HALE COUNTY

Hatch, Alfred, House (Holbrook Residence/Elm Ridge Plantation) (NRHP)
 Hwy 14, Sawyerville Road, Greensboro
 1840s Listed: 11-2-90

Newbern Village Historic District (55), Newbern
 Antebellum Listed: 11/26/75

Salem Baptist Church, Greensboro
 Listed: 7/29/92

Oak Grove Missionary Baptist Church, Oak Grove Road, Gallion
 Mid-1870s Listed: 9/28/00

Seay Homes (2)

1) Williams Place (Reubern Seay Home), 304 Seay Street, Greensboro
 Circa 1939 Listed: 12/21/77

2) Morrison House, 806 Seay Street, Greensboro
 Circa 1839 Listed: 12/21/77

St. Matthews AME Church, Greensboro
 1861 Listed: 10/31/75

The President's House, 514 College Street, Greensboro
 Listed: 7/29/92

HENRY COUNTY

Abbie Creek Bridge, CR 26, just off AL 95, 3 mi N of Haleburg
 Circa 1930 Listed: 6/16/76

Edwin Community Clubhouse, Route 1, Clopton
 late 1930s Listed: 9/28/00

Kennedy House, 300 Kirkland St, Abbeville (NRHP)
 1866 Listed: 7/19/76

Mount Zion Baptist Church, Rt. 2, Columbia
 c. 1871 Listed: 4/16/85

Old Methodist Parsonage (Dow-Parsonage), 113 Franklin Street, Abbeville
 Circa 1880 Listed: 4/16/85

Trawick-Pinkerton House, 408 Kirkland Street, Abbeville
 1869 Listed: 7/6/78

Wright's Chapel Cemetery and Church Site, Abbeville
1822-24 Listed: 12/19/91

HOUSTON COUNTY

Alabama Midland Depot, Railroad Street, Ashford (NRHP)
Circa 1892 Listed: 1/25/77

Atlantic Coastline Railroad Depot, Powell Street, Dothan (NRHP)
1908 Listed: 8/3/90

Columbia Jail, North Street, one block off Main St, Columbia
Circa 1862 Listed: 10/27/75

Dothan Municipal Light and Water Plant, 126 N College St, Dothan (NRHP)
1912-1913 Listed: 3/23/90

Express Car and Business Car #502, 2076 Ross Clark Circle, South, Dothan
1885 thru 1974 Listed: 3/20/81

First Missionary Baptist Church, 370 Chickasaw Street, Dothan
1912 Listed: 5/3/01

Murphy's Grist Mill, 3623 Murphy Mill Road, 5 mi N of US 231, NE of Dothan.
Circa 1906 Listed: 6/16/76

NBCAR Historic District (Newton, Burdeshaw, Cherry, Adams, & Range Streets), Dothan
Circa 1910-present Listed: 5/3/01

Pilgrim Rest Baptist Church East and Cemetery, 3009 Pilgrim
Church Road, Gordon vic.
1911 Listed: 3/20/03

JACKSON COUNTY

Bridgeport Depot, Bridgeport
1917 Listed: 9/15/75

Brown-Proctor House, 208 South Houston Street, Scottsboro (NRHP)
1881 Listed: 2/4/81

College Hill Historic District, portion College Ave & Kyle St, Scottsboro (NRHP)
Between 1890 and 1970 Listed: 2/19/82

Doran's Cove Church and Cemetery, Rt 1, Doran's Cove (CR 75), Bridgeport
School and Church c.1850 - earliest burial 1840
Listed: 4/16/85

Doran House, Near AL/Tenn. state line in Doran Cove
 Circa 1816 Listed: 10/11/78

Kilpatrick-Hughes House, 305 Olcott, Bridgeport
 Circa 1891, 1925 Listed: 1/31/79

Maples House, Market Street, Scottsboro
 Circa 1860 Listed: 11/23/76

Scottsboro MRA (24)
 Listed: 2/19/82

Scottsboro Public Square Historic District, Scottsboro (NRHP)
 Circa 1870, 1930 Listed: 6/29/81

Shelton-Jones House, 414 South Scott Street, Scottsboro
 1907 Listed: 5/10/00

Skyline School
 Listed: 10/7/98

Stevenson Depot, Stevenson (NRHP)
 1872 Listed: 9/15/75

Whitcher-Denton House, 201 Olcott Avenue, Battery Hill, Bridgeport
 1891-1892 Listed: 10/11/78

JEFFERSON COUNTY

Adams House, 2974 Rhodes Circle, Birmingham
 1908-1909 Listed: 5/25/76

Alabama Theatre Pipe Organ, Alabama Theatre, 1811 Third Ave, B'ham (NRHP)
 Circa 1927 Listed: 2/15/77

Anderson, Margaret, House, 6474 Old Bradford Road, Birmingham
 c. 1842 Listed: 9/30/99

Barnett-Tannahill Sutton House, 3832 10th Avenue South, Birmingham
 Circa 1908 Listed: 5/18/78

Beaumont House, 4151 Montevallo Road, Birmingham
 Circa 1850 Listed: 5/12/76

Bessemer Public Library, 321 N 18th Street, Bessemer
 1907 Listed: 7/6/78

Bethel Baptist Church, 3233 North 29th Ave, Birmingham
 early 1900s Listed: 11/13/96

Bivens Chapel Cemetery, Brookside
c. 1836 Listed: 12/19/91

Black Creek Bridge, Old Decatur Highway, Fultondale
1926 Listed: 7/16/76

Blossburg Hollow Coke Ovens, N of US 78, along Prudes Creek N of Adamsville
1889 Listed: 9/14/77

Bridge Over The Little Cahaba River, Parker's Mill Ford, Birmingham
1905 Listed: 8/6/93

Chamblee-Sterne House, 2437 Tyler Road, Birmingham
Circa 1830 Listed: 11/30/77

City Federation of Colored Woman's Clubs House, 551 Jasper Road, Birmingham
1899-1900 Listed: 7/29/77

Coe House, 1108 29th Street South, Birmingham
1908 Listed: 7/21/77

Copeland, Ann Susan Hale, House, 641 Shades Cest Road, Hoover
1908 Listed: 8/25/94

Davis, Angela Y., House, 1 Eleventh Court North, Birmingham
Listed: 10/7/98

Dobbins Building, 1506 Ridge Road, Birmingham
1905 Listed: 3/24/95

Donnelly House, 2838 Highland Avenue South, Birmingham
Circa 1905 Listed: 5/20/75

Drenner-Rich House, 1220 South 28th Street, Birmingham
Circa 1903 Listed: 4/29/77

Dunbar High School, between 5th and 6th Ave and 27th and 28th St, Bessemer
1922 Listed: 2/19/88

Ellard-Thomas House, 7600 5th Ave South (Eastlake), Birmingham
1928-1929 Listed: 4/11/84

Engle-Armstrong House, 1516 Roseland Drive, Birmingham
1937 Listed: 11/17/95

Five-Mile Creek Bridge at Bivens Chapel, CR 115 1 mi N of CR 105 S of Brookside (NRHP)

Circa 1906-1910 Listed: 3/19/76

Forest Park District (650), Birmingham (NRHP) Bounded on W by 38th St between Cliff Rd Alley (13th), S of Cliff Rd Alley to its end and all property N of Altamont Rd at intersection with Cliff Rd, on E by a line between center of Cliff Rd where it intersects Altamont Rd

1906 Listed: 9/13/78

Fowler/Woods House, 218 N 52nd St, Birmingham
1892 Listed: 12/4/92

Gates-Ballew House, 1602 Manhattan Street, Homewood
1925 Listed: 6/30/95

Graham Cemetery, Mount Olive Road, Mount Olive
1880 Listed 2/2/01

Guild Hall (Edgewater United Methodist Church), corner Galveston St and Holland Ave, Birmingham/Edgewater Vicinity
1914 Listed: 3/22/91

Hale House, 2136 Bluff Road, Hoover
1910 Listed: 3/8/94

Happy Hollow District Bridge, Civitan Park, 100 yds N of US 11, over Cahaba River, Trussville
1909 Listed: 3/19/86

Holy Rosary Catholic Church, 7406 Georgia Road, S, Birmingham
1889 Listed: 5/12/76

Hoover House, 2255 Tyler Road, Hoover
1948-50 Listed: 8/3/90

Howze, Judge H.R., House, 1218 South 28th Street, Birmingham
Circa Listed: 7/21/77

Jackson, Ruth J., Cottage, 1301 30th St N, Birmingham
1900 Listed: 5/17/77

Johnston=s Log Cabin, 3208 Karl Daly Road, Birmingham
c. 1925 Listed: 11/13/96

Jordan, Mortimer, House, 2834 Highland Avenue, Birmingham
1906 Listed: 7/21/77

Lawler Cemetery, 7501 Thed Brasfield Road, Dora
1812 Listed: 2/25/99

Loeb-Crowe House, 1018 32nd St. South, Birmingham
1913-1914 Listed: 8/6/76

Loveman, A.B., House, 2954 Rhodes Circle, Birmingham
1906 Listed: 7/21/77

Loveman, J., House, 2944 Rhodes Circle, Birmingham
1908 Listed: 7/21/77

Martin, Hugh, Cottage, 1919 15th Avenue South, Birmingham
Circa 1920-21 Listed: 4/11/84

McDaniel House, 1100 Saulter Road, Birmingham
Circa 1870 Listed: 10/27/75

Miles Memorial College Hist. Dist, 5501 Myron Massey Blvd, Fairfield (NRHP)
1907-1942 Listed: 3/19/93

Morrow House, 2800 South 11 Court, Birmingham
1910 Listed: 7/21/77

Oak Hill Cemetery and Pioneer Memorial Chapel, 1120 19th St N Birmingham (NRHP) 1871
Listed: 10/27/75

Parham Apothecary Building, 401 60th Street, Fairfield (NRHP)
1947 Listed: 11/17/95

Park Avenue Historic District, Bluff Park community, Hoover
Listed: 10/7/98

Pinson School, 4509 Center Point Road (AL Hwy 75), Pinson
1919-21 Listed: 4/21/99

Pratt City Carline Historic District (NRHP)
Ave U from Ave A to Carline and Carline from Ave W to 6th St, Birmingham
Listed: 2/19/88

Rickwood Field, 1137 2nd Avenue W, Birmingham (NRHP)
1910 Listed: 12/19/91

Rock Manor, 2217 Vestavia Drive, Vestavia
1925 Listed: 6/10/76

Roebuck Springs Historic District (NRHP)
S from Old Blountsville Rd to Ridge & Rutherford Circles W from Cumberland/North Dr
to Exeter Rd encompassing original 1910 road network, Birmingham

Listed: 5/7/87

Rowan House, 1900 Montevallo Road SW, Leeds

Circa 1904-05

Listed 2/2/01

Sandusky School, 1241 Pratt Highway, Birmingham

Listed: 7/29/92

Shades Crest Road Historic District, 601-937 Shades Crest Road, Hoover
mid-to-late 19th century Listed: 11/13/96

Shook-Wikstrom House, 1120 South 28th Place, Birmingham

1906

Listed: 7/21/77

Simon-Buck House, 2160 14th Ave S, Birmingham

1930

Listed: 11/17/95

Sixteenth Street Baptist Church, 1530 6th Ave N, Birmingham (NRHP)

1911

Listed: 6/16/76

Stonecroft, 1453 Shades Crest Road, Hoover

c.1821

Listed: 7/22/91

(Listed on NR: 11/29/01)

Temple of Sibyl, NE corner Shades Crest Rd, Hwy 31 inter., Vestavia Hills

1924-1925

Listed: 10/28/85

The Overseer=s House, 393 Park Avenue, Hoover

c. 1889

Listed: 9/28/00

Thomas Historic District, area between 1st and 8th Sts N of Village Creek and W of St.
Louis and San Francisco Railroad tracks, Birmingham (NRHP)

Listed: 2/19/88

Thompson House, 2848 Highland Ave, Birmingham

Circa 1910

Listed: 7/21/77

Turkey Creek Archaeological Historic District, Pinson vcn.

Listed: 1/15/99

Union Baptist Church, 189 Avenue K, Libscomb

1922

Listed: 4/11/84

Virginia Mines (30), 2 mi SW of Hueytown

Circa 1902

Listed: 4/14/78

Whitehead-Falls House, 1330 33rd Street S, Birmingham

1913 Listed: 10/17/80

Wilson-Chapel Methodist Church, 412 Cumberland Drive (Roebuck), Birmingham
1917 Listed: 2/25/80

Wood Family Cemetery, 57th St between 1st and 2nd Ave N, Birmingham
1890 Listed: 1/25/77

Woodlawn City Hall, 5525 1st Ave N, Birmingham (NRHP)
Early 1900s Listed: 11/23/76

Zanaty Realty, Inc. Office, 2911 Crescent Ave, Birmingham
Circa 1904 Listed: 1/14/80

LAMAR COUNTY

Ogden House, 350 Vernon Street, Sulligent
1888 Listed: 3/5/76

Woods, Dr. Thomas Bailey, Place, 6 mi NE Vernon, 6 mi SE Sulligent, Shiloh Com.
Circa 1890 Listed: 11/13/78

LAUDERDALE COUNTY

Abstract Building, 119 South Court Street, Florence
Circa 1905 Listed: 1/29/81

Armistead House, Hwy 20 (Savannah Hwy) W, 5 mi from Florence (NRHP)
Circa 1818 Listed: 10/11/78

Ashcraft-Ingram House, 803 Meridan Street, Florence
1859 Listed: 4/11/84

Bayles, Dr. L.E., House, N edge of town, E side Hwy 207 through Anderson
Circa 1915 Listed: 1/31/79

College Place Historic District, Florence (NRHP)
Listed: 7/29/92

Crossland-Smith House, 658 Wood Avenue, Florence
1889 Listed: 10/12/76

Dowdy Homestead, 10 mi NW of Florence
c. 1840 Listed: 8/3/90

East Florence Historic District (11), Huntsville Rd & Royal Ave, Florence
1880 thru 1930 Listed: 2/15/77

Florence Indian Mound/"Wawmanone," South Court Street, Florence
Mississippian Culture Indians Listed: 4/11/84

Forks of Cypress Plantation, Florence vcn (NRHP)
Listed: 4/14/92

Fuqua Place, from Hwy 72E S onto Lamb's Ferry Rd, L onto CR 70, 3rd house on right
near Rogersville
1836 Listed: 11/26/78

Gaskins Building, 218 North Court Street, Florence
Listed: 2/6/98

Hall-Westmoreland Home, 652 Wood Avenue, Florence
Circa 1900 Listed: 10/12/71

Handy, W.C., Home and Birthplace, 620 West College Street, Florence
Circa 1870 Listed: 3/11/76

Jackson, Aristides, House, N side of Hwy 72, one-fourth mi E of Elgin
Circa 1840 Listed: 1/31/79

Kennedy-Douglass House, 217 E Tuscaloosa Street, Florence
1918 Listed: 5/11/76

Killen Elementary School, Killen community
Listed: 10/7/98

Lamar Building, 111 S Court Street, Florence
1887 Listed: 3/30/89

Lauderdale County Jackson=s Military Road Historic District
1817 Listed: 11/13/96

Leftwich-Dillard House, 612 Wood Avenue, Florence
1888 Listed: 10/12/76

Littleton-Holt Log Cabin, near Bethel Grove Church, N of Cloverdale
Circa 1818 Listed: 3/29/77

Lock #3 of Muscle Shoals Canal, at the Mouth of Bluewater Creek
First Canal-1831; Completed-1890 Listed: 5/26/86

Mapleton (McFarland Home), 420 S Pine Street, Florence (NRHP)
1820 Listed: 10/19/79

Mars Hill Church of Christ, Mars Hill Road, Rt 11, Florence
1904 Listed: 5/20/81

Martin-Bounds House, 1400 Cypress Mill Road, Florence (NRHP)
1843-1860 Listed: 10/19/79

Moody House, Bailey Springs Road, SW of Bailey Springs
Circa 1893 Listed: 11/26/78

Neon Signs--Coca-Cola Bottling Co., SE, 502 S Court Street, Florence
1949 Listed: 8/3/90

Norfolk-Southern Railroad Bridge, Tennessee River, Florence vcn
1870s (Lauderdale/Colbert Counties)
Listed: 8/16/91

Old Florence Water Tower, Seymore Avenue, Florence (NRHP)
Late 19th century Listed: 10/19/79

Pope's Tavern, 203 Hermitage Drive, Florence
Early 1800s Listed: 9/14/77

Reisman-Coffee House, 618 Wood Avenue, Florence
Circa 1900 Listed: 10/12/76

Rogers Department Store, 117 North Court Street, Florence (NRHP)
1894, 1910, 1944 Listed: 8/25/94

Simpson-Wood House, 640 N Wood Avenue, Florence
Circa 1830 Listed: 10/12/76

Wesley Chapel United Methodist Church Cemetery, Rt 2 Box 242, Florence
1819 Listed: 3/19/93

Wilson Park Historic District (7), extends 1/2 block N and 2 blocks S of Wilson Park
between Wood Avenue and Seminary Street, Florence
1800s Listed: 5/17/77

Wood Avenue Historic District (55), (NRHP) 423-801 (except 643) N Wood Ave;
203-219 Hermitage Dr; 438 Seminary St; 6 and 110 Hawthorne St; N Wood Ave
roughly bounded by Tuscaloosa and Hawthorne Sts, Florence
1880s-1930 Listed: 5/9/78

LAWRENCE COUNTY

Albemarle, SE of Courtland 1 mi S of US 72 on S side of Southern RR Tracks
Circa 1821 Listed: 5/26/86

Bride's Hill (Sunnybrook) 1 1/4 mi N Joe Wheeler House Near Hy 20 (NRHP)
 Circa 1828 Listed: 4/16/85

Byrd Log House, Courtland vcn
 Listed: 3/22/91

Courtland Historic District, Courtland (NRHP)
 1818-1819 Listed: 12/15/89

High Town Path Historic District, Bankhead National Forest
 Listed: 11/17/95

Holland, Thomas, House, Hillsboro vcn (NRHP)
 Circa 1836 Listed: 3/22/91

Irwin, Dr. Robert Price, House, 560 Main Street, Moulton
 1907 Listed: 3/20/03

Kinlock Historic District, Bankhead National Forest
 Listed: 11/17/95

Leetch House, 2020 Morgan St, Moulton
 Listed: 7/29/92

Masterson's Mill Site, AL 33, approx. 5 miles N of Moulton
 1870s Listed: 5/23/88

Oakville Indian Mounds and Cemetery, Oakville Indian Mounds Park, 1219 County
 Road 187, Danville
 Listed: 5/3/01

Pine Torch Log Church, Bankhead Forest, Hwy 33 approx. 8 mi S of Moulton
 Circa 1808 Listed: 8/19/76

Tennessee Valley School, Hillsboro
 ca. 1921-25 Listed: 5/10/00

LEE COUNTY

Antioch Methodist Church, Hwy 12-E, Salem
 Listed: 3/23/90

Auburn Depot, Mitchell Street, Auburn
 1904 Listed: 1/25/77

Bean=s Mill, 6247 US 29 N, Opelika
 1870s to 1930s Listed: 10/1/97

Auburn University Fisheries Research Units (Lower Ponds) N of Auburn on AL

Hwy 147 just beyond Saugahatchee Creek
1940 Listed: 2/15/77

Baptist Hill Cemetery, Dean and Old Mill Rds, Auburn
1870s Listed: 1/12/94

Bedell-Triplett House, 114 N 8th Street, Opelika
1905 Listed: 9/6/84

Buchanan-Clegg House, 23385 US Hwy 80, Opelika, Marvyn vcn
1840 Listed: 11/13/96

Burton House, 315 East Magnolia Ave, Auburn (moved to Opelika 7/93 - remove from AR?)
1885 Listed: 1/29/80

Ensminger House, Gold Hill
1840s Listed: 4/11/84

Halliday-Cary-Pick House, 360 N College Street, Auburn
1848 Listed: 6/19/76

Kinnebrew-Middlebrooks-Newell House, Waverly vic
1830 Listed: 6/19/96

Lake Condry, 528 Andrews Road, Opelika
1878 Listed: 2/6/98

Lane House (Auburn Women's Club), 712 Sanders Street, Auburn
1853 Listed: 12/19/91

McLain's, Dr. Andrew D., Office & Drugstore, SE cor Main & Crawford, Salem (NRHP)
Late 19th century Listed: 1/4/81

"Old Nancy," Mell Street, Auburn University, Auburn
1905 Listed: 4/14/78

Pine Hill Cemetery, Armstrong Street, Auburn
Late 1830s Listed: 1/31/78

"Pinetucket" (Foster Home), Auburn
1850 Listed: 5/25/77

Ridge Grove Missionary Baptist Church, 1098 Lee Road 155, Opelika vic.
1913 Listed: 5/3/01

Salem-Shotwell Covered Bridge (Pea Ridge Covered Bridge), across
Wacoochee, off US 280 E of Salem
1900 Listed: 1/25/77

Samford-Brown House, 304 N 8th Street, Opelika

Circa 1900 Listed: 4/11/84

Shivers-Rhodes House, 2210 Highpoint Drive, Opelika
Listed: 1/29/80

Stroud, Eli, Cemetery, Smith=s Station vcn.
1861 Listed: 10/1/97

Summers-Cooper House, 475 Lee Road 181, Opelika (NRHP)
1837; 1870s Listed: 3/23/90

Thompson Chapel A.M.E. Zion Church, 605 Torbert Blvd, Opelika
Listed: 10/19/79

LIMESTONE COUNTY

Blackburn-Mastich House, 5 mi W of Athens, NE corner of inters. US 72 and
Limestone CR 43, Rt 5, Box 84, Athens (NRHP)
Circa 1873 Listed: 6/27/83

Bullington House, 209 East Bryan Street, Athens
1910 Listed: 3/12/97

Cambridge United Methodist Church, Cambridge Lane, Athens
Listed: 10/7/98

Dogwood Flat School, Dogwood Flat Road, Tanner
1948 Listed: 2/6/98

Eddins House, Rt 2, Box 95, Ardmore (NRHP)
1808-1810 Listed: 11/2/90

Elkmont Depot, Elkmont
1887 Listed: 3/11/76

Fort Henderson Site/Trinity Congregation Church Complex, Trinity Cir, Athens
1865 Listed: 5/14/93

Founders Hall, Athens College, Athens (NRHP)
1842-1844 Listed: 5/12/76

Hines Hobbs Cemetery, Hines and Hobbs Streets, Athens
c. 1852 Listed: 06/25/02

Little Elk School, Little Elk Road, Athens
1939 Listed: 3/12/97

Walker-Kuykendall House, 309 S Clinton, Athens
Circa 1851 Listed: 2/4/81

West Limestone High School, 14 mi NW Athens, 1/2 mi off AL 99, Rt 1, Lester
1935 Listed: 3/12/86

Woodside, Belle Mina (NRHP)
Circa 1830-1900 Listed: 10/19/79

LOWNDES COUNTY

County Jail, 35 Oak Street, Hayneville
1958 Listed: 9/30/99

Davis, Tony Jr., House, 20 Davis Road, Ramer
1871 Listed: 12/4/92

Holy Ground Battle Site, N of Lowndes County on AL River, NE of Benton
1813 Listed: 5/25/76
Lamar Memorial United Methodist Church, Main Street (Hwy 97), Letohatchee
1869 Listed: 3/20/81

Mather-Easterly House, 75 North Commerce Street, Hayneville
c. 1847 Listed: 9/28/00

Mt. Zion Elementary School/Mt. Zion School, White Hall 23 and Trickem
Road/Freedom Road, White Hall
1923, with c.1947 rear addition Listed:
11/2/90 B Revised: 9/30/99

Old Hayneville Baptist Church, 208 East Tuskeena Street, Hayneville
1890 Listed: 5/10/00

Ramah Baptist Church, Calhoun Cutoff Road, Calhoun
1904 Listed: 9/30/99

SNCC Freedom House Complex, 756 Freedom Road, White Hall
c. 1900, 1958 Listed: 9/30/99

Snow Cemetery, W of CR 11 .4 mi SE of Jct with Rd 21; Dutch Bend Community
Circa 1819 Listed: 9/12/88

Somerville-Harrell House, Pleasant Hill
Listed: 11/2/90

Tent City, US Hwy. 80 & Lowndes CR 23, White Hall
Listed: 9/30/99

Williamson, James Spullock, House-Merry Oaks Farm, Hwy 31, Sandy Ridge (NRHP)
 Circa 1860 Listed: 9/12/88

MACON COUNTY

Armstrong Church, Junction of CR 53 and 54; 4 mi S of Notasulga
 1856 Listed: 3/11/76

Bartram Trail, Tuskegee National Forest
 1775-1776 Listed: No info.

Butler Chapel A.M.E. Zion Church, 105 N Church Street, Tuskegee (NRHP)
 1887 Listed: 4/16/85

Camp Watts, Notasulga vic
 Listed: 7/29/92

Creekwood, CR 79, 1/4 mi of junction of CR 10, Creek Stand (NRHP)
 1840 Listed: 2/15/77

Hardaway Baptist Church (Ebenezer Baptist Church), CR 2, Hardaway
 1845, 1895 Listed: 10/19/79

Thompson, G.C., House, 304 N Main Street, Tuskegee (Moved to Montgomery -
 now Montgomery Visitor Center)
 1855 Listed: 1/14/80

Tuskegee Veterans Administration Medical Center, Tuskegee
 Listed: 4/14/92

Woodward-Bledsoe (The Annex), 500 S Elm Street, Tuskegee
 1835 Listed: 8/31/82

MADISON COUNTY

Alabama A & M University Historic District, Normal
 1911 Listed: 8/3/90
 NRHP Listed: 12/31/01

Allison-Hewlett House, 1829 Winchester Road, Huntsville
 ca. 1823 Listed: 8/25/94

Camp Monte Sano Archaeological Site, 4904 Panorama Drive, Monte Sano, Huntsville.
 ca. 1888-1898 Listed: 5/21/01

Constitution Hall Park, Franklin Street and Gates Avenue, Huntsville
1819 Listed: 10/31/75

Ditto=s Landing, 301 W. Eugene Morgan Rd, Huntsville
c. 1807 Listed: 9/30/99

East Hall (Oakwood Sanitarium), Oakwood Road, Huntsville
1909 Listed: 8/13/87

"Fairview," 515 Randolph Avenue, Huntsville
Circa 1868 Listed: 10/20/77

Gurley Cumberland Presbyterian Church, College & Section Line Sts, Gurley
1912 Listed: 11/4/87

Gurley Historic District, Gurley
Listed: 11/17/95

House/Hinds Cemetery, east of Huntsville
1809-11 Listed: 3/22/91

Jude-Crutchner, Huntsville (NRHP - George Jude House)
1812 Listed: 5/19/99

Laura=s View Train Station Archaeological Site, 4107 Shelby Avenue, Monte Sano,
Huntsville.
1889 Listed 5/21/01

Leech-Hauer House, 502 Governor's Drive, Huntsville (NRHP)
Circa 1830 Listed: 7/28/78
Madison County Poorhouse Cemetery, New Market
Listed: 11/2/90

McCrary House, Riverton Road, NE of Huntsville (NRHP)
Prior to 1830; 1870 Listed: 1/31/79

Memphis and Charleston Railroad Freight Depot, 330 Church Street NW, Huntsville
c.1856 Listed: 06/25/02

Monte Sano Elementary School, 1107 Monte Sano Blvd., Huntsville
1958-59, c 1976, 1998 Listed 1/19/99

Monte Sano State Park, 5105 Nolen Avenue, Huntsville
1930s Listed: 6/19/96

Moore-Jordan-Busbin Mansion, 1997 Jordan Road, Huntsville (NRHP)

Late 1840s Listed: 10/1/81

New Hope High School, Main Street, New Hope (demolished)
1920; 1936 Listed: 6/14/77

New Market Historic District, New Market
1850-1940 Listed: 7/22/91

Otey House, North of Bob Wade Road, vicinity of Merdiannville (NRHP)
Circa 1850 Listed: 1/31/79

Owens Cross Roads Church of Christ, 116 Wilson Mann Road, Owens Cross Roads
1933 Listed: 2/4/00

Phelps-Jones House, 6112 Pulaski Pike, Huntsville (NRHP)
Early 1820s Listed: 1/31/79

Poplar Ridge School, 790 Poplar Ridge Road, New Hope
1858 Listed: 8/3/90

Quick, William LaFayette, House, 4 mi E Hwy 431N, 1877 Walker Ln, New Market
Early 1900s Listed: 5/23/88

Schrimsher Farm/Sunrise Terrace Subdivision, 3518-4321 Panorama Dr & 3605, 3609,
3611 Skyview Dr, Huntsville
1950 Listed: 5/19/98

Simmons House, North of Huntsville
Circa 1850 Listed: 5/26/75

Steamboat Gothic House, Lowe Avenue and South Green Street, Huntsville
1890 Listed: 10/27/75

Steger-Nance House (Dr. Howard Place), 3141 Maysville Rd, Huntsville (NRHP)
Circa 1854 Listed: 9/24/81

Temple B'Nai Shalom, 103 Lincoln Street SE, Huntsville
1898 Listed: 7/29/77

Union Chapel (UAH), Campus of University of Alabama at Huntsville
Circa 1835 Listed: 9/9/75

Viduta Historic District, Monte Sano Mountain, Huntsville
1830-1930 Listed: 3/8/94

Warden=s Residence, Wheeler National Wildlife Refuge/Triana Medical Clinic,
295-A Stone Street, Triana
1941 Listed: 2/2/01

William Hooper Councill High School, 620 St. Clair Avenue, Huntsville

Circa 1927-1953 Listed: 2/2/01

MARENGO COUNTY

Altwood, Faunsdale, in 1988 moved to Cedar Crest Farms near Dayton (NRHP)
Circa 1836 Listed: 2/19/88

Ashe Cottage (Ely House), 307 North Commissioners Ave, Demopolis (NRHP)
1832 Listed: 8/22/75

Askew House (Beechwood), Hwy 43, Linden vic.
Listed: 7/29/92

Bethel Baptist Church, McKinley
Circa 1840 Listed: 4/11/84

Bolton-Agee House, 704 North Main, Demopolis
mid 1840s Listed: 10/4/78

Dayton "Town Hall," (Boddie Law Office) Dayton
Circa 1858 Listed: 9/9/77

First United Methodist Church, 200 E Decatur Street, Demopolis
1895-1897 Listed: 10/4/78

Marengo County High School, 501 Range Street, Thomaston
1909 Listed: 3/24/95

Morning Star Baptist Church, 614 E Jackson Street, Demopolis
Listed: 5/13/88

Robertson Banking Company, 100 E Washington, Demopolis
Early 1900s Listed: 10/12/76

Rosenbush Furniture Company, 101 North Walnut Street, Demopolis
Circa 1895 Listed: 6/20/78

Spight-Davis House, 201 S Strawberry Street, Demopolis
1854 Listed: 10/4/78

St. Leo's Catholic Church, 309 S Main Street, Demopolis
1905 Listed: 1/31/79

Victorian House (Dr. Cock=s Office), 209 South Strawberry Street, Demopolis
c. 1890 Listed: 6/19/97

Victorian House (Shelby=s Boarding House), 400 East Washington Street, Demopolis
c. 1890 Listed: 6/19/97

Victorian House (Parr House), 401 East Washington Street, Demopolis
c. 1890 Listed: 6/19/97

Welch-George House, 400 S Strawberry Street, Demopolis
 Circa 1882 Listed: 9/20/78

MARION COUNTY

Dickinson's Store, Main Street, Brilliant
 1907 Listed: 7/18/89

Fite, Ernest, House and Fite Law Office, Military Rd, Hamilton (NRHP)
 Listed: 12/4/92

Hamilton House, US 73, Hamilton
 1875 Listed: 7/15/76

"Hillcrest," Trull Drive, Winfield
 Listed: 9/6/84

Johnson Rural Medical Museum, 16th Avenue Southwest, Hamilton
 Circa 1902 Listed: 10/19/79

Winfield Bank, 194 Bankhead Highway, Winfield
 1961 Listed: 10/1/97

MARSHALL COUNTY

Albertville High School, 402 East McCord Avenue, Albertville
 1912 Listed: 3/24/95

Christ Episcopal Church, 607 E Main Street, Albertville
 1882 Listed: 10/19/79

East Main Street Historic District, 400-623 East Main Street, Albertville
 Listed: 5/19/98

Episcopal Church of the Epiphany, 2132 Debow Street, Guntersville
 1917 Listed: 6/19/96

First Baptist Church and Cemetery, 225 South Main Street, Boaz
 1922-23 Listed: 2/6/98

First Presbyterian Church, Corner of Gunter and Greenwood, Guntersville
 1911 Listed: 10/19/79

Guntersville Depot, 905 Railroad Avenue, Guntersville
 1892 Listed: 3/7/02

Harbor Master Building at City Boat Docks, Guntersville
 Mid 1950s Listed: 5/19/98

Hotel Thompson, 108 1st Avenue, NE, Arab (NRHP) (Burned 1989)
1890; 1936 Listed: 8/22/85

Methodist Episcopal Church, South, Thomas and Darnell Streets, Boaz
1917 Listed: 6/30/95

Snead Junior College, 220 N Walnut St, 308 W Mann Ave, 201 College Ave, 300 Elder
St, Boaz (NRHP)
1920-1942 Listed: 4/6/98

Snellgrove Homestead, 515 East Mann Avenue, Boaz (NRHP)
1900 Listed: 6/30/95

Spanish House (Carter House), 280 Gunter Avenue, Guntersville
1928 Listed: 9/15/75

MOBILE COUNTY

Alexander House, 217 Edington Place, Mobile
1853 Listed: 7/6/78

Bankhead Tunnel, US 90, Mobile
1938 Listed: 1/25/77

Battleship Alabama Memorial Park, Battleship Parkway, Mobile Bay
launched 1942 Listed: 10/28/77

Bellingrath Gardens and Home, 20 mi S of Mobile, near Theodore (NRHP)
1927; 1935 Listed: 9/14/77

Citronell Depot, adjacent to Mobile & Ohio RR, Citronelle
1902 and 1917 Listed: 2/20/86

Creola Station, 1584 Dead Lake Marina Road, Creola
1905 Listed: 12/19/91

Dawes-Theodore School, 5761 Theodore Dawes Road, Theodore
1911 Listed: 7/18/89

Faith-Brown House, 65 South Ann Street, Mobile
1878 Listed: 9/9/77

Fowl River Community House, 5401 Fowl River Road, Theodore
c. 1939 Listed: 3/24/95

Grant, Ella, School (House of Hope Inc), 740 W. Clark St, Prichard
1923 Listed: 3/8/94

Gulf City Paper Company Site, 30 miles N of Mobile on US Hwy 45
 1867-1878 Listed: 7/17/81
 Kimball-McMillan-Yarborough, 1150 Dauphin Street, Mobile
 Circa 1855 Listed: 7/29/77

Loper-Young House, 207 6th Street, Chickasaw
 1919 Listed: 2/4/00

Manley-Ruther House, 204 Lee Street, Chickasaw
 1919 Listed: 2/4/00

McDonald, Alfred Sidney, House, 222 Court Street, Chickasaw
 1947 Listed: 2/4/00

Satsuma School, E side of Railroad S of Maple Ave, Satsuma
 1936 Listed: 5/23/88

Semmes School, Wulff Road, Mobile
 1902 Listed: 8/25/94

Smith-Goolsby House, 209 Third Street, Chickasaw
 1919 Listed: 9/30/99

Stack, Jay W., House, 3054 Riverside Drive, Mobile
 1926 Listed: 7/22/91

State Street A.M.E. Zion Church, 502 State St, Mobile (NRHP)
 1854 Listed: 10/20/77

Steam Locomotive 1527, Municipal Park, Mobile
 1926 Listed: 8/19/76

Stone Street Baptist Church, 311 Tunstall Street, Mobile (NRHP)
 1931 (1909) Listed: 4/11/84

Whistler Historic District (125), Prichard
 Turn-of-the-century Listed: 11/26/75

MONROE COUNTY

Bethany Baptist Church and Cemetery, County Road #5, Burnt Corn
 1874 (church) Listed: 5/3/01

Concord Baptist Church, CR 56, Buena Vista
 1904-1905 Listed: 1/31/78

Dennis House, 621 N Mt. Pleasant Avenue, Monroeville
 1905 Listed: 8/19/83

First National Bank of Monroeville-Elbrecht Building, Monroeville

Listed: 11/13/96

New Hope Baptist Church & Cemetery, Natchez
c. 1855 Listed: 2/4/00

Old Scotland Presbyterian Church, 2 1/2 mi W of Tunnel Springs
1837 Listed: 5/23/88
Perdue Hill Masonic Lodge, US 84, Perdue Hill
1819 Listed: 11/1/76

Rikard=s Mill, AL Hwy 265, 3 mi N of Beatrice
c. 1935, reconstructed 1993-94) Listed: 10/7/98

Village of Buena Vista (25), CR 56 betw Beatrice & Vredenburgh, Buena Vista
Early 1800s Listed: 4/14/78

Watkins House, CR 5, Burnt Corn vcn
c. 1830 Listed: 10/4/93

MONTGOMERY COUNTY

Abner McGehee Burying Gound, Hope Hull
1827-1935 Listed: 11/13/96

Alabama War Memorial, 120 North Jackson, Montgomery
1968 Listed: 10/28/77

Alabama State University Historic District, Montgomery (NRHP)
1916-1945 Listed: 8/25/94

Barnes, J.M., House, Highway 331, Montgomery
1898 Listed: 12/19/91

Belser/Marshall House, Old Pike Road, Mt. Meigs
c. 1840 Listed: 3/12/97

Bethel Cemetery, Pintlala
1843-1962 Listed: 9/30/99

Margaret Booth School for Girls (Montgomery Fellowship House for Men)
529 Sayre Street, Montgomery
Circa 1880s Listed: 4/11/84

Brame-Cody-Neal House, 402-404 South Hull Street, Montgomery (NRHP)
1836 Listed: 1/29/80

Centennial Hill Historic District, Montgomery (encompasses 300-500 blocks of S.Jackson +)
Listed: 4/14/92

Church of The Good Shepherd, 439 South Jackson Street, Montgomery

Listed: 1/29/80

Cleveland Court Apartments (620-638), 620-638 Rosa Parks Avenue, Montgomery
Circa 1943 Listed: 3/30/89 (NRHP 10/29/2001)

Cole-Samford House, 1524 St. John Street, Montgomery
Circa 1915 Listed: 2/15/77

Community House (Jackson Community House) 409 S Union St, Montgomery (NRHP)
1853 Listed: 7/21/78

Cottage Hills Historic District, bounded by Goldthwaite, Bell, Holt, Clayton, Montgomery (NRHP)
Late 19th, early 20th century Listed: 4/16/75

Cradle of the Confederacy RR Museum of Montgomery, Alabama, Inc. (Louisville &
Nashville Baggage Car No. 1456) Union Station, 318 Water St, Montgomery
1926-1974 Listed: 1/29/80

Davis Theater for the Performing Arts, 247 Montgomery Street, Montgomery
1929 Listed: 4/11/84

Day Street Baptist Church, 861 Day Street, Montgomery
1882 Listed: 6/20/78

Dept. of Public Safety Headquarters and Museum, 500 Dexter Ave, Montgomery
1937 Listed: 4/14/78

Electric Street Car, Union Station, Riverfront Park, Montgomery
1886 Listed: 5/9/78

First Baptist Church, 347 North Ripley Street, Montgomery
1910-15 Listed: 5/10/00

Frazier Hill, 6716 Old Selma Road, Montgomery
c. 1830 Listed: 06/25/02

General Richard Montgomery Riverboat, Montgomery
1974-1976 Listed: 7/21/76

Grace Episcopal Church, Mt. Meigs (NRHP)
1892-1893 Listed: 1/29/80

Gunter House, Rt 2, Box 195-B, Mt. Zion Road, Ramer
Circa 1830s Listed: 6/2/81

Highland Avenue School, 2024 Highland Avenue, Montgomery
1903 Listed: 10/22/93

Holt Street Baptist Church, 903 S Holt Street, Montgomery
Circa Listed: 5/26/86

Kilby Hall, 1115 North University Drive, Alabama State Univ., Montgomery
1922 Listed: 8/25/94

Lincoln Cemetery, Lincoln & Harrison Roads, Montgomery
1907 Listed: 9/30/99

Little House, 514 Morgan Avenue, Montgomery
Circa 1890 Listed: 1/31/79

Lucas House, Mt. Meigs, E side Old Pike Rd .1 mi S of inters. Old US 80
1826 Listed: 2/20/86

Marks House, Old Pike Road, 1 mi S of Pike Road Community, Pike Road
1825-1830 Listed: 11/23/76

McIntyre-Napier House, Mt. Zion Road, Ramer
1941-56 Listed: 3/13/96

Metcalf-Crommelin-Wood House (World Heritage Museum), 119 W Jeff Davis, Montgomery
1890s Listed: 10/14/81

Marshall J. Moore House, 754 South Jackson Street, Montgomery
1900 Listed: 2/25/99

Mount Zion AME Zion Church, 467 Holt Street, Montgomery
1899 Listed: 6/30/95

Noble-Adair-Roper House (Noble Hill), 216 Noble Avenue, Montgomery
Circa 1881 Listed: 1/31/79

Old Ship A.M.E. Zion Church, 483 Holcombe Street, Montgomery (NRHP)
1834 Listed: 3/3/76

Pintlala School, 175 Federal Road, Pintlala
Listed: 4/14/92

Providence Presbyterian Church, Hwy 331, LeGrand
1854, 1895 Listed: 3/25/83

Ramer Baptist Church, Ramer (Old Ramer Baptist Church/Ramer Masonic Lodge #243)

Listed: 11/13/96

Red=s Little School House, intersection AL 94 & Gardner Rd., Rt 2 Box 200, Grady
1910, 1985 Listed: 10/7/98

Riverview, end of "Old" Washington Ferry Road, Montgomery vcn
c. 1870s-1880s Listed: 12/19/91

Rose Hill, 11250 Hwy 80 East, Mt. Meigs
1918 Listed: 7/18/89

Stone-Young Plantation (Magnolia), 5001 Old Selma Road, Montgomery
1856 Listed: 9/28/00

Tabernacle Methodist Church, Tabernacle Rd off Hwy 31 S, Pintlala Community
Circa 1893 Listed: 7/6/78

Tharin Hall, Pleasant Grove Road, Snowdown
c. 1880 Listed: 10/7/98

Thorington-Arrington-Campbell House, 1846 South Hull Street, Montgomery
1914 Listed: 2/2/83

Tillison, F.J., House (The Teacher's Home), Rt 2, Ramer
1900 Listed: 12/4/92

West Boylston Manufacturing Company Textile Mill and Mill Village
c. 1927-1928 Listed: 09/24/2002

Western Railway of Alabama Car Shops and Engine Terminal Historic District, Montgomery
c. 1898 - c. 1920s Listed: 5/19/98

Williams, Hank, Grave, Oakwood Cemetery (Annex), Montgomery
1954 Listed: 1/25/77

Willow Glen, 1/2 mi S of Hwy 94 on Smilie Road, Rt 2, Box 104, Grady
1872 Listed: 4/11/84

Wright Brothers Flying School Site (Wright Bro's Hanger) Chennault Cir MAFB
1910, 1976 Listed: 11/5/76

647 Clinton Street, Montgomery
1946-1948 Listed: 5/26/86

MORGAN COUNTY

Bethel Road Historic District (51), Bethel Road, Hartselle
Early 1900 Listed: 12/21/77

Cotaco Opera House (Masonic Lodge), Johnson Street, Decatur (NRHP)
1890 Listed: 11/5/76

Dancy-Polk House, Church Street, Decatur (NRHP)
1829 Listed: 10/11/78

East Main Street (48), Hartselle
Turn-of-the-century Listed: 7/21/75

First Missionary Baptist Church, Corner Vine and Grove Sts, NW, Decatur
1919 Listed: 11/2/90

Forest Home, S of US 72, E of Trinity, Decatur vcn (NRHP)
1857-59 Listed: 10/19/79

Hartselle Depot, Hartselle
1915 Listed: 5/12/76

Hartselle Elementary School/F. E. Burleson Elementary School, 305 East
College Street, Hartselle
1916 Listed 5/3/01

Hartselle Tabernacle, Tabernacle Road, SW, Hartselle
1897 Listed: 12/15/89

L & N Freight Depot, 200 Railroad Street, Hartselle
1915 Listed: 3/13/96

Morrow Cemetery, Six Mile Community, 6 mi S of Somerville
Revolutionary War Listed: 11/13/78

Murphy, William, House, Trinity Vicinity (NRHP)
Circa 1830 Listed: 4/16/85

Old Cotaco White House, Rt 3 Box 402, Somerville
c. 1818 Listed: 3/8/94

Old Decatur Courthouse Site, Corner of Ferry and Cain streets, Decatur
1926 Listed: 4/23/76

Old Morgan County High School, 604 Sparkman Street, Hartselle
1909 Listed: 1/31/79

Price-Wooten Home (Springwood), Hwy 67, 1 1/2 mi E of I-65, Priceville

1856 Listed: 10/17/80

Princess Theater, 112 2nd Ave NE, Decatur (in NRHP New Decatur-Albany Historic District)
1887 Listed: 10/23/81

Roberts Duplex, 803 East Main Street, Hartselle
1935 Listed: 5/10/00

Southern L & N Railroad Merchant Shops, 927 2 - 933 4th Avenue SE, Decatur
ca. late 19th century Listed: 5/19/99
Demolished 12/28/00

U.S. Post Office (Hartselle Utilities Bldg.), 113 N Sparkman St, Hartselle
1939 Listed: 5/26/86

Westview Plantation, Indian Hill Road, 3 mi N of Hartselle, Decatur (NRHP)
1841 Listed: 10/19/79

PERRY COUNTY

Carlisle Hall (Kenworthy), AL 14, W of Marion (NRHP)
1958-61 Listed: 12/15/89

Cocke House, on Hamburg Road near city limits of Marion
Early 1930s Listed: 5/80

Fairhope, US Highway 80, Uniontown vcn (NRHP)
1857-1861 Listed: 12/19/91

Fikes Ferry Bridge, E of Marion
1904 Listed: 7/15/76

Fiquet-Perkins-Sturdivant-Moore House, 213 Polk Street, Marion
1850s Listed: 2/6/78

Lockett-Martin House (Napolen Locket House), 211 W LaFayette St, Marion
Early 1840s Listed: 7/7/80
Ocmulgee Baptist Church, 1 mi off Hwy 219 N, on Perry County 6, Selma
1834 Listed: 3/10/78

Phillips Memorial Auditorium, 200 Lincoln Street, Marion (NRHP)
1938-1939 Listed: 2/19/88

Uniontown Post Office, Main Street and US 80, Uniontown
Before 1861 Listed: 11/23/76

Zion United Methodist Church, CR 29, Marion
Listed: 10/17/80

PICKENS COUNTY

Ball, Parks E., Plantation, .5 mi off Hwy 14, Garden Cem, Aliceville (NRHP)
Circa 1826 Listed: 10/19/79

Beard-McShan House, US Hwy 82, McShawn
1840 Listed: 10/19/79

Going-Craft House, Benevola Community, Rt 2, Gordo, AL 35466
Circa 1829 Listed: 10/17/91

Mancel-Gentry House (The White House), 401 3rd Avenue NE, Aliceville
Circa 1913 Listed: 2/20/86

Merchants and Farmers Bank Building, 202 Broad Street NE, Aliceville
1911 Listed: 4/14/82

Milner, John Turner, Bridge, Tombigbee River at Cochrane
1927 Listed: 11/5/76

Pickens County Courthouse, Courthouse Square, Carrollton (NRHP)
1877 Listed: 7/23/76

Pickensville Methodist Church, Pickensville
1842 Listed: 6/9/77

Pilgrim's Rest Primitive Baptist Church, Rt 1, Carrollton
1882 Listed: 10/1/82

Summerville, James M., House (Plantation House), Hwy. 14, Aliceville
1903-05 Listed: 8/22/85

PIKE COUNTY

Bashinsky-Crow-Poole House (The Crow House), 212 Pine Street, Troy
1919-1920 Listed: 4/11/84

Carroll Street Memorial Cemetery, Inc., Intersection Vine & Pine Sts, Troy
Listed: 9/28/00

First United Methodist Church, 213 North 3 Notch Street, Troy
1904 Listed: 6/30/95

Good Hope Baptist Church and Cemetery, Rt 1, Troy, 1 mi N of US 29
1940s Listed: 8/4/78

Lightfoot House, South Main Street, Brundidge
1897 Listed: 8/6/93

Little Oak United Methodist Church, 3 1/2 mi SW of Troy, CR 21 then CR 18

1908 Listed: 8/18/83

Pike Pioneer Museum (10), US 231, Troy
1970s Listed: 11/6/75

Troy High School, 436 Elm Street, Troy (NRHP)
1919 Listed: 11/30/77

Union Springs Primitive Baptist Church and 2 Cemeteries, Hilliard=s Crossroads vcn.
1880s Listed: 10/1/97

RANDOLPH COUNTY

Craft, Gay, House, Hwy 77, Wadley
Circa 1840 Listed: 11/13/78

Lebanon Christian Church and Cemetery, Old Franklin Road E of Roanoke
Circa 1880 Listed: 3/30/89

Perry House, Wedowee
1837 Listed: 9/4/75

RUSSELL COUNTY

Blessed Trinity Shrine, Hwy 165, Holy Trinity
1895 Listed: 2/19/76

Cedar Heights Plantation, 3 mi S of Pittsview on US 431 (NRHP)
1837 Listed: 10/19/79

Cliatt Plantation, AL Hwy 165, 2 mi S of Jernigan
1865 Listed: 6/16/76

Confederate Breastworks (Ft No. 5) Opelika Hwy US 80, 431 Phenix Cty (NRHP)
1863-1864 Listed: 8/20/75

Crowell-Whitaker-Howard Log Cabin, Hwy 165, 3/4 mi S of Ft. Mitchell
Circa 1838 Listed: 1/31/78
Davis House, 401 21st Street, Phenix City
Circa 1880-1890 Listed: 2/3/83

Greenwood Plantation, (Samuel R. Pitts House) US Hwy 431, Pittsview (NRHP)
1846 Listed: 8/16/91

Kearney House, 1223 Broad Street, Phenix City
1890 Listed: 2/3/83

Morgan-Curtis House (Morgan Sanitorium), 1815 Abbot Dr, Phenix City (NRHP)
1904, 1914 Listed: 10/19/79

Southern Railway Depot Building, Depot Street, Hurtsboro (demolished)
1884 Listed: 2/4/81

Trinity United Methodist Church, 1600 5th Avenue, Phenix City
1872 Listed: 2/3/83

Tuckabatchie Masonic Lodge No. 96 F&AM, US Hwy 80, Crawford
1948 Listed: 7/6/78

Walker, Augustus Benning, House, 596 Uchee Road (CR 65), Hatchechubbee
Circa 1892 Listed: 7/22/91

Williams-Holland House, 2000 9th Avenue, Phenix City
1884 Listed: 1/14/80

SAINT CLAIR COUNTY

Adams House, 15 Annie Lee Road, Whites Chapel, Moody vic.
c. 1926 Listed: 06/25/02

Ash, John, House, Rt. 2 Hwy 411, Ashville (NRHP)
c. 1820 Listed: 11/2/90

Ashville Masonic Lodge, Ashville
1853-58 Listed: 8/3/90

Bothwell-Embry House, Hartford Avenue, Ashville (NRHP)
1835 Listed: 10/19/79

Box, Leroy, House, 5th Street and Hwy 231, Ashville
1896 Listed: 6/30/95

Cason-Tipton House, 601 5th Avenue, Ashville
c. 1873 Listed: 10/1/97

Forman, James, House, 2 1/2 mi N of Odenville
c. 1850 Listed: 8/3/90

Harkey's Chapel Methodist Church, AL 144, 2 mi E Hwy 231, 8.3 mi W Ragland
1903-1904 Listed: 7/21/78

Mays Bend Family Cemetery, Cove Drive, Pell City vcn.

1837 Listed: 6/30/95

Merry Oaks Inn (Dr. J.T. Brown Home), River Street, Riverside

1872 Listed: 5/21/81

Montgomery-Ritchie House (Judge Elisha Robinson), US 231 S & AL 23 (NRHP)

1890 Listed: 11/4/87

Newton Homestead, Rt 2, Hwy 411, Ashville (NRHP)

c. 1817 Listed: 11/2/90

O'Donnell's Mill (Gibson's Mill), US 231 S from Ashville toward Pell City

Circa 1840 Listed: 11/13/78

Riser House (Evans-Eatman House), 116 North 21st Street, Pell City

1890 Listed: 3/5/76

Springville Historic District, Springville (NRHP)

1873-1980s Listed: 3/8/94

Steele Cemetery, on Chandler Mt. Road, off Hwy 11, S of Steele

1880 Listed: 7/21/78

Union United Methodist Church, 1/2 mi NE Hwy 231 on Cove Rd 5 mi SW Steele

1921 Listed: 7/21/78

SHELBY COUNTY

Archer House, intersection of New Hwy 280 and CR 55, 9481 Hwy 55, Westover 35185

1880s, 1910 Listed: 7/21/78

Bel May Farm, Hwy 16, off Hwy 22, 5 mi SE, Route 5 Box 314, Montevallo

Circa 1869 Listed: 4/11/84

The Brick House, Shelby Co. Hwy. 42, 1 mi. W of Co. Hwy. 47, Shelby

Listed: 2/19/88

Buck Creek District (6), 1 mi NW Helena, Cahaba River and Buck Creek

Circa 1865 Listed: 7/5/78

Calera Presbyterian Church, 1987 14th Street, Calera

C. 1885 Listed: 3/12/97

Carter Residence (The Bowden Home), 19th Avenue, Calera

1915 Listed: 3/29/77

Chancellor House, intersection CRs 76 & 79, 4 1/2 mi from Harpersville
1935 Listed: 11/26/78

Cowart Drug Store, SW Corner of 17th Avenue and Hwy 31, Calera
Circa 1885 Listed: 2/15/77

Cunningham-Stamps House, N on Hwy 119 from Montevallo, CR 22 at Moore's
Circa 1828 Listed: 1/31/79

Densler, John E., House, 50535 Alabama Highway 25, Wilsonville
1879 Listed: 9/28/00

Ebenezer Church, AL 119 N to CR 24, 1 mi left on unpaved Rd, Ebenezer Com.
1891 Listed: 7/21/78

Falkner School, CR 43, 4 mi E of Vandiver
Circa 1850 Listed: 3/21/78

Frost-Sorrell Log House/Crowson-Ward House, N of Montevallo
Circa 1820 Listed: 3/29/77

Harrison House, intersection CRs 17 and 22, Dogwood (N. of Montevallo)
1887 Listed: 4/11/78

Jones-Bailey Cemetery, W of Old Hwy 31, N of Dargin Crossroad, Dargin
1860 Listed: 11/13/78

Klein-Wallace Home, junction Hwys 25 and 76, Route 1, Harpersville
1841 Listed: 1/18/78

McGaughy Farms, Rt 2, Box 41-C, Montevallo
1840-1845 Listed: 2/15/77

McKibbon House, 611 E Boundary Street, Montevallo
1884 Listed: 7/21/78 NRHP Listed: 12/31/01

Meredith-McLaughlin House (McLaughlin Farm), Route, Box 129, Maylene
Circa 1820 Listed: 10/4/78

Mt. Calvary Baptist Church, AL Hwy 74 at Chelsea
1905 Listed: 4/16/85

Old Shelby Hotel, Broadway and Church streets, Shelby
1900 Listed: 9/14/77

People's Hotel, 16th Avenue, Calera (demolished)
1909 Listed: 3/25/76

Perry Hall (Shoal Creek Farm, Inc.), Hwy 119, Rt 2, Box 11, Montevallo
1834 Listed: 9/17/76

Railey House, Hwy 231, Vincent
1890 Listed: 11/26/78

Rock House (Eastis House), off US Hwy 230 East, Harpersville
c.1835 Listed: 12/4/92

Scott-Bradford Home, Rt 1, Harpersville, Hwy 25 to Wilsonville on Hwy 76
1824; 1830s Listed: 1/18/78 (4/93 - to be moved)

Wilson-Albright Log Cabin, 1/4 mi N CRs 22 & 107, Montevallo vicinity
Circa 1820 Listed: 2/6/78

Wilson-Lathem-Taff House, 131 Shelby Street, Montevallo
Circa 1880 Listed: 2/28/79

Woods-Cleveland-Cooling House, off AL Hwy 25, 1 mi S of Wilton
Circa 1845 Listed: 11/16/78

SUMTER COUNTY

Branch-Stuart Home, 183 Jefferson Street, Livingston
1903 Listed: 3/29/77

Gainesville Historic District (17), Gainesville (NRHP)
Early 1800s Listed: 3/25/76

Geiger School, Broadway Street, Geiger
1911-12 Listed: 5/10/00

Hawkins House, 4 mi S on CR 21, Epes
1848 Listed: 6/25/81

Inge-Moon House, US Hwy 11, Washington Street, Livingston
Circa 1834 Listed: 2/19/88

Oakhurst, 2 1/2 mi W AL 17, N Dan Mitchell Rd, Rt 1 Bx 204, Emelle (NRHP)
Early 1850s Listed: 1/14/80

St. James Episcopal Church, SW corner Spring and Monroe Sts, Livingston
Circa 1840 Listed: 4/11/84

Twin Magnolias, Rt. 2 Hwy 28, Coatopa
c. 1860 Listed: 3/12/97

Voss-Pate House, Westside Spring St inters. with Madison St, Livingston
Circa 1850 Listed: 4/11/84

Ward-Ganguet-Gray House, 202 Fourth Avenue, Cuba (NRHP)
Between 1860-1870 Listed: 11/17/95

TALLADEGA COUNTY

Butler-Harris-Rainwater House, Corner First St and Tenth Ave, Childersburg
(NRHP) c. 1890s Listed: 6/23/94

DeForest Chapel, West Battle Street, Talladega
1904 Listed: 6/9/77

DeSoto Caverns, AL Hwy 76, 5 mi E of Childersburg
Prehistoric Listed: 7/19/76

Dowdell, W.C., House (Boxwood), 406 North Street East, Talladega (NRHP)
1854 Listed: 10/22/82

Fairfax Station, 22901 AL Hwy 21, Winterboro, Alpine vcn
1850 Listed: 11/17/95

Fort Williams Cemetery, Coosa River, SW of Fayetteville
1813 Listed: 5/12/76

Guy, Birdie, House, Rt 6, Sylacauga
Late 1800s Listed: 1/14/80

Hendrick House, Rt 5, NE corner inters. CR 42 & 43, 7 mi from Talladega
Between 1835-1840 Listed: 2/28/79

Hightower Brothers Livery Stable, 413 Norton Avenue, Sylacauga (NRHP)
1914-1946 Listed: 11/13/96

Idlewild, Hwy 21, Talladega vcn (NRHP)
c. 1843 Listed: 3/19/93

Jemison-Turner House, CR 21 L 93, 6 mi L Turners Mill, 3 mi N of Talladega
(NRHP) 1836-1837 Listed: 12/15/89

Lanning-Livingston Home, 112 S Broadway, Sylacauga
1901 Listed: 1/14/80

Lawler-Whiting House (Orangevale), 5.6 mi S of Talladega on AL 21 (NRHP)
1852-1854 Listed: 10/8/81

Marble City Cemetery, 606 West Fourth St, Sylacauga
1898 Listed: 11/17/95

Mt. Canaan Baptist Church, 438 West Battle Street, Talladega
Listed: 4/11/84
Ogletree House, Eastaboga vcn
c. 1845 Listed: 3/22/91

Old Town Lincoln Commercial Historic District, (12 buildings) Railroad Avenue,
Lincoln
Circa 1883-1959 Listed: 3/7/02

Porch-Drake House, 1 South Main Avenue, Sylacauga
1914-1915 Listed: 2/6/78

Robinson House (Baker House), E on 46, 4 mi from Childersburg
Circa 1885 Listed: 8/6/76

St. Peter's Episcopal Church, 208 North Street E, Talladega
1927 Listed: 7/7/80

Smith House (Towassa), 301 South Broadway Avenue, Sylacauga
1909 Listed: 2/6/98

Sylacauga Cemetery, E Fort Williams Street, Sylacauga
1832-1900 Listed: 9/15/75

Talladega Public Library, 202 South East Street, Talladega
1908 Listed: 6/10/76

The Oaks/Burns Home, 581 Magnolia Street, Lincoln
1898, 1906 Listed: 10/1/97

Wallis House, Howell's Cove, 4 mi N on Stemley Bridge Rd, Rt 1, Talladega
1832 Listed: 1/31/78

Westview Cemetery (Needmore Cemetery), Long Street, Talladega
1890 Listed: 8/19/81

TALLAPOOSA COUNTY

Browning House, 1 mi S Pleasant Ridge Church Hwy 49, Rt 1 Box 99, Dadeville
1850s Listed: 2/27/78

Coley-Joiner House, 416 Hillabee Street, Alexander City (NRHP)
c. 1895 Listed: 3/30/89

Dillard's Cemetery, AL 63, Hackneyville
1860 Listed: 3/13/96

First Universalist Church of Camp Hill, 48 Oak Street, Camp Hill
1907 Listed: 3/13/96

Martin Dam, Tallapoosa River, N of Tallassee (a portion is in Elmore Co.)
Listed: 1/5/76

McClendon-Mayfield House, 4 1/2 mi N of Alex City on Rt 63 N, Kellyton
1851 Listed: 7/29/77

Pleasant Ridge Baptist Church, Route 1, on AL 49, 3 mi S of Dadeville
1882 Listed: 6/20/78

Tallassee Mills, off AL Hwy 14 East of Tallassee
1841 Listed: 1/18/78

Young, Fred Walker, House, 803 Cherokee Road, Alexander City
c. 1900 Listed: 3/8/94

TUSCALOOSA COUNTY

Alabama Great Southern Railroad Station, 2105 Greensboro Avenue, Tuscaloosa
1911 Listed: 10/19/79

Audubon Place Historic District (28), University Blvd between 17th Ave and 15th
Ave, Tuscaloosa (NRHP)
1912 Listed: 11/24/82

Bama Theater (City Hall), 600 Greensboro Avenue, Tuscaloosa (NRHP)
1938 Listed: 6/30/83

Big Creek Cemetery & Church Site, Coker vcn
1833 Listed: 11/17/95

Brown House, 903 Greensboro Avenue, Tuscaloosa
1870 Listed: 7/31/75

Bucksville Cemetery, Bucksville community, McCalla
1832 Listed: 9/30/99

Caplewood Drive, Caplewood Drive, Tuscaloosa (NRHP)

Listed: 4/11/84

Christ Episcopal Church, 605 25th Avenue, Tuscaloosa
Circa 1830 Listed: 7/28/75

Clements House (Isaac Lee Home-Old Buckhouse Place-J. Wash Deason Home)
1802 20th Avenue, Northport
1850s Listed: 7/28/75

College Park Historic District, Tuscaloosa
Listed: 4/14/92

Dearing Place Historic District, Tuscaloosa
Listed: 4/14/92

Dorroh House (Jim Winn Place), Hwy 2, approx. 2 mi E of Romulus
Circa 1830 Listed: 7/28/75

Drish House, 2300 17th Street, Tuscaloosa
1830 Listed: 7/31/75

Eighth Street Historic District, Tuscaloosa (21 buildings)
1910-1937 Listed: 7/22/91

First Baptist Church, 1403 12th Street, Northport
1913 Listed: 8/6/93

Fitts, Alston, House, 1506 University Boulevard, Tuscaloosa
Listed: 4/14/92

Greenwood Cemetery, 9th Street and 27th Avenue SW, Tuscaloosa
1821-1983 Listed: 7/26/83

Jemison-Borghese House, 2303 13th Street, Tuscaloosa (NRHP)
1860-1862 Listed: 7/31/75

Kennedy-Foster House, 1842 25th Avenue, Tuscaloosa
1870 Listed: 7/31/75

Martin-Gulliver House, #3 Forest Lake, Tuscaloosa
1940 Listed: 6/19/96

Maxwell-Peters House, 302 Main Street, Northport
1865-1870 Listed: 7/31/75

Maxwell-Richardson-Hellums House, 2703 6th Street, Tuscaloosa
1906 Listed: 7/28/75

Murphy, Will, House (Murphy/Collins Hse), 2601 Paul Bryant Dr, Tusc (NRHP)
c. 1923 Listed: 4/14/92

North River Hunt Club (4), N of Tuscaloosa
1970s Listed: 10/12/76

Phi Kappa Psi Fraternity House, University Blvd, Tuscaloosa
1931, 1936 Listed: 6/1/82

Pinehurst Historic District, 215-305 17th Ave, 1-28 Pinehurst Dr, Tuscaloosa (NRHP)
1908-1935 Listed: 4/11/84

Saint John The Baptist Catholic Church, 800 25th Avenue, Tuscaloosa
1846 Listed: 6/12/75

Searcy House (Old Library), 815 Greensboro Ave, Tuscaloosa (NRHP)
1904 Listed: 7/28/75

Seventh Street District, 7th St between 14th & Queen City Aves, Tuscaloosa
Early 20th century Listed: 10/28/85

Shirley Bridge, Spans Sipsey River, CR 21 (Upper Columbus Road), Echola
1882, 1922 Listed: 2/15/77

Smelson House, Sanders Ferry Road, Tuscaloosa
Circa 1830 Listed: 7/31/75

Thirteenth Street Residential Historic District, Tuscaloosa
Listed: 5/19/99

Tuscaloosa City Hall (Old Post Office), 2201 University Blvd, Tuscaloosa
1910 Listed: 9/15/75

V.F.W. Club, 2803 6th Street, Tuscaloosa
1835 Listed: 7/31/75

Warren House, Rt 1, Samantha
Circa 1820 Listed: 7/6/76

Watson-Jones House (The "Salt House"), Watermelon Road, N of Northport
1831-1845 Listed: 7/31/75

White-Sullivan Log Cabin, Star Route, Elrod
Mid 1840s Listed: 8/3/90

Winn-Rice House, 10 Oak Bluff Lane, Northport
Circa 1840, 1985 Listed: 8/13/87

WALKER COUNTY

Alabama Mining Museum, Allbritton Street and Cemetery Street, Dora
Early 1930 Listed: 8/18/83

Confederate Monument, 1900 3rd Avenue, Jasper
1907 Listed: 5/19/99

Cook, William, House, Carbon Hill Rd, CR 11, 7.1 mi frm Carbon Hill, Nauvoo
Circa 1900 Listed: 3/23/90

Davis Cemetery, Horse Creek Blvd., Dora
1847 Listed: 11/13/96

First United Methodist Church, 1800 3rd Avenue, Jasper (NRHP)
1914 Listed: 1/31/83

Fite-Taylor House, 501 East 21st Street, Jasper
1912 Listed: 6/22/81

Harbin Hotel, 3rd Street, Nauvoo
1923 Listed: 8/3/90

Jackson, Dr. C.B., House, 80 Sutton Avenue, Dora
1902 Listed: 8/6/93

Jasper Community Hospital (Walker Co Hospital) 1100 7th Ave, Jasper (NRHP)
1923 Listed: 9/6/84

Stephenson, Dr., House, Oakman
Circa 1890 Listed: 1/27/76

Tubbs Cemetery, Oakman vcn
1840 Listed: 12/4/92

WASHINGTON COUNTY

St. Stephens Methodist Church, St. Stephens
Circa 1857 Listed: 3/25/76

St. Stephens Masonic Lodge, CR 34, St Stephens (NRHP)

1853 Listed: 10/11/78

Taylor House (Washington County State Bank), US Hwy 43, Leroy
Circa 1843 Listed: 4/16/85

Williams-Turner House, Eastern side of US Hwy 43, Sunflower
1871 Listed: 7/7/80

Garris Hill, US Hwy. 43, HC 63, Box 318, Leroy
1904, 1920 Listed: 5/19/98

WILCOX COUNTY

Ackerville Baptist Church, Ackerville
Circa 1850 Listed: 7/22/91 Listed in NR: 4/18/03

Antioch Baptist Church, Camden
1870, 1924 Listed: 11/13/96

Beck-Creswell House, 500 Broad St, Camden
1855 Listed: 11/13/96

Beck-Darwin House, Clifton Road, Camden
Circa 1840 Listed: 10/19/79

Cathcart House, Alberta
Circa 1840s Listed: 3/23/90

Cedarcrest, Hwy 10, Oak Hill
Between 1840-1846 Listed: 4/21/81

Cook Hill, Canton Bend, Camden Vicinity
c. 1839 Listed: 10/19/79

Creagh-Glover Family Cemetery, Catherine Vicinity
1826 Listed: 3/22/91

Gee's Bend Farms Community School, Boykin
1937 Listed: 3/30/89

Griffin House, CR 32, Arlington
Circa 1838 Listed: 7/21/78

Hawthorne House, North Main St/9 North Broad St, Pine Apple (NRHP)

1854 Listed: 11/9/82

Hope Well Church, 17481 Hwy 21, Furman

1864 Listed: 5/19/99

Irby, William S. Sr., House, Lower Peach Tree

1900 Listed: 12/4/92

Kaster House, Broad Street, Camden (demolished)

Circa 1860 Listed: 11/6/80

Moore Academy School, 1/2 mi S of intersection of Hwys 10 & 59, Pine Apple

1920 Listed: 6/30/95

Prairie Mission School, Catherine vcn

Circa 1894 Listed: 7/22/91
(NRHP 10/29/2001)

Primm-Rouse-Dunnam House, 312 Broad Street, Camden

Circa 1906 Listed: 10/17/80

Reeves Chapel Methodist Church and Cemetery, Rt 2, CR 16, 15 mi SE Camden

Circa 1900 Listed: 7/7/80

Snow Hill Institute, CR 26, off AL Hwy 21, S of Snow Hill (NRHP)

1893-1925 Listed: 7/14/81

Sterrett House, 400 Clifton Street, Camden

1851 Listed: 4/14/92

White Columns (Starr Plantation/Felix Tait Plantation) Possum Bend Community 9
mi from Camden on Clifford Ferry Rd

1860 Listed: 3/25/76

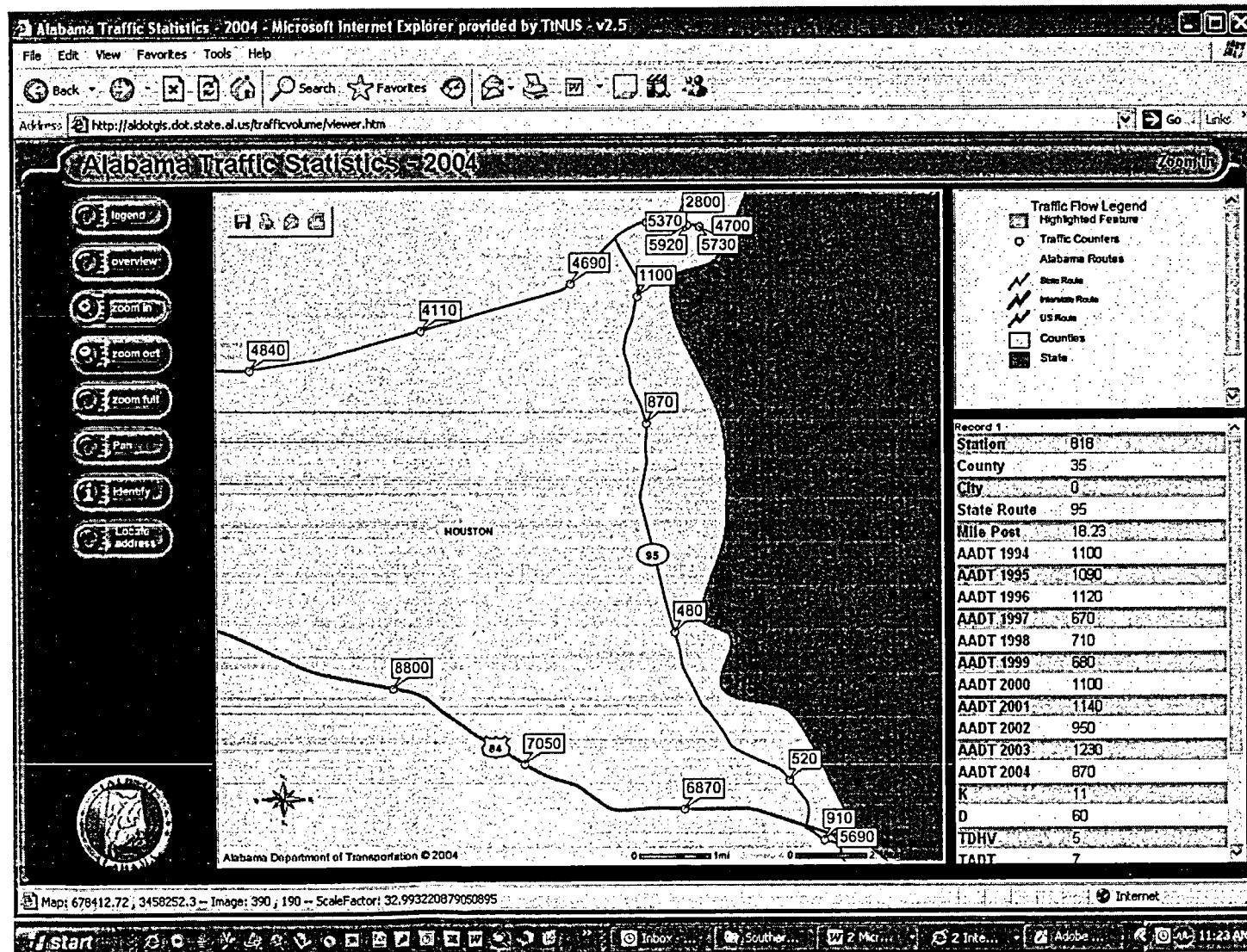
WINSTON COUNTY

Ingle-Blake House, Main Street, Double Springs (demolished 1982)

1886 Listed: 2/6/81

Looney's Tavern Site, on CR 41, 3.5 mi N of Addison, Inmanfield

1861 Listed: 9/17/76



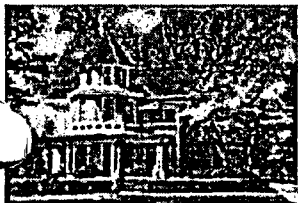
Alan R. Barton Nuclear Plant

Preliminary Safety Analysis Report

VOLUME 1



AUGUST 1974



Garden Path Inn

Columbia, Alabama

1890 Queen Anne Victorian located in the River Heritage Region of southeast Alabama, just a short drive to Dothan.

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GO

Introduction

For I know the plans I have for you declares the LORD, plans to prosper you and not to harm you, plans to give you a hope and a future. Jeremiah 29:11

The Garden Path Inn is located in the historic Purcell-Killingsworth House located in Columbia, Alabama. The house, a Queen Anne Victorian, was originally constructed in 1890. Over the last 11 months we have been completing an extensive renovation of the home for the purpose of operating a Bed and Breakfast and dining by reservation. The Inn has three guestrooms upstairs, each with a luxurious king-sized bed and private bath. The nightly rate includes a southern style breakfast for up to two people the next morning. There are two dining rooms located in the Inn. We are also available for special events such as group dining by reservation, reunions, business meetings, luncheons, bridal showers, baby showers, teas, etc.



Nightly Rates

Sunday - Thursday \$85 per night

Friday - Saturday \$95 per night

Corporate rates available.

- Discounts are available for Pastors and Ministry Leaders.
- Gift Certificates are available.
- We also offer special packages which include dinner the evening of your stay, breakfast the next morning, and can make arrangements for flowers or gift baskets for that special occasion.
- For the romantically challenged we can help arrange a birthday or anniversary evening or get away for that special someone.

- Regretfully, we do not have an elevator or wheel chair access.

The Harrison Room

The Harrison Room, located on the main floor, is our Victorian style Dining Room decorated in deep reds with teapot accents.

The Elizabeth Room

The Elizabeth Room is perfect for ladies luncheons, teas, baby showers, and bridal showers. Pink and green are the featured colors with rose accents. This room is located on the 2nd floor in the octagonal turret room.

Upstairs commons areas include: Color TV, coffee bar, refreshments, sitting area. After dinner relax in the parlor on comfortable couches and chairs or play board games and enjoy your evening.



In everything we do at the Garden Path Inn we strive to give God all the Glory and Honor. It is because of HIM that we exist and have our being. Our heart's desire is to be a place of rest, refuge, and ministry for our guests.


Garden Path Inn is a member of the following associations:

Bed & Breakfast Association of Alabama

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Garden Path Inn
305 North Main Street
Columbia, Alabama 36319
(334) 696-2304
email: gnorman@centurytel.net
Gary & Diane Norman, Innkeepers

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Lower Coosa River Basin Management Plan



Final Draft: May 2005



Alabama
Clean
Water
Partnership

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Introduction

The goal of the Lower Coosa River Basin Management Plan is to produce *a locally endorsed and supported plan that can be cooperatively implemented through private incentives and by local state government programs to maintain the beneficial uses of water throughout the Lower Coosa River Basin*. The purpose of the plan is to address nonpoint source pollution through the identification of watershed management issues and education of the residents, governments, businesses and industries in the Lower Coosa River Basin of the cumulative impact of their individual actions.

Nonpoint Source Pollution

Pollution is basically the discharge of nutrients, pathogens, toxics or causing thermal changes that vary from the natural background parameters of the receiving stream. Prior to the implementation of the National Pollution Discharge Elimination System (NPDES), there were direct discharges of pollution into surface waters and on the ground that far exceeded the natural parameters of the waterway. The discharges relied on the mere volume of water to dilute the discharge. In addition, discharges were typically downstream of locations where drinking water was extracted so the specific water user was not contaminating their own water supply. There was no regard for the proximity of downstream water withdrawers. Under the NPDES program, point sources of pollution are required to meet certain permit standards, but the discharge may still be at variance with the natural parameters of the stream. The discharge allowed may still depend on the natural cleansing process of the waterway. This is why the old adage, "*dilution is the solution to pollution*" became prominent.

Nonpoint sources of pollution are diverse in character and so distributed throughout the watershed that a change in thinking must be implemented to solve the problem. The best approach to controlling nonpoint pollution is to deal with it at the source and prevent the contaminants from entering the water network. This applies to the pollution of either ground or surface water supplies. Pollution prevention must address both resources because they are integrally connected and are often interchanged by natural processes within the water network.

When pollution occurs in a surface water resource there is a natural cleansing process that occurs within a natural stream. For this reason the process takes a certain distance of stream flow in conjunction with the volume of water to overcome lower levels of pollution. When the same pollution is introduced into groundwater resources there is a much slower travel

time and infinitely smaller flows of water. The natural cleansing process takes a significantly extended period. In addition, the artificial clean-up of groundwater pollution is significantly more expensive. Therefore, avoiding pollution of groundwater resources is equally important within the watershed area. Priority is given to eliminating or controlling sources of pollution at the point of origination. Secondary to controlling the source of pollution is the implementation of actions and projects designed to prevent or reduce the transport of pollution contaminants from the point of origin to the water network. As a last resort, measures can be implemented to directly address streams and channels because the pollution contaminants have already entered the water network.

This priority for preventative action is also related to relative cost and the potential transfer of costs. When pollution is addressed at the point of origin the cost of containing the contaminant causing the pollution is usually nominal or the least costly. For example, many actions taken by individual householders incur no cost, but merely represent changes in day-to-day practices that the individual may not have even been aware was causing a pollution problem. When there is a nominal cost involved to control the point of origination the burden of the cost is then borne by the entity responsible for the pollution.

When pollution is transported away from the point of origin, the cost of treatment typically increases because treatment must occur on someone else's property. The acquisition of property rights or ownership is incurred on top of the cost of treatment. The cost of treatment is also likely to be increased because the contaminant has been dispersed over a larger area. Due to the dispersal it is likely that larger volumes of material will have to be treated. That also increases the cost of treatment.

When pollution contaminants reach the water network the cost is increased again. When contamination is introduced in the water network, all the water must be treated when it is withdrawn for consumption or use. In addition, increased water treatment is required before discharges can be made to the water network. These increased costs are usually transferred to users in the form of higher fees. In rare instances when the level of pollution in the waterway is severe, the ability to allow any new discharges may be terminated until other discharges can farther reduce the contaminants. In essence, a development moratorium is self-imposed because local water pollution has not been controlled.

The Planning Process

The planning process for the Lower Coosa River Basin Management Plan began with an inventory and understanding of the existing characteristics of the basin and its watershed components. This was achieved through research and documentation of the existing physical, structural, cultural and demographic features of the Lower Coosa River Basin, which are presented in Part I of this plan. Part II of the plan provides information about the existing water quality of the Lower Coosa River Basin as available from water quality monitoring results and basin assessments. Part III proposes a management strategy to accomplish the goals and objectives of the plan. The management measures presented in Chapter 14 are intended to address nonpoint source issues as well as water quality issues so that the framework of the watershed approach is upheld.

During the planning process, two phases of public education and awareness were conducted in which information was presented to residents of the basin in public meetings. As a part of these public education and awareness meetings, residents were asked to complete surveys, identify local issues, and identify and comment on local water quality management efforts.

The first phase of the education and awareness component of the project was to address elected officials and residents at local government meetings. A short presentation was made at a meeting of each of the 22 local governments located within the Lower Coosa River Basin, and the same presentation also being made at regular meetings of each of the three homeowner and boat owner associations (HOBOS) that are located within the basin. The purpose of these meetings was to educate citizens and local decision-makers regarding development of the plan, make them aware of the issues in water quality protection and in watershed management, provide them with an encapsulated view of the existing conditions within the basin, receive comments and suggestions for water quality protection alternatives, and to encourage participation in the stakeholder process of the Coosa River Clean Water Partnership. In this process, a combined total of approximately 450 stakeholders were addressed in the meetings and provided with a four-page brochure about the Lower Coosa River Basin Management Plan project.

With the brochure, residents were asked to complete a survey identifying water quality issues and/or concerns of both the basin and their local watershed. Response rate to the surveys that were distributed was just under 10 percent, with 43 surveys returned. Responses to the survey indicated that approximately one-third of those in attendance at the meetings knew about the development of the Lower Coosa River Basin Management Plan and understood what nonpoint source pollution is. Responses show that residents thought that most common types of nonpoint source pollution present in the Lower Coosa River Basin are urban runoff, agricultural runoff, failing onsite septic systems, illegal dumping and sedimentation. Residents stated that the most harmful types of nonpoint source pollution are urban runoff and failing septic systems, followed distantly by illegal dumping, sedimentation and silviculture runoff. Locally identified water quality issues in the survey included pollutants, urban growth, high nutrient loads, point source discharges, and stream flow (quantity of water).

In the second phase of the education and awareness component of the Lower Coosa River Basin Management Plan planning process, a series of five public meetings were held in Shelby, Talladega, Chilton, Coosa and Elmore Counties in May and June, 2004. Residents were notified of the meetings by a flyer that was mailed to approximately 2000 residents and through notification in local newspapers. The purpose of the second phase of education and awareness meetings was to review the findings presented in Parts I and II of the plan, present the issues that had been identified, and to receive citizen comments on ways to address nonpoint source pollution, thereby managing the water quality of the Lower Coosa River and its contributing streams.

Following the two series of public meetings, a draft of the Lower Coosa River Basin Management Plan, an executive summary, and an atlas of the watersheds of the basin was prepared and posted on the website of Alabama Clean Water Partnership for public

comments. Citizens were notified of the posting through an email list that was compiled from the attendance rosters at the series of public meetings and through presentation to stakeholders at the Coosa River Basin Clean Water Partnership Steering Committee Meeting and the Lower Coosa River Basin Clean Water Partnership Meeting. Following citizen comments, final modifications were made to the plan and it was produced in a final form in June 2005.

Final production of the plan, however, is only the beginning of the plan review and amendment process. It is intended that the Lower Coosa River Basin Management Plan will be reviewed by the Lower Coosa River Clean Water Partnership and the Coosa River Basin Clean Water Partnership Steering Committee annually and major review and revisions should occur at least every five years. The format of the plan lends itself to easy updates and amendments so that the plan can remain current and usable. Additionally, the format of the watershed management protection measures is meant to be actively utilized by stakeholders by maintaining a status log of watershed management activities and "checking off" the actions that have been completed.

Key Elements

To ensure that Section 319 projects make progress towards restoring waters impaired by nonpoint source pollution, watershed protection plans that are developed or implemented with Section 319 funds to address Section 303(d)-listed waters must include at least the nine elements listed in the table on the following page. The Lower Coosa River Basin Management Plan has addressed these key issues to the extent possible at the basinwide level. Additional watershed plans will be needed to identify specific local projects and estimate funding and technical assistance needs, however, the Atlas of Watersheds (Section 3) provides much of the background information that will be needed to complete the development of the local watershed plans and implementation strategies. The location of where information may be found within the Lower Coosa River Basin Management Plan is shown in the right column of the table below, along with recommendations for future studies to fully address the key elements, as outlined by the U.S. Environmental Protection Agency.

The Nine Elements of a Watershed Protection Plan	
Key Element	Work Element Where EPA Key Element Is Addressed
1. An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).	Part I: Basin Characteristics Part II: Water Quality Part III, Chapter 12: Priority Watersheds Atlas of Watershed
2. An estimate of the load reductions expected for the management measures described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded streambanks).	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.
3. A description of the NPS management measures that will need to be implemented to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.	Part III, Chapter 14: Water Quality Improvement Program
4. An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement this plan. As sources of funding, States should consider the use of their Section 319 programs, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds that may be available to assist in implementing this plan.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process. Additionally, watershed management resources have been identified and are included in Appendix E.

5. An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.	Part III, Chapter 13: Watershed Management Framework, the Executive Summary, and the planning process that was utilized in the development of the Lower Coosa River Basin Management Plan
6. A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.	Part III, Chapter 14: Water Quality Improvement Program
7. A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.	Part III, Chapter 14: Water Quality Improvement Program
8. A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether this watershed-based plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.
9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.	Subwatershed management plans will need to be completed to fully address this element, however, issues identified in the Atlas of Watersheds provide a starting point for this process.

Part I

Basin Characteristics



- Chapter 1: Location and Setting
- Chapter 2: Physical Characteristics
- Chapter 3: Demographics
- Chapter 4: Ecoregions and Habitat
- Chapter 5: Land Use

Chapter 1 Location and Setting

The Lower Coosa River Basin is the southernmost watershed of the Coosa River Basin, which begins in Rome, Georgia. The Coosa River is formed at the confluence of the Oostanaula and Etowah Rivers at Rome and flows in a westerly direction for approximately 30 miles through Georgia and enters Alabama about ten miles northeast of Cedar Bluff in Cherokee County. After entering Alabama, the Coosa River flows in a southwesterly direction until it reaches the vicinity of Lay Lake in Coosa County, where it begins to flow to the southeast. The Coosa River wanders through approximately 250 miles within Alabama before joining the Tallapoosa River about ten miles north of Montgomery in Elmore County to form the Alabama River.¹

Figure 1: A view of the Coosa River from Bibb Graves Bridge in Wetumpka, Alabama.



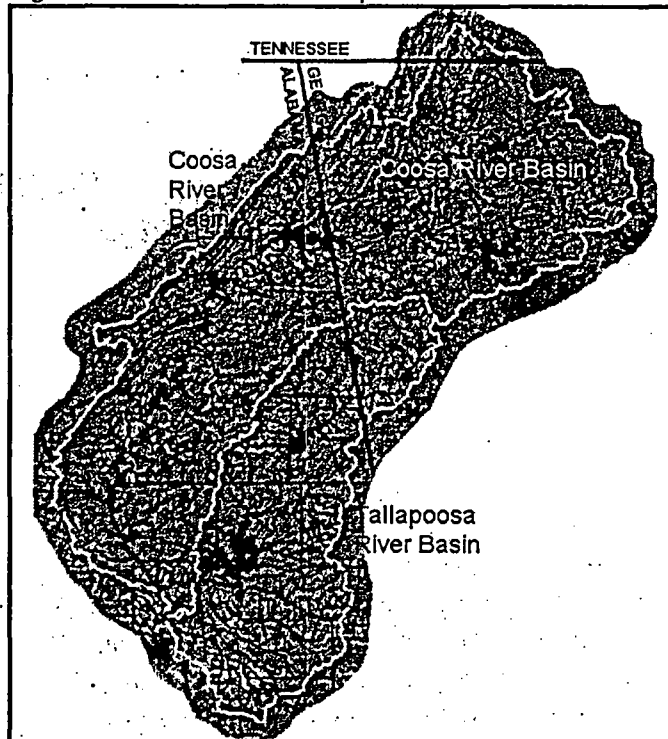
Source: Alabama Clean Water Partnership

A total of 10,266 square miles drain to the Coosa River, of which 5,407 square miles are within the State of Alabama. The Coosa River drains portions of 13 Alabama counties, with Talladega County contributing the most land area, at 480,000 acres, and Autauga County contributing the least land area, at 8,255 acres.¹ Using hydrologic unit codes (HUC) (as established by the U.S. Geological Survey and explained in the *Watersheds* section that

follows) the Coosa River Basin is subdivided into three smaller basins: the Upper Coosa River Basin (HUC 03150105), the Middle Coosa River Basin (HUC 03150106) and the Lower Coosa River Basin (HUC 03150107). The Upper Coosa River Basin encompasses 1,610 square miles in Alabama, Georgia and Tennessee; the Middle Coosa River Basin encompasses 2,580 square miles in Alabama; and, the Lower Coosa River Basin is 1,910 square miles in size, also located entirely in Alabama.²

As defined for purposes of this study, the Lower Coosa River Basin begins just north of Childersburg at the confluence of the Tallaseehatchee Creek with the Coosa River and stretches to the confluence of the Coosa and Tallapoosa Rivers just south of Wetumpka. It drains portions of seven counties and all or portions of 14 municipalities. Counties located within the Lower Coosa River Basin include Autauga, Chilton, Clay, Coosa, Elmore, Shelby and Talladega. The area of each county that is located within the basin is shown in Figure 3, along with the municipalities of each county that are partially or entirely located within the basin boundaries. Coosa County contributes the most land area to the Lower Coosa River Basin, at 375,792 acres, which is 88.12 percent of the total area of the county. Just over half of Shelby County, 50.39 percent, and just under half of Chilton County, 46.52 percent, are located within the basin. Autauga County contributes the least land area, at 8,255 acres, which is only 2.13 percent of the total area of the county.

Figure 2: The Coosa and Tallapoosa River Basins



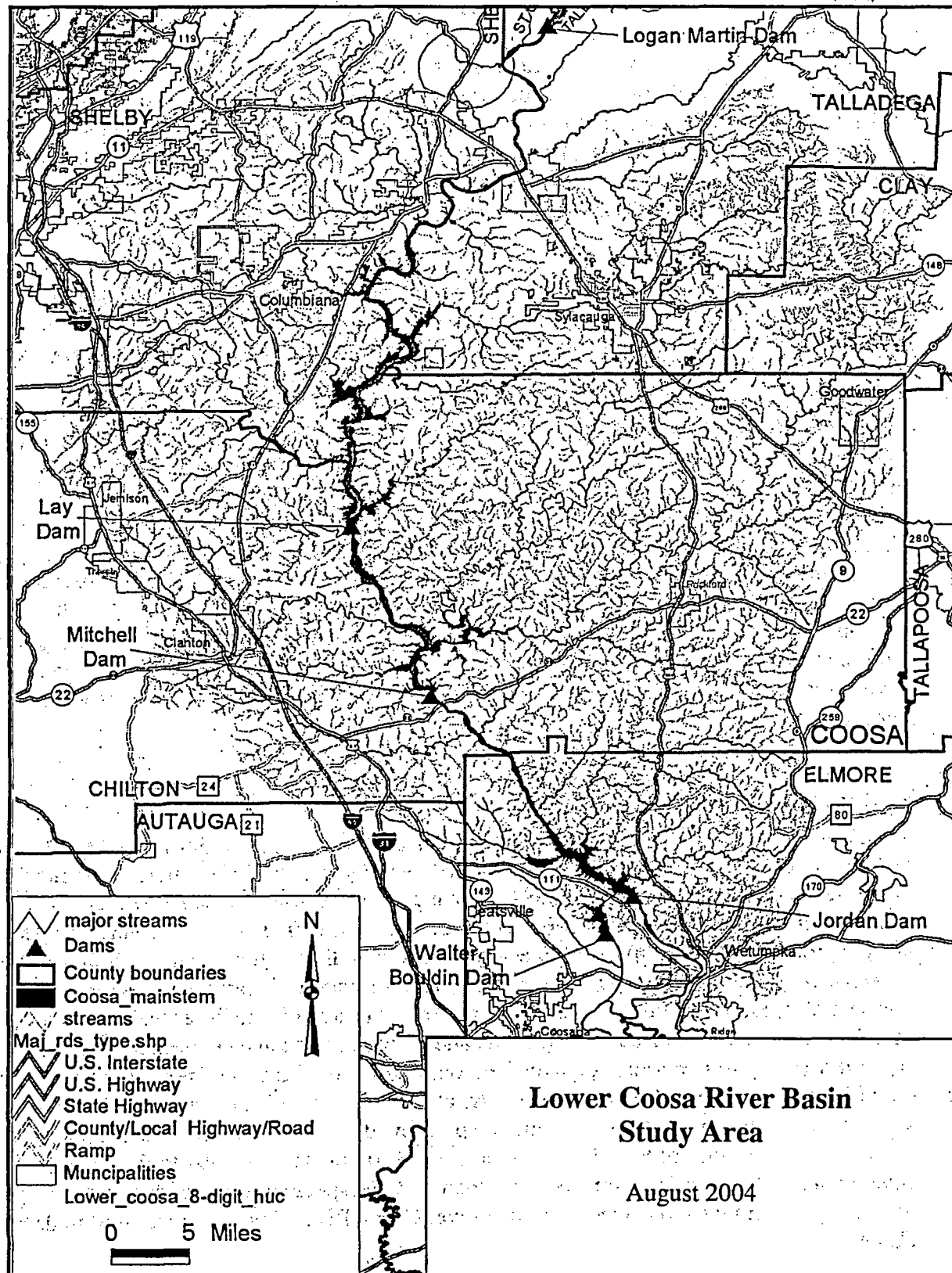
Source: Alabama Water Watch, *Citizen Guide to Alabama Rivers: Alabama, Coosa and Tallapoosa*, 2002

Figure 3:

Area By County Located Within The Lower Coosa River Basin				
County	Acres of Land Within Basin	% of County Within Basin	% of Total Basin Area	Municipalities
Autauga	8,255	2.13%	0.66%	
Chilton	208,633	46.52%	16.75%	Clanton, Jemison, Thorsby
Clay	75,600	19.49%	6.06%	
Coosa	375,792	88.12%	30.18%	Goodwater, Rockford
Elmore	135,313	32.17%	10.86%	Wetumpka
Shelby	261,093	50.39%	20.97%	Calera, Chelsea, Columbiana, Harpersville, Pelham, Wilsonville
Talladega	180,909	37.18%	14.52%	Childersburg, Sylacauga

Source: Alabama Soil and Water Conservation Committee. *Alabama Watershed Assessment*. August 2004.
<http://www.swcc.state.al.us/watershedmenu.htm>

Figure 4:



Source: Alabama Department of Environmental Management. August 2004.

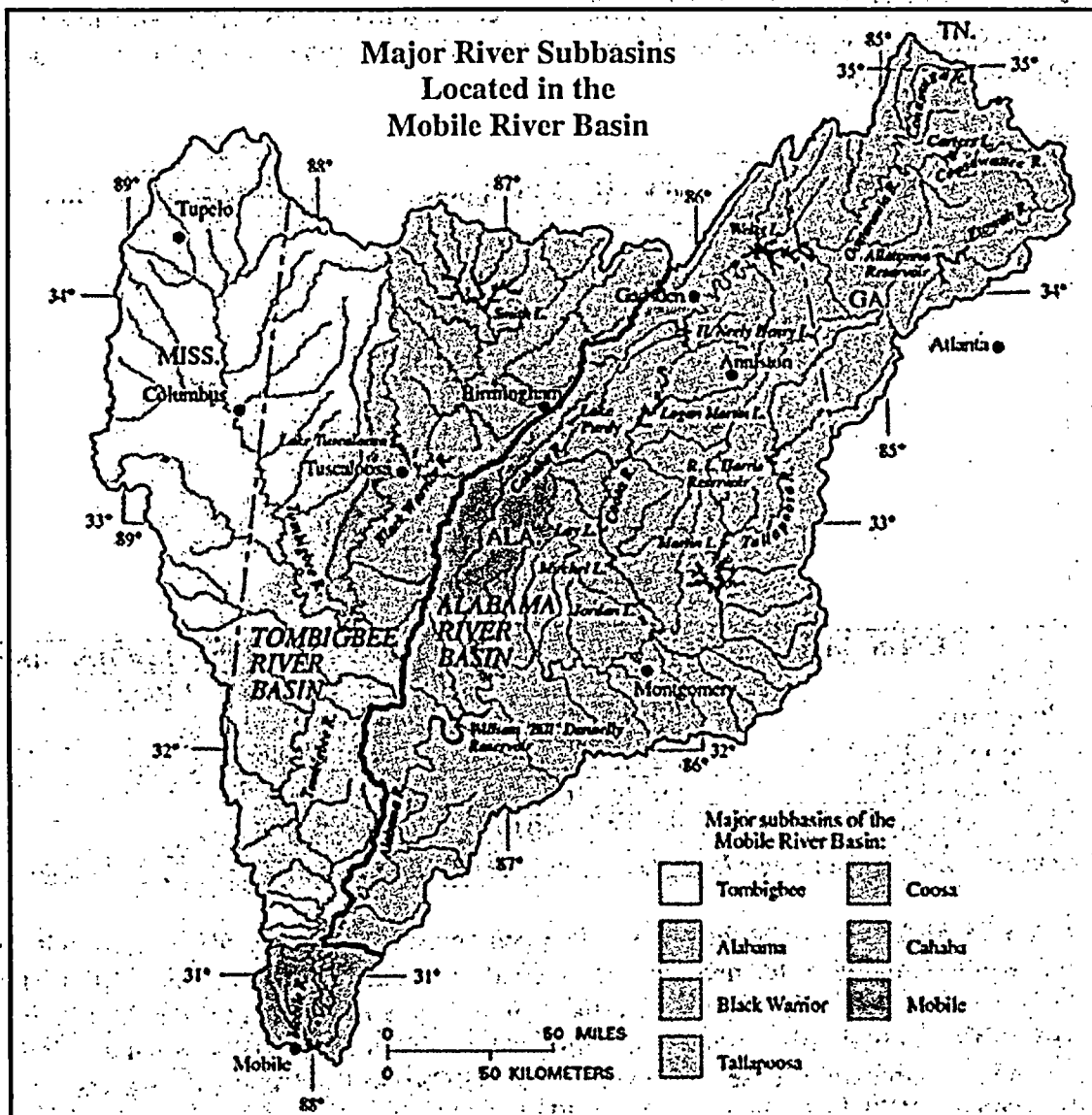
Of the 14 municipalities located within the Lower Coosa Basin, most are found in the northern part of the basin with six municipalities in Shelby County, two in Talladega County and one in the north part of Coosa County. The southern portion is considerably less urbanized with only five municipalities. The smallest town in the basin is Rockford, with a population of 428 as of 2000, while the largest city located entirely in the basin area is Sylacauga, with a 2000 population of 12,616. The City of Pelham, with a population of 14,369, is larger than Sylacauga, however, only the eastern portion of Pelham is located within the Lower Coosa River Basin. Outside of the incorporated areas, the Lower Coosa River Basin is generally characterized by rural lands, the majority of which is used as forest land.

The mean elevation of the Coosa River within this basin is 595.1 feet above sea level, with land elevations ranging from 131.2 feet to 1,878.3 feet above sea level. There are 1,612.5 miles of perennial streams and 1,002.9 miles of intermittent streams within the basin. As of January 2003, there were 4,812 miles of roads, 179.2 miles of railroad and 338.3 miles of pipes and power lines located within the basin boundaries.³ The transportation system within the Lower Coosa Basin is limited, with only four locations to cross the Coosa River: one in Wetumpka, two near Clanton and one in Childersburg. Interstate-65, which is the only interstate in the basin area, runs along the western border of the basin. U.S. Highways include U.S. Highway 280, which runs southeast-northwest in the northern part of the basin; U.S. Highway 231, which runs north-south through the eastern portion; and a small part of U.S. Highway 31, which is located along the southwestern basin boundary. A significant system of state highways is present which includes Alabama Highways 9, 21, 22, 25, 70, 76, 145, and 148. The state highway system primarily provides access to the larger incorporated cities and towns. The central portion of the Lower Coosa Basin surrounding the Coosa River, particularly in Coosa County, is only accessible by county roads, many of which are unpaved.

Mobile River Basin

The Coosa River basin is one of ten river systems in Alabama that drains to the Mobile River and then into the Gulf of Mexico. The Mobile River Basin is one of the most biologically diverse ecosystems in the nation. The significance of the Lower Coosa River Basin's location within the Mobile River Basin is the Lower Coosa River's role in contributing to, and the protection of, this spectacular ecosystem. According to the *Recovery Plan for Mobile River Basin Aquatic Ecosystem*, "the [Mobile] Basin's endemic (native to a region and found nowhere else) fauna includes 40 fishes, 33 mussels, 110 aquatic snails, as well as turtles, aquatic insects, and crustaceans. The fauna and their habitats have been extensively affected over the years by impoundment, channelization, mining, dredging, and pollution from point (specific) and nonpoint (diffuse) sources. As a result, at least 17 mussels and 37 aquatic snails are presumed extinct, most within the past few decades."⁴ Of the endemic species identified, the confines of the Lower Coosa River Basin provides habitat to five species covered under the Mobile Basin Recovery Plan and one species covered under another recovery plan. Endangered species in the Lower Coosa River Basin are discussed in detail in Chapter 4.

Figure 5:



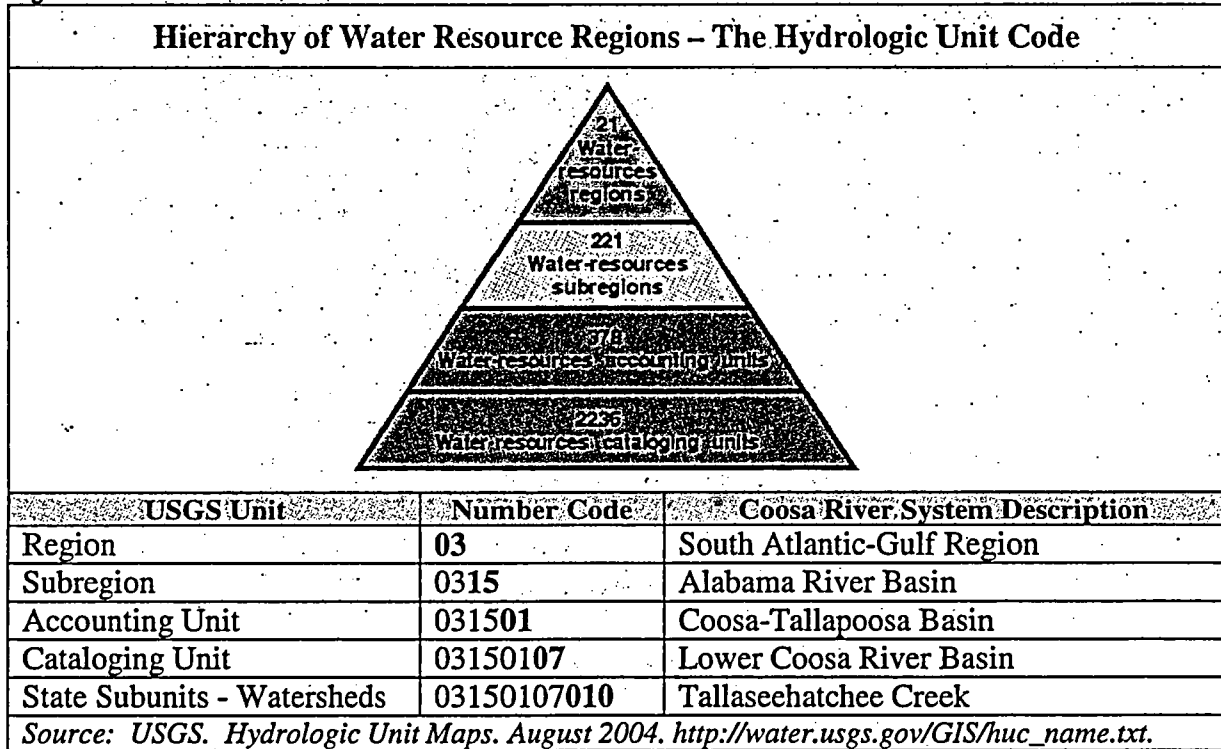
Source: U.S. Geological Survey, Alabama Office of Water Resources

Watersheds

A watershed is the surrounding land area that drains into water body. The size of a watershed can vary depending on the size of the portion of a water body that is being referenced. The U.S. Geological Survey has developed a system of consistent delineation and identification of watersheds throughout the nation which is explained as follows. The United States is divided and subdivided into successively smaller water-resource regions (areas). The regions are arranged within each other, starting from the smallest (water-resources cataloging units) to the largest (water-resources regions). All areas have unique two-digit numbers to identify them. The numbers are progressively appended to specify the more detailed areas. In the United States, there are 21 water resource regions (2 digits), 221 subregions (4 digits), 378 accounting units (6 digits) and 2,236 cataloging units (8 digits).

The 8-digit cataloging unit for the Lower Coosa River is 03-15-01-07, which is also referred to as the hydrologic unit code, or HUC. The cataloging unit is a geographic area representing part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature.⁵

Figure 6:



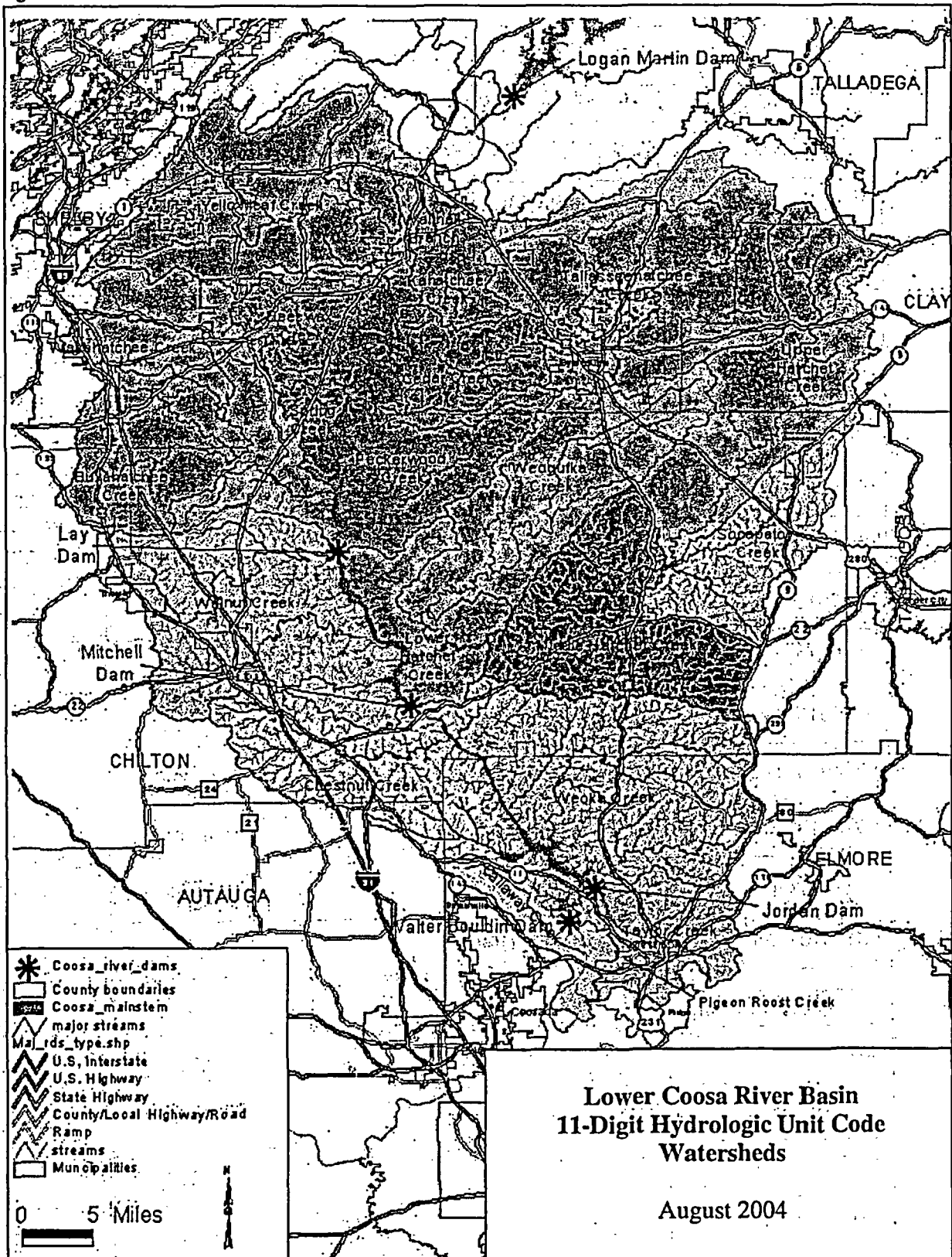
In Alabama, each of the 8-digit HUCs has been appended with an additional 3-digit number to designate smaller watersheds within the cataloging units resulting in an 11-digit HUC to designate the smaller drainage areas around major streams found in the cataloging unit. Alabama's 11-digit HUC map was last updated by USGS in July 1984 and used by the Natural Resource and Conservation Service's (NRCS) Soil and Water Conservation Committee (SWCC) to prepare a report titled *State of Alabama Hydrologic Unit Map With Drainage Area By Counties and Subwatersheds* in January 1995. The 11-digit HUC system is currently undergoing revision to a 12-digit HUC system to designate even smaller watersheds. The 12-digit HUC, however, is not expected to be utilized until early 2005. Therefore, all HUC references in this plan are made on the 8-digit or 11-digit HUC system.

Using the 11-digit HUC, there are 20 watersheds found in the Lower Coosa River Basin. Figure 7 lists the watersheds by number and name and provides the area of each. The location of each watershed is shown on Figure 8. For detailed information on each of the watersheds refer to the *Atlas of Lower Coosa Watersheds*. Walthall Branch is the smallest watershed, at 8,611 acres, comprising only 0.7 percent of the total basin area. The largest watershed is Tallaseehatchee Creek which is 128,147 acres in size and encompasses 10.29 percent of the Lower Coosa River Basin.

Figure 7:

Watersheds of the Lower Coosa River Basin			
11-Digit HUC	Watershed Name	Area in Acres	% of Basin
03150107010	Tallaseehatchee Creek	128,147	10.29%
03150107020	Walthall Branch	8,611	.69%
03150107030	Yellowleaf Creek	118,484	9.51%
03150107040	Kahatchee Creek	15,836	1.27%
03150107050	Beeswax Creek	36,371	2.92%
03150107060	Cedar Creek	41,594	3.34%
03150107070	Peckerwood Creek	53,130	4.27%
03150107080	Spring Creek	14,511	1.16%
03150107090	Buxahatchee Creek	44,551	3.58%
03150107100	Waxahatchee Creek	87,372	7.01%
03150107110	Upper Hatchet Creek	96,450	7.74%
03150107120	Socapatoy Creek	48,708	3.91%
03150107130	Middle Hatchet Creek	84,188	6.76%
03150107140	Weogufka Creek	78,757	6.32%
03150107150	Lower Hatchet Creek	38,844	3.12%
03150107160	Walnut Creek	112,675	9.05%
03150107170	Chestnut Creek	80,961	6.50%
03150107180	Weoka Creek	121,204	9.73%
03150107190	Pigeon Roost Creek	11,288	.91%
03150107200	Taylor Creek	28,913	2.32%
Source: Alabama Soil and Water Conservation Committee. Alabama Watershed Assessment, August 2004. http://www.swcc.state.al.us/watershedmenu.htm			

Figure 8:



Source: Alabama Department of Environmental Management. August 2004.

Climate

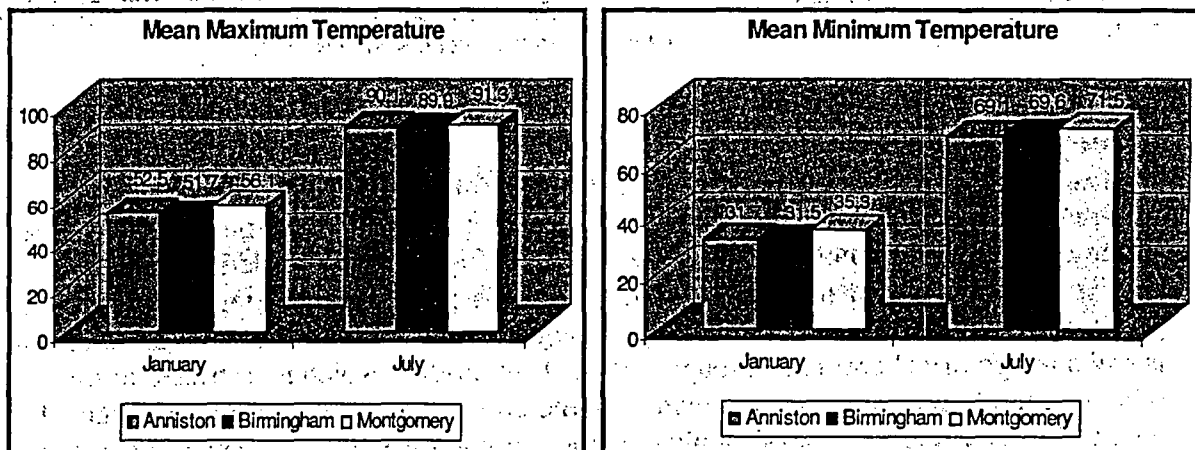
The Lower Coosa River Basin has a temperate to subtropical climate characterized by mild and humid conditions. The area has four distinct seasons with long, warm summers and short, mild winters. The land-surface altitude and distance from the Gulf of Mexico are major factors influencing climate in the basin. In the summer months, the Gulf of Mexico produces warm, humid air masses that move inland and provide precipitation in the form of thunderstorms. Arctic fronts that move south from the mid-western part of the United States contribute most of the precipitation in the winter months.⁶

Precipitation in the Mobile River Basin is mainly rainfall with amounts reasonably distributed throughout the year. A distinct dry period usually occurs during midsummer to late fall, but the pattern may be disrupted by tropical depressions, storms and hurricanes, which enter the Gulf of Mexico and move inland in the late summer and early fall. These storms may produce an overabundance of rainfall and flooding. Snowfall accumulation is rare, with annual averages generally less than an inch.⁶

Coldest months in the Lower Coosa River Basin are generally December, January and February with average temperatures ranging from 41.5° F to 45.7° F in the northern part of the basin to 46.1° F to 49.8° F in the southern part of the basin. Warmest temperatures occur in June, July and August, with July being the hottest month. The average temperature in July is 79.8° F in the northern part of the basin and 81.3° F in the southern part of the basin.

Figure 9:

Lower Coosa River Basin Monthly Mean Temperatures 1961 to 1990



Source: Climate Diagnostics Center, NOAA. August, 2004. www.cdc.noaa.gov/cgi-bin/USclimate/

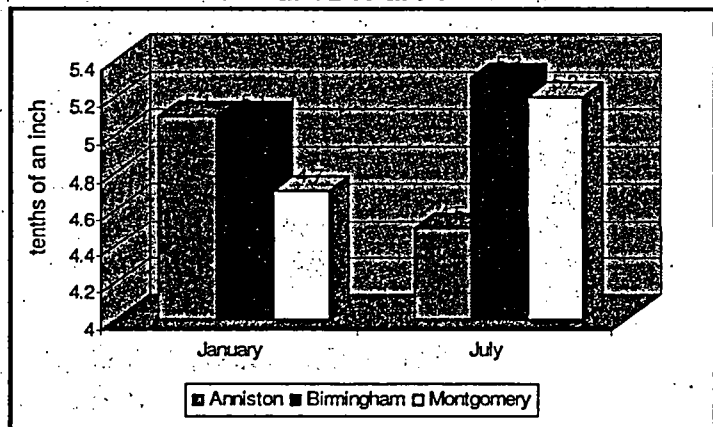
The National Oceanic and Atmospheric Administration's (NOAA) Climate Diagnostics Center provides climatological data for three weather stations in the vicinity of the Lower Coosa River Basin: one in Anniston, northeast of the basin; one in Birmingham, northwest of the basin; and, one in Montgomery, south of the basin. Climatological data, based on a 30-year period from 1961 to 1990, was obtained from these three stations to provide an overview of area weather, with the Anniston and Birmingham stations being representative of the northern portion of the basin and the Montgomery station being representative of the

southern part. There is only slight fluctuation in temperature between the north and south ranges. As shown in Figure 9, the mean monthly maximum temperature in January is between 51.7° F and 56.1° F and between 89.9° F and 91.3° F in July. Mean monthly minimum temperatures range between 31.5° F and 35.3° F in January and 69.7° F and 71.5° F in July.

Morning humidity is generally high throughout the year ranging from about 80 percent in January and February to 90 percent in July, August and September. Afternoon humidity is lower, ranging from about 55 percent in the colder months to about 63 percent during the summer. The area climate does not have a dry season and severe drought is rare. The annual average chance of precipitation is 28.7 percent in Anniston, 31.7 percent in Birmingham, and 29.1 percent in Montgomery. The annual average wind speed is 6.4 miles per hour and the annual average percent of available sun is 58.25 percent. The mean annual precipitation ranges from 52.6 inches in Anniston to 54.6 inches in Birmingham. Mean annual snowfall is lowest in Montgomery, at 0.4 inches, and is 1.2 inches in Anniston and 1.4 inches in Birmingham.⁷

Figure 10:

**Lower Coosa River Basin
Monthly Mean Precipitation
1961 to 1990**



Source: Climate Diagnostics Center, NOAA. August, 2004.
www.cdc.noaa.gov/cgi-bin/USclimate/

Drought

Although there are a variety of definitions, drought is best defined as “a condition of moisture deficit sufficient to have an adverse effect on vegetation, animals, and man over a sizeable area.”⁸ In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Although drought occurs over an extended period of time, it is still a temporary aberration. Drought differs from aridity, which is restricted to low rainfall regions and is a permanent feature of the climate in those locations. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Three operational definitions of drought are:

Meteorological drought:

A period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area.

Agricultural drought:

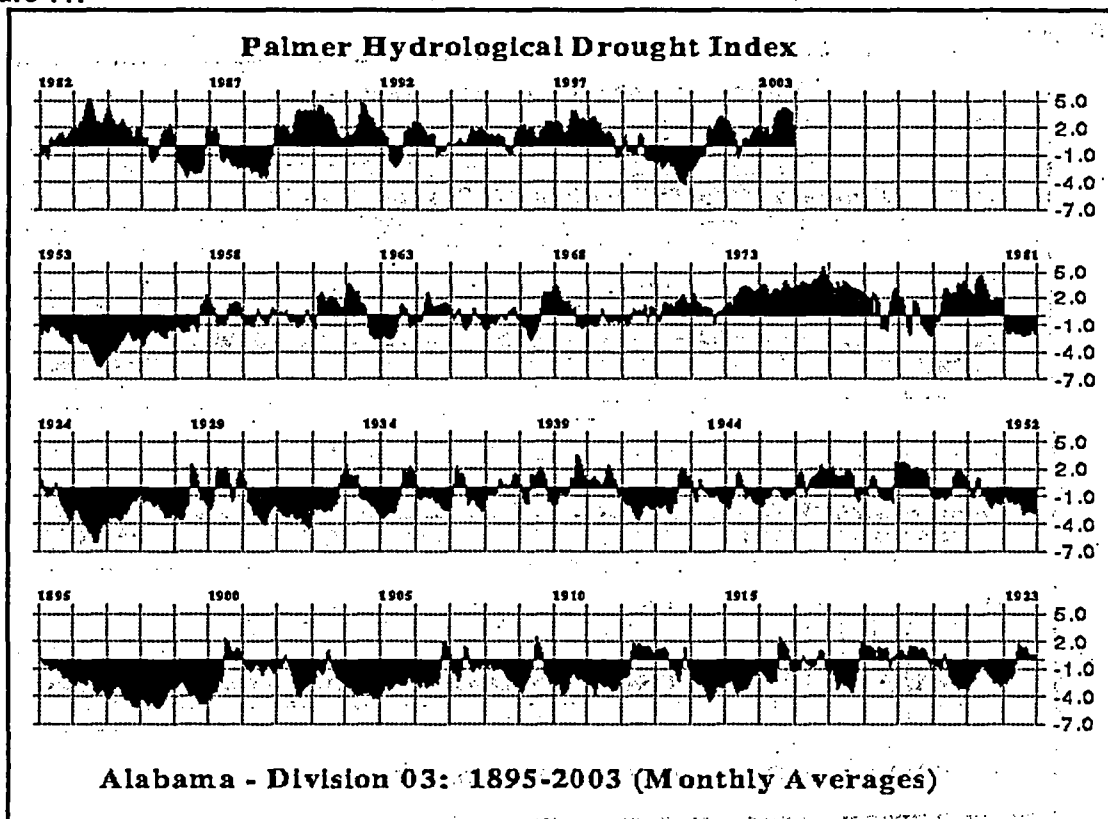
A climatic occurrence involving a shortage of precipitation sufficient to adversely affect crop production or range production.

Hydrologic drought:

A period of below average water content in streams, reservoirs, ground-water aquifers, lakes and soils.

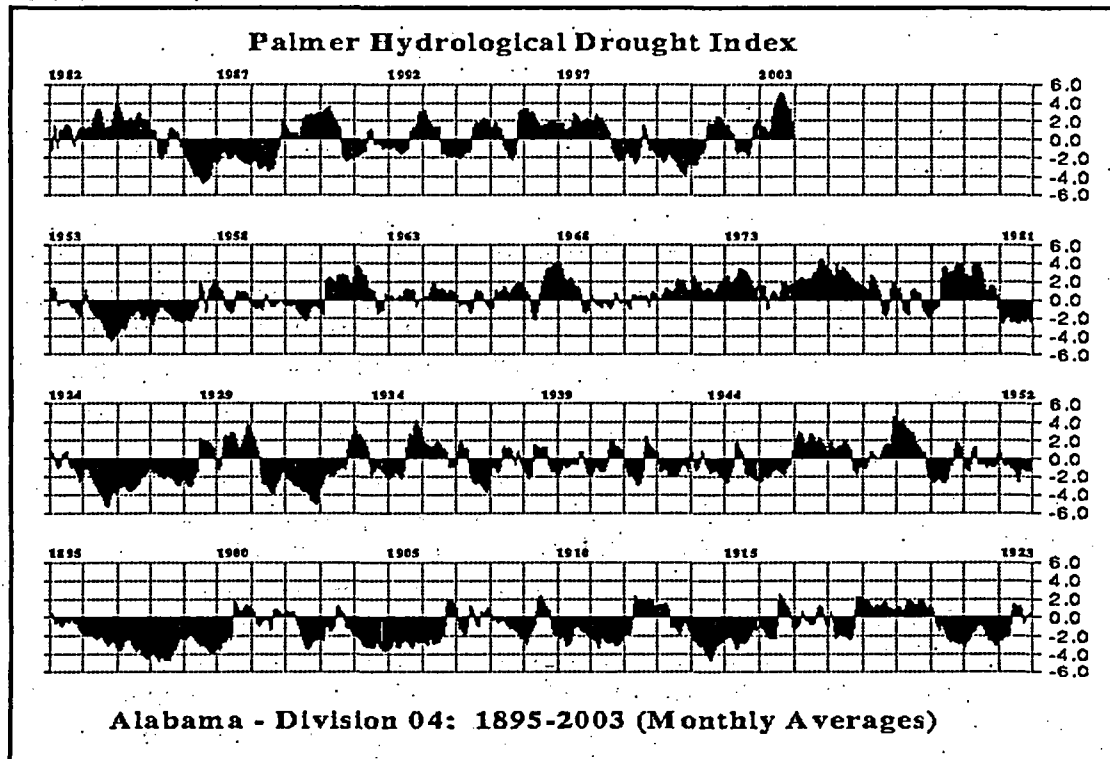
The Lower Coosa River Basin lies within three climatic divisions of the State. Division 3 includes Autauga and Chilton Counties. Division 4 includes Shelby and Talladega Counties. And, Division 5 includes Clay, Coosa and Elmore Counties. Historical drought conditions were collected for all three divisions using graphs of the Palmer Hydrological Drought Index. On the Palmer Index, a factor of 0 is normal, a factor of 4.0 or more is extremely wet, and a factor of -4.0 or less is extreme drought. Figures 11, 12, and 13 show the historical Palmer Hydrological Index for all three climatic divisions of the Lower Coosa River Basin from 1895 to 2003. The Index indicates a trend for decreasing hydrologic drought over the 108 year time frame, with hydrologic droughts becoming noticeably less frequent and less severe since the late 1950s. Prior to 1950, hydrologic drought was very frequent and often lasted two or more years. Between 1983 and 2003, severe hydrologic drought was reported in four years in one or all three of the climatic divisions, in 1986 through 1990 and again in 2000. Moderate hydrologic drought was reported in 1992 in Division 3, in 1990-91, 1993-94 and 1998-99 in Division 4, and in 1993-1995, 1998-99, and in 2002 in Division 5.⁹

Figure 11:



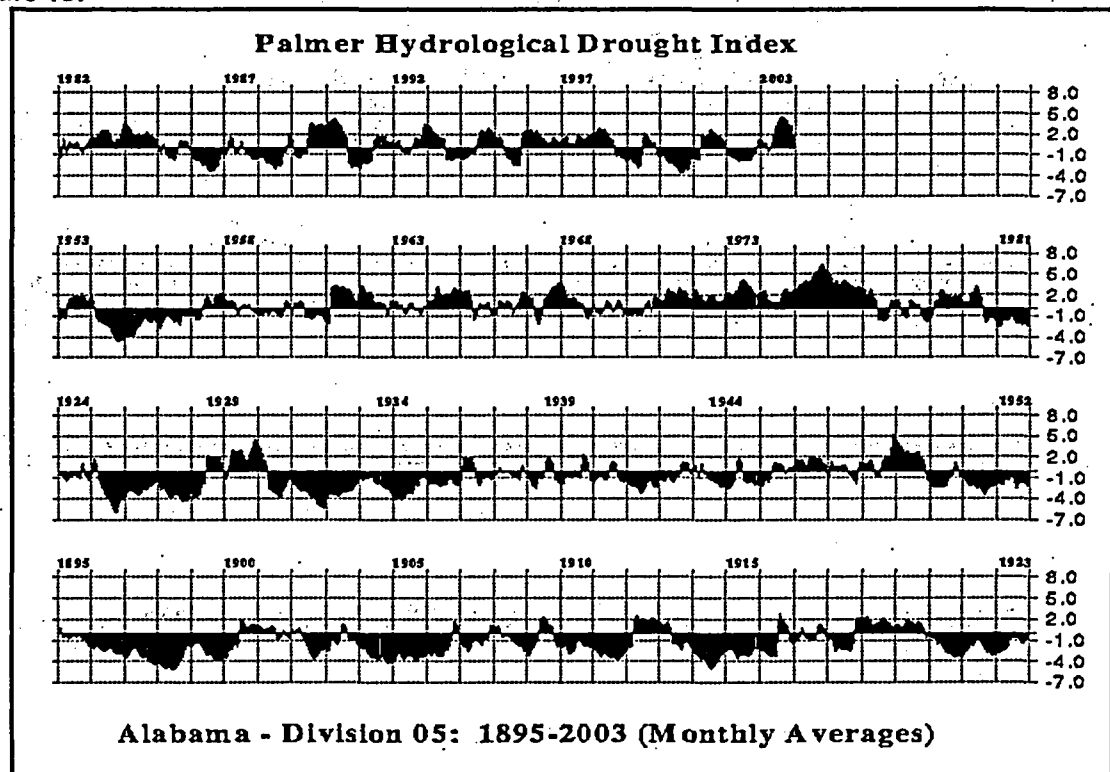
Source: National Climatic Data Center, CLIMVIS

Figure 12:



Source: National Climatic Data Center, CLIMVIS

Figure 13:



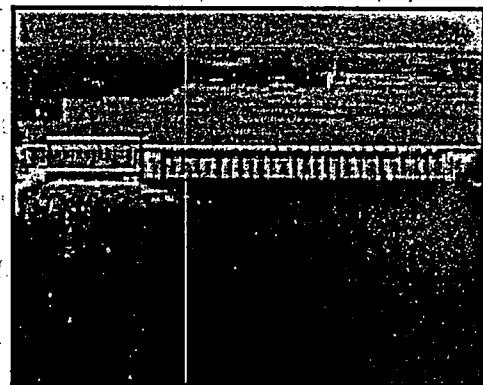
Source: National Climatic Data Center, CLIMVIS

Lakes and Dams

Seven Alabama Power Company dams form continuous impoundments over nearly the entire length of the Coosa River located in Alabama, with each dam discharging into the upper end of the next downstream impoundment. Four of these dams are located in the Lower Coosa River Basin: Lay, Mitchell, Jordan, and Bouldin. The upper three dams located north of the Lower Coosa River Basin (Weiss, H. Neely Henry, and Logan Martin) operate as hydropower peaking facilities, with releases occurring several hours each weekday and with minimal releases on the weekends to maintain minimum flow. The lower four dams (inside the Lower Coosa River Basin) operate generally as run-of-river projects for hydropower production and to maintain stable flows from Jordan Dam over the weekends when the upstream peaking facilities do not operate. Because the reservoirs provide continuous inundation from one dam to the next, the effects of the peaking operation are tempered and attenuated.¹⁰

Construction on Lay Dam, which straddles the Chilton-Coosa County line just south of Shelby County, began in 1910. It was the first of the dams constructed on the Coosa River and the northernmost dam in the series of dams in the Lower Coosa River Basin. Originally known as Lock 12 Dam, it was renamed in 1929 in recognition of Captain William Patrick Lay who was the company's first president. The dam went into service in 1914. It was later redeveloped in 1967 as part of an Alabama Company project that included construction of the three dams to the north, H. Neely Henry, Weiss and Logan Martin, and Bouldin Dam to the south. Lay Dam, a gravity concrete type, is 2,260 feet in length and has a maximum height of 129.6 feet. The dam includes six generators, each rating 29,500 kilowatts for a total generating capacity of 177,000 kilowatts. Lay Lake is approximately 12,000 acres in size with an elevation of 396 feet above sea level. The lake is 48.2 miles in length with a shore line of 289 miles and a maximum depth of 88 feet at the dam.

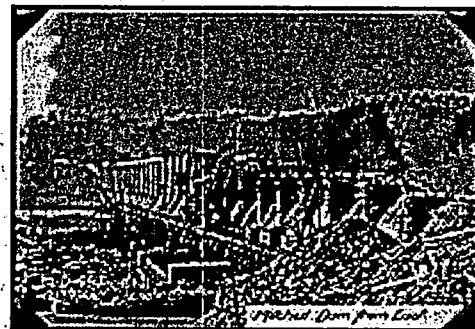
Figure 14: Lay Dam and Lake



Source: Alabama Power Company

Mitchell Dam, which also straddles the Chilton-Coosa County line, is located near Verbena at what was once known as Duncan's Riffle. It was Alabama Power Company's second dam on the Coosa River with construction of units one through three beginning in 1921. One unit was added in 1948, and in 1977, three more units were added. In 1985 a new powerhouse was constructed at the dam and the first three generating units were taken out of service. Mitchell Dam was named for James Mitchell, the company's president from 1912 to 1920. Mitchell Dam is also a gravity concrete type dam that is 1,277 feet long with a maximum height of 106 feet. Of the four generators now in service at the dam, one rates

Figure 15: Mitchell Dam



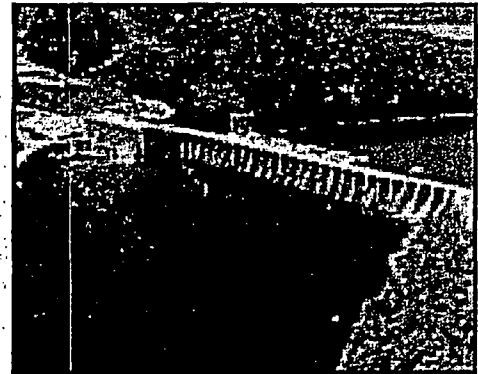
Source: Alabama Power Company

20,000 kilowatts and the other three rate 50,000 kilowatts each, for a total generating capacity of 170,000 kilowatts. Lake Mitchell is the smallest of the three reservoirs in the Lower Coosa River Basin at 5,850 acres. It is 312 feet above sea level, 14 miles long and has 147 miles of shoreline with a maximum depth at the dam of 90 feet. Mitchell Dam also includes a fishing facility, located below the dam, which is open to the public all year with other facilities that include parking, restrooms, picnic tables and an overlook.

Construction on Jordan Dam began in 1926 and it went into service on December 31, 1928. At the time of its construction, it was the largest power project built by private funds in the south. Its name is the maiden name of the mother of two brothers, Reuben and Sidney Mitchell, who played a major role in the early development of the Alabama Power Company. Jordan Dam is located about 14 miles north of Wetumpka at the beginning of what was once known as "Devils Staircase." This was the wildest part of the Coosa River, with the 14-mile stretch cascading over and around falls creating a roar of water that could be heard a mile from the river. The City of Wetumpka also takes its name from this area, as Wetumpka is an Indian word meaning "rumbling waters." A gravity concrete type dam, Jordan Dam is 252 feet in length and has a maximum depth of 110 feet. The dam has a total generating capacity of 100,000 kilowatts with four generators rating 25,000 kilowatts each.

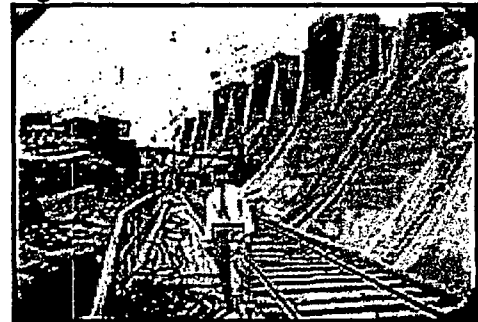
The last of Alabama Power Company's dams on the Coosa River to be constructed was Walter Bouldin Dam, which was built on a canal connected to Lake Jordan 40 years after Jordan Dam was complete. Construction began on Bouldin Dam in 1963 and it went into service on July 27, 1967. It has the largest generating capacity of any of the company's 14 hydro facilities. Each of the three generators at Bouldin Dam rates 75,000 kilowatts for a total generating capacity of 25,000 kilowatts. Bouldin Dam is gravity concrete and earth fill type dam. The length of the earth dikes are 10,950 feet and the length of the concrete is 228 feet. The maximum

Figure 16: Mitchell Dam and Lake



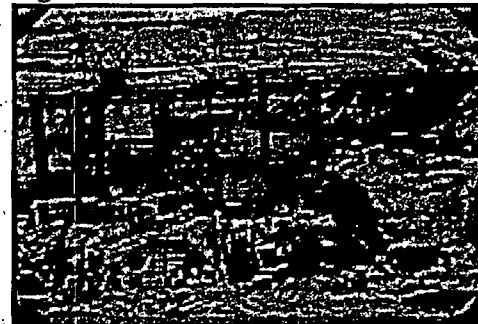
Source: Alabama Power Company

Figure 17: Jordan Dam



Source: Alabama Power Company

Figure 18: Bouldin Dam



Source: Alabama Power Company

height is 120 feet. The length of the forbay reservoir is three miles. Lake Jordan is the reservoir for both Jordan and Bouldin Dams. It is 6,800 acres in size, 18.4 miles long and has 118 miles of shoreline. Maximum depth at Jordan Dam is 110 feet and at Bouldin Dam is 52 feet. Lake Jordan has an elevation of 252 feet above sea level.¹¹ Besides Alabama Power Company's hydro power dams located on the main stem of the Coosa River, there are approximately 84 other dams located within the basin on the streams and creeks that are tributaries to the Lower Coosa. These are primarily private dams for personal use on private property.

Significant and Historical Features

According to the Geographic Names Information System (GNIS), developed by the USGS in cooperation with the U.S. Board on Geographic Names (BGN), there are 2,203 named places in the Lower Coosa River Basin. The GNIS is our nation's official repository of domestic geographic names information. Figure 19 lists the type and number of each feature that is included in the GNIS database, and includes the number of those features that are historical features. Due to the sheer volume of named places in the basin, each of these will not be itemized in this plan. Instead, only significant, or major, physical, geographical and historical features will be described, beginning at the north end of the basin and working south. Following the description of the basin's significant features is a list of sites included on Alabama's Register of Landmarks and Heritage and the National Register of Historic Places. The lists of named places and historic sites are included as a reference to what sort of resources are located within the basin as a basis for making land use and water quality mitigation recommendations. The intent is to provide a balanced plan that ensures water quality while working within the parameters of what is already in place.

Figure 19:

Named Places Within the Lower Coosa River Basin					
Type	Total Number	Number Historic	Type	Total Number	Number Historic
Airports	7		Lake	10	
Bar	7	3	Locales	166	
Basin	1		Mine	29	
Bend	7		Park	13	
Building	13		Post Office	26	10
Canal	1		Range	1	
Cemetery	263		Reservoirs	100	
Churches	386		Ridge	13	
Civil Division	23		Schools	121	43
Cliffs	2		Spring	13	
Crossing	21		Stream	292	
Dam	91		Summit	39	
Falls	3		Swamp	2	
Forest	1		Tower	15	
Gap	19		Valley	3	
Hospital	7	3			
Island	15	4			

Source: Montana State University Environmental Statistics Group, Geographical Locator, GNIS, Last Updated May 31, 2002, www.esg.montana.edu

Figure 20:

Sites in the Lower Coosa River Basin Listed On The Alabama Register of Landmarks and Heritage			
Site	County	Date Constructed	Date Listed
Confederate Memorial Cemetery, Mountain Creek	Chilton	1903-1933	1976
Lay Dam, Coosa River, near Clanton	Chilton	1910-1914	1976
Matthews-Reynolds Home, Clanton	Chilton	1908-09	1975
Mims Ferry, Coosa River	Chilton-Coosa	1895; 1957	1975
Tomlinson House, Jemison	Chilton	1893	1986
Midway School, Hollins	Clay	1917	1996
Carmichael Place, Goodwater	Clay	1887	1994
Old Rockford Elementary School, Rockford	Coosa	1927	1999
James Powell House, Rockford	Coosa		1996
Rockford Women's Club House, Rockford	Coosa	1932	1996
Weogufka State Park	Coosa		
Florence Bateman House, Wetumpka	Elmore	1842	1977
Francis Beaulieu House	Elmore	1816	1977
Bibb-Graves Bridge, Wetumpka	Elmore	1931	1977
Busch Log Cabin, Wetumpka	Elmore	1935	1991
Crommelin's Landing, Wetumpka	Elmore	1820	1977
Edward Rock Dogtrot House, Wetumpka	Elmore	1830	1977
Elmore County Courthouse, Wetumpka	Elmore	1931	1977
Elmore County Training School, Wetumpka	Elmore	1924	2002
First Baptist Church, Wetumpka	Elmore	1846	1977
Gantt Dogtrot House, Titus	Elmore		1977
Hagerty-Turner-Yung House, Wetumpka	Elmore	1840-1860	1999
Crommelin House, Wetumpka	Elmore	1905	1977
John Howle House, Wetumpka	Elmore	1904-1905	1986
Jasmine Hill Gardens, Wetumpka	Elmore	1820	1977
Jordan Dam, Wetumpka	Elmore	1927	1976
McCowen House, Wetumpka	Elmore	1904-1905	1977
Museum of Music, Wetumpka	Elmore		1977
Old Calaboose, Wetumpka	Elmore	1840	1976
Old Wetumpka Post Office, Wetumpka	Elmore	1937	1999
Swayback Bridge, Wetumpka	Elmore	1931	1977
Titus Historic District, Titus	Elmore	1800	1978
Tuskeena Street District, Wetumpka	Elmore		1977
Tom Wall House, Wetumpka	Elmore	1830	1980
Wetumpka Lock, Coosa River, Wetumpka	Elmore	1896	1977
Christian Wingard Home Place, Wetumpka	Elmore	1937	1995
The Brick House, Shelby	Shelby		1988
Calera Presbyterian Church, Calera	Shelby	1885	1997
Carter Residence, Calera	Shelby	1915	1977
Chancellor House, Harpersville	Shelby	1935	1978
Cowart Drug Store, Calera	Shelby	1885	1977
John E. Densler House, Wilsonville	Shelby	1879	2000
Klein-Wallace Home, Harpersville	Shelby	1841	1978
Mt. Calvary Baptist Church, Chelsea	Shelby	1905	1985
Old Shelby Hotel, Shelby	Shelby	1900	1977
People's Hotel, Calera (demolished)	Shelby	1909	1976
Rock House, Harpersville	Shelby	1835	1992
Scott-Bradford Home, Harpersville	Shelby	1824-1830s	1978

Continuation of Sites in the Lower Coosa River Basin Listed On The Alabama Register of Landmarks and Heritage			
Site	County	Date Constructed	Date Listed
Woods-Cleveland-Cooling House, Wilton	Shelby	1845	1978
Butler-Harris-Rainwater House, Childersburg	Talladega	1890s	1994
DeSoto Caverns, Childersburg	Talladega	Prehistoric	1976
Fairfax Station, Winterboro	Talladega	1850	1995
Fort Williams Cemetery, Coosa River, Fayetteville	Talladega	1813	1976
Birdie Guy House, Sylacauga	Talladega	Late 1800s	1980
Hightower Brothers Livery Stable, Sylacauga	Talladega	1914-1946	1996
Lanning-Livingston Home, Sylacauga	Talladega	1901	1980
Marble City Cemetery, Sylacauga	Talladega	1898	1995
Porch-Drake House, Sylacauga	Talladega	1914-1915	1978
Robinson (Baker) House, Childersburg	Talladega	1885	1976
Smith (Towassa) House, Sylacauga	Talladega	1909	1998
Sylacauga Cemetery, Sylacauga	Talladega	1832-1900	1975
Source: Alabama Register of Landmarks and Heritage, August 2004, www.preserveala.org			

Figure 21:

Sites In the Lower Coosa River Basin Listed On The National Register of Historic Places		
Site	County	Date Listed
Gragg Field Historic District, Clanton	Chilton	2004
Verbena	Chilton	1976
Coosa County Jail, Rockford	Coosa	1974
Alabama State Penitentiary, Wetumpka	Elmore	1973
East Wetumpka Commercial District, Wetumpka	Elmore	1992
First Presbyterian Church of Wetumpka, Wetumpka	Elmore	1976
First United Methodist Church, Wetumpka	Elmore	1973
Fort Toulouse, Wetumpka	Elmore	1966
Hickory Ground, Wetumpka	Elmore	1980
Wetumpka L&N Depot, Wetumpka	Elmore	1975
Chancellor House, Harpersville	Shelby	2001
Columbiana City Hall, Columbiana	Shelby	1974
Benjamin H. Averiett House, Sylacauga	Talladega	1986
William Averiett House, Sylacauga	Talladega	1986
Charles Butler House, Childersburg	Talladega	1996
Goodwin-Hamilton House, Sylacauga	Talladega	1986
Hightower Brothers Livery Stable, Sylacauga	Talladega	1997
Kymulga Mill and Covered Bridge, Childersburg	Talladega	1976
Sylacauga Historic Commercial District, Sylacauga	Talladega	2004
William Watters House, Sylacauga	Talladega	1987
Welch-Averiett House, Sylacauga	Talladega	1986
Source: National Park Service, National Register of Historic Places. August 2004. www.cr.nps.gov		

The Childersburg area is now recognized as the oldest settlement in the United States as it was visited by Hernando DeSoto in 1540, which was 25 year prior to the founding of St. Augustine, which is believed to be the oldest city in the U.S. Known as Old Coosa, it was the political power base of the great Indian Chieftain Tuscaloosa, who also kept a military base at Maubila (near Mobile). DeSoto's exploring army of 2,600 men, after exploring the area, took Tuscaloosa prisoner and forced him to go to Maubila for the big battle where

11,000 Coosa Indians were slain. This battle apparently destroyed the Tuscaloosa empire forever.¹⁰ Two features near Childersburg are DeSoto Caverns Park and the Kymulga Covered Bridge. DeSoto Caverns Park is the location of the first recorded cave in the United States. In 1796, Benjamin Hawkins, General Superintendent and US Agent for all tribes south of the Ohio River, visited the cave and described its natural beauty to then President George Washington. DeSoto Caverns Park is now a privately-owned tourist attraction featuring speleothem formations that include soda straws, stalactites, stalagmites, flowstones, and draperies. DeSoto Caverns Park is open to the public with an entrance fee to the cavern and theme park. Once an Indian burial ground, the cave was a gunpowder mining center and was mined for saltpeter, a vital element in the process, during the Civil War. The cave has also been mined for onyx. DeSoto Caverns was opened as a "show cave" in 1965.¹² Also near Childersburg is the Kymulga Grist Mill Park, which includes the Kymulga Covered Bridge, which was built in 1861. The 105-foot bridge crosses Talladega Creek in the old Kymulga community. Kymulga Bridge was built just before the Civil War and a gristmill was constructed there during the war. Both the bridge and the mill have been restored in recent years and are open to the public. The park includes two miles of scenic nature trails. The Kymulga Grist Mill and Bridge were listed on the National Register of Historic Place in 1976.¹³

The Talladega Division of the Talladega National Forest is located in the northeast portion of the Lower Coosa River Basin near Sylacauga. The Talladega National Forest stretches from Piedmont to Sylacauga, encompassing approximately 7,500 acres of camping, hiking, and backpacking resources, as well as innumerable opportunities for communing with nature's splendor. A portion of the Talladega National Forest covers the southernmost extension of the Appalachian Mountain Range.

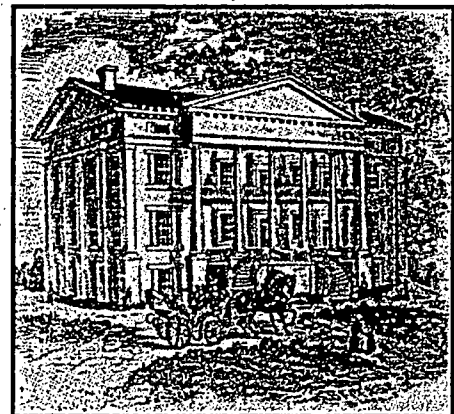
The Alabama Institute for Deaf and Blind, located in Sylacauga is the world's most comprehensive education and rehabilitation system serving children and adults who are deaf, blind and multidisabled. Children ages 3

Figure 22: Desoto Caverns Park and Kymulga Bridge (below)



Source: City of Childersburg and Chamber of Commerce, August 2004, <http://childersburg.com>

Figure 23: Alabama Institute for Deaf and Blind in Sylacauga



Source: Alabama Institute for Deaf and Blind, August 2004, <http://www.aidb.org>

to 21 are served through Alabama School for the Deaf, the Alabama School for the Blind and the Helen Keller School of Alabama, accredited residential programs. E.H. Gentry Technical Facility is an accredited two-year technical school for sensory impaired adults. Alabama Institute for the Deaf and Blind was started by Dr. Joseph Henry Johnson and began with the enrollment of two students and grew to 22 by the end of the first year. Today, Alabama Institute for Deaf and Blind serves more than 11,600 people and their families each year. The first home for Alabama Institute for Deaf and Blind was the former East Alabama Masonic Female Institute. The spacious four story building featured sun-drenched classrooms and dormitory rooms on the first and second floor, teachers' accommodations in the attic, and a stable in the basement. Now named Manning Hall, it is home to AIDB's administrative offices, the Warren Museum, archives and a library.¹⁴

The Heart of Dixie Railroad Museum, the official railroad museum of the state of Alabama, is located in Calera. The museum features operating standard gauge and narrow gauge trains, two restored depots, an indoor collection of railroad artifacts and memorabilia, and an outdoor collection of railroad cars, locomotives, and cabooses, and old-fashioned train rides through scenic forests. The Heart of Dixie Railroad Museum is dedicated to the preservation, restoration, and operation of historically significant railway equipment.¹⁵

Weogufka State Forest is located in northwest Coosa County and includes Flagg Mountain, which at 1,152 feet above sea level, is one of the southernmost mountains above one thousand feet. The area includes hiking trails and the Flagg Mountain Lookout Tower, which has been listed on the National Historic Lookout Register. Built in 1935, the 50-foot stone lookout tower is a unique structure with walls that are two- to three-feet thick. The tower was staffed by the Alabama Forestry Commission until 1989 and has been leased to the Coosa County Cooperative for restoration.¹⁶

The Water Course: An Alabama Center for Water and Environmental Education is a project of the Alabama Power Foundation featuring interactive exhibits that whet the imagination of visitors and encourage them to learn about Alabama waterways, environment, and impact of state's geography on everyday lifestyles.¹⁷

Figure 24: Flagg Mountain Lookout Tower



Source: National Historic Lookout Register, August 2004, www.firetower.org

The Confederate Memorial Park, located in the Marbury community in Autauga County, is the site of Alabama's only home for Confederate veterans, serving between 650 and 800 residents between 1902 and 1939. The facility includes two cemeteries containing 313 graves. The museum houses Civil War uniforms, weapons and equipment, plus many relics from soldiers' homes. The site also includes walking and driving tours, a nature trail and picnic areas.¹⁸

Built in 1931, Bibb-Graves Bridge in Wetumpka is the last bridge spanning the Coosa River before it joins with the Tallapoosa River and forms the Alabama River just south of Fort

Toulouse / Fort Jackson. Listed on the Alabama Register of Landmarks and Heritage in 1977, the bridge was designed by state bridge engineer Edward Houk and named after Alabama's first Governor Bibb Graves. A focal point for the City of Wetumpka, Bibb Graves Bridge is reported to be one of only two bridges south of the Mason-Dixon line to be suspended by reinforced concrete.¹⁸

At the southern extent of the Lower Coosa River Basin are the foothills of the Appalachian Mountains ending in Bald Knob Mountain in Wetumpka. The area is also home to the Wetumpka Astrobleme or "star-wound."

The Wetumpka Astrobleme is an impact crater formed by a cosmic event that occurred some 80 to 83 millions years ago. It is one of the few above-ground impact crater locations in the United States and one of only about six in the entire World. Even more unusual is the fact that the structure is actually exposed. Despite the weathering that has occurred through millions of years, the crater walls are still prominent, so the rim was obviously much higher at one time. The projectile of the meteor impact was probably traveling between 10 and 20 miles per second. So this means the impact would have produced winds in excess of 500 miles per hour, and the meteor most likely struck at a 30-45 degree angle as it came from the northeast. Geologists determined that it came from the northeast by the angle at which the rocks are slanted within the impact area which includes the current flow path of the Coosa River. This can be seen looking from both directions on the Bibb Graves Bridge. Geologists also theorize that the strike area would have been under a shallow sea, perhaps 300 to 400 feet of water, which covered most of southern Alabama at the time of the impact. One distinctively unique feature is the impact crater's horseshoe-shaped ridge of rock which is not submerged in water or covered or eroded beyond visibility.¹⁹

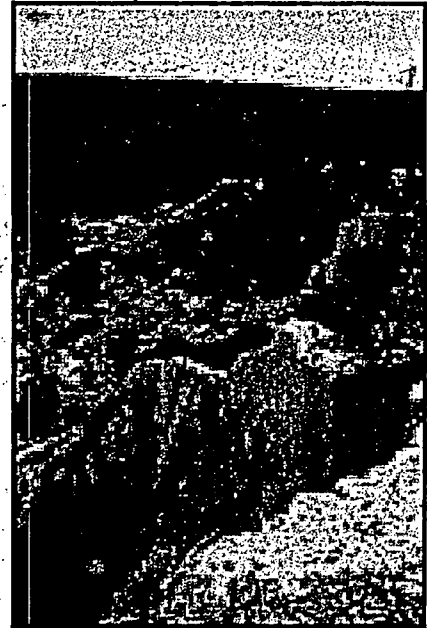
Located at the confluence of the Coosa and Tallapoosa Rivers is Fort Toulouse / Fort Jackson State Historic Site, which has been a part of over 6,000 years of history. The park is open year round to the public and includes an A.D. 11 Mississippian Indian mound, a recreation of the 1751 French Fort Toulouse, and the partially restored 1814 American Fort Jackson. It was here that the Treaty of Fort Jackson was signed, marking the formal end of the bitter Creek war phase of the War of 1812. Fort Toulouse / Fort Jackson are also home to many natural wonders. William Bartram, a famed 18th-century botanist and friend of Benjamin Franklin, visited the site in 1776 creating notes and drawings of the area's flora and fauna.

Figure 25: Bibb-Graves Bridge in Wetumpka.



Source: Wetumpka Chamber of Commerce, August 2004,
www.wetumpkachamber.com

Figure 26: Bald Knob Mountain in Wetumpka



Source: Wetumpka Chamber of Commerce, August 2004,
www.wetumpkachamber.com

The Graves House, a Carolina Tidewater Cottage built between 1825 and 1830 in Lowndes County, Alabama, was moved to the site and serves as the visitor center and museum. Books and souvenirs may be purchased and site artifacts may be viewed at the visitor center. The park also features a 39-unit RV campground, a boat launch, a picnic pavilion and open picnic areas and Bartram Nature Trail.²⁰

Source Documents:

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Chapter 5 Land Use

Land and land use can be examined from more than one perspective, the first of which is how the land is currently being used and the second, a perspective including the land's capacity for future uses. There are many factors affecting why development has or has not occurred in the Lower Coosa River Basin, including the physical characteristics and capacity of the land as discussed in Chapter 2 of this plan. Factors that are paramount in the continued development of the basin, and management of that development, is the expected population and economic growth of the area as discussed in Chapter 3 and those features that might be preserved and/or protected, including historical features, prime farmland, natural forests and endangered species, all of which have been discussed in an earlier chapter. Other factors include accessibility and available infrastructure. This chapter examines vehicular accessibility through and around the basin area and existing land use, both basin-wide and at the watershed level, with some references to expected growth and development. The basin's capacity for future growth and development and specific features that might be safeguarded are addressed at the watershed level in Part IV of this plan and in the supplemental document, *Atlas of Watersheds*.

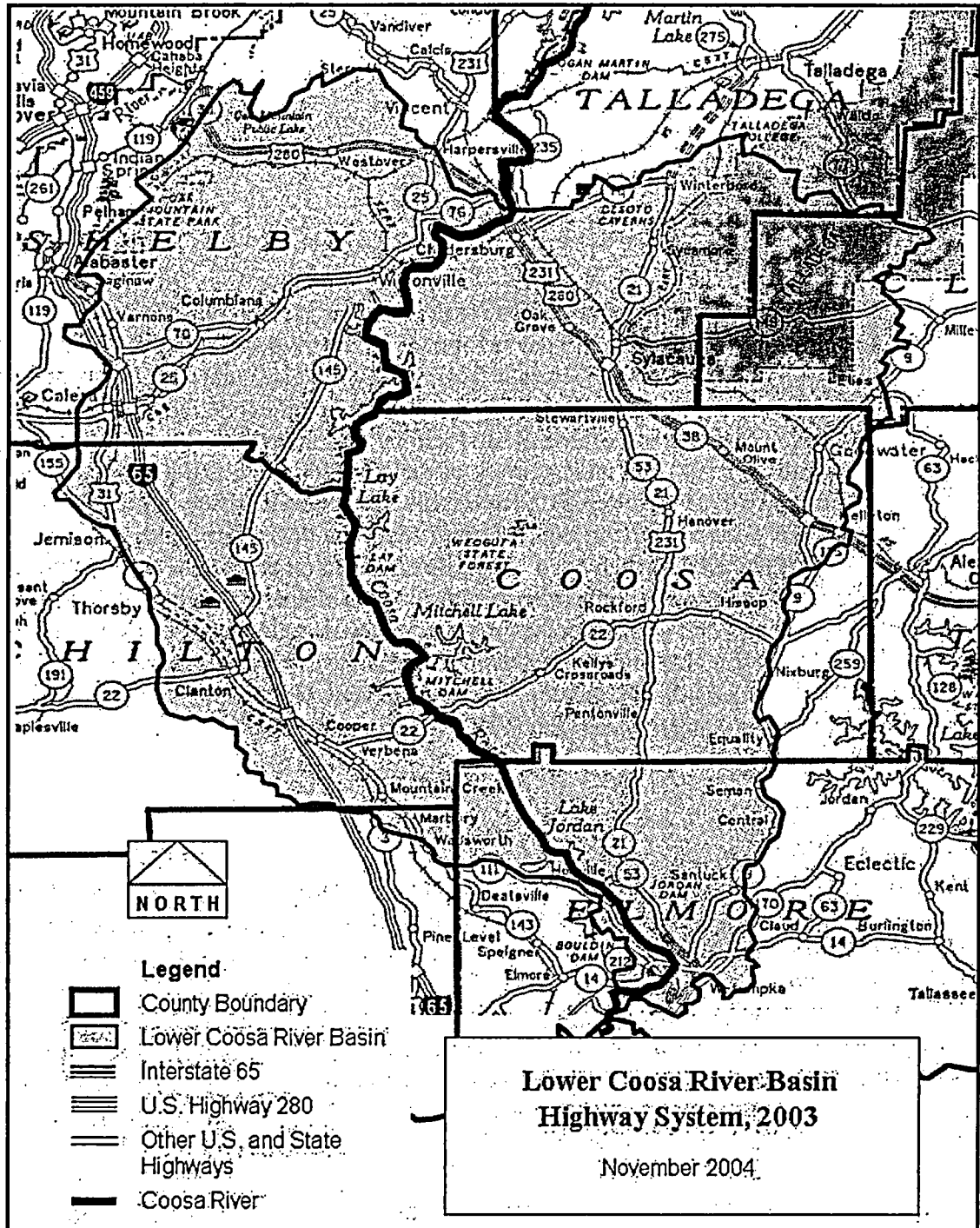
Accessibility

Primary access to the Lower Coosa River Basin area is provided via Interstate 65, which runs in a northwesterly direction between Montgomery and Birmingham along the western boundary of the basin. Interstate 65 provides direct access to Clanton, Thorsby, and Jemison in Chilton County and to Calera in Shelby County. Other primary access routes include US Highway 280, which runs in a southeasterly direction between Birmingham and Auburn; US Highway 231, which runs north-south in the eastern part of the basin between Wetumpka and Sylacauga; and US Highway 31, which runs almost parallel to Interstate 65 between Montgomery and Birmingham. US Highway 280 is a four-lane divided highway, while US Highways 31 and 231 are two-lane highways.

Secondary access is provided via a system of eight State highways. Four are north-south state highways, including Alabama Highway 9, between Wetumpka and Heflin; Alabama Highway 21, between Wetumpka and Anniston; Alabama Highway 25, between Centreville and Ashville; and, Alabama Highway 145, between Clanton and Childersburg. The four

east-west state highways include Alabama Highway 22, between Maplesville and Roanoke; Alabama Highway 70, between Interstate 65 and Columbiana; Alabama Highway 76, between Wilsonville and Winterboro; and Alabama Highway 148, between Sylacauga and Millerville.

Figure 70:



Source: Alabama Department of Transportation, Official 2003 Alabama State Highway Map, State Route System and Delaney Consultant Services, Inc.

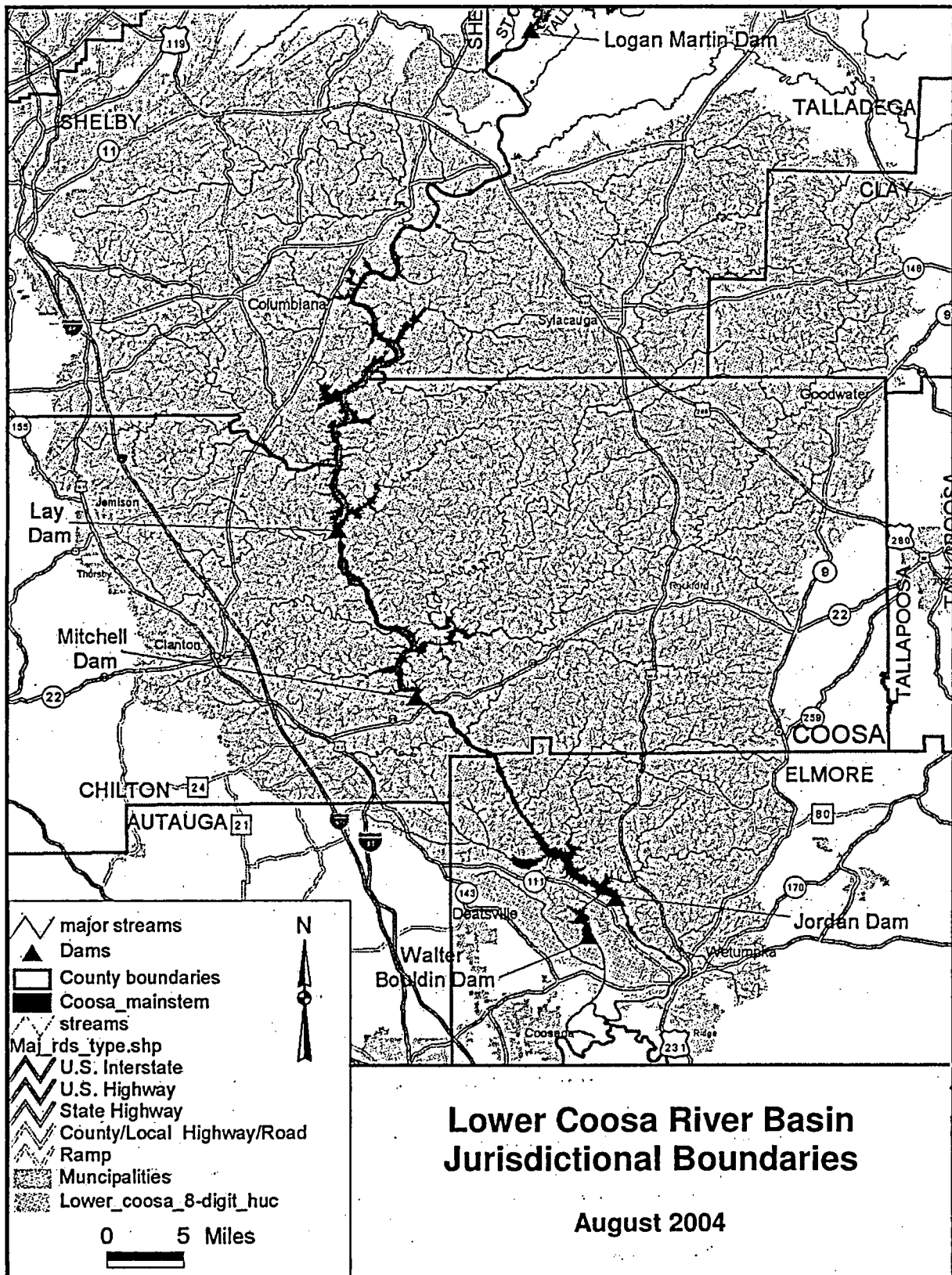
An overlay of the Lower Coosa River Basin boundaries on a state highway map shows that while north-south access is adequate through the basin, the east-west access is extremely limited, resulting in only two locations within the basin to cross the Coosa River via a state highway. Although there are an equal number of state highways providing access both north-south and east-west, the north-south routes are longer and are located on both sides of the Coosa River. With the exception of Alabama Highway 22, all of the east-west state highways are located in the northern part of the basin in Shelby and Talladega Counties. The result is a large portion of the central part of the basin is only accessible by a system of county roads.

The lack of accessibility is also evident in the location of municipalities within the basin boundaries. Of the 14 municipalities in the basin, eight are located in the two northern counties, with six in Shelby County and two in Talladega County. In the two central counties, the three municipalities in Chilton County are located along the western edge of the basin and the two municipalities in Coosa County are located along the eastern edge of the basin. In the southern part of the basin, there is only Wetumpka located at the southern tip of the basin. The map in Figure 70 shows the jurisdictional boundaries of the municipalities in the basin and a void in the central part of the basin where there is limited access and no municipalities. In Coosa County, the lack of development can be attributed to the presence of the Coosa Wildlife Management Area and the Weogufka State Forest. Just north of the Coosa Wildlife Management Area, County Road 55 provides one additional access across the Coosa River between Chilton and Coosa Counties.

Historical routes through the Lower Coosa River Basin include the Route of DeSoto in 1540, General Andrew Jackson's March Against Creeks, Pensacola Trading Path, Montgomery and Talladega Stage Road, Central Plank Road of 1851, and the Coosada Okfuskee Indian Trail. The routes of DeSoto, Jackson and the Pensacola Trading Path all follow the Coosa River from Montgomery to Georgia and Tennessee. The Montgomery and Talladega Stage Road began in Montgomery and ran northwest to southcentral Shelby County where it turned northeast to travel through Talladega and Cleburne Counties to Georgia. Central Plank road began in the Montgomery area and ran northeast through the central part of Elmore County and the eastern part of Coosa County to the Talladega area. The Coosada Okfuskee Indian Trail began in southwest Elmore County and ran northeast through Tallapoosa, Randolph and Cleburne Counties to Rome, Georgia.¹

Growth trends of the Lower Coosa River Basin were established in the previous two chapters, with a loss of over one-fourth of the prime agricultural land in the basin to development and an average population increase of 22 percent among the counties in the basin. These growth trends are also reflected in the increased traffic volume on the state highways within the basin boundaries. The Alabama Department of Transportation (ALDOT), Bureau of Transportation Planning, maintains traffic counts at specific sites every two years indicating increases and decreases in traffic volume and also indicating future road improvement needs by following a trend analysis. These traffic counts are called the Annual Average Daily Traffic, or AADT. The terms AADT and traffic volume are used interchangeably in this section.

Figure 71:



Source: Alabama Department of Environmental Management, August, 2004

Figure 72:

Change in Traffic Volume in Lower Coosa River Basin, 1994 to 2002					
Route	Location	1994	2002	Number Change 1994-2002	Percent Change 1994-2002
Interstate 65	South of Exit 238	39,300	51,000	11,700	29.77%
	Between Exits 231 and 229	28,530	36,450	7,920	27.76%
	South of Chilton-Shelby County Line	27,770	35,610	7,840	28.23%
	Near Exit 219	26,250	34,050	7,800	29.71%
	South of Exit 212	25,540	32,450	6,910	27.06%
	North of Exit 205	25,210	31,550	6,340	25.15%
	South of Exit 205	25,420	30,950	5,530	21.75%
US Highway 31	At Varnons	6,290	7,410	1,120	17.81%
	South of I-65 Exit 231	8,660	12,110	3,450	39.84%
	South of AL Highway 25	7,010	7,700	690	9.84%
	At Cooper	5,560	5,780	220	3.96%
US Highway 231	South of US Highway 280	5,750	6,650	900	15.65%
	At Stewartville	4,790	5,100	310	6.47%
	At Hanover	2,830	3,080	250	8.83%
	North of AL Highway 22	2,880	3,060	180	6.25%
	South of AL Highway 22	1,980	2,060	80	4.04%
	North of Elmore CR 29	1,830	1,920	90	4.92%
	South of Elmore CR 29	2,720	3,050	330	12.13%
	North of Wallsboro	4,860	5,720	860	17.70%
US Highway 280	At Shelby CR 43	19,610	30,210	10,600	54.05%
	At Shelby CR 55	16,010	20,180	4,170	26.05%
	At AL Highway 25	13,910	17,500	3,590	25.81%
	At Coosa River	16,270	20,710	4,440	27.29%
	South of AL Highway 76	21,510	23,290	1,780	8.28%
	North of US Highway 231	12,160	14,110	1,950	16.04%
	South of Coosa-Talladega County Line	8,330	10,790	2,460	29.53%
	South of Mount Olive	7,920	9,670	1,750	22.10%
	West of AL Highway 9	8,030	9,860	1,830	22.79%
	East of AL Highway 9	10,330	11,850	1,520	14.71%
Alabama Highway 9	At AL Highway 63	1,430	1,900	470	32.87%
	At Goodwater	4,850	4,860	10	0.21%
	North of US Highway 280	3,770	3,560	-210	-5.57%
	North of AL Highway 22	1,250	1,580	330	26.40%
	South of AL Highway 22	2,270	2,600	330	14.54%
	South of Santuck	5,630	5,610	-20	-0.36%
Alabama Highway 21	North of Winterboro	5,760	7,170	1,410	24.48%
	South of Sycamore	6,630	7,960	1,330	20.06%
	North of AL Highway 148	11,710	10,550	-1,160	-9.91%

Figure 72, Continued:

Route	Location	1994	2002	Number Change 1994-2002	Percent Change 1994-2002
Alabama Highway 22	West of US Highway 31	8,670	8,670	0	0.00%
	East of US Highway 31	1,460	1,510	50	3.42%
	At Coosa River	1,190	1,380	190	15.97%
	East of Kelly's Crossroads	940	970	30	3.19%
	East of US Highway 231	1,540	1,760	220	14.29%
	West of AL Highway 9	1,620	1,730	110	6.79%
Alabama Highway 25	East of Interstate 65	3,040	3,890	850	27.96%
	Southwest of AL Highway 70	2,890	3,220	330	11.42%
	Northeast of AL Highway 70	4,470	5,280	810	18.12%
	West of Shelby CR 61	3,070	3,580	510	16.61%
	South of AL Highway 76	4,470	5,550	1,080	24.16%
	South of US Highway 280	2,560	3,110	550	21.48%
Alabama Highway 70	East of US Highway 31	3,710	6,060	2,350	63.34%
	West of AL Highway 25	9,040	10,490	1,450	16.04%
Alabama Highway 76	East of US Highway 231	6,850	6,820	-30	-0.44%
	At DeSoto Caverns	3,540	2,230	-1,310	-37.01%
	West of AL Highway 21	1,590	2,130	540	33.96%
Alabama Highway 145	Northeast of I-65	4,690	3,290	-1,400	-29.85%
	At Shelby-Chilton County Line	2,010	2,500	490	24.38%
	South of AL Highway 25	2,590	2,660	70	2.70%
Alabama Highway 148	East of AL Highway 21	3,380	3,380	0	0.00%
	At Talladega-Clay County Line	880	1,110	230	26.14%
	At Clay CR 7	770	960	190	24.68%
	West of Millerville	960	1,020	60	6.25%

Source: Alabama Department of Transportation, 1994 Alabama Traffic Flow Map and 2002 Alabama Traffic Flow Map, and Delaney Consultant Services, Inc.

An inventory of 62 sites where traffic counts were conducted within the Lower Coosa River Basin during 1994 and 2002 indicates an average increase of 15.80 percent in traffic volume on the federal and state roads within the basin. Twelve roads were inventoried: Interstate 65, three US highways, and eight state highways. See Figure 72. Individual sites showing the greatest increase in traffic volume are as follows:

Alabama Highway 70 east of US Highway 3163.34 percent increase
 US Highway 280 at Shelby CR 4354.05 percent increase
 US Highway 31 south of I-65 Exit 23139.84 percent increase
 Alabama Highway 76 west of Alabama Highway 21.....33.96 percent increase
 Alabama Highway 9 at Alabama Highway 6332.87 percent increase

All of the individual sites with the greatest percentage increase in annual average daily traffic volume over the eight year time period are located in the northern part of the basin in Shelby and Talladega Counties. Coincidentally, they are also all located along the edge of the basin boundaries. Those four sites which saw a decrease in traffic volume over the time period are

located throughout the basin, with two in Talladega County, one in Chilton County and one in Elmore County.

Along Interstate 65, traffic volume in 2002 ranged from 30,950 to 51,000 vehicles per day, with traffic volume increases between 1994 and 2002 ranging between 21.75 percent and 29.71 percent. Interstate 65 showed the most consistent traffic volume increases along the entire length of the road that is located within the Lower Coosa River Basin.

Traffic volume along US Highway 31 is highest south of Interstate 65 Exit 231 at Calera with 12,100 vehicles per day in 2002. Traffic volume elsewhere along US Highway 31, however, is considerably less 5,780 to 7,700 vehicles per day. US Highway 231 has the lowest traffic volume of the three federal highways found in the basin, ranging between 1,920 and 6,650 vehicles per day in 2002. Although traffic volume did increase between 1994 and 2002, the percentage of increase was considerably less than in other areas of the basin, ranging between 4.04 percent and 17.70 percent. Following Interstate 65, US Highway 280 is the most heavily traveled road in the basin, with 2002 AADT ranging between 9,670 to 30,210 vehicles per day. Traffic volume increases during the eight-year period were also significant on US Highway 280, ranging between 8.28 percent and 54.05 percent. With the exception of three of ten sites, all of the traffic increases along US Highway 280 were in excess of 20 percent.

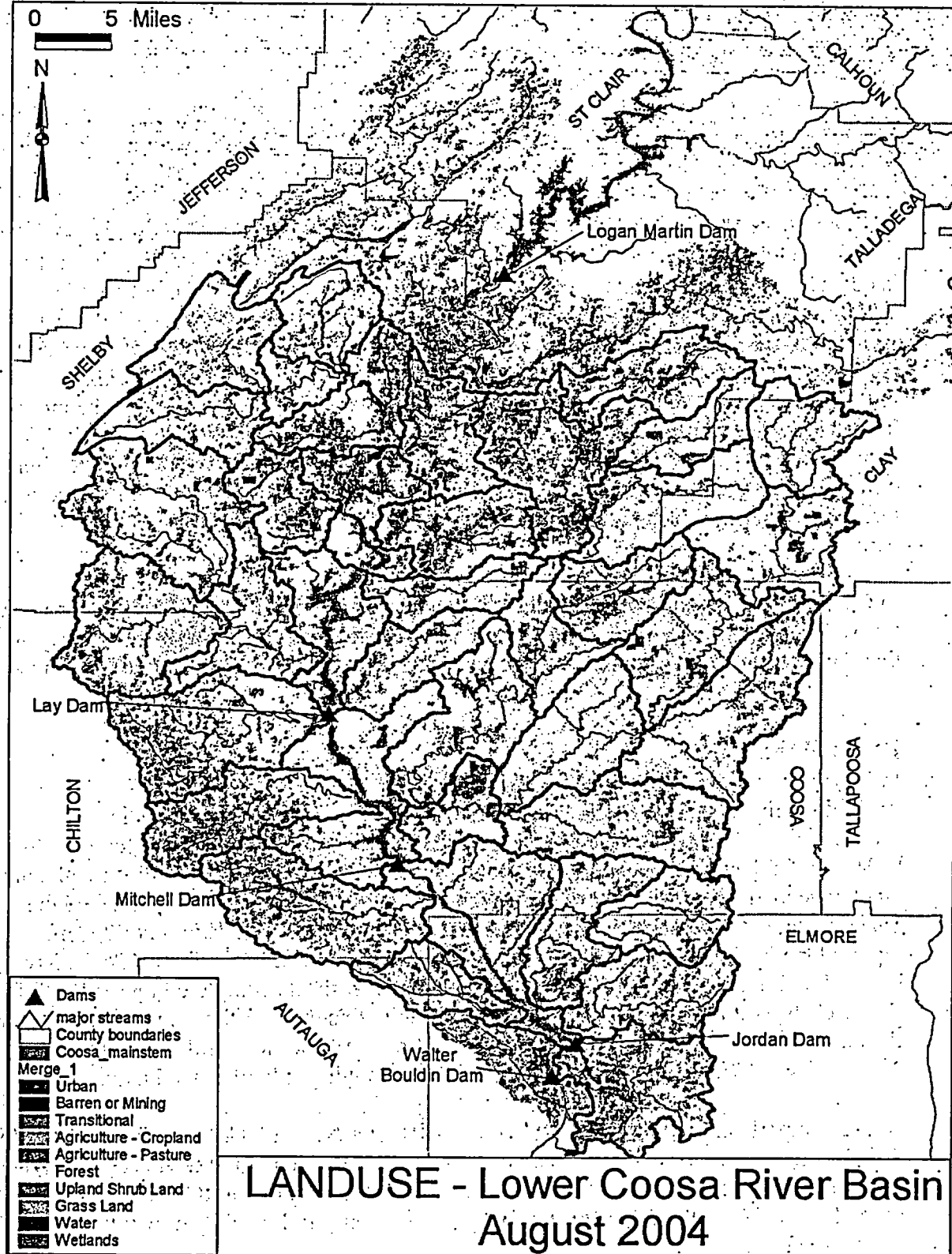
In Chapter 3, the population projections indicated an increase of 49,063 people in the Lower Coosa River Basin over the next 20 years. The resulting impact of this population growth is that there will be ever-increasing traffic volume on an already limited transportation system.

Basin Land Use

In July 1976, the *Water Quality Management Plan: Coosa River Basin* reported that approximately 73 percent of the land within the entire Coosa River basin is in a forest land-use category. The next largest category, at 22 percent, was agricultural. Open land (includes water, wetland, and barren areas) accounted for three percent of the total basin while urban land made up a mere 2 percent of the total area.² In April 2002, ADEM published the *Surface Water Quality Screening Assessment of the Coosa River Basin - 2000*, which reported land uses for each of the 8-digit hydrologic unit code basins in the Coosa River basin. Land use data was drawn from assessment worksheets completed by the local Soil and Water Conservation Districts in 1998. According to this data for the Lower Coosa River Basin, 78 percent of the land was forested, 13 percent was agricultural, 5 percent was urban, 2 percent was open water, and 1 percent each were mining and other land uses.³

A true comparison between the 1976 land use data for the entire Coosa Basin and the 1998 data for the Lower Coosa River Basin cannot be made, however, the data is closely related enough to see that land use patterns are fairly consistent throughout the basin. The majority of the land, by far, is used for forestry purposes, distantly followed by agricultural and then urban land uses.

Figure 73:



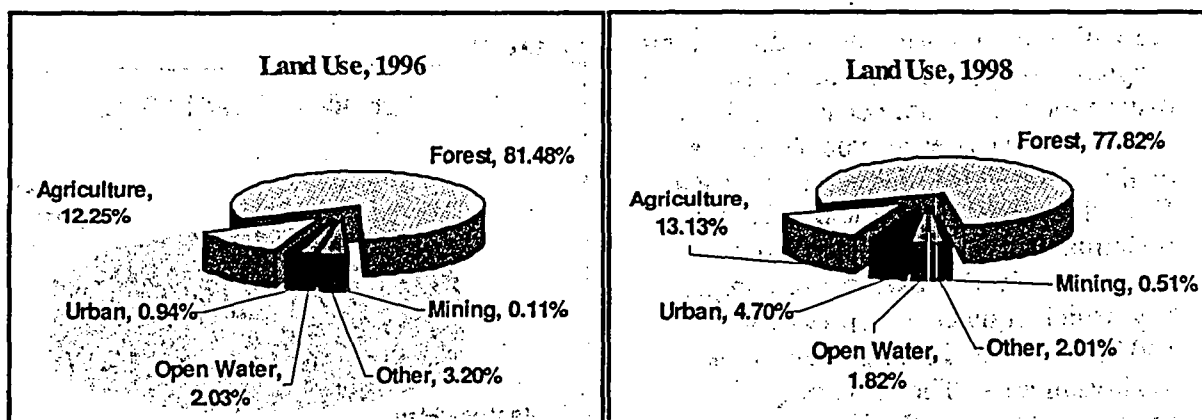
Source: Alabama Department of Environmental Management, August 2004.

To provide more land use detail at the local level, this plan provides a comparison between land satellite data from 1996 provided through the Alabama Department of Environmental Management from the U.S. Geological Survey (USGS) for each of the 20 watersheds in the basin and land use data provided by the Alabama Soil and Water Conservation Committee (SWCC) at the watershed level in 1998. A comparison of the two sources of data show some minor discrepancies, some of which may be attributed to interpretation of the aerial photographs in the land satellite data. For instance, pine seedlings of forested land can be misconstrued as row crops in an aerial shot, and vice versa. Discrepancies may also be attributed to errors in estimating land acreage at the ground level with information drawn from a number of different sources including the seven county tax assessors and/or mapping offices. The estimates are, however, close enough for either to be representative of the basin land uses for the level of accuracy needed at this point in the watershed management planning process.

A description of the land uses for the entire Lower Coosa River Basin follows with a comparison of data from both sources. For purposes beyond that initial discussion and comparison, land use data from the Soil and Water Conservation Committee will primarily be used. Information gathered from the land satellite data reports the total Lower Coosa River Basin size at 1,255,898 acres while the Soil and Water Conservation Committee data reports the total basin size at 1,256,511 (SWCC March 1985) acres. All in all, the difference in total basin size from the two sources is less than one percent.

Figure 74:

Land Use in the Lower Coosa River Basin 1996 - USGS and 1998 - SWCC



Source: Alabama Department of Environmental Management, Land Satellite Data, 1996
Alabama Soil and Water Conservation Committee, Basin Assessments, 1998.

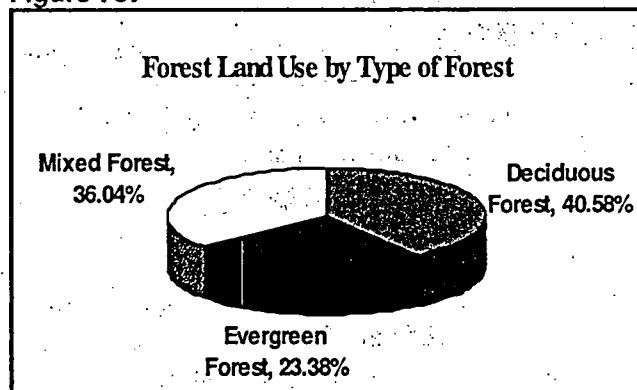
The difference between the two sources of land use data is seen, primarily, in the amount of land that is used for forest purposes. The land satellite data reports 3.66 percent more land in forest uses than the SWCC information, however, both sources report that more than three-fourths of the basin is used for forestry. This was also the case in 1976 with the information gathered by the Alabama Water Improvement Commission. The SWCC data shows 3.76 percent more urban land use than the land satellite data, 0.88 percent more agricultural land use, and 0.40 more mining land use. The land satellite data shows 0.21 percent more open

water than the SWCC data and 1.19 percent more land in the other category. The "other" land uses include bare rock, sand and clay, transitional land uses, woody wetlands and emergent herbaceous wetlands. Using the land use information from the Soil and Water Conservation Committee, the three major land uses in the Lower Coosa River Basin are forestry, agriculture and urban land uses.

Using the land satellite data, the forest land use category can be divided into three types of forested land: deciduous forests, evergreen forests, and mixed forests. Generally speaking, deciduous forest are natural forests, as would be found in the Talladega National Forest. Rarely would this land be counted as land that is used for timber, or silviculture, purposes. Mixed forests are often seen as land that has not been developed, but neither is it being preserved purely for natural forest purposes. Evergreen forests, along with some mixed forests, are most often used for the purpose of silviculture, or timber production. Using this data, potentially 59.42 percent of the forest land in the basin is used for silviculture. This equates to approximately 581,596 acres or almost half of the total Lower Coosa River Basin area, at 46.50 percent. It is estimated that in 2001, cash receipts from timber production in Chilton, Coosa, Elmore, Shelby and Talladega Counties combined totaled just under \$37 million.⁴

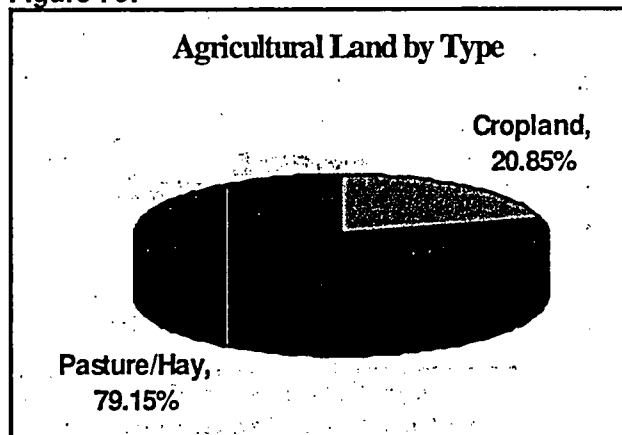
Agricultural land uses can be divided into cropland and pasture/hay land. The distinction is relevant because of the different impacts each type has on water quality, which is discussed more in Part III of this plan. Using the SWCC data, it is estimated that 79.15 percent of the agricultural land is used for pasture and hay, which equates to approximately 130,723 acres or 10.45 percent of the total basin area. The remaining agricultural land, at 20.85 percent, is used for crop production. This equates to 34,435 acres or 2.75 percent of the total land area in the Lower Coosa River Basin. It is estimated that in 2001, cash receipts from agricultural land uses combined in the five counties of Chilton, Coosa, Elmore, Shelby and Talladega totaled approximately \$66.4 million, with \$31.1 million generated by crop production and 35.3 generated from livestock and poultry.⁴ A review of concentrated animal feeding operation (CAFO) registrations from 2003 showed that there are no CAFOs located in the Lower Coosa River Basin.

Figure 75:



Source: Alabama Department of Environmental Management, Land Satellite Data from USGS, 1996.

Figure 76:



Source: Alabama Soil and Water Conservation Committee, Basin Assessment. 1998.

Urban land uses, which comprise approximately 4.70 percent of the basin land area, include developed land such as industrial, commercial and residential uses along with accompanying infrastructure and recreational uses. Of the 59,140 acres in the basin categorized as urban land uses, it is estimated that 42.85 percent is used for residential purposes, 33.66 percent is used for commercial, industrial and transportation purposes, and 23.50 percent is used for urban recreational purposes, such as lawns and parks.

Land used for mining purposes constitutes 0.51 percent of the total basin area which equates to approximately 6,456 acres. There are 13 permitted mining facilities in the Lower Coosa River Basin, of which six are in Talladega County, three are in Elmore County, two are in Chilton County, and one each are in Coosa and Shelby Counties. All of these are rock quarries or sand and gravel pits.

Land Use by Watershed

Those watersheds with the highest percentages of forested, agricultural and urban land are shown in Figure 77. Figure 78 provides the total acreage per watershed and the amount of acreage used for crop land, pasture land, forest land, urban land, open ponds and water, mined land, and land for other uses along with the percentage for land use each category for the particular watershed.

Note: The land use numbers in the chart have been adjusted to correct mathematical errors found in the original SWCC data. The corrected data will be utilized for land use purposes throughout the remainder of this plan.

As with the entire Lower Coosa River Basin, the predominant land use in each of the watersheds is forest land, ranging from 50 percent in the Walthall Branch watershed to 92 percent in the Middle Hatchet Creek watershed. Following the Middle Hatchet Creek watershed, the watersheds with the highest percentage of forest land are Upper Hatchet Creek at 91 percent, Socapatoy Creek at 91 percent, Lower Hatchet Creek at 89 percent, and Peckerwood Creek at 88 percent.

Figure 77:

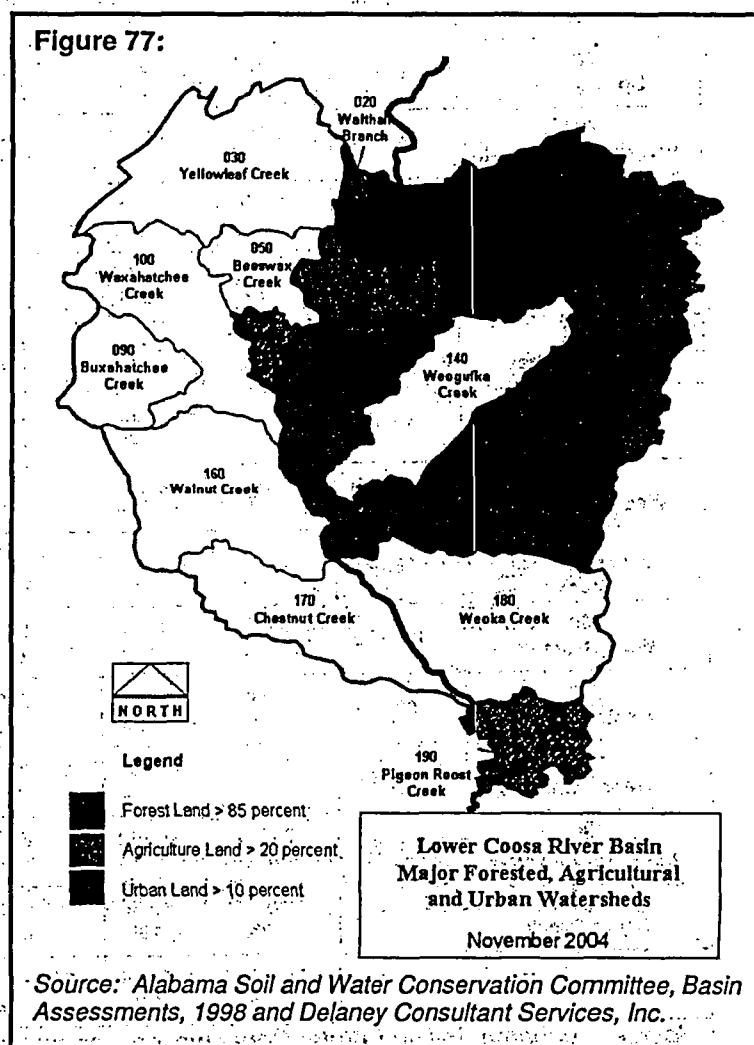


Figure 78:

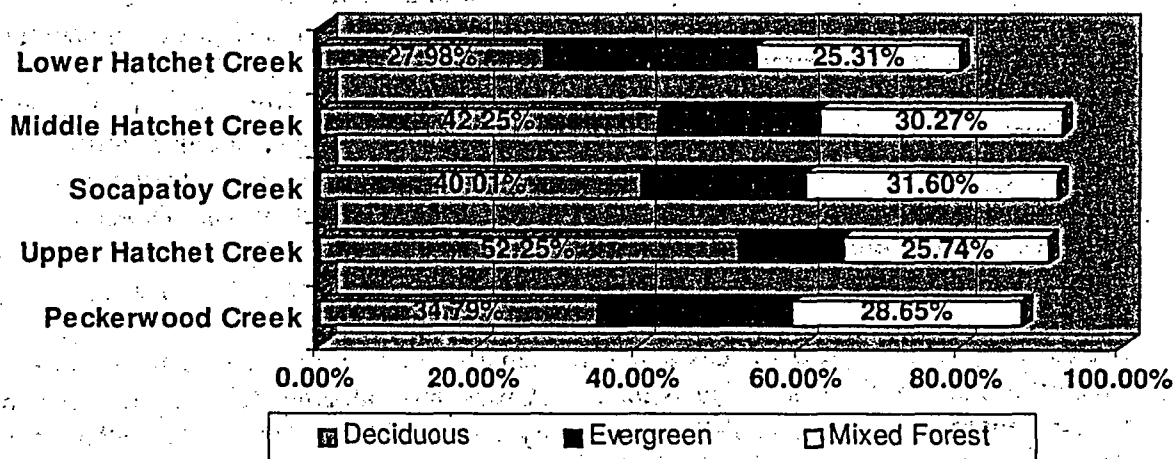
Land Use by Watershed, 1998								
Watershed Name	Total Acres	Crop Land (acres) % total	Pasture Land (acres) % total	Forest Land (acres) % total	Urban Land (acres) % total	Ponds & Lakes (acres) % total	Mined Lands (acres) % total	Other Land (acres) % total
010 Tallaseehatchee Creek	128,147	3,305 3%	9,914 8%	87,353 68%	17,626 14%	2,208 2%	4,406 3%	3,335 3%
020 Walthall Branch	8,611	1,050 12%	2,570 30%	4,331 50%	300 3%	360 4%	0 0%	0 3%
030 Yellowleaf Creek	118,484	5,250 4%	19,500 16%	83,550 71%	7,600 6%	950 1%	47 0%	1,587 1%
040 Kahatchee Creek	15,836	633 4%	2,375 15%	8,552 54%	2,375 15%	1,109 7%	317 2%	475 3%
050 Beeswax Creek	36,371	1,000 3%	6,100 17%	25,091 69%	3,055 8%	800 2%	70 0%	255 1%
060 Cedar Creek	41,594	1,664 4%	10,399 25%	24,955 60%	1,248 3%	2,912 7%	0 0%	416 1%
070 Peckerwood Creek	53,130	162 0%	2,450 5%	46,848 88%	73 0%	3,101 6%	108 0%	388 1%
080 Spring Creek	14,511	350 2%	2,800 19%	8,781 61%	2,200 15%	380 3%	0 0%	0 0%
090 Buxahatchee Creek	44,551	1,050 2%	4,200 9%	37,040 83%	890 2%	282 1%	180 0%	909 2%
100 Waxahatchee Creek	87,372	1,000 1%	6,700 8%	74,421 85%	2,310 3%	580 1%	1,080 1%	1,281 1%
110 Upper Hatchet Creek	56,450	75 0%	6,803 7%	88,000 91%	194 0%	265 0%	10 0%	1,103 1%
120 Socapatoy Creek	48,708	0 0%	2,922 6%	44,539 91%	779 2%	127 0%	0 0%	341 1%
130 Middle Hatchet Creek	84,188	0 0%	3,368 4%	77,452 92%	1,684 2%	842 1%	0 0%	842 1%
140 Weogufka Creek	78,757	516 1%	8,821 11%	67,300 85%	129 0%	179 0%	158 0%	1,654 2%
150 Lower Hatchet Creek	38,844	0 0%	0 0%	34,735 89%	97 0%	3,884 10%	0 0%	128 0%
160 Walnut Creek	112,675	7,594 7%	14,338 13%	85,361 76%	3,500 3%	150 0%	0 0%	1,732 2%
170 Chestnut Creek	80,961	6,080 8%	8,670 11%	57,369 71%	4,610 6%	2,437 3%	0 0%	1,795 2%
180 Weoka Creek	121,204	1,519 1%	11,252 9%	101,839 84%	4,205 3%	1,840 2%	2 0%	547 0%
190 Pigeon Roost Creek	11,288	2,370 21%	1,242 11%	3,837 34%	2,934 26%	905 8%	0 0%	0 0%
200 Taylor Creek	28,913	819 3%	5,460 19%	16,611 57%	5,823 20%	200 1%	0 0%	0 0%
Basin	1,250,595	34,437 3%	129,884 10%	977,965 78%	61,632 5%	23,511 2%	6,378 1%	16,788 1%

Source: Alabama Soil and Water Conservation Committee. Basin Assessments, 1998

The type of forest land is another indicator of how the land is used. Those watersheds which have a high percentage of evergreen and mixed forest are more likely to be used for silviculture, or timber production. Of the five watersheds that have the highest percentage of forested land, Upper Hatchet Creek has the highest percentage of deciduous forest, at 52.25 percent reflecting the presence of the Talladega National Forest in the watershed. In the Middle Hatchet Creek and Socapatoy watersheds the percentage of deciduous forest is just over 40 percent in each. In the Lower Hatchet Creek and Peckerwood Creek watersheds, the type of forest is roughly divided in thirds between deciduous, evergreen and mixed forest. Other watersheds with a high percentage of deciduous forest in relation to the total forested land are the Weogufka Creek watershed, at 39.71 percent, and the Weoka Creek watershed, at 86.61 percent.

Figure 79:

Type of Forests in Major Forested Watersheds



Source: Alabama Department of Environmental Management, 2004, USGS Land Satellite Data, 1996.

Basin-wide, the percentage of mixed and evergreen forest combined is 48.42 percent, representing significant potential for silviculture activities throughout the basin. Those watersheds which have the highest potential for silviculture, based on the combined percentage of mixed and evergreen forests, are as follows:

Watershed	% Mixed and Evergreen	Total % Forested
Buxahatchee Creek	63.55%	83%
Waxahatchee Creek	61.10%	85%
Taylor Creek	54.23%	57%
Spring Creek	53.02%	61%
Peckerwood Creek	52.83%	88%
Socatoy Creek	51.99%	91%
Lower Hatchet Creek	51.79%	89%
Weoka Creek	50.59%	84%
Middle Hatchet Creek	50.32%	92%

Those watersheds with the highest percentage of agricultural land are Walthall Creek at 42 percent, Pigeon Roost Creek at 32 percent, Cedar Creek at 29 percent, Taylor Creek at 22 percent, and Spring Creek at 21 percent. In all of the watersheds except one, the percentage of pasture land is significantly higher than the percentage of crop land. In the five primary agricultural watersheds, pasture land ranges from 11 percent in the Pigeon Roost Creek watershed to 30 percent in the Walthall Creek watershed. The Pigeon Roost Creek watershed is the only watershed out of all 20 watersheds in which there is more land used for crop purposes, at 21 percent, than for pasture land.

Those watersheds with the highest percentage of urban land are Pigeon Roost Creek at 26 percent, Taylor Creek at 20 percent, Kahatchee Creek at 15 percent, Spring Creek at 15 percent, and Tallassehatchee Creek at 14 percent. Although these five watersheds have the highest percentage of urban land uses, the percentage of urban land is still low. Urban land uses, however, have a much greater impact on water quality than other land uses. Thus, by making even a small percentage of change to the land use of an urban area, a potential major contribution to water quality issues can result. The Pigeon Roost Creek watershed encompasses a very small area, only 11,288 acres, and includes the western half of Wetumpka and Interstate 65. The Pigeon Roost Creek watershed also has a high percentage of agricultural land (32 percent) and the lowest percentage of forested land of any of the watersheds, at 34 percent. The Taylor Creek watershed, located adjacent to the Pigeon Roost Creek watershed, includes the eastern half of the City of Wetumpka and high traffic volumes on US Highway 231. In the Wallsboro community, north of Wetumpka, traffic volume increased 17.70 percent between 1992 and 2004. The Alabama Industrial Directory lists 17 industries in the Wetumpka area employing between 876 and 1,110 persons. Together, these two watersheds only occupy 3.21 percent of the entire Lower Coosa River Basin.⁵

The Kahatchee Creek, Spring Creek and Tallassehatchee Creek watersheds are all located in the northern part of the basin. The Kahatchee Creek and Tallassehatchee Creek watersheds are adjacent to one another in Talladega County. Approximately half of the Tallassehatchee Creek watershed is occupied by the Talladega National Forest. The western half, however, includes Sylacauga, the eastern half of Childersburg and the Oak Grove, Sycamore and Winterboro communities and US Highway 280. The Kahatchee Creek watershed, which is only 15,836 acres in size, encompasses the western half of Childersburg. The Alabama Industrial Directory lists seven industries in the Childersburg area, employing between 222 and 341 persons, and 39 industries in the Sylacauga area, employing between 3348 and 4250 persons. The Spring Creek watershed, located between Alabama Highway 145 and the Coosa River in southern Shelby County, is only 14,511 acres in size. Although there are no municipalities within the Spring Creek watershed, the area does include a major portion of Lay Lake and is in a high growth area of Shelby County.⁵

Land use in the remaining eight watersheds is primarily forest land ranging from 69 percent in the Beeswax Creek watershed to 85 percent in the Waxahatchee Creek and Weogufka Creek watersheds, however, they have more of a mix of land uses than the major forested watersheds. Yellowleaf Creek watershed has a significant mix of land uses with forest at 71 percent, agriculture at 20 percent, and urban at 6 percent. The same is true for the Beeswax Creek watershed, with 69 percent forest, 20 percent agriculture and 8 percent urban. The

Buxahatchee Creek, Waxahatchee Creek, Weogufka Creek and Weoka Creek watersheds are more heavily forested than the other four watersheds, at 83 percent, 85 percent, 85 percent and 84 percent forest, respectively. Buxahatchee Creek watershed also has 11 percent agriculture, 2 percent urban and 2 percent other land uses while Waxahatchee Creek watershed has 9 percent agriculture, 3 percent urban and 1 percent mined land uses. Weogufka Creek watershed has 12 percent agriculture and 2 percent other land uses. And, Weoka Creek has 10 percent agriculture and three percent urban land uses. The Walnut Creek and Chestnut Creek watersheds primarily have agriculture and forest land uses with small amounts of other uses mixed in. The Walnut Creek watershed is 20 percent agriculture, 76 percent forest, 3 percent urban and 2 percent other land uses. The Chestnut Creek watershed is 19 percent agriculture, 71 percent forest, 6 percent urban and 2 percent other land uses. Mining land uses are only found in three of the watersheds: Tallaseehatchee Creek watershed, at 3 percent; Kahatchee Creek watershed at 2 percent, and Waxahatchee Creek watershed, at 1 percent. Watersheds with the highest percentage of ponds and lakes are Lower Hatchet Creek at 10 percent, Cedar Creek at 7 percent and Peckerwood Creek at 6 percent.

Source Documents:

1. Alabama Department of Transportation. Historic Road and Trails Map. April 1975.
2. Alabama Water Improvement Commission, *Water Quality Management Plan: Coosa River Basin*. July 1976.
3. Alabama Department of Environmental Management. *Surface Water Quality Screening Assessment of the Coosa River Basin – 2000*. Prepared by the Aquatic Assessment Unit, Montgomery Branch – Field Operations Division. April 1, 2002.
4. Alabama Agricultural Statistical Service. *2002 Alabama Agricultural Statistics Annual Bulletin*. September 2002.
5. Alabama Development Office. *2003-2004 Alabama Industrial Directory*.

Chapter 6

Water Uses in the Lower Coosa River Basin

Alabama has traditionally been considered to be a water abundant state. During the droughts that occurred in the late 1980s, however, it became apparent that certain water problems were not drought related. That created a renewed awareness among water resource managers that the quality and quantity of this important resource had to be protected.

“Access to water determines the economic prosperity and quality of life in all cultures.” Neither Alabama nor the Lower Coosa River Basin are exceptions to this statement made by the Alabama Water Resources Study Commission in 1991. Water is a pervasive resource that impacts all facets of the lives of every resident in the Lower Coosa River Basin.

There exists an infinite variety of users of the surface water found in the Lower Coosa River Basin. Some of the water uses require a permit and some do not. Users of the streams and creeks and of the Coosa River include those who take water from the river system and those who use the river system to discharge water. Water uses often correspond to the land use, and more often than not, the water uses are inherently tied to the local economy. Thus, the protection, sharing and management of water resources is vital to the long-term well-being of the population and their lifestyles. This chapter provides an inventory of the both withdrawal and non-withdrawal water users in the Lower Coosa River Basin and, to the extent possible, their economic impact on the basin area.

Tracking Water Use

In 1991, by Executive Order, the Governor of Alabama directed that the Director of the Alabama Department of Economic and Community Affairs (ADECA) establish an Office of Water Resources in the department. The Office of Water Resources was commissioned to develop comprehensive plans and strategies for the use of the state's water resources. The Office of Water Resources was also requested to assess areas of the state analytically to determine if available water supplies are sufficient to satisfy existing and future demands. The Office of Water Resources was officially created on February 23, 1993, when the legislature passed the Alabama Water Resources Act.¹

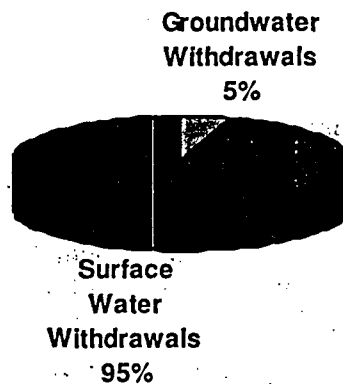
The Alabama Water Resources Act directed the 19-member Alabama Water Resources Commission to adopt rules and regulations for the operation of the commission and for governing declarations of beneficial water use and certificates of water use. The rules and regulations were adopted on December 9, 1993, and became effective on February 22, 1994. The Alabama Water Resources Act requires all public water-supply systems and any person who diverts, withdraws, or consumes more than 100,000 gallons of water each day to submit a Declaration of Beneficial Use to the Office of Water Resources. However, no Declaration of Beneficial Use is required for in-stream uses of water or for impoundments less than 100 acres in size that are confined upon one's property or are solely used for recreational purposes. The Office of Water Resources issues a Certificate of Use to water users after they submit a Declaration of Beneficial Use. Each year, water users who are required to submit a Declaration of Beneficial Use must report the amount of water consumed, diverted, or withdrawn each month as a condition of re-issuance of the Certificate of Use. This certificate is issued for a period ranging from 5 to 10 years, at the discretion of the Division Chief of the Office of Water Resources. Water users required to file a Declaration of Beneficial Use who either fail to file or provide false information are violating the Alabama Water Resources Act. Also, violations of the act after issuance of the Certificate of Use could result in suspension, revocation, termination, or modification of the Certificate of Use. Violations of the Act may result in civil penalties that are assessed by the Office of Water Resources. The penalties will not exceed \$1,000 for each violation; however, each day a violation continues constitutes a separate violation. The maximum penalty will not exceed \$25,000 in any calendar year.¹

Withdrawal Uses

Those who take water from the river system are categorized as withdrawal uses and include public water systems, self-supplied industrial and commercial facilities, agricultural, self-supplied domestic, power generation and mining. Based on data available from ADECA, an estimated 6.148 billion gallons per day (bgd) was withdrawn from surface water and groundwater sources for use in Alabama, which equates to approximately 1,474 gallons per day per person in the State. This is a tremendous decrease from water withdrawals in 1980, when approximately 25.6 bgd were withdrawn according to data collected by the U.S. Geological Survey.¹ This trend in the decrease of water usage has also occurred nationwide. Since the decreasing trend in water usage is accompanied by an increase in population, the decrease must result from a combination of

Figure 80:

Water Withdrawals, 2000 Lower Coosa River Basin Counties



Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000. <http://water.usgs.gov/wateruse>

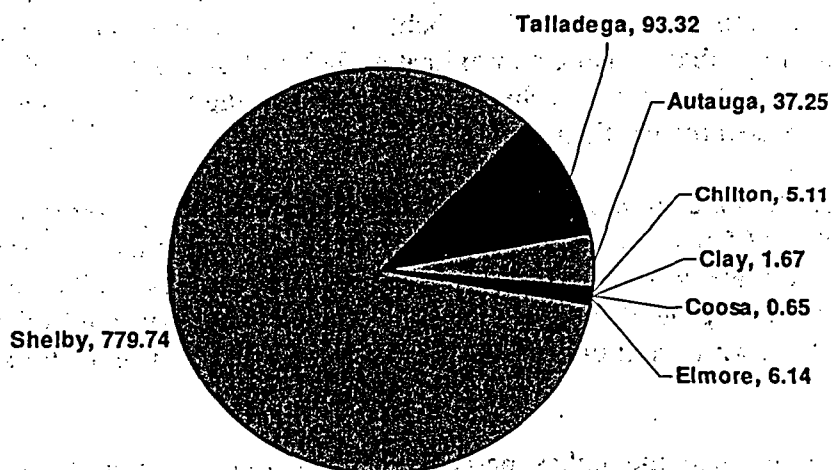
conservation and reuse. While the use of reclaimed wastewater was 36 percent higher nationwide in 1995 than in 1990, there was no report of wastewater reclamation in Alabama.¹

In 2000, water use withdrawal of both ground and surface water in the seven counties located in the Lower Coosa River Basin totaled 923.88 million gallons per day. Of this total water withdrawal, 879.71 million gallons per day, or 95 percent, was withdrawn from surface water. Shelby County had the highest water withdrawal rates, by far, with 84.4 percent of the total water withdrawn occurring there. Shelby County was distantly followed by Talladega County with 10 percent of the total water withdrawals. Autauga, Chilton, Clay, Coosa, and Elmore Counties combined only had water withdrawal rates of 5.6 percent of the total. When divided into surface water and ground water, the rate for Shelby County was even higher, with more than 98 percent of the county water withdrawal being from surface water sources.²

Of the 923.88 million gallons of water withdrawn per day in the seven-county area, the greatest portion, at 82.69 percent, is used for thermoelectric power, followed distantly by industrial uses at 11.25 percent. Public and private water supply systems combined only use 5.91 percent and irrigation purposes use less than 1 percent.²

Figure 81:

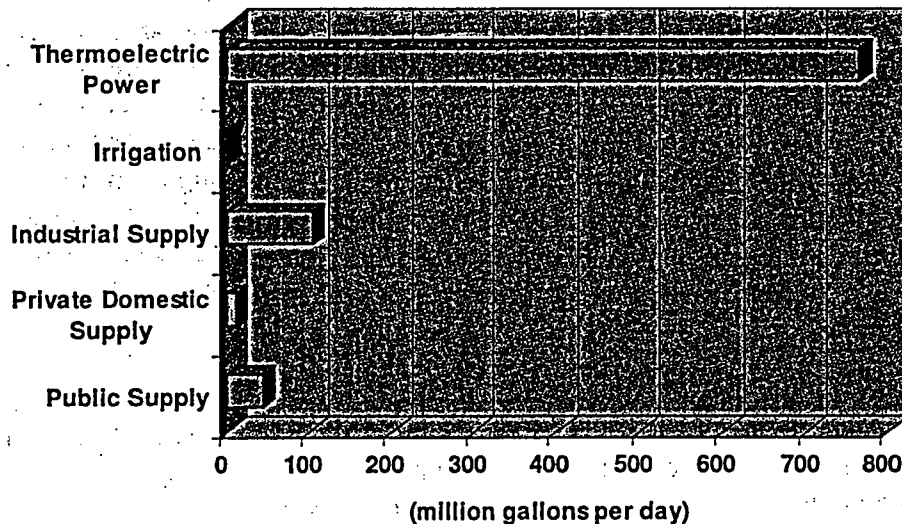
Water Withdrawal By County, 2000
(million gallons per day)



Source: USGS. *Estimated Use of Water in the United States, County Level Data, 2000.*
<http://water.usgs.gov/wateruse>

Figure 82:

Water Withdrawal by User Type, 2000



Source: USGS. *Estimated Use of Water in the United States, County Level Data, 2000.*
<http://water.usgs.gov/wateruse>

Water Systems. Municipal and private, or self supplied, use of water in the Lower Coosa River Basin provides domestic water for culinary and cleaning purposes, lawn irrigation, and certain recreational activities such as filling and maintaining swimming pools. Municipal water use also includes lost water including water used for fire fighting and system losses occurring in transmission lines. In 1997, public water systems served an estimated 3.97 million people in Alabama, using approximately 787 million gallons per day, which was an increase of about 1.3 percent over the previous year. During that same year, the state's population increased by less than one percent.¹

In the seven county area of the Lower Coosa River Basin, public water systems served approximately 74.05 percent of the total population, while the remainder of the population was served by private water systems. In the private water systems, 100 percent of the water was withdrawn from groundwater sources. In the public water systems, 66 percent of the water was withdrawn from groundwater sources and 34 percent was withdrawn from surface water.²

In 2000, the county with the highest percentage of water usage for public water systems was Talladega County, at 34.91 percent of the total public water system usage, followed by Shelby County at 28.75 percent of the total public water system usage. Public water supply usage in Coosa County is only .35 million gallons per day ranking as the county with the lower public water supply usage. Autauga County has the highest percentage of private water supply usage, at 28.39 percent, but is followed closely by Talladega County, at 24.45 percent, and Shelby County, at 23.00 percent. Again, Coosa County has the lowest percentage of water used for private water systems, at 2.89 percent of the total for the seven-county area.²

Figure 83:

Water System Water Usage by County, 2000					
Public Water System			Private Water System		
County	MGD	% Total	County	MGD	% Total
Autauga	5.70	12.87%	Autauga	2.95	28.39%
Chilton	3.51	7.93%	Chilton	1.10	10.59%
Clay	1.10	2.48%	Clay	0.57	5.49%
Coosa	0.35	0.79%	Coosa	0.30	2.89%
Elmore	5.43	12.26%	Elmore	0.54	5.20%
Shelby	12.73	28.75%	Shelby	2.39	23.00%
Talladega	15.46	34.91%	Talladega	2.54	24.45%
7-County Total	44.28	100.00%	7-County Total	10.39	100.00%

Source: USGS. Estimated Use of Water in the United States, County Level Data, 2000.
<http://water.usgs.gov/wateruse>

As of July 2004, the Office of Water Resources only reports four water use certificate holders for public water systems in the Lower Coosa River Basin. These are the Clanton Waterworks and Sewer Board, Five Star Water Supply, the Goodwater Water Works and Sewer Board and the Sylacauga Utilities Board. Therefore, the great majority of the water users for public and private water systems in the seven-county area must be located outside the Lower Coosa River Basin boundaries.

Self-Supplied Industrial and Commercial Facilities. Industrial water use in the lower Coosa River basin includes water used in industrial processes, cooling water and domestic water used by employees during their respective work shifts. The Office of Water Resources only reported one water use certificate holder for non-public industrial usage in the Lower Coosa River Basin in July 2004, which is Avondale Mills, Sylacauga Facility. Industrial water usage by the seven counties in the Lower Coosa River Basin totals 103.90 million gallons per day. Of the industrial water usage in the seven-county area, just over 92 percent of the water is used by operations in Shelby County. The only other county that reported industrial water usage was Autauga County.² The 2003-2004 Alabama Industrial Directory, however, lists 176 industries in the Lower Coosa River Basin, employing between 8,811 and 10,950 persons. The largest industries in the basin, in terms of employment, are ABC Rail Products in Calera (451-550), Madix Inc. in Goodwater (651-700), Avondale Mills in Sylacauga (800- 1,000 in three plants), Imerys in Sylacauga (451-550), and Russell Corporation in Sylacauga (551 – 650).³

Figure 84:

Industrial Resources in Lower Coosa River Basin		
County	Number of Industries	Estimated Number of Employees
Autauga	1	41-50
Chilton	67	1,200 – 1,500
Clay	0	0
Coosa	9	1,000 – 1,250
Elmore	17	875 – 1,110
Shelby	35	1,920 – 2,440
Talladega	47	3,775 – 4,600
Basin	176	8,811 – 10,950

Source: Alabama Development Office. Alabama Industrial Directory, 2003-2004.

Agricultural Uses. For purposes of water usage, agriculture includes crops, livestock and silviculture. Agricultural uses of water include in the Lower Coosa River Basin include irrigation of crops, orchards and sod farms, water for livestock, and catfish farming. For the State of Alabama, agricultural water use for 1997 was estimated at 306 million gallons per day, a 32 percent increase from 1996. On a national level, however, irrigation water use has been decreasing since 1980.¹

There are 2,394 farms in the Chilton, Coosa, Elmore, Shelby and Talladega Counties, encompassing approximately 442,703 acres. Autauga and Clay were not included in the inventory of agricultural statistics since the entire area of each county that is within the basin boundaries is so small that inclusion of the two counties has the potential to skew the information to an extreme that would not be representative of the Lower Coosa River Basin. Just over one-fourth (28.06 percent) of the total agricultural land in the five counties is located in Elmore County, which is followed closely by Talladega County, at 24.74 percent. Shelby County has the least number of farms, but Coosa County has the least amount of acreage in farm use. These farms provide a significant economic base for the area as shown in Figure 85.

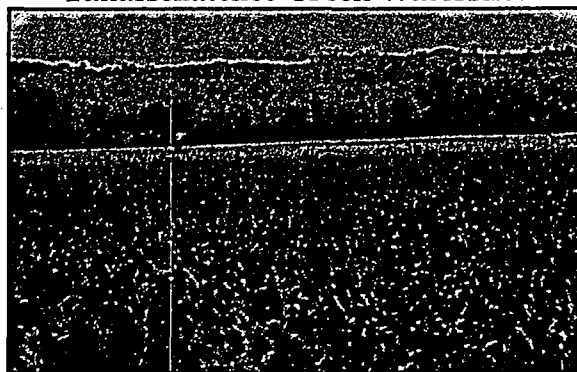
Figure 85:

Farm Land and Agricultural Cash Receipts							
County	Farm Data			Cash Receipts, 2001 (in \$1,000s)			
	Number of Farms	Acres in Farms	Avg Farm Size (acres)	Crops	Livestock and Poultry	Forest Products	Total Farm and Forestry
Chilton	663	98,746	149	9,925	5,053	9,466	27,476
Coosa	213	41,716	196	245	1,683	12,441	14,701
Elmore	560	124,260	222	8,515	6,165	3,573	23,856
Shelby	435	68,421	157	7,363	3,728	6,000	18,546
Talladega	523	109,560	209	5,088	18,717	5,490	34,366
Total	2,394	442,703	933	\$31,136	\$35,346	\$36,970	\$118,945
<i>Source: Census of Agriculture, 1997 and the United States Department of Agriculture, National Agricultural Statistics Service, Alabama Agricultural Statistics, 2002 - Bulletin 44</i>							

According to the *Alabama Agricultural Statistics, 2002 - Bulletin 44*, produced by the United States Department of Agriculture, National Agricultural Statistics Service, farm products produced in the five-county area include corn, cotton, hay, soybeans, wheat, peaches, pecans, cattle, hogs and pigs, sod and nursery plants, and timber. The primary agricultural counties in the basin area are Elmore and Talladega in terms of the variety of agricultural production. Chilton County is also a major producer of peaches. A comparison of agricultural production in 1991 with

Figure 86:

Corn Production in the Tallassehatchee Creek Watershed



agricultural production in 2001 corn, soybeans, pecans, beef. Figure 88. Product areas showing beef cattle. Product areas showing descending order are hogs and increases range from a 7.75 percent increase in hogs and pigs. decrease in sod and nursery plants

Figure 88:

shows a decline in half of the product areas: cattle, poultry, and sod and nursery plants. See the most significant decline are pecans, corn and the most significant increase in production in pigs, cotton, timber and peaches. Production percent increase in hay to a 67.83 percent. Production decreases range from a 5.02 percent to a 68.42 percent decrease in pecans.

Agricultural Production Comparison, 1991 to 2001				
Crop	1991 Production	2001 Production	% Change	2001 Production Counties (1991)
Corn	366,000 bushels	214,000 bushels	-41.5%	Elmore, Shelby
Cotton	32,230 bales	58,000 bales	+44.43%	Coosa, Elmore, Talladega (Coosa)
Hay	131,000 bales	142,000 bales	+7.75%	All
Soybeans	239,000 bushels	216,000 bushels	-10.65%	Talladega (Elmore)
Wheat	149,000 bushels	184,000 bushels	+19.02%	Elmore, Talladega (Chilton)
Peaches	10,650,000 pounds	16,000,000 pounds	+33.44%	Chilton (Coosa, Shelby, Talladega)
Pecans	95,000 pounds	30,000 pounds	-68.42%	Elmore (Chilton, Coosa, Talladega)
Beef Cattle	55,600 cows	35,500 cows	-36.15%	All
Hogs & Pigs	19,300 hogs/pigs	60,000 hogs/pigs	+67.83%	Elmore (All)
Cattfish	Data suppressed	---	---	Elmore
Poultry	8,709 broilers	6,681 broilers	-23.29%	Talladega (Coosa, Elmore)
Sod & Nursery	\$7,972	\$7,572	-5.02%	All but Chilton (All)
Timber	\$17,961	\$29,842	+39.81%	All

Source: United States Department of Agriculture, National Agricultural Statistics Service. Alabama Agricultural Statistics, 2002 - Bulletin 44.

Power Generation. Water use by nuclear and fossil fuel power generation plants in Alabama accounted for 4,094 million gallons per day in 1997, or about 67 percent of the

water withdrawal in that year.¹ Of the seven counties in the Lower Coosa River Basin, water withdrawal for thermonuclear power facilities is found only in Shelby County. In 2000, this withdrawal was 763.94 million gallons per day, which equated to 82.69 percent of the total water withdrawal.²

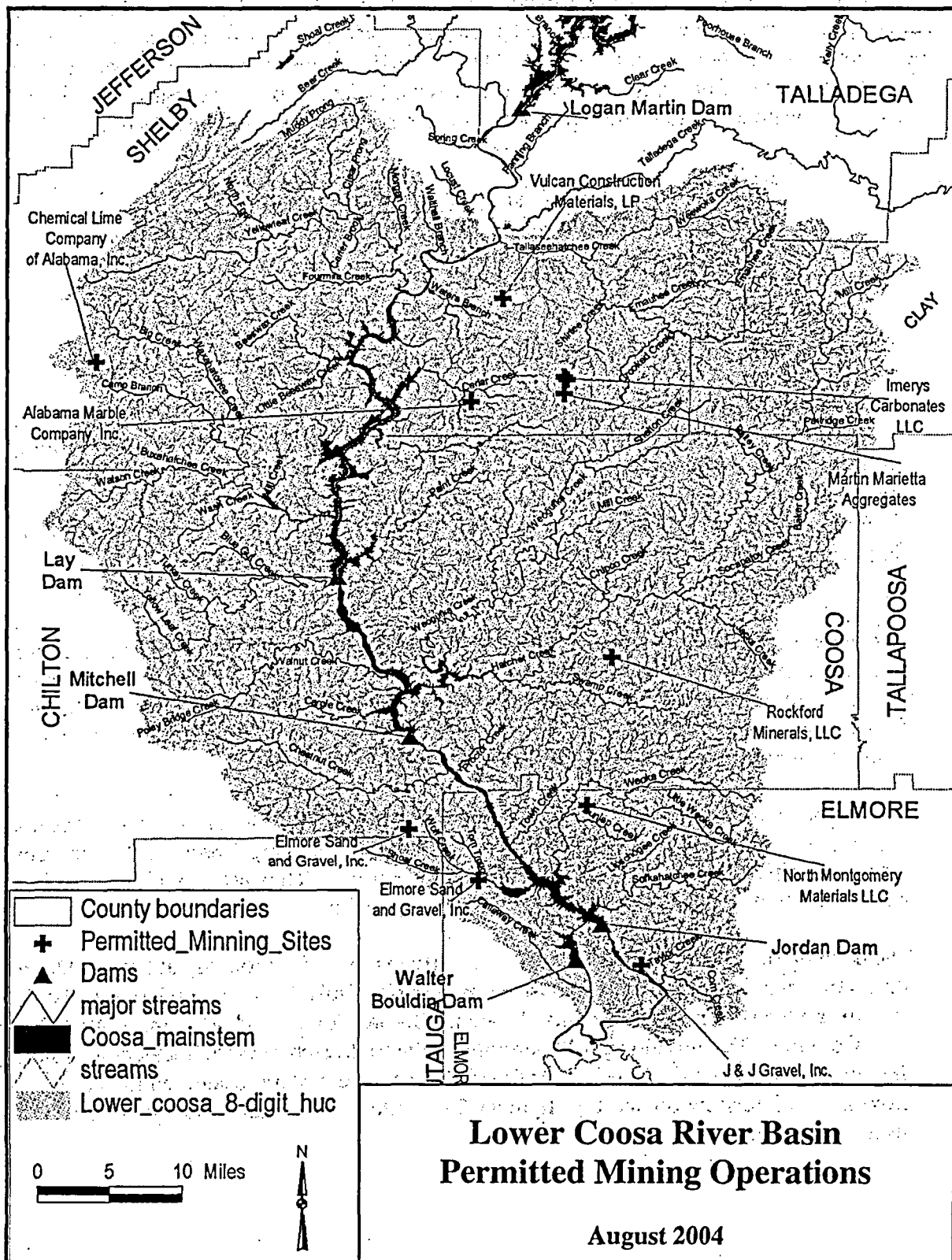
Mining. Statewide, the amount of water withdrawn for mining was insufficient to constitute a major water use. About 20 million gallons per day was withdrawn in 1997 for washing coal, sand and gravel, and for enhanced recovery of hydrocarbons. Much of this water was recycled. Also, water produced by coalbed methane production wells has increased the mining water use value in recent years.¹ There is no data available for water withdrawal for the seven counties in the Lower Coosa River Basin.² The map in Figure 89, however, shows the location of thirteen permitted mining operations within the basin boundaries. The highest concentration is found in Talladega County with six operations: two Imerys Carbonates, LLC facilities, Martin Marietta Aggregates, Vulcan Construction Materials, Alabama Marble Company and Alabama Carbonates. There are three operations in Elmore County: Elmore Sand and Gravel, Inc., North Montgomery Materials, LLC, and J&J Gravel, Inc.; two operations in Chilton County, both of which belong to Elmore Sand and Gravel, Inc.; and one operation each in Coosa and Shelby Counties. Rockford Minerals, LLC is located in Coosa County and Chemical Lime Company of Alabama, Inc. is located in Shelby County.

Non-Withdrawal Uses

Those uses that discharge water back into the river system or utilize the water in-stream are categorized as non-withdrawal uses, which include hydroelectric power generation, water treatment, sewage treatment, navigation and recreation/preservation uses. There were 337 permitted discharges into the Lower Coosa River Basin as of September 2003 according to the databases available through the Environmental Protection Agency. Of these, eight are municipal water treatment systems, 22 are municipal wastewater treatment plants, 147 are industrial permits, 13 are mining operations and 102 are stormwater runoff permits.

Hydroelectric Power Generation. At a hydroelectric facility, the force of falling water makes electricity – the greater the fall, the more energy can be produced. A dam stores large amounts of water in a reservoir or lake. The stored water is released to produce electricity, either to meet the electricity demand or to maintain a constant lake level and/or to provide flood control. Water is carried through a penstock, which is basically a big pipe. The penstock distributes water to the wicket gates. The wicket gates control water flow to a turbine. The rushing water forces the turbine to spin. The spinning turbine rotates the generator, which produces electricity. The water exits the power plant through a draft tube into the plant's tailrace, which is immediately downstream of the dam. Power lines carry the produced electricity to residential, commercial and industrial customers.⁵

Figure 89:



Power generation use of water in the Lower Coosa River Basin is primarily in-stream use to produce hydropower at Jordan, Mitchell and Lay dams. The construction, operation and capacities of these dams are described in Chapter 1 of this plan. A summary chart, Figure 90, is provided here, however, for ease of reference. All of these facilities are operated by the Alabama Power Company. All of the dams in the Lower Coosa River Basin are run-of-river facilities, utilized to generate power for peak demands, such as air conditioning on hot days.

Figure 90:

Alabama Hydroelectric Dams Capacity			
Dam	Reservoir Size	# Generators	Total Capacity
Lay Dam	12,000 acres	6	177,000 kw
Mitchell Dam	5,850 acres	4	170,000 kw
Jordan Dam	6,800	4	100,000 kw
Bouldin Dam		3	225,000 kw
Source: Alabama Power Company			

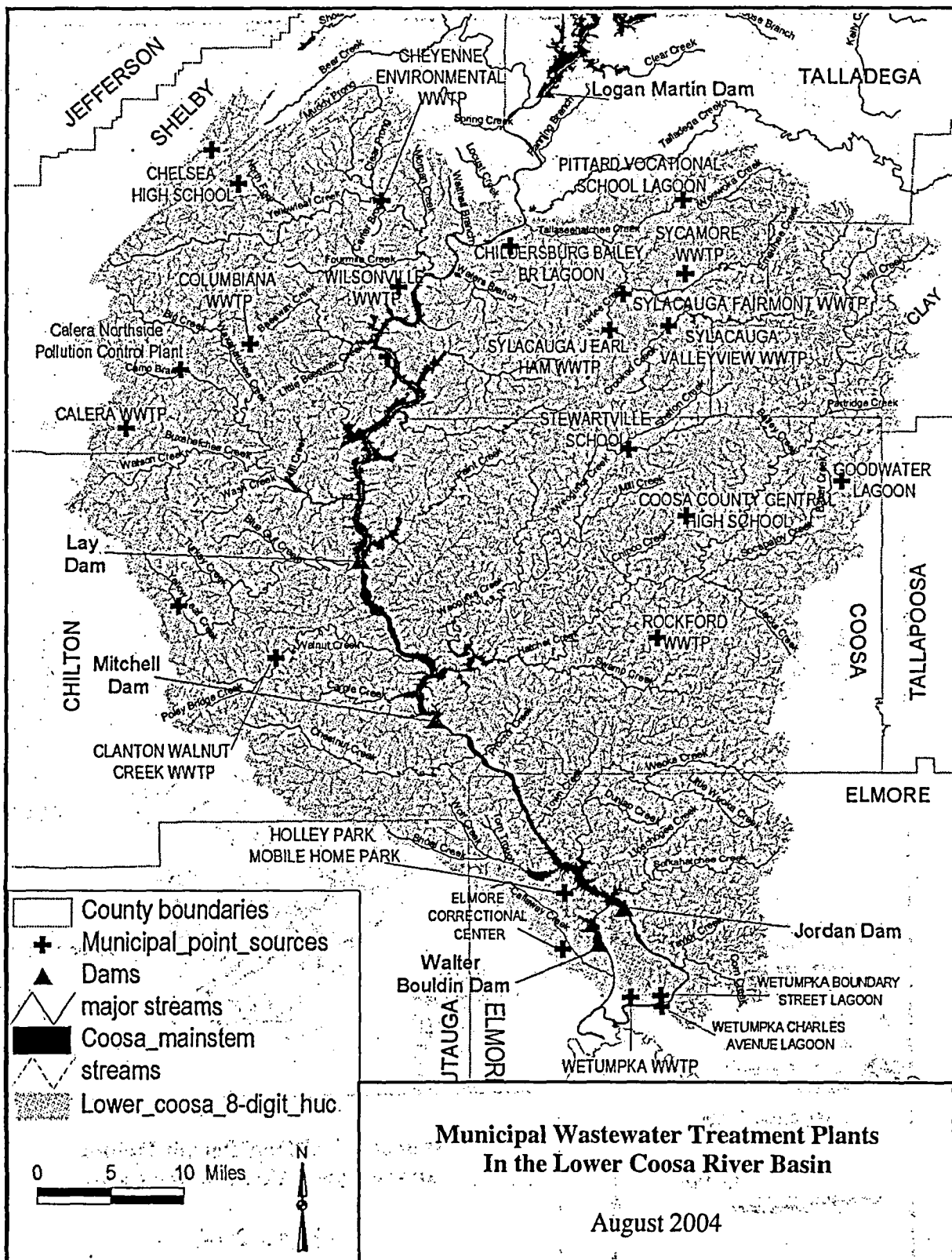
Waste Assimilation. As of September 2003, there were a total of 177 permitted discharges in the Lower Coosa River Basin for waste assimilation. Of the 30 municipalities holding permits, 22 are permitted for discharge of treated sanitary sewer effluent into the Coosa River, or as is the case more often, a tributary to the Coosa River; and eight are permitted for discharge of treated drinking water back into the river system. The remaining permitted discharges are industrial wastewater treatment plants. Each of these permitted uses is shown on the maps in Figure 91 and Figure 92.

The water in the streams or river must be substantial enough to assimilate the treated waste into the receiving water body, using the old adage that the solution to pollution is dilution. Waste water is treated to specifications as required by the National Pollutant Discharge Elimination System permit. The waste is then discharged back into a receiving body of water to mix with non-waste water to further decrease pollution levels.

The majority of the permitted water treatment plants (19 out of 30) are located in the northern part of the basin in Shelby and Talladega Counties. The municipal permitted dischargers serve municipalities, school systems, and prison facilities. They are a combination of wastewater treatment package facilities and lagoon facilities.

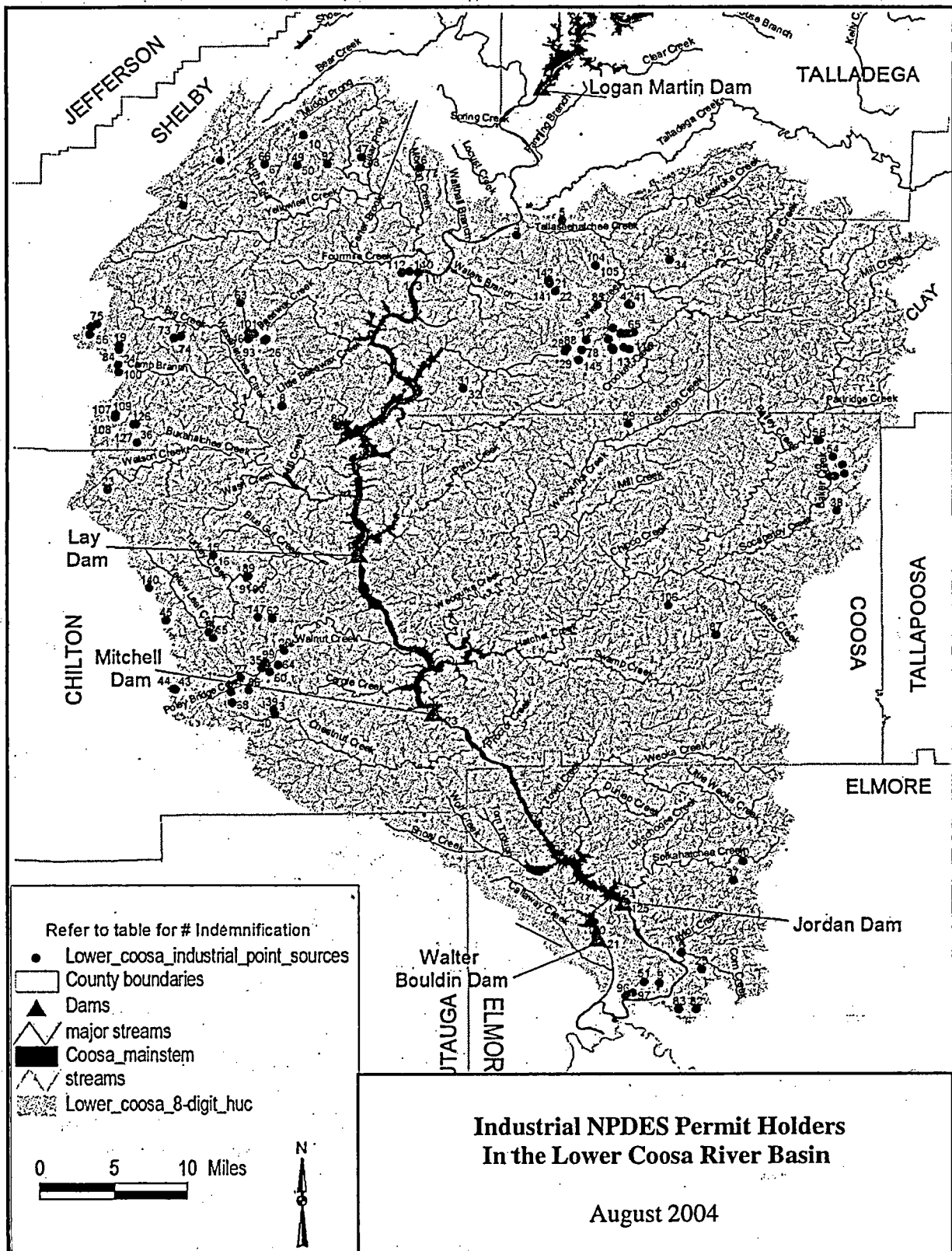
The development patterns of the basin are clearly evident when looking at Figure 92 which shows the location of permitted industrial discharges. Only 10 of the total 147 industrial permits are located in Coosa County, 12 are in Elmore County and none are in Autauga and Clay Counties. The remaining 125 permitted industrial discharges are located in Chilton, Shelby and Talladega Counties. All of these industrial users are located within close proximity to Interstate 65 and US Highway 280, following the land use patterns that were discussed in Chapter 5.

Figure 91:



Source: Alabama Department of Environmental Management, August 2004.

Figure 92:



Source: Alabama Department of Environmental Management. August 2004.

Navigation. At the present time the Coosa River, above Montgomery, is still authorized for the development of a navigable waterway from Montgomery, Alabama to Rome, Georgia. Down stream in the Alabama River, water is used for the movement of goods and eventually affects the production of seafood in the Mobile Bay area. Commercial navigation in the Lower Coosa River Basin is limited by the hydroelectric power dams. Commercial use of the existing river can be made in pool (between dams) for either the movement of goods or commercial passenger services such as sight seeing and river boat rides.

Recreation / Preservation. There are no state parks adjacent to or within the Lower Coosa River Basin area. Recreational use of water in the Lower Coosa River Basin is dominated by the activities related to Jordan, Mitchell and Lay Lakes. These uses include a variety of recreational boating, fishing including major tournaments, and water contact sports such as skiing and swimming. It is conservatively estimated that there are registered boats located within the Lower Coosa River Basin. Boat registration data by county is available through the Alabama Department of Conservation and Natural Resources, Marine Police Division. As of September 2003, there were 28,341 boats registered in the seven counties of the Lower Coosa River Basin. Estimates on the number of boats actually within the basin boundaries was done by applying the same proportion as the proportion of the county population that resides within the basin boundaries to the total number of registered boats in each county.

Figure 93:

Estimated Registered Boats in the Lower Coosa River Basin			
County	Total Boat Registrations	Percentage of County Population Within Basin	Estimated # of Boats in Basin
Autauga	2,509	8.46%	212
Chilton	3,501	48.67%	1,704
Clay	754	11.38%	86
Coosa	980	83.49%	818
Elmore	6,173	28.41%	1,754
Shelby	9,390	20.43%	1,918
Talladega	5,034	44.22%	2,226
Total	28,341	30.76%	8,718

Source: Alabama Department of Conservation and Natural Resources, Marine Police Division. As of September 2003.

Clearly, water is omni-present in everyone's life. It is the lifeblood of the Lower Coosa River Basin and Alabama. It enables human existence, provides a fundamental utility service for social institutions in all communities, provides present and future economic opportunities, and sustains the environment around individuals and communities that create the quality of life that the residents of the lower Coosa River basin live in on a daily basis.

Source Documents:

1. Geologic Survey of Alabama. *Water in Alabama (including basic water data)*. Circular 1220. David C. Kopaska-Merkel and James D. Moore. Tuscaloosa, Alabama, 2002.

2. USGS. *Estimated Use of Water in the United States, County Level Data, 2000*.
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Package for the Mitchell Development FERC No. 82.

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Nonattainment Areas

1-Hour Ozone

8-Hour Ozone

Carbon Monoxide

Nitrogen Dioxide

Sulfur Dioxide

PM-10

PM-2.5

Lead

Currently Designated Nonattainment Areas for All Criteria Pollutant

Listed by State, County then Pollutant
As of March 02, 2006

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

ALABAMA

Jackson Co
PM-2.5

* Chattanooga, AL-TN-GA - Nonattainment

Jefferson Co
8-Hr Ozone
PM-2.5

Birmingham, AL - Subpart 1
Birmingham, AL - Nonattainment

Shelby Co
8-Hr Ozone
PM-2.5

Birmingham, AL - Subpart 1
Birmingham, AL - Nonattainment

Walker Co
PM-2.5

* Birmingham, AL - Nonattainment

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

ALASKA

Anchorage Municipality
PM-10

* Eagle River, AK - Moderate

Juneau City and Borough
PM-10

* Juneau, AK - Moderate

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

ARIZONA

Cochise Co

PM-10

* Douglas (Cochise County), AZ - Moderate

PM-10

* Paul Spur, AZ - Moderate

SO2

* Douglas (Cochise County), AZ - Primary

Gila Co

PM-10

* Hayden/Miami, AZ - Moderate

SO2

* Miami (Gila County), AZ - Primary

Maricopa Co

8-Hr Ozone

* Phoenix-Mesa, AZ - Subpart 1

PM-10

* Phoenix, AZ - Serious

Pima Co

PM-10

* Ajo (Pima County), AZ - Moderate

PM-10

* Rillito, AZ - Moderate

Pinal Co

8-Hr Ozone

* Phoenix-Mesa, AZ - Subpart 1

PM-10

* Hayden/Miami, AZ - Moderate

PM-10

* Phoenix, AZ - Serious

SO2

* Hayden (Pinal County), AZ - Primary

SO2

* San Manuel (Pinal County), AZ - Primary

Santa Cruz Co

PM-10

* Nogales, AZ - Moderate

Yuma Co

PM-10

* Yuma, AZ - Moderate

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

ARKANSAS

Crittenden Co

8-Hr Ozone

Memphis, TN-AR - Marginal

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

CALIFORNIA

Alameda Co

8-Hr Ozone	San Francisco Bay Area, CA - Marginal
Amador Co	
8-Hr Ozone	Amador and Calaveras Cos (Central Mtn), CA - Subpart 1
Butte Co	
8-Hr Ozone	Chico, CA - Subpart 1
Calaveras Co	
8-Hr Ozone	Amador and Calaveras Cos (Central Mtn), CA - Subpart 1
Contra Costa Co	
8-Hr Ozone	San Francisco Bay Area, CA - Marginal
El Dorado Co	
8-Hr Ozone	* Sacramento Metro, CA - Serious
Fresno Co	
8-Hr Ozone	San Joaquin Valley, CA - Serious
PM-10	* San Joaquin Valley, CA - Serious
PM-2.5	San Joaquin Valley, CA - Nonattainment
Imperial Co	
8-Hr Ozone	Imperial Co, CA - Marginal
PM-10	* Imperial Valley, CA - Serious
Inyo Co	
PM-10	* Coso Junction, CA - Moderate
PM-10	* Owens Valley, CA - Serious
Kern Co	
8-Hr Ozone	* Kern Co (Eastern Kern), CA - Subpart 1
8-Hr Ozone	* San Joaquin Valley, CA - Serious
PM-10	* San Joaquin Valley, CA - Serious
PM-2.5	* San Joaquin Valley, CA - Nonattainment
Kings Co	
8-Hr Ozone	San Joaquin Valley, CA - Serious
PM-10	* San Joaquin Valley, CA - Serious
PM-2.5	San Joaquin Valley, CA - Nonattainment
Los Angeles Co	
Carbon Monoxide	* Los Angeles South Coast Air Basin, CA - Serious
8-Hr Ozone	* Los Angeles South Coast Air Basin, CA - Severe 17

8-Hr Ozone	* Los Angeles-San Bernardino Cos(W Mojave), CA - Moderate
PM-10	* Los Angeles South Coast Air Basin, CA - Serious
PM-2.5	* Los Angeles-South Coast Air Basin, CA - Nonattainment
Madera Co	
8-Hr Ozone	San Joaquin Valley, CA - Serious
PM-10	* San Joaquin Valley, CA - Serious
PM-2.5	San Joaquin Valley, CA - Nonattainment
Marin Co	
8-Hr Ozone	San Francisco Bay Area, CA - Marginal
Mariposa Co	
8-Hr Ozone	Mariposa and Tuolumne Cos (Southern Mtn), CA - Subpart 1
Merced Co	
8-Hr Ozone	San Joaquin Valley, CA - Serious
PM-2.5	San Joaquin Valley, CA - Nonattainment
Mono Co	
PM-10	* Mono Basin, CA - Moderate
Napa Co	
8-Hr Ozone	San Francisco Bay Area, CA - Marginal
Nevada Co	
8-Hr Ozone	* Nevada Co. (Western Part), CA - Subpart 1
Orange Co	
Carbon Monoxide	Los Angeles South Coast Air Basin, CA - Serious
8-Hr Ozone	Los Angeles South Coast Air Basin, CA - Severe 17
PM-10	Los Angeles South Coast Air Basin, CA - Serious
PM-2.5	Los Angeles-South Coast Air Basin, CA - Nonattainment
Placer Co	
8-Hr Ozone	* Sacramento Metro, CA - Serious
Riverside Co	
Carbon Monoxide	* Los Angeles South Coast Air Basin, CA - Serious
8-Hr Ozone	* Los Angeles South Coast Air Basin, CA - Severe 17
8-Hr Ozone	* Riverside Co, (Coachella Valley), CA - Serious
PM-10	* Coachella Valley, CA - Serious
PM-10	* Los Angeles South Coast Air Basin, CA - Serious
PM-2.5	* Los Angeles-South Coast Air Basin, CA - Nonattainment

Sacramento Co 8-Hr Ozone PM-10	Sacramento Metro, CA - Serious Sacramento Co, CA - Moderate
San Bernardino Co Carbon Monoxide 8-Hr Ozone 8-Hr Ozone PM-10 PM-10 PM-10 PM-2.5	* Los Angeles South Coast Air Basin, CA - Serious * Los Angeles South Coast Air Basin, CA - Severe 17 * Los Angeles-San Bernardino Cos(W Mojave), CA - Moderate * Los Angeles South Coast Air Basin, CA - Serious * San Bernardino Co, CA - Moderate * Trona, CA - Moderate * Los Angeles-South Coast Air Basin, CA - Nonattainment
San Diego Co 8-Hr Ozone	* San Diego, CA - Subpart 1
San Francisco Co 8-Hr Ozone	San Francisco Bay Area, CA - Marginal
San Joaquin Co 8-Hr Ozone PM-10 PM-2.5	San Joaquin Valley, CA - Serious * San Joaquin Valley, CA - Serious San Joaquin Valley, CA - Nonattainment
San Mateo Co 8-Hr Ozone	San Francisco Bay Area, CA - Marginal
Santa Clara Co 8-Hr Ozone	San Francisco Bay Area, CA - Marginal
Solano Co 8-Hr Ozone 8-Hr Ozone	* Sacramento Metro, CA - Serious * San Francisco Bay Area, CA - Marginal
Sonoma Co 8-Hr Ozone	* San Francisco Bay Area, CA - Marginal
Stanislaus Co 8-Hr Ozone PM-10 PM-2.5	San Joaquin Valley, CA - Serious * San Joaquin Valley, CA - Serious San Joaquin Valley, CA - Nonattainment
Sutter Co	

8-Hr Ozone	* Sacramento Metro, CA - Serious
8-Hr Ozone	* Sutter Co (Sutter Buttes), CA - Subpart 1
Tulare Co	
8-Hr Ozone	San Joaquin Valley, CA - Serious
PM-10	* San Joaquin Valley, CA - Serious
PM-2.5	San Joaquin Valley, CA - Nonattainment
Tuolumne Co	
8-Hr Ozone	Mariposa and Tuolumne Cos (Southern Mtn), CA - Subpart 1
Ventura Co	
8-Hr Ozone	* Ventura Co, CA - Moderate
Yolo Co	
8-Hr Ozone	Sacramento Metro, CA - Serious

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

COLORADO

Adams Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Arapahoe Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Boulder Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Broomfield Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Denver Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Douglas Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Jefferson Co	
8-Hr Ozone	Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC
Larimer Co	
8-Hr Ozone	* Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC

Weld Co
8-Hr Ozone

* Denver-Boulder-Greeley-Ft Collins-Love., CO - Subpart 1 EAC

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

CONNECTICUT

Fairfield Co
8-Hr Ozone
PM-2.5

New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate
New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment

Hartford Co
8-Hr Ozone

Greater Connecticut, CT - Moderate

Litchfield Co
8-Hr Ozone

Greater Connecticut, CT - Moderate

Middlesex Co
8-Hr Ozone

New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate

New Haven Co
8-Hr Ozone
PM-2.5

New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate
New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment

New London Co
8-Hr Ozone

Greater Connecticut, CT - Moderate

Tolland Co
8-Hr Ozone

Greater Connecticut, CT - Moderate

Windham Co
8-Hr Ozone

Greater Connecticut, CT - Moderate

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DELAWARE

Kent Co
8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci,PA-NJ-MD-DE - Moderate

New Castle Co
8-Hr Ozone
PM-2.5

Philadelphia-Wilmin-Atlantic Ci,PA-NJ-MD-DE - Moderate
Philadelphia-Wilmington, PA-NJ-DE - Nonattainment

Sussex Co
8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

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DISTRICT OF COLUMBIA

Entire District

8-Hr Ozone
PM-2.5

Washington, DC-MD-VA - Moderate
Washington, DC-MD-VA - Nonattainment

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GEORGIA

Barrow Co

8-Hr Ozone
PM-2.5

Atlanta, GA - Marginal
Atlanta, GA - Nonattainment

Bartow Co

8-Hr Ozone
PM-2.5

Atlanta, GA - Marginal
Atlanta, GA - Nonattainment

Bibb Co

8-Hr Ozone
PM-2.5

Macon, GA - Subpart 1
Macon, GA - Nonattainment

Carroll Co

8-Hr Ozone
PM-2.5

Atlanta, GA - Marginal
Atlanta, GA - Nonattainment

Catoosa Co

8-Hr Ozone
PM-2.5

Chattanooga, TN-GA - Subpart 1 EAC
Chattanooga, AL-TN-GA - Nonattainment

Cherokee Co

8-Hr Ozone
PM-2.5

Atlanta, GA - Marginal
Atlanta, GA - Nonattainment

Clayton Co

8-Hr Ozone
PM-2.5

Atlanta, GA - Marginal
Atlanta, GA - Nonattainment

Cobb Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Coweta Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
De Kalb Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Douglas Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Fayette Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Floyd Co	
PM-2.5	Rome, GA - Nonattainment
Forsyth Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Fulton Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Gwinnett Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Hall Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Heard Co	
PM-2.5	* Atlanta, GA - Nonattainment
Henry Co	
8-Hr Ozone	Atlanta, GA - Marginal

PM-2.5	Atlanta, GA - Nonattainment
Monroe Co	
8-Hr Ozone	* Macon, GA - Subpart 1
PM-2.5	* Macon, GA - Nonattainment
Murray Co	
8-Hr Ozone	* Murray Co (Chattahoochee Nat Forest), GA - Subpart 1
Newton Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Paulding Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Putnam Co	
PM-2.5	* Atlanta, GA - Nonattainment
Rockdale Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Spalding Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment
Walker Co	
PM-2.5	Chattanooga, AL-TN-GA - Nonattainment
Walton Co	
8-Hr Ozone	Atlanta, GA - Marginal
PM-2.5	Atlanta, GA - Nonattainment

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

GUAM

Piti	
SO2	* Piti, GU - Primary
Tanguisson	
SO2	* Tanguisson, GU - Primary

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IDAHO

Bannock Co

PM-10

* Fort Hall Reservation, ID - Moderate

PM-10

* Portneuf Valley, ID - Moderate

Bonner Co

PM-10

* Bonner Co (Sandpoint), ID - Moderate

Power Co

PM-10

* Fort Hall Reservation, ID - Moderate

PM-10

* Portneuf Valley, ID - Moderate

Shoshone Co

PM-10

* Pinehurst, ID - Moderate

PM-10

* Shoshone Co, ID - Moderate

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ILLINOIS

Cook Co

8-Hr Ozone

Chicago-Gary-Lake County, IL-IN - Moderate

PM-2.5

Chicago-Gary-Lake County, IL-IN - Nonattainment

Du Page Co

8-Hr Ozone

Chicago-Gary-Lake County, IL-IN - Moderate

PM-2.5

Chicago-Gary-Lake County, IL-IN - Nonattainment

Grundy Co

8-Hr Ozone

* Chicago-Gary-Lake County, IL-IN - Moderate

PM-2.5

* Chicago-Gary-Lake County, IL-IN - Nonattainment

Jersey Co

8-Hr Ozone

St Louis, MO-IL - Moderate

Kane Co

8-Hr Ozone

Chicago-Gary-Lake County, IL-IN - Moderate

PM-2.5

Chicago-Gary-Lake County, IL-IN - Nonattainment

Kendall Co

8-Hr Ozone	* Chicago-Gary-Lake County, IL-IN - Moderate
PM-2.5	* Chicago-Gary-Lake County, IL-IN - Nonattainment
Lake Co	
8-Hr Ozone	Chicago-Gary-Lake County, IL-IN - Moderate
PM-2.5	Chicago-Gary-Lake County, IL-IN - Nonattainment
Madison Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
Mc Henry Co	
8-Hr Ozone	Chicago-Gary-Lake County, IL-IN - Moderate
PM-2.5	Chicago-Gary-Lake County, IL-IN - Nonattainment
Monroe Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
Randolph Co	
PM-2.5	* St. Louis, MO-IL - Nonattainment
St Clair Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
Will Co	
8-Hr Ozone	Chicago-Gary-Lake County, IL-IN - Moderate
PM-2.5	Chicago-Gary-Lake County, IL-IN - Nonattainment

State, County, Pollutant, * Part County NAA, NAA Area Name, Classification Standard

INDIANA

Allen Co	
8-Hr Ozone	Fort Wayne, IN - Subpart 1
Boone Co	
8-Hr Ozone	Indianapolis, IN - Subpart 1
Clark Co	
8-Hr Ozone	Louisville, KY-IN - Subpart 1
PM-2.5	Louisville, KY-IN - Nonattainment

Dearborn Co 8-Hr Ozone PM-2.5	* Cincinnati-Hamilton, OH-KY-IN - Subpart 1 * Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Dubois Co PM-2.5	Evansville, IN - Nonattainment
Elkhart Co 8-Hr Ozone	South Bend-Elkhart, IN - Subpart 1
Floyd Co 8-Hr Ozone PM-2.5	Louisville, KY-IN - Subpart 1 Louisville, KY-IN - Nonattainment
Gibson Co PM-2.5	* Evansville, IN - Nonattainment
Hamilton Co 8-Hr Ozone PM-2.5	Indianapolis, IN - Subpart 1 Indianapolis, IN - Nonattainment
Hancock Co 8-Hr Ozone	Indianapolis, IN - Subpart 1
Hendricks Co 8-Hr Ozone PM-2.5	Indianapolis, IN - Subpart 1 Indianapolis, IN - Nonattainment
Jefferson Co PM-2.5	* Louisville, KY-IN - Nonattainment
Johnson Co 8-Hr Ozone PM-2.5	Indianapolis, IN - Subpart 1 Indianapolis, IN - Nonattainment
La Porte Co 8-Hr Ozone	La Porte, IN - Marginal
Lake Co 8-Hr Ozone PM-2.5	Chicago-Gary-Lake County, IL-IN - Moderate Chicago-Gary-Lake County, IL-IN - Nonattainment
Madison Co 8-Hr Ozone	Indianapolis, IN - Subpart 1

Marion Co	Indianapolis, IN - Subpart 1
8-Hr Ozone	Indianapolis, IN - Nonattainment
PM-2.5	
Morgan Co	Indianapolis, IN - Subpart 1
8-Hr Ozone	Indianapolis, IN - Nonattainment
PM-2.5	
Pike Co	
PM-2.5	* Evansville, IN - Nonattainment
Porter Co	
8-Hr Ozone	Chicago-Gary-Lake County, IL-IN - Moderate
PM-2.5	Chicago-Gary-Lake County, IL-IN - Nonattainment
Shelby Co	
8-Hr Ozone	Indianapolis, IN - Subpart 1
Spencer Co	
PM-2.5	* Evansville, IN - Nonattainment
St Joseph Co	
8-Hr Ozone	South Bend-Elkhart, IN - Subpart 1
Vanderburgh Co	
PM-2.5	Evansville, IN - Nonattainment
Warrick Co	
PM-2.5	Evansville, IN - Nonattainment

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KENTUCKY

Boone Co	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
PM-2.5	
Boyd Co	
8-Hr Ozone	Huntington-Ashland, WV-KY - Subpart 1
PM-2.5	Huntington-Ashland, WV-KY-OH - Nonattainment
SO2	* Boyd County (part), KY - Primary

Bullitt Co	
8-Hr Ozone	Louisville, KY-IN - Subpart 1
PM-2.5	Louisville, KY-IN - Nonattainment
Campbell Co	
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
PM-2.5	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Jefferson Co	
8-Hr Ozone	Louisville, KY-IN - Subpart 1
PM-2.5	Louisville, KY-IN - Nonattainment
Kenton Co	
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
PM-2.5	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Lawrence Co	
PM-2.5	* Huntington-Ashland, WV-KY-OH - Nonattainment
Oldham Co	
8-Hr Ozone	Louisville, KY-IN - Subpart 1

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LOUISIANA

Ascension Par	
8-Hr Ozone	Baton Rouge, LA - Marginal
East Baton Rouge Par	
8-Hr Ozone	Baton Rouge, LA - Marginal
Iberville Par	
8-Hr Ozone	Baton Rouge, LA - Marginal
Livingston Par	
8-Hr Ozone	Baton Rouge, LA - Marginal
West Baton Rouge Par	
8-Hr Ozone	Baton Rouge, LA - Marginal

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MAINE

Androscoggin Co 8-Hr Ozone	* Portland, ME - Marginal
Cumberland Co 8-Hr Ozone	* Portland, ME - Marginal
Hancock Co 8-Hr Ozone	* Hancock, Knox, Lincoln & Waldo Cos, ME - Subpart 1
Knox Co 8-Hr Ozone	* Hancock, Knox, Lincoln & Waldo Cos, ME - Subpart 1
Lincoln Co 8-Hr Ozone	* Hancock, Knox, Lincoln & Waldo Cos, ME - Subpart 1
Sagadahoc Co 8-Hr Ozone	Portland, ME - Marginal
Waldo Co 8-Hr Ozone	* Hancock, Knox, Lincoln & Waldo Cos, ME - Subpart 1
York Co 8-Hr Ozone	* Portland, ME - Marginal

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MARYLAND

Anne Arundel Co 8-Hr Ozone PM-2.5	Baltimore, MD - Moderate Baltimore, MD - Nonattainment
Baltimore (City) 8-Hr Ozone PM-2.5	Baltimore, MD - Moderate Baltimore, MD - Nonattainment
Baltimore Co 8-Hr Ozone PM-2.5	Baltimore, MD - Moderate Baltimore, MD - Nonattainment
Calvert Co 8-Hr Ozone	Washington, DC-MD-VA - Moderate

Carroll Co	Baltimore, MD - Moderate
8-Hr Ozone	Baltimore, MD - Nonattainment
PM-2.5	
Cecil Co	
8-Hr Ozone	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate
Charles Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Frederick Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Harford Co	
8-Hr Ozone	Baltimore, MD - Moderate
PM-2.5	Baltimore, MD - Nonattainment
Howard Co	
8-Hr Ozone	Baltimore, MD - Moderate
PM-2.5	Baltimore, MD - Nonattainment
Kent Co	
8-Hr Ozone	Kent and Queen Anne's Cos, MD - Marginal
Montgomery Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Prince George's Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Queen Annes Co	
8-Hr Ozone	Kent and Queen Anne's Cos, MD - Marginal
Washington Co	
8-Hr Ozone	Washington Co (Hagerstown), MD - Subpart 1 EAC
PM-2.5	Martinsburg, WV-Hagerstown, MD - Nonattainment

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MASSACHUSETTS

Barnstable Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Berkshire Co 8-Hr Ozone	Springfield (Western MA), MA - Moderate
Bristol Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Dukes Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Essex Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Franklin Co 8-Hr Ozone	Springfield (Western MA), MA - Moderate
Hampden Co 8-Hr Ozone	Springfield (Western MA), MA - Moderate
Hampshire Co 8-Hr Ozone	Springfield (Western MA), MA - Moderate
Middlesex Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Nantucket Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Norfolk Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Plymouth Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Suffolk Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate
Worcester Co 8-Hr Ozone	Boston-Lawrence-Worcester (E. MA), MA - Moderate

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MICHIGAN

Allegan Co 8-Hr Ozone	Allegan Co, MI - Subpart 1
Benzie Co 8-Hr Ozone	Benzie Co, MI - Subpart 1
Berrien Co 8-Hr Ozone	Benton Harbor, MI - Subpart 1
Calhoun Co 8-Hr Ozone	Kalamazoo-Battle Creek, MI - Subpart 1
Cass Co 8-Hr Ozone	Cass Co, MI - Marginal
Clinton Co 8-Hr Ozone	Lansing-East Lansing, MI - Subpart 1
Eaton Co 8-Hr Ozone	Lansing-East Lansing, MI - Subpart 1
Genesee Co 8-Hr Ozone	Flint, MI - Subpart 1
Huron Co 8-Hr Ozone	Huron Co, MI - Subpart 1
Ingham Co 8-Hr Ozone	Lansing-East Lansing, MI - Subpart 1
Kalamazoo Co 8-Hr Ozone	Kalamazoo-Battle Creek, MI - Subpart 1
Kent Co 8-Hr Ozone	Grand Rapids, MI - Subpart 1
Lapeer Co 8-Hr Ozone	Flint, MI - Subpart 1
Lenawee Co 8-Hr Ozone	Detroit-Ann Arbor, MI - Marginal

Livingston Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Macomb Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Mason Co 8-Hr Ozone	Mason Co, MI - Subpart 1
Monroe Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Muskegon Co 8-Hr Ozone	Muskegon, MI - Marginal
Oakland Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Ottawa Co 8-Hr Ozone	Grand Rapids, MI - Subpart 1
St Clair Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Van Buren Co 8-Hr Ozone	Kalamazoo-Battle Creek, MI - Subpart 1
Washtenaw Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment
Wayne Co 8-Hr Ozone PM-2.5	Detroit-Ann Arbor, MI - Marginal Detroit-Ann Arbor, MI - Nonattainment

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MISSOURI

Franklin Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
Jefferson Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
Lead	* Jefferson County (part); Herculaneum, MO -
PM-2.5	St. Louis, MO-IL - Nonattainment
St Charles Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
St Louis	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment
St Louis Co	
8-Hr Ozone	St Louis, MO-IL - Moderate
PM-2.5	St. Louis, MO-IL - Nonattainment

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MONTANA

Flathead Co	
PM-10	* Columbia Falls, MT - Moderate
PM-10	* Flathead County; Whitefish and vicinity, MT - Moderate
PM-10	* Kalispell, MT - Moderate
Lake Co	
PM-10	* Polson, MT - Moderate
PM-10	* Ronan, MT - Moderate
Lewis And Clark Co	
Lead	* East Helena Area (Lewis and Clark Co.), MT -
SO2	* East Helena Area (Lewis and Clark Co.), MT - Primary, Secor
Lincoln Co	
PM-10	* Libby, MT - Moderate
PM-2.5	* Libby, MT - Nonattainment
Missoula Co	

Carbon Monoxide	* Missoula, MT - Moderate <= 12.7ppm
PM-10	* Missoula, MT - Moderate
Rosebud Co	
PM-10	* Lame Deer, MT - Moderate
Sanders Co	
PM-10	* Sanders County (part);Thompson Falls and vicinity,MT - Mode
Silver Bow Co	
PM-10	* Butte, MT - Moderate
Yellowstone Co	
SO2	* Laurel Area (Yellowstone County), MT - Primary

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NEVADA

Clark Co	
Carbon Monoxide	* Las Vegas, NV - Serious
8-Hr Ozone	* Las Vegas, NV - Subpart 1
PM-10	* Clark Co, NV - Serious
Washoe Co	
Carbon Monoxide	* Reno, NV - Moderate <= 12.7ppm
PM-10	* Washoe Co, NV - Serious

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NEW HAMPSHIRE

Hillsborough Co	
8-Hr Ozone	* Boston-Manchester-Portsmouth(SE),NH - Moderate
Merrimack Co	
8-Hr Ozone	* Boston-Manchester-Portsmouth(SE),NH - Moderate
Rockingham Co	
8-Hr Ozone	* Boston-Manchester-Portsmouth(SE),NH - Moderate
Strafford Co	
8-Hr Ozone	* Boston-Manchester-Portsmouth(SE),NH - Moderate

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NEW JERSEY

Atlantic Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

Bergen Co

8-Hr Ozone

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Burlington Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

PM-2.5

Philadelphia-Wilmington, PA-NJ-DE - Nonattainment

Camden Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

PM-2.5

Philadelphia-Wilmington, PA-NJ-DE - Nonattainment

Cape May Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

Cumberland Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

Essex Co

8-Hr Ozone

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Gloucester Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

PM-2.5

Philadelphia-Wilmington, PA-NJ-DE - Nonattainment

Hudson Co

8-Hr Ozone

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Hunterdon Co

8-Hr Ozone

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

Mercer Co

8-Hr Ozone

Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Middlesex Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Monmouth Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Morris Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Ocean Co	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate
8-Hr Ozone	
Passaic Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Salem Co	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate
8-Hr Ozone	
Somerset Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Sussex Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	
Union Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
PM-2.5	
Warren Co	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate
8-Hr Ozone	* Warren Co, NJ - Primary, Secondary
SO2	

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NEW MEXICO

Dona Ana Co
PM-10

* Anthony, NM - Moderate

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NEW YORK

Albany Co

8-Hr Ozone

Albany-Schenectady-Troy, NY - Subpart 1

Bronx Co

8-Hr Ozone

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Chautauqua Co

8-Hr Ozone

Jamestown, NY - Subpart 1

Dutchess Co

8-Hr Ozone

Poughkeepsie, NY - Moderate

Erie Co

8-Hr Ozone

Buffalo-Niagara Falls, NY - Subpart 1

Essex Co

8-Hr Ozone

* Essex Co (Whiteface Mtn), NY - Subpart 1

Genesee Co

8-Hr Ozone

Rochester, NY - Subpart 1

Greene Co

8-Hr Ozone

Albany-Schenectady-Troy, NY - Subpart 1

Jefferson Co

8-Hr Ozone

Jefferson Co, NY - Moderate

Kings Co

8-Hr Ozone

PM-2.5

New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate

New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

Livingston Co

8-Hr Ozone

Rochester, NY - Subpart 1

Monroe Co

8-Hr Ozone

Rochester, NY - Subpart 1

Montgomery Co

8-Hr Ozone

Albany-Schenectady-Troy, NY - Subpart 1

Nassau Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
New York Co 8-Hr Ozone PM-10 PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate New York Co, NY - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
Niagara Co 8-Hr Ozone	Buffalo-Niagara Falls, NY - Subpart 1
Ontario Co 8-Hr Ozone	Rochester, NY - Subpart 1
Orange Co 8-Hr Ozone PM-2.5	Poughkeepsie, NY - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
Orleans Co 8-Hr Ozone	Rochester, NY - Subpart 1
Putnam Co 8-Hr Ozone	Poughkeepsie, NY - Moderate
Queens Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
Rensselaer Co 8-Hr Ozone	Albany-Schenectady-Troy, NY - Subpart 1
Richmond Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
Rockland Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT - Moderate New York-N. New Jersey-Long Island,NY-NJ-CT - Nonattainment
Saratoga Co 8-Hr Ozone	Albany-Schenectady-Troy, NY - Subpart 1

Schenectady Co 8-Hr Ozone	Albany-Schenectady-Troy, NY - Subpart 1
Schoharie Co 8-Hr Ozone	Albany-Schenectady-Troy, NY - Subpart 1
Suffolk Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment
Wayne Co 8-Hr Ozone	Rochester, NY - Subpart 1
Westchester Co 8-Hr Ozone PM-2.5	New York-N. New Jersey-Long Island, NY-NJ-CT - Moderate New York-N. New Jersey-Long Island, NY-NJ-CT - Nonattainment

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NORTH CAROLINA

Alamance Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Alexander Co 8-Hr Ozone	Hickory-Morganton-Lenoir, NC - Subpart 1 EAC
Burke Co 8-Hr Ozone	* Hickory-Morganton-Lenoir, NC - Subpart 1 EAC
Cabarrus Co 8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Caldwell Co 8-Hr Ozone	* Hickory-Morganton-Lenoir, NC - Subpart 1 EAC
Caswell Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Catawba Co 8-Hr Ozone PM-2.5	Hickory-Morganton-Lenoir, NC - Subpart 1 EAC Hickory, NC - Nonattainment
Chatham Co	

8-Hr Ozone	* Raleigh-Durham-Chapel Hill, NC - Subpart 1
Cumberland Co 8-Hr Ozone	Fayetteville, NC - Subpart 1 EAC
Davidson Co 8-Hr Ozone PM-2.5	Greensboro-Winston Salem-High Point, NC - Marginal EAC Greensboro-Winston Salem-High Point, NC - Nonattainment
Davie Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Durham Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Edgecombe Co 8-Hr Ozone	Rocky Mount, NC - Subpart 1
Forsyth Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Franklin Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Gaston Co 8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Granville Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Guilford Co 8-Hr Ozone PM-2.5	Greensboro-Winston Salem-High Point, NC - Marginal EAC Greensboro-Winston Salem-High Point, NC - Nonattainment
Haywood Co 8-Hr Ozone	* Haywood and Swain Cos (Great Smoky NP), NC - Subpart 1
Iredell Co 8-Hr Ozone	* Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Johnston Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Lincoln Co	

8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Mecklenburg Co 8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Nash Co 8-Hr Ozone	Rocky Mount, NC - Subpart 1
Orange Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Person Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1
Randolph Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Rockingham Co 8-Hr Ozone	Greensboro-Winston Salem-High Point, NC - Marginal EAC
Rowan Co 8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Swain Co 8-Hr Ozone	* Haywood and Swain Cos (Great Smoky NP), NC - Subpart 1
Union Co 8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC - Moderate
Wake Co 8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC - Subpart 1

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OHIO

Adams Co PM-2.5	* Huntington-Ashland, WV-KY-OH - Nonattainment
Allen Co 8-Hr Ozone	Lima, OH - Subpart 1
Ashtabula Co 8-Hr Ozone	Cleveland-Akron-Lorain, OH - Moderate

PM-2.5	* Cleveland-Akron-Lorain, OH - Nonattainment
Belmont Co	
8-Hr Ozone	Wheeling, WV-OH - Subpart 1
PM-2.5	Wheeling, WV-OH - Nonattainment
Butler Co	
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
PM-2.5	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Clark Co	
8-Hr Ozone	Dayton-Springfield, OH - Subpart 1
PM-2.5	Dayton-Springfield, OH - Nonattainment
Clermont Co	
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
PM-2.5	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Clinton Co	
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
Columbiana Co	
8-Hr Ozone	Youngstown-Warren-Sharon, OH-PA - Subpart 1
Coshocton Co	
PM-2.5	* Columbus, OH - Nonattainment
Cuyahoga Co	
8-Hr Ozone	Cleveland-Akron-Lorain, OH - Moderate
PM-2.5	Cleveland-Akron-Lorain, OH - Nonattainment
Delaware Co	
8-Hr Ozone	Columbus, OH - Subpart 1
PM-2.5	Columbus, OH - Nonattainment
Fairfield Co	
8-Hr Ozone	Columbus, OH - Subpart 1
PM-2.5	Columbus, OH - Nonattainment
Franklin Co	
8-Hr Ozone	Columbus, OH - Subpart 1
PM-2.5	Columbus, OH - Nonattainment
Gallia Co	

PM-2.5	* Huntington-Ashland, WV-KY-OH - Nonattainment
Geauga Co 8-Hr Ozone	Cleveland-Akron-Lorain, OH - Moderate
Greene Co 8-Hr Ozone PM-2.5	Dayton-Springfield, OH - Subpart 1 Dayton-Springfield, OH - Nonattainment
Hamilton Co 8-Hr Ozone PM-2.5	Cincinnati-Hamilton, OH-KY-IN - Subpart 1 Cincinnati-Hamilton, OH-KY-IN - Nonattainment
Jefferson Co 8-Hr Ozone PM-2.5	Steubenville-Weirton, OH-WV - Subpart 1 Steubenville-Weirton, OH-WV - Nonattainment
Knox Co 8-Hr Ozone	Columbus, OH - Subpart 1
Lake Co 8-Hr Ozone PM-2.5	Cleveland-Akron-Lorain, OH - Moderate Cleveland-Akron-Lorain, OH - Nonattainment
Lawrence Co PM-2.5	Huntington-Ashland, WV-KY-OH - Nonattainment
Licking Co 8-Hr Ozone PM-2.5	Columbus, OH - Subpart 1 Columbus, OH - Nonattainment
Lorain Co 8-Hr Ozone PM-2.5	Cleveland-Akron-Lorain, OH - Moderate Cleveland-Akron-Lorain, OH - Nonattainment
Lucas Co 8-Hr Ozone	Toledo, OH - Subpart 1
Madison Co 8-Hr Ozone	Columbus, OH - Subpart 1
Mahoning Co 8-Hr Ozone	Youngstown-Warren-Sharon, OH-PA - Subpart 1

Medina Co	Cleveland-Akron-Lorain, OH - Moderate
8-Hr Ozone	Cleveland-Akron-Lorain, OH - Nonattainment
PM-2.5	
Miami Co	Dayton-Springfield, OH - Subpart 1
8-Hr Ozone	
Montgomery Co	Dayton-Springfield, OH - Subpart 1
8-Hr Ozone	Dayton-Springfield, OH - Nonattainment
PM-2.5	
Portage Co	Cleveland-Akron-Lorain, OH - Moderate
8-Hr Ozone	Cleveland-Akron-Lorain, OH - Nonattainment
PM-2.5	
Scioto Co	Huntington-Ashland, WV-KY-OH - Nonattainment
PM-2.5	
Stark Co	Canton-Massillon, OH - Subpart 1
8-Hr Ozone	Canton-Massillon, OH - Nonattainment
PM-2.5	
Summit Co	Cleveland-Akron-Lorain, OH - Moderate
8-Hr Ozone	Cleveland-Akron-Lorain, OH - Nonattainment
PM-2.5	
Trumbull Co	Youngstown-Warren-Sharon, OH-PA - Subpart 1
8-Hr Ozone	
Warren Co	Cincinnati-Hamilton, OH-KY-IN - Subpart 1
8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN - Nonattainment
PM-2.5	
Washington Co	Parkersburg-Marietta, WV-OH - Subpart 1
8-Hr Ozone	Parkersburg-Marietta, WV-OH - Nonattainment
PM-2.5	
Wood Co	Toledo, OH - Subpart 1
8-Hr Ozone	

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OREGON

Jackson Co PM-10	* Medford-Ashland, OR - Moderate
Lake Co PM-10	* Lake Co, OR - Moderate
Lane Co PM-10 PM-10	* Eugene-Springfield, OR - Moderate * Lane Co, OR - Moderate
Marion Co Carbon Monoxide	* Salem, OR - Not Classified
Polk Co Carbon Monoxide	* Salem, OR - Not Classified
Union Co PM-10	* LaGrande, OR - Moderate

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PENNSYLVANIA

Adams Co 8-Hr Ozone	York, PA - Subpart 1
Allegheny Co 8-Hr Ozone PM-2.5 PM-2.5	Pittsburgh-Beaver Valley, PA - Subpart 1 * Liberty-Clairton, PA - Nonattainment * Pittsburgh-Beaver Valley, PA - Nonattainment
Armstrong Co 8-Hr Ozone PM-2.5 SO2	Pittsburgh-Beaver Valley, PA - Subpart 1 * Pittsburgh-Beaver Valley, PA - Nonattainment * Armstrong Co, PA - Primary
Beaver Co 8-Hr Ozone PM-2.5	Pittsburgh-Beaver Valley, PA - Subpart 1 Pittsburgh-Beaver Valley, PA - Nonattainment
Berks Co 8-Hr Ozone PM-2.5	Reading, PA - Subpart 1 Reading, PA - Nonattainment

Blair Co 8-Hr Ozone	Altoona, PA - Subpart 1
Bucks Co 8-Hr Ozone PM-2.5	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate Philadelphia-Wilmington, PA-NJ-DE - Nonattainment
Butler Co 8-Hr Ozone PM-2.5	Pittsburgh-Beaver Valley, PA - Subpart 1 Pittsburgh-Beaver Valley, PA - Nonattainment
Cambria Co 8-Hr Ozone PM-2.5	Johnstown, PA - Subpart 1 Johnstown, PA - Nonattainment
Carbon Co 8-Hr Ozone	Allentown-Bethlehem-Easton, PA - Subpart 1
Centre Co 8-Hr Ozone	State College, PA - Subpart 1
Chester Co 8-Hr Ozone PM-2.5	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate Philadelphia-Wilmington, PA-NJ-DE - Nonattainment
Clearfield Co 8-Hr Ozone	Clearfield and Indiana Cos, PA - Subpart 1
Cumberland Co 8-Hr Ozone PM-2.5	Harrisburg-Lebanon-Carlisle, PA - Subpart 1 Harrisburg-Lebanon-Carlisle, PA - Nonattainment
Dauphin Co 8-Hr Ozone PM-2.5	Harrisburg-Lebanon-Carlisle, PA - Subpart 1 Harrisburg-Lebanon-Carlisle, PA - Nonattainment
Delaware Co 8-Hr Ozone PM-2.5	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate Philadelphia-Wilmington, PA-NJ-DE - Nonattainment
Erie Co 8-Hr Ozone	Erie, PA - Subpart 1
Fayette Co	

8-Hr Ozone	Pittsburgh-Beaver Valley, PA - Subpart 1
Franklin Co	
8-Hr Ozone	Franklin Co, PA - Subpart 1
Greene Co	
8-Hr Ozone	Greene Co, PA - Subpart 1
PM-2.5	* Pittsburgh-Beaver Valley, PA - Nonattainment
Indiana Co	
8-Hr Ozone	Clearfield and Indiana Cos, PA - Subpart 1
PM-2.5	* Johnstown, PA - Nonattainment
Lackawanna Co	
8-Hr Ozone	Scranton-Wilkes-Barre, PA - Subpart 1
Lancaster Co	
8-Hr Ozone	Lancaster, PA - Marginal
PM-2.5	Lancaster, PA - Nonattainment
Lawrence Co	
PM-2.5	* Pittsburgh-Beaver Valley, PA - Nonattainment
Lebanon Co	
8-Hr Ozone	Harrisburg-Lebanon-Carlisle, PA - Subpart 1
PM-2.5	Harrisburg-Lebanon-Carlisle, PA - Nonattainment
Lehigh Co	
8-Hr Ozone	Allentown-Bethlehem-Easton, PA - Subpart 1
Luzerne Co	
8-Hr Ozone	Scranton-Wilkes-Barre, PA - Subpart 1
Mercer Co	
8-Hr Ozone	Youngstown-Warren-Sharon, OH-PA - Subpart 1
Monroe Co	
8-Hr Ozone	Scranton-Wilkes-Barre, PA - Subpart 1
Montgomery Co	
8-Hr Ozone	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate
PM-2.5	Philadelphia-Wilmington, PA-NJ-DE - Nonattainment
Northampton Co	

8-Hr Ozone	Allentown-Bethlehem-Easton, PA - Subpart 1
Perry Co	
8-Hr Ozone	Harrisburg-Lebanon-Carlisle, PA - Subpart 1
Philadelphia Co	
8-Hr Ozone	Philadelphia-Wilmin-Atlantic Ci, PA-NJ-MD-DE - Moderate
PM-2.5	Philadelphia-Wilmington, PA-NJ-DE - Nonattainment
Tioga Co	
8-Hr Ozone	Tioga Co, PA - Subpart 1
Washington Co	
8-Hr Ozone	Pittsburgh-Beaver Valley, PA - Subpart 1
PM-2.5	Pittsburgh-Beaver Valley, PA - Nonattainment
Westmoreland Co	
8-Hr Ozone	Pittsburgh-Beaver Valley, PA - Subpart 1
PM-2.5	Pittsburgh-Beaver Valley, PA - Nonattainment
Wyoming Co	
8-Hr Ozone	Scranton-Wilkes-Barre, PA - Subpart 1
York Co	
8-Hr Ozone	York, PA - Subpart 1
PM-2.5	York, PA - Nonattainment

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PUERTO RICO

Guaynabo Co
PM-10

* Mun. of Guaynabo, PR - Moderate

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RHODE ISLAND

Bristol Co
8-Hr Ozone

Providence (All RI), RI - Moderate

Kent Co
8-Hr Ozone

Providence (All RI), RI - Moderate

Newport Co 8-Hr Ozone	Providence (All RI), RI - Moderate
Providence Co 8-Hr Ozone	Providence (All RI), RI - Moderate
Washington Co 8-Hr Ozone	Providence (All RI), RI - Moderate

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SOUTH CAROLINA

Anderson Co 8-Hr Ozone	Greenville-Spartanburg-Anderson, SC - Subpart 1 EAC
Greenville Co 8-Hr Ozone	Greenville-Spartanburg-Anderson, SC - Subpart 1 EAC
Lexington Co 8-Hr Ozone	* Columbia, SC - Subpart 1 EAC
Richland Co 8-Hr Ozone	* Columbia, SC - Subpart 1 EAC
Spartanburg Co 8-Hr Ozone	Greenville-Spartanburg-Anderson, SC - Subpart 1 EAC
York Co 8-Hr Ozone	* Charlotte-Gastonia-Rock Hill, NC-SC - Moderate

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TENNESSEE

Anderson Co 8-Hr Ozone PM-2.5	Knoxville, TN - Subpart 1 Knoxville, TN - Nonattainment
Blount Co 8-Hr Ozone PM-2.5	Knoxville, TN - Subpart 1 Knoxville, TN - Nonattainment
Cocke Co	

8-Hr Ozone	* Knoxville, TN - Subpart 1
Davidson Co	
8-Hr Ozone	Nashville, TN - Subpart 1 EAC
Hamilton Co	
8-Hr Ozone	Chattanooga, TN-GA - Subpart 1 EAC
PM-2.5	Chattanooga, AL-TN-GA - Nonattainment
Hawkins Co	
8-Hr Ozone	Johnson City-Kingsport-Bristol, TN - Subpart 1 EAC
Jefferson Co	
8-Hr Ozone	Knoxville, TN - Subpart 1
Knox Co	
8-Hr Ozone	Knoxville, TN - Subpart 1
PM-2.5	Knoxville, TN - Nonattainment
Loudon Co	
8-Hr Ozone	Knoxville, TN - Subpart 1
PM-2.5	Knoxville, TN - Nonattainment
Meigs Co	
8-Hr Ozone	Chattanooga, TN-GA - Subpart 1 EAC
Montgomery Co	
8-Hr Ozone	Clarksville-Hopkinsville, TN-KY (TN portion) - Subpart 1
Roane Co	
PM-2.5	* Knoxville, TN - Nonattainment
Rutherford Co	
8-Hr Ozone	Nashville, TN - Subpart 1 EAC
Sevier Co	
8-Hr Ozone	Knoxville, TN - Subpart 1
Shelby Co	
8-Hr Ozone	Memphis, TN-AR - Marginal
Sullivan Co	
8-Hr Ozone	Johnson City-Kingsport-Bristol, TN - Subpart 1 EAC

Sumner Co 8-Hr Ozone	Nashville, TN - Subpart 1 EAC
Williamson Co 8-Hr Ozone	Nashville, TN - Subpart 1 EAC
Wilson Co 8-Hr Ozone	Nashville, TN - Subpart 1 EAC

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TEXAS

Bexar Co 8-Hr Ozone	San Antonio, TX - Subpart 1 EAC
Brazoria Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Chambers Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Collin Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Comal Co 8-Hr Ozone	San Antonio, TX - Subpart 1 EAC
Dallas Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Denton Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
El Paso Co Carbon Monoxide PM-10	* El Paso, TX - Moderate <= 12.7ppm * El Paso Co, TX - Moderate
Ellis Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Fort Bend Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate

Galveston Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Guadalupe Co 8-Hr Ozone	San Antonio, TX - Subpart 1 EAC
Hardin Co 8-Hr Ozone	Beaumont-Port Arthur, TX - Marginal
Harris Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Jefferson Co 8-Hr Ozone	Beaumont-Port Arthur, TX - Marginal
Johnson Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Kaufman Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Liberty Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Montgomery Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate
Orange Co 8-Hr Ozone	Beaumont-Port Arthur, TX - Marginal
Parker Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Rockwall Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Tarrant Co 8-Hr Ozone	Dallas-Fort Worth, TX - Moderate
Waller Co 8-Hr Ozone	Houston-Galveston-Brazoria, TX - Moderate

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UTAH

Salt Lake Co	
PM-10	Salt Lake Co, UT - Moderate
SO2	Salt Lake Co, UT - Primary, Secondary
Tooele Co	
SO2	* Tooele Co, UT - Primary, Secondary
Utah Co	
PM-10	Utah Co, UT - Moderate
Weber Co	
PM-10	* Ogden, UT - Moderate

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VIRGINIA

Alexandria	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Arlington Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Botetourt Co	
8-Hr Ozone	Roanoke, VA - Subpart 1 EAC
Charles City Co	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Chesapeake	
8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Chesterfield Co	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Colonial Heights	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Fairfax	
8-Hr Ozone	Washington, DC-MD-VA - Moderate

PM-2.5	Washington, DC-MD-VA - Nonattainment
Fairfax Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Falls Church	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Frederick Co	
8-Hr Ozone	Frederick Co, VA - Subpart 1 EAC
Gloucester Co	
8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Hampton	
8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Hanover Co	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Henrico Co	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Hopewell	
8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Isle Of Wight Co	
8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
James City Co	
8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Loudoun Co	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Manassas	
8-Hr Ozone	Washington, DC-MD-VA - Moderate
PM-2.5	Washington, DC-MD-VA - Nonattainment
Manassas Park	
8-Hr Ozone	Washington, DC-MD-VA - Moderate

PM-2.5	Washington, DC-MD-VA - Nonattainment
Newport News 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Norfolk 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Petersburg 8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Poquoson 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Portsmouth 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Prince George Co 8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Prince William Co 8-Hr Ozone PM-2.5	Washington, DC-MD-VA - Moderate Washington, DC-MD-VA - Nonattainment
Richmond 8-Hr Ozone	Richmond-Petersburg, VA - Marginal
Roanoke 8-Hr Ozone	Roanoke, VA - Subpart 1 EAC
Roanoke Co 8-Hr Ozone	Roanoke, VA - Subpart 1 EAC
Salem 8-Hr Ozone	Roanoke, VA - Subpart 1 EAC
Suffolk 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Virginia Beach 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal
Williamsburg 8-Hr Ozone	Norfolk-Virginia Beach-Newport News (HR), VA - Marginal

Winchester
8-Hr Ozone

Frederick Co, VA - Subpart 1 EAC

York Co
8-Hr Ozone

Norfolk-Virginia Beach-Newport News (HR), VA - Marginal

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WEST VIRGINIA

Berkeley Co
8-Hr Ozone
PM-2.5

Berkeley and Jefferson Counties, WV - Subpart 1 EAC
Martinsburg, WV-Hagerstown, MD - Nonattainment

Brooke Co
8-Hr Ozone
PM-10
PM-2.5

Steubenville-Weirton, OH-WV - Subpart 1
* Weirton, WV - Moderate
Steubenville-Weirton, OH-WV - Nonattainment

Cabell Co
8-Hr Ozone
PM-2.5

Huntington-Ashland, WV-KY - Subpart 1
Huntington-Ashland, WV-KY-OH - Nonattainment

Hancock Co
8-Hr Ozone
PM-10
PM-2.5

Steubenville-Weirton, OH-WV - Subpart 1
* Weirton, WV - Moderate
Steubenville-Weirton, OH-WV - Nonattainment

Jefferson Co
8-Hr Ozone

Berkeley and Jefferson Counties, WV - Subpart 1 EAC

Kanawha Co
8-Hr Ozone
PM-2.5

Charleston, WV - Subpart 1
Charleston, WV - Nonattainment

Marshall Co
8-Hr Ozone
PM-2.5

Wheeling, WV-OH - Subpart 1
Wheeling, WV-OH - Nonattainment

Mason Co
PM-2.5

* Huntington-Ashland, WV-KY-OH - Nonattainment

Ohio Co

8-Hr Ozone PM-2.5	Wheeling, WV-OH - Subpart 1 Wheeling, WV-OH - Nonattainment
Pleasants Co PM-2.5	* Parkersburg-Marietta, WV-OH - Nonattainment
Putnam Co 8-Hr Ozone PM-2.5	Charleston, WV - Subpart 1 Charleston, WV - Nonattainment
Wayne Co 8-Hr Ozone PM-2.5	Huntington-Ashland, WV-KY - Subpart 1 Huntington-Ashland, WV-KY-OH - Nonattainment
Wood Co 8-Hr Ozone PM-2.5	Parkersburg-Marietta, WV-OH - Subpart 1 Parkersburg-Marietta, WV-OH - Nonattainment

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WISCONSIN

Door Co 8-Hr Ozone	Door Co, WI - Subpart 1
Kenosha Co 8-Hr Ozone	Milwaukee-Racine, WI - Moderate
Kewaunee Co 8-Hr Ozone	Kewaunee Co, WI - Subpart 1
Manitowoc Co 8-Hr Ozone	Manitowoc Co, WI - Subpart 1
Milwaukee Co 8-Hr Ozone	Milwaukee-Racine, WI - Moderate
Ozaukee Co 8-Hr Ozone	Milwaukee-Racine, WI - Moderate
Racine Co 8-Hr Ozone	Milwaukee-Racine, WI - Moderate
Sheboygan Co	

8-Hr Ozone	Sheboygan, WI - Moderate
Washington Co	
8-Hr Ozone	Milwaukee-Racine, WI - Moderate
Waukesha Co	
8-Hr Ozone	Milwaukee-Racine, WI - Moderate

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WYOMING

Sheridan Co	
PM-10	* Sheridan, WY - Moderate

* Only a portion of the county is designated nonattainment (NAA). Exception for a few ozone counties: Each county below is designated NAA for ozone. The entire county is NAA for ozone. In addition, each is split into two or more ozone NAA areas. Los Angeles and Sutter Counties, CA; Fairfield and Litchfield Counties, CT; Hillsborough and Rockingham Counties, NH; Orange County, NY. For detailed description for portion of the county that is NAA, see the individual pollutant tables. This is not an official list of nonattainment areas. See the Code of Federal Regulations (40 CFR Part 81) and pertinent Federal Register notices for legal lists and boundaries.

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Section 9.3



U.S. Fish & Wildlife Service

Georgia Ecological Services
Athens, Brunswick & Columbus

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V-438

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H	
	<u>Habersham</u> <u>Hall</u> <u>Hancock</u> <u>Haralson</u> <u>Harris</u>
	<u>Hart</u> <u>Heard</u> <u>Henry</u> <u>Houston</u>
I	
	<u>Irwin</u>
J	
	<u>Jackson</u> <u>Jasper</u> <u>Jeff Davis</u> <u>Jefferson</u>
	<u>Jenkins</u> <u>Johnson</u> <u>Jones</u>
L	
	<u>Lamar</u> <u>Lanier</u> <u>Laurens</u> <u>Lee</u> <u>Liberty</u>
	<u>Lincoln</u> <u>Long</u> <u>Lowndes</u> <u>Lumpkin</u>
M	
	<u>Macon</u> <u>Madison</u> <u>Marion</u> <u>McDuffie</u> <u>McIntosh</u> <u>Meriwether</u> <u>Miller</u>
	<u>Mitchell</u> <u>Monroe</u> <u>Montgomery</u> <u>Morgan</u> <u>Murray</u> <u>Muscogee</u>
N	
	<u>Newton</u>
O	
	<u>Oconee</u> <u>Oglethorpe</u>
P	
	<u>Paulding</u> <u>Peach</u> <u>Pickens</u> <u>Pierce</u>
	<u>Pike</u> <u>Polk</u> <u>Pulaski</u> <u>Putnam</u>
Q	
	<u>Quitman</u>
R	
	<u>Rabun</u> <u>Randolph</u> <u>Richmond</u> <u>Rockdale</u>
S	

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Listed Species in Baker County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Birds				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia. Active eagle nests were located in Baker County 1989, 1991, 1993-1994, 1996-1998 and 2000-2002	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptiles				
Alligator snapping turtle <i>Macrolemys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Barbour's map turtle <i>Graptemys barbouri</i>	No Federal Status	T	Restricted to the Apalachicola River and larger tributaries including the Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.	
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Amphibians				
Flatwoods salamander <i>Ambystoma cingulatum</i>	T	T	Adults and subadults are fossorial; found in open mesic pine/wiregrass flatwoods dominated by longleaf or slash pine and maintained by frequent fire. During breeding period, which coincides with heavy rains from Oct.-Dec., move to isolated, shallow, small, depressions (forested with emergent vegetation) that dry completely on a cyclic basis. Active breeding sites found in Baker County since 1990.	Habitat destruction as a result of agricultural and silvicultural practices (e.g., clearcutting, mechanical site preparation), fire suppression and residential and commercial development.
Georgia blind salamander <i>Haideotriton wallacei</i>	No Federal Status	T	Subterranean waters of upland limestone karst system; restricted to Dougherty Plain region of Georgia	
Invertebrates				

Fat three-ridge mussel <i>Amblema neislerii</i>	E	E	Main channels of small to large rivers with slow to moderate currents, in substrates ranging from gravel to a rocky rubble mixture of sand and sandy mud to a mixture of sand, sandy/clay substrates	Habitat modification, sedimentation, and water quality degradation
Gulf moccasinshell mussel <i>Medionidus pencillatus</i>	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation
Oval pigtoe mussel <i>Pleurobema pyriforme</i>	E	E	River tributaries and main channels in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates	Habitat modification, sedimentation, and water quality degradation
Purple bankclimber mussel <i>Elliptioideus sloatianus</i>	T	T	Main channels of ACF basin rivers in moderate currents over sand, sand mixed with mud, or gravel substrates	Habitat modification, sedimentation, and water quality degradation
Shiny-rayed pocketbook mussel <i>Lampsilis subangulata</i>	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
Fish				
Bluestripe shiner <i>Cyprinella callitaenia</i>	No Federal Status	T	Brownwater streams	
Highscale shiner <i>Notropis hypsilepis</i>	No Federal Status	T	Blackwater and brownwater streams	
Plants				
American chaffseed <i>Schwalbea americana</i>	E	E	Fire-maintained wet savannahs in the Coastal Plain (with grass pinks, colic root, huckleberry and gallberry); grassy openings and swales of relict longleaf pine woods in the Piedmont	Fire suppression, habitat conversion, and incompatible agriculture and forestry practices
Buckthorn <i>Sideroxylon thornei</i>	No Federal Status	E	Oak flatwoods where soil normally is saturated for long periods after floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)	
Harper Fimbry <i>Fimbristylis perpusilla</i>	No Federal Status	E	Muddy bottoms and silty margins of drying pine barren ponds and farm ponds	
Pondberry <i>Lindera melissifolia</i>	E	E	Shallow depression ponds of sandhills, margins of cypress ponds, and in seasonally wet low areas among bottomland hardwoods	Drainage ditching and subsequent conversion of habitat to other uses; domestic hogs, cattle grazing, and timber harvesting; and apparent lack of seedling production
Variable-leaf indian-plantain	No Federal	T	Swamps and muddy stream and river banks	

<i>Cacalia diversifolia</i>	Status		
Wagner spleenwort	No Federal Status	T	Marl outcrops, damp limestone ledges, and tabby masonry
<i>Asplenium heteroresiliens</i>			

Listed Species in Coffee County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia. An active eagle nest was located in Coffee County in 1999 and 2000-2002.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Plant				
Creeping Morning-glory <i>Evolvulus sericeus var sericeus</i>	No Federal Status	E	Sparsely vegetated, partially shaded outcrops of Altamaha Grit (a coarse, gritty, sandstone-like hardened clay)	
Georgia plume <i>Elliottia racemosa</i>	No Federal Status	T	Sand ridges, dry oak ridges, evergreen hammocks, and sandstone outcrops in a variety of sandy soil conditions ranging from moist to very dry	
Parrot pitcher-plant <i>Sarracenia psittacina</i>	No Federal Status	T	Acid soils of open bogs, wet savannahs, and low areas in pine flatwoods.	
Pondspice <i>Litsea aestivalis</i>	No Federal Status	T	Margins of swamps, cypress ponds, and sandhill depression ponds and in hardwood swamps	

Listed Species in Decatur County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia. Active eagle nests were located in Decatur County in 1988 and 1990-1999 and 2000-2002.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macrochelys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Barbour's map turtle <i>Graptemys barbouri</i>	No Federal Status	T	Restricted to the Apalachicola River and larger tributaries including the Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.	
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Amphibian				
Georgia blind salamander <i>Haideotriton wallacei</i>	No Federal Status	T	Subterranean waters of upland limestone karst system; restricted to Dougherty Plain region of Georgia	
Invertebrate				
Fat three-ridge mussel <i>Amblema neislerii</i>	E	E	Main channels of small to large rivers with slow to moderate currents, in substrates ranging from gravel to a rocky rubble mixture of sand and sandy mud to a mixture of sand, sandy/clay substrates	Habitat modification, sedimentation, and water quality degradation
Gulf moccasinshell mussel <i>Medionidus</i>	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation

<i>penicillatus</i>				
Oval pigtoe mussel	E	E	River tributaries and main channels in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates	Habitat modification, sedimentation, and water quality degradation
<i>Pleurobema pyriforme</i>				
Purple bankclimber mussel	T	T	Main channels of ACF basin rivers in moderate currents over sand, sand mixed with mud, or gravel substrates	Habitat modification, sedimentation, and water quality degradation
<i>Elliptioideus sloatianus</i>				
Shiny-rayed pocketbook mussel	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
<i>Lampsilis subangulata</i>				
Fish				
Alabama Shad			Candidate	Candidate
<i>Alosa Alabamae</i>				
Bluestripe shiner	No Federal Status	T	Brownwater streams	
<i>Cyprinella callitaenia</i>				
Plant				
Bay star-vine	No Federal Status	T	Twining on subcanopy and understory trees/shrubs in rich alluvial woods	
<i>Schisandra glabra</i>				
Buckthorn	No Federal Status	E	Oak flatwoods where soil normally is saturated for long periods after floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)	
<i>Sideroxylon thornei</i>				
Climbing buckthorn	No Federal Status	T	Calcareous rocky bluffs, forested shell middens on barrier islands, and evergreen hammocks along streambanks and coastal marshes	
<i>Sageretia minutiflora</i>				
Croomia	No Federal Status	T	Rich moist deciduous woodlands, ravines, and river bluffs, often with ginseng	
<i>Croomia pauciflora</i>				
Curtiss loosestrife	No Federal Status	T	Swamps over limestone, boggy open areas in pinelands, shallow water of wet thickets and floodplains, and occasionally in openings along right-of-ways	
<i>Lythrum curtissii</i>				
Florida anise-tree	No Federal Status	E	Moist wooded ravines and seepages along small streams	
<i>Illicium floridanum</i>				
Florida torreyia	E	E	Beech-magnolia forests and mixed hardwoods on middle slopes of steep ravines with nearly permanent seepage (steepheads)	A disease (first observed in late 1950's that killed all mature trees) that kills needles and stems, causing defoliation and tree death
<i>Torreya taxifolia</i>				
Fringed	E	E	Mature hardwood or hardwood-pine	Residential development, logging, and

campion <i>Silene polypetala</i>			forests on river bluffs, small stream terraces, moist slopes and well-shaded ridge crests; two Decatur County populations last observed in 1993 and 1994	spread of Japanese honeysuckle
Lax Water-milfoil <i>Myriophyllum laxum</i>	No Federal Status	T	Sinkholes and other shallow freshwater pools; also sandy clear streams draining spring-fed swamps	
Narrowleaf obedient plant <i>Physostegia leptophylla</i>	No Federal Status	T	Wet muck or peat in shallow water of river swamp openings and in the margins of both fresh and brackish (tidal) marshes	
Pondspice <i>Litsea aestivalis</i>	No Federal Status	T	Margins of swamps, cypress ponds, and sandhill depression ponds and in hardwood swamps	

Listed Species in Early County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia. Active eagle nest were located in Early County 1997-1999 and 2000-2002.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macrolemys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	
Amphibian				
Flatwoods salamander <i>Ambystoma cingulatum</i>	T	T	Adults and subadults are fossorial; found in open mesic pine/wiregrass flatwoods dominated by longleaf or slash pine and maintained by frequent fire. During breeding period, which coincides with heavy rains from Oct.-Dec., move to isolated, shallow, small, depressions (forested with emergent vegetation) that dry completely on a cyclic basis. Last breeding record for Early County was in the 1940's.	
Invertebrate				
Gulf moccasinshell mussel <i>Medionidus pencillatus</i>	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation
Oval pigtoe mussel <i>Pleurobema pyriforme</i>	E	E	River tributaries and main channels in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates	Habitat modification, sedimentation, and water quality degradation
Shiny-rayed pocketbook mussel <i>Lampsilis</i>	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation

<i>subangulata</i>				
Fish				
Bluestripe shiner <i>Cyprinella callitaenia</i>	No Federal Status	T	Brownwater streams	
Plant				
Alabama milkvine <i>Matelea alabamensis</i>	No Federal Status	T	Upper areas of slopes and bluffs and in oak-hickory-mixed hardwood forests	
American chaffseed <i>Schwalbea americana</i>	E	E	Fire-maintained wet savannahs in the Coastal Plain (with grass pinks, colic root, huckleberry and gallberry); grassy openings and swales of relict longleaf pine woods in the Piedmont	Fire suppression, habitat conversion, and incompatible agriculture and forestry practices
Baltzell sedge <i>Carex baltzellii</i>	No Federal Status	E	Rich hardwood forests with a beech-southern magnolia canopy and an abundance of wildflowers	
Buckthorn <i>Sideroxylon thornei</i>	No Federal Status	E	Oak flatwoods where soil normally is saturated for long periods after floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)	
Clearwater butterwort <i>Pinguicula primuliflora</i>	No Federal Status	T	Shallow running water of sandy, clear streams and spring-fed rivulets (spring runs); also along moist streambanks in mats of peat moss	
Curtiss loosestrife <i>Lythrum curtissii</i>	No Federal Status	T	Swamps over limestone, boggy open areas in pinelands, shallow water of wet thickets and floodplains, and occasionally in openings along right-of-ways	
Florida willow <i>Salix floridana</i>	No Federal Status	E	In low woods, rocky and gravelly shores, and along stream beds	
Lax Water-milfoil <i>Myriophyllum laxum</i>	No Federal Status	T	Sinkholes and other shallow freshwater pools; also sandy clear streams draining spring-fed swamps	
Parrot pitcher-plant <i>Sarracenia psittacina</i>	No Federal Status	T	Acid soils of open bogs, wet savannahs, and low areas in pine flatwoods	
Plumleaf azalea <i>Rhododendron prunifolium</i>	No Federal Status	T	Moist soils of rich hardwood ravines	
Relict trillium <i>Trillium reliquum</i>	E	E	Hardwood forests; in the Piedmont, found in either in rich ravines or adjacent alluvial terraces with other spring-flowering herbs	Logging, road construction, agricultural conversion, mining, residential/industrial development, and encroachment by Japanese honeysuckle and kudzu
Sweet pitcher-plant <i>Sarracenia rubra</i>	No Federal Status	E	Acid soils of open bogs, savannahs, and low areas in pine flatwoods	
Variable-leaf	No	T	Swamps and muddy stream and river banks	

indian-plantain <i>Arnoglossum diversifolium</i>	Federal Status		
White trumpet <i>Sarracenia leucophylla</i>	No Federal Status	E	Acid soils of open bogs and on sphagnum mats in light gaps along streams and in red maple-blackgum swamps

Listed Species in Miller County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macrolemys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Amphibian				
Flatwoods salamander <i>Ambystoma cingulatum</i>	T	T	Adults and subadults are fossorial; found in open mesic pine/wiregrass flatwoods dominated by longleaf or slash pine and maintained by frequent fire. During breeding period, which coincides with heavy rains from Oct.-Dec., move to isolated, shallow, small, depressions (forested with emergent vegetation) that dry completely on a cyclic basis. Found in Miller County on Mayhaw WMA in 1998	Habitat destruction as a result of agricultural and silvicultural practices (e.g., clearcutting, mechanical site preparation), fire suppression and residential and commercial development.
Georgia blind salamander <i>Haideotriton wallacei</i>	No Federal Status	T	Subterranean waters of upland limestone karst system; restricted to Dougherty Plain region of Georgia	
Invertebrate				
Oval pigtoe mussel <i>Pleurobema pyriforme</i>	E	E	River tributaries and main channels in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates	Habitat modification, sedimentation, and water quality degradation

Shiny-rayed pocketbook mussel <i>Lampsilis subangulata</i>	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
Plant				
American chaffseed <i>Schwalbea americana</i>	E	E	Fire-maintained wet savannahs in the Coastal Plain (with grass pinks, colic root, huckleberry and gallberry); grassy openings and swales of relict longleaf pine woods in the Piedmont; the known population of this species in Miller County has been extirpated	Fire suppression, habitat conversion, and incompatible agriculture and forestry practices
Buckthorn <i>Sideroxylon thornei</i>	No Federal Status	E	Oak flatwoods where soil normally is saturated for long periods after floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)	
Curtiss loosestrife <i>Lythrum curtissii</i>	No Federal Status	T	Swamps over limestone, boggy open areas in pinelands, shallow water of wet thickets and floodplains, and occasionally in openings along right-of-ways	
Pondspice <i>Litsea aestivalis</i>	No Federal Status	T	Margins of swamps, cypress ponds, and sandhill depression ponds and in hardwood swamps	
Variable-leaf indian-plantain <i>Cacalia diversifolia</i>	No Federal Status	T	Swamps and muddy stream and river banks	

Listed Species in Mitchell County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macroclmys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Barbour's map turtle <i>Graptemys barbouri</i>	No Federal Status	T	Restricted to the Apalachicola River and larger tributaries including the Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.	
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Amphibian				
Georgia blind salamander <i>Haideotriton wallacei</i>	No Federal Status	T	Subterranean waters of upland limestone karst system; restricted to Dougherty Plain region of Georgia	
Invertebrate				
Gulf moccasinshell mussel <i>Medionidus pencillatus</i>	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation
Purple bankclimber mussel	T	T	Main channels of ACF basin rivers in moderate currents over sand, sand mixed with mud, or gravel substrates	Habitat modification, sedimentation, and water quality degradation

<i>Elliptioideus sloatianus</i>			
Shiny-rayed pocketbook mussel	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay
<i>Lampsilis subangulata</i>			
Fish			
Bluestripe shiner	No Federal Status	T	Brownwater streams
<i>Cyprinella callitaenia</i>			
Plant			
Creeping Morning-glory	No Federal Status	E	Sparsely vegetated, partially shaded outcrops of Altamaha Grit.
<i>Evolvulus sericeus</i> var <i>sericeus</i>			
Parrot pitcher-plant	No Federal Status	T	Acid soils of open bogs, wet savannahs, and low areas in pine flatwoods
<i>Sarracenia psittacina</i>			

Listed Species in Seminole County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia. Active eagle nest were located in Seminole county in 2000	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macrochelys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Barbour's map turtle <i>Graptemys barbouri</i>	No Federal Status	T	Restricted to the Apalachicola River and larger tributaries including the Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.	
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Invertebrate				
Shiny-rayed pocketbook mussel <i>Lampsilis subangulata</i>	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
Fish				
Bluestripe shiner <i>Cyprinella callitaenia</i>	No Federal Status	T	Brownwater streams	
Plant				
Buckthorn	No Federal	E	Oak flatwoods where soil normally is saturated for long periods after	

<i>Sideroxylon thornei</i>	Status		floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)
Harper Fimbry <i>Fimbristylis perpusilla</i>	No Federal Status	E	Muddy bottoms and silty margins of drying pine barren ponds and farm ponds
Lax Water-milfoil <i>Myriophyllum laxum</i>	No Federal Status	T	Sinkholes and other shallow freshwater pools; also sandy clear streams draining spring-fed swamps
White trumpet <i>Sarracenia leucophylla</i>	No Federal Status	E	Acid soils of open bogs and on sphagnum mats in light gaps along streams and in red maple-blackgum swamps

Listed Species in Tift County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Plant				
Parrot pitcher-plant <i>Sarracenia psittacina</i>	No Federal Status	T	Acid soils of open bogs, wet savannahs, and low areas in pine flatwoods.	

Listed Species in Worth County (updated May 2004)				
Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	T	E	Inland waterways and estuarine areas in Georgia.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Red-cockaded woodpecker <i>Picoides borealis</i>	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and to encroachment of hardwood midstory in older age pine stands due to fire suppression
Wood stork <i>Mycteria americana</i>	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps. Active rookeries were located in Worth County in 1996 - 1999.	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
Reptile				
Alligator snapping turtle <i>Macrolemys temminckii</i>	No Federal Status	T	Rivers, lakes, and large ponds near stream swamps.	Destruction and modification of habitat and overharvesting.
Barbour's map turtle <i>Graptemys barbouri</i>	No Federal Status	T	Restricted to the Apalachicola River and larger tributaries including the Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.	
Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	During winter, den in xeric sandridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to overcollecting for the pet trade
Gopher tortoise <i>Gopherus polyphemus</i>	No Federal Status	T	Well-drained, sandy soils in forest and grassy areas; associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Amphibian				
Flatwoods salamander <i>Ambystoma cingulatum</i>	T	T	Adults and subadults are fossorial; found in open mesic pine/wiregrass flatwoods dominated by longleaf or slash pine and maintained by frequent fire. During breeding period, which coincides with heavy rains from Oct.-Dec., move to isolated, shallow, small, depressions (forested with emergent vegetation) that dry completely on a cyclic basis. Last breeding record for Worth County was in 1962.	Habitat destruction as a result of agricultural and silvicultural practices (e.g., clearcutting, mechanical site preparation), fire suppression and residential and commercial development.
Invertebrate				
Purple bankclimber mussel <i>Elliptioideus</i>	T	T	Main channels of ACF basin rivers in moderate currents over sand, sand mixed with mud, or gravel substrates	Habitat modification, sedimentation, and water quality degradation

<i>sloatianus</i>				
Shiny-rayed pocketbook mussel	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
<i>Lampsilis subangulata</i>				
Gulf moccasinshell mussel	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation
<i>Medionidus penicillatus</i>				
Oval pigtoe mussel	E	E	River tributaries and main channels in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates	Habitat modification, sedimentation, and water quality degradation
<i>Pleurobema pyriforme</i>				
Fish				
Bluestripe shiner	No Federal Status	T	Brownwater streams	
<i>Cyprinella callitaenia</i>				
Plant				
American chaffseed	E	E	Fire-maintained wet savannahs in the Coastal Plain (with grass pinks, colic root, huckleberry and gallberry); grassy openings and swales of relict longleaf pine woods in the Piedmont ; the known population of this species in Worth County has been extirpated	Fire suppression, habitat conversion, and incompatible agriculture and forestry practices
<i>Schwalbea americana</i>				
Buckthorn	No Federal Status	E	Oak flatwoods where soil normally is saturated for long periods after floods/heavy rain (i.e., calcareous swamps; woods bordering cypress ponds)	
<i>Sideroxylon thornei</i>				
Cooley meadowrue	E	E	On fine sandy loam in open, seasonally wet mixed pine-hardwoods and in adjacent wet savannahs; in Georgia, may be restricted to roadsides and powerline right-of-ways	Most extirpated populations were eliminated by fire suppression and/or silvicultural or agricultural development.
<i>Thalictrum cooleyi</i>				
Parrot pitcher-plant	No Federal Status	T	Acid soils of open bogs, wet savannahs, and low areas in pine flatwoods	
<i>Sarracenia psittacina</i>				
Pondberry	E	E	Shallow depression ponds of sandhills, margins of cypress ponds, and in seasonally wet low areas among bottomland hardwoods	Drainage ditching and subsequent conversion of habitat to other uses; domestic hogs, cattle grazing, and timber harvesting; and apparent lack of seedling production
<i>Lindera melissifolia</i>				



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Daphne Ecological Services Field Office

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ALABAMA'S FEDERALLY LISTED SPECIES

**BY COUNTY**

Updated - November 8, 2005

For the Media
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We are continually updating this list and, therefore, it may be incomplete and is provided strictly for informational purposes. This list does not constitute any form of Section 7 consultation. We recommend that this office (Daphne, AL Field Office - USFWS) be contacted for more current, site specific information prior to project activities. To be certain of occurrence, surveys should be conducted by qualified biologists to determine if a Federally protected species occurs within a project area.

Key to codes on list:

E - Endangered
T - Threatened
CH - Critical Habitat has been designated
PE - Proposed to be listed as Endangered
PT - Proposed to be listed as Threatened
PCH - Proposed Critical Habitat
C - Candidate Species
(P) - Possible Occurrence

Autauga

E - Wood stork *Mycteria Americana*
T - Bald eagle *Haliaeetus leucocephalus*
E - Alabama sturgeon *Scaphirhynchus suttkusi*
E - Alabama canebrake pitcher plant *Sarracenia rubra ssp. alabamensis*
T - Price's potato bean *Apios priceana*

Baldwin

ECH - Alabama beach mouse *Peromyscus polionotus ammobates*
 ECH - Perdido Key beach mouse *Peromyscus polionotus trissylepsis*
 E - West Indian manatee *Trichechus manatus*
 E - Red-cockaded woodpecker *Picoides borealis*
 E - Least tern *Sterna antillarum*
 TCH - Piping plover *Charadrius melodus*
 T - Bald eagle *Haliaeetus leucocephalus*
 E - Wood stork *Mycteria americana*
 E - Alabama red-bellied turtle *Pseudemys alabamensis*
 T - Loggerhead sea turtle *Caretta caretta*
 E - Kemp's ridley sea turtle *Lepidochelys kempii*
 T - Green sea turtle *Chelonia mydas* (P)
 T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
 E - Alabama sturgeon *Scaphirhynchus suttkusi*
 E - Heavy pigtoe mussel *Pleurobema taitianum*
 T - Inflated heelsplitter mussel *Potamilus inflatus*
 E - American chaffseed *Schwalbea americana*
 T - Eastern indigo snake *Drymarchon corais couperi* (P)
 T - Flatwoods salamander *Ambystoma cingulatum* (P)
 C - Panhandle lily *Lillium iridollae*

Barbour

E - Wood stork *Mycteria Americana*
 T - Bald Eagle *Haliaeetus leucocephalus*

Bibb

E - Red-cockaded woodpecker *Picoides borealis*
 E - Cahaba shiner *Notropis cahabae*
 T - Goldline darter *Percina aurolineata*
 T - Orange-nacre mucket mussel *Lampsilis perovalis*
 T - Fine-lined pocketbook mussel *Lampsilis altilis*
 E - Triangular Kidneyshell *Ptychobranhus greenii*
 E - Cylindrical lioplax snail *Lioplax cyclostomaformis*
 E - Flat pebblesnail *Lepyrium showalteri*
 T - Round rocksnail *Leptoxis ampla*
 E - Mitchell's satyr butterfly *Neonympha mitchellii mitchellii*
 T - Mohr's Barbara's buttons *Marshallia mohrii*
 E - Tennessee yellow-eyed grass *Xyris tennesseensis*
 C - Georgia rockcress *Arabis georgiana*

Blount

T - Flattened musk turtle *Sternotherus depressus*
 E - Triangular kidneyshell mussel *Ptychobranhus greenii*
 T - Fine-lined pocketbook mussel *Lampsilis altilis*
 T - Orange-nacre mucket mussel *Lampsilis perovalis*

- E - Ovate clubshell mussel *Pleurobema perovatum*
- E - Plicate rocksnail *Leptoxis plicata*
- E - Cahaba shiner *Notropis cahabae*
- C - Black Warrior waterdog *Necturus alabamensis*
- C - Georgia aster *Aster georgianus*

Bullock

- E - Red cockaded woodpecker *Picoides borealis*
- E - Relict trillium *Trillium reliquum*

Butler

- E - Wood stork *Mycteria americana*
- T - Red hills salamander *Phaeognathus hubrichti*

Calhoun

- E - Gray bat *Myotis grisescens*
- E - Red-cockaded woodpecker *Picoides borealis*
- T - Pygmy sculpin *Cottus paulus*
- T - Blue shiner *Cyprinella caerulea*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Tulotoma snail *Tulotoma magnifica*
- T - Painted rocksnail *Leptoxis taeniata*
- E - Southern pigtoe mussel *Pleurobema georgianum*
- E - Triangular kidneyshell mussel *Ptychobranchus greenii*
- E - Southern clubshell mussel *Pleurobema decisum*
- E - Tennessee yellow-eyed grass *Xyris tennesseensis*
- T - Mohr's Barbara's buttons *Marshallia mohrii*
- C - White fringeless orchid *Platanthera integrilabia*

Chambers

- T - Little amphianthus *Amphianthus pusillus*

Cherokee

- T - Bald eagle *Haliaeetus leucocephalus*
- T - Blue shiner *Cyprinella caerulea*
- E - Coosa moccasinshell mussel *Medionidus parvulus*
- E - Triangular kidneyshell mussel *Ptychobranchus greenii*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- E - Southern clubshell mussel *Pleurobema decisum*
- E - Green pitcher plant *Sarracenia oreophila*

E - Harperella *Ptilimnium nodosum*
T - Mohr's Barbara's buttons *Marshallia mohrii*
E - Alabama leather flower *Clematis socialis*
T - Kral's water-plantain *Sagittaria secundifolia*
C - Whorled sunflower *Helianthus verticillatus*

Chilton

T - Bald eagle *Haliaeetus leucocephalus*
E - Red-cockaded woodpecker *Picoides borealis*
E - Wood stork *Mycteria americana*
E - Alabama canebreak pitcher plant *Sarracenia rubra ssp.alabamensis*
T - Painted rocksnail *Leptoxis taeniata*
T - Fine-lined pocketbook mussel *Lampsilis altilis*

Choctaw

T - Bald eagle *Haliaeetus leucocephalus*
E - Wood stork *Mycteria americana*
T - Gopher tortoise *Gopherus polyphemus*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
T - Inflated heelsplitter mussel *Potamilus inflatus*

Clarke

E - Wood stork *Mycteria americana*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
E - Alabama sturgeon *Scaphirhynchus suttkusi*
T - Inflated heelsplitter mussel *Potamilus inflatus*
E - Heavy pigtoe mussel *Pleurobema taitianum* (P)
C - Black pine snake *Pituophis melanoleucus lodingi*

Clay

E - Southern pigtoe mussel *Pleurobema georgianum*
T - Blue shiner *Cyprinella caerulea*
E - Tulotoma snail *Tulotoma magnifica*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
C - Georgia aster *Aster georgianus*
C - White fringeless orchid *Platanthera integrilabia*

Cleburne

E - Red-cockaded woodpecker *Picoides borealis*
E - Southern pigtoe mussel *Pleurobema georgianum*
E - Southern clubshell mussel *Pleurobema decisum*

E - Triangular kidneyshell mussel *Ptychobranthus greenii*
T - Fine-lined pocketbook *Lampsilis altilis*
C - White fringeless orchid *Platanthera integrilabia*

Coffee

E - Wood stork *Mycteria americana*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*

Colbert

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalis* (P)
E - Pink mucket pearly mussel *Lampsilis abrupta*
E - White warty-back pearly mussel *Plethobasus cicatricosus*
E - Rough pigtoe pearly mussel *Pleurobema plenum*
E - Cumberlandian combshell mussel *Epioblasma brevidens*
E - Ring pink mussel *Obovaria retusa*
E - Turgid blossom pearlymussel *Epioblasma turgidula*
E - Cracking pearlymussel *Hemistena lata*
E - Fanshell *Cyprogenia stegaria*
E - Anthony's riversnail *Athearnia anthonyi*
T - Lyrate bladder-pod *Lesquerella lyrata*
E - Alabama cave shrimp *Palaemonias alabamiae*
E - Spottfin chub *Cyprinella (=Hybopsis) monacha*
C - Slabside pearlymussel *Lexingtonia dolabelloides*
E - Leafy prairie-clover *Dalea foliosa*

Conecuh

E - Gray bat *Myotis grisescens*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
T - Red hills salamander *Phaeognathus hubrichti*
E - Red-cockaded woodpecker *Picoides borealis*
C - Alabama pearlshell *Margaritifera marrianae*
E - Louisiana quillwort *Isoetes louisianensis*

Coosa

E - Red-cockaded woodpecker *Picoides borealis*
T - Bald eagle *Haliaeetus leucocephalus*
T - Blue shiner *Cyprinella caerulea*
E - Tulotoma snail *Tulotoma magnifica*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
E - Southern pigtoe *Pleurobema georgianum*
T - Kral's water-plantain *Sagittaria secundifolia*

Covington

E - Red-cockaded woodpecker *Picoides borealis*
E - Wood stork *Mycteria Americana*
T - Bald eagle *Haliaeetus leucocephalus*
T - Eastern indigo snake *Drymarchon corais couperi* (P)
T - Red hills salamander *Phaeognathus hubrichti*
T - Flatwoods salamander *Ambystoma cingulatum* (P)
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
E - Pondberry *Lindera melissifolia*
T - Louisiana quillwort *Isoetes louisianensis* (P)

Crenshaw

T - Red hills salamander *Phaeognathus hubrichti*
E - Wood stork *Mycteria americana*

Cullman

T - Flattened musk turtle *Sternotherus depressus*
E - Ovate clubshell mussel *Pleurobema perovatum*
E - Triangular kidneyshell mussel *Ptychobranhus greenii*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
C - Black Warrior waterdog *Necturus alabamensis*

Dale

T - Gulf sturgeon *Acipenser oxyrinchus desotoi*

Dallas

T - Bald eagle *Haliaeetus leucocephalus*
E - Wood stork *Mycteria americana*
E - Red-cockaded woodpecker *Picoides borealis*
E - Alabama sturgeon *Scaphirhynchus suttkusi*
E - Southern clubshell mussel *Pleurobema decisum*
E - Heavy pigtoe mussel *Pleurobema taitianum*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
T - Fine-lined pocketbook mussel *Lampsilis altilis*

DeKalb

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalis* (P)
T - Blue shiner *Cyprinella caerulea*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
T - Kral's water-plantain *Sagittaria secundifolia*

- E - Green pitcher plant *Sarracenia oreophila*
- E - Harperella *Ptilimnium nodosum*

Elmore

- T - Bald eagle *Haliaeetus leucocephalus*
- E - Tulotoma snail *Tulotoma magnifica*
- E - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Alabama canebrake pitcher plant *Sarracenia rubra ssp.alabamensis*
- C - Georgia rockcress *Arabis georgiana*

Escambia

- E - Wood stork *Mycteria americana*
- E - Red-cockaded woodpecker *Picoides borealis*
- T - Gulf sturgeon *Acipenser oxyrinchus desotoi*

Etowah

- T - Flattened musk turtle *Sternotherus depressus*
- T - Mohr's Barbara's buttons *Marshallia mohrii*
- E - Green pitcher plant *Sarracenia oreophila*
- E - Alabama leather flower *Clematis socialis*
- E - Southern clubshell mussel *Pleurobema decisum*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Triangular kidneyshell mussel *Ptychobranthus greenii*
- E - Southern pigtoe mussel *Pleurobema georgianum*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- C - Rush darter *Etheostoma phytophilum*

Fayette

- T - Orange-nacre mucket mussel *Lampsilis perovalis*
- E - Dark pigtoe mussel *Pleurobema furvum*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*

Franklin

- E - Gray bat *Myotis grisescens*
- E - Cumberlandian combshell mussel *Epioblasma brevidens*
- T - Lyrate bladder-pod *Lesquerella lyrata*
- E - Leafy prairie clover *Dalea foliosa*
- E - Tennessee yellow-eyed grass *Xyris tennesseensis*
- C - Slabside pearlymussel *Lexingtonia dolabelloides*

Geneva

- T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
- E - Red-cockaded woodpecker *Picoides borealis*
- E - Gentian pinkroot *Spigelia gentianoides* var. *gentianoides*

Greene

- E - Wood stork *Mycteria americana*
- T - Orange-nacre mucket mussel *Lampsilis perovalis*
- T - Alabama moccasinshell mussel *Medionidus acutissimus*
- E - Southern clubshell mussel *Pleurobema decisum*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- E - Heavy pigtoe mussel *Pleurobema taitianum*
- T - Inflated heelsplitter mussel *Potamilus inflatus*
- E - Stirrup shell mussel *Quadrula stapes*
- E - Mitchell's satyr butterfly *Neonympha mitchellii mitchellii*

Hale

- E - Red-cockaded woodpecker *Picoides borealis*
- T - Bald eagle *Haliaeetus leucocephalus*
- E - Wood stork *Mycteria americana*
- T - Inflated heelsplitter mussel *Potamilus inflatus*

Henry

- T - Bald eagle *Haliaeetus leucocephalus*
- E - Wood stork *Mycteria americana*
- E - Relict trillium *Trillium reliquum*

Houston

- T - Bald eagle *Haliaeetus leucocephalus*
- T - Flatwoods salamander *Ambystoma cingulatum* (P)
- E - Gulf moccasinshell *Medionidus penicillatus*
- E - Oval pigtoe *Pleurobema pyriforme*

Jackson

- E - Gray bat *Myotis grisescens*
- E - Indiana bat *Myotis sodalis*
- T - Bald eagle *Haliaeetus leucocephalus*
- E - Palezone shiner *Notropis albizonatus*
- E - Anthony's riversnail *Athearnia anthonyi*
- E - Shiny pigtoe pearly mussel *Fusconaia cor* (*edgariana*)

E - Pink mucket pearly mussel *Lampsilis abrupta*
E - Alabama lamp pearly mussel *Lampsilis virescens*
E - Pale lilliput pearly mussel *Toxolasma cylindrellus*
E - Fine-rayed pigtoe mussel *Fusconaia cuneolus*
E - Hine's emerald dragonfly *Somatochlora hineana* (P)
E - Green pitcher plant *Sarracenia oreophila*
E - Morefield's leather-flower *Clematis morefieldii*
T - American hart's-tongue fern *Phyllitis scolopendrium* var. *americana*
T - Price's potato-bean *Apios priceana*
C - Slabside pearlymussel *Lexingtonia dolabelloides*
C - White fringeless orchid *Platanthera integrilabia*

Jefferson

T - Flattened musk turtle *Sternotherus depressus*
E - Watercress darter *Etheostoma nuchale*
E - Cahaba shiner *Notropis cahabae*
T - Goldline darter *Percina aurolineata*
C - Rush darter *Etheostoma phytophilum*
E - Vermilion darter *Etheostoma chermocki*
E - Upland combshell mussel *Epioblasma metastriata*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
E - Triangular kidneyshell mussel *Ptychobranhus greenii*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
E - Plicate rocksnail *Leptoxis plicata*
E - Leafy prairie clover *Dalea foliosa*
C - Black Warrior waterdog *Necturus alabamensis*

Lamar

E - Southern combshell mussel *Epioblasma penita*
E - Southern clubshell mussel *Pleurobema decisum*
E - Ovate clubshell mussel *Pleurobema perovatum*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
T - Alabama moccasinshell mussel *Medionidus acutissimus*

Lauderdale

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalis* (P)
T - Bald eagle *Haliaeetus leucocephalus*
TCH - Slackwater darter *Etheostoma boschungii*
ECH - Alabama cavefish *Speoplatyrhinus poulsoni*
E - Spottfin chub *Cyprinella* (= *Hybopsis*) *monacha*
E - Anthony's riversnail *Atheurnia anthonyi*
E - Ring pink mussel *Obovaria retusa*
E - Turgid blossom pearlymussel *Epioblasma turgidula*
E - Cracking pearlymussel *Hemistena lata*
E - Pink mucket pearly mussel *Lampsilis abrupta*
E - White warty-back pearly mussel *Plethobasus cicatricosus*
E - Rough pigtoe pearly mussel *Pleurobema plenum*
E - Fanshell *Cyprogenia stegaria*

Lawrence

- E - Gray bat *Myotis grisescens*
- E - Indiana bat *Myotis sodalis*
- E - Red-cockaded woodpecker *Picoides borealis*
- T - Bald eagle *Haliaeetus leucocephalus*
- E - Pink mucket pearly mussel *Lampsilis abrupta*
- T - Alabama moccasinshell mussel *Medionidus acutissimus*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- T - Orange-nacre mucket mussel *Lampsilis perovalis*
- E - Dark pigtoe mussel *Pleurobema furvum*
- E - Triangular kidneyshell mussel *Ptychobranhus greenii*
- E - Rough pigtoe mussel *Pleurobema plenum*
- E - Leafy prairie clover *Dalea foliosa*
- T - Lyrate bladder-pod *Lesquerella lyrata*
- C - Fleshyfruit gladebush *Leavenworthia crassa*

Lee

- E - Relict trillium *Trillium reliquum*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- T - Purple bankclimber *Eliptoideus sloatianus*
- E - Southern clubshell mussel *Pleurobema decisum*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*

Limestone

- E - Gray bat *Myotis grisescens*
- E - Indiana bat *Myotis sodalis* (P)
- T - Slackwater darter *Etheostoma boschungii*
- E - Boulder darter *Etheostoma wapiti*
- E - Pink mucket pearly mussel *Lampsilis abrupta*
- E - Rough pigtoe mussel *Pleurobema plenum*
- E - Cumberland monkeyface mussel *Quadrula intermedia*
- E - Cracking pearlymussel *Hemistena lata*
- E - Ring pink mussel *Obovaria retusa*
- E - Anthony's riversnail *Athearnia anthonyi*
- E - Slender campeloma snail *Campeloma decampi*
- E - Armored snail *Pyrgulopsis pachyta*

Lowndes

- E - Wood stork *Mycteria Americana*
- T - Bald eagle *Haliaeetus leucocephalus*
- E - Alabama sturgeon *Scaphirhynchus suttkusi*

Macon

E - Red-cockaded woodpecker *Picoides borealis*
E - Wood stork *Mycteria americana*
E - Southern clubshell mussel *Pleurobema decisum*
E - Ovate clubshell mussel *Pleurobema perovatum*
T - Fine-lined pocketbook mussel *Lampsilis altilis*

Madison

E - Gray bat *Myotis grisescens*
T - Slackwater darter *Etheostoma boschungii*
T - Snail darter *Percina tanasi*
E - Alabama cave shrimp *Palaemonias alabamiae*
E - Pink mucket pearly mussel *Lampsilis abrupta*
E - Shiny pigtoe pearly mussel *Fusconaia cor (edgariana)*
E - Fine-rayed pigtoe mussel *Fusconaia cuneolus*
E - Rough pigtoe mussel *Pleurobema plenum*
C - Slabside pearlymussel *Lexingtonia dolabelloides*
E - Slender campeloma snail *Campeloma decampi*
T - Price's potato bean *Apios priceana*
E - Morefield's leather flower *Clematis morefieldii*

Marengo

T - Bald eagle *Haliaeetus leucocephalus*
T - Inflated heelsplitter mussel *Potamilus inflatus*

Marion

T - Orange-nacre mucket mussel *Lampsilis perovalis*
E - Southern combshell mussel *Epioblasma penita*
C - White fringeless orchid *Platanthera integrilabia*

Marshall

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalis*
E - Red-cockaded woodpecker *Picoides borealis*
T - Bald eagle *Haliaeetus leucocephalus*
T - Flattened musk turtle *Sternotherus depressus*
T - Snail darter *Percina tanasi*
E - Pink mucket pearly mussel *Lampsilis abrupta*
E - Shiny pigtoe pearly mussel *Fusconaia cor (edgariana)*
E - Fine-rayed pigtoe mussel *Fusconaia cuneolus*
E - Orange-footed pimpleback mussel *Plethobasus cooperianus*
E - Rough pigtoe mussel *Pleurobema plenum*
T - Price's potato bean *Apios priceana*
E - Green pitcher plant *Sarracenia oreophila*
C - Slabside pearlymussel *Lexingtonia dolabelloides*

Mobile

E - West Indian manatee *Trichechus manatus*
T - Piping plover *Charadrius melodus*
E - Red-cockaded woodpecker *Picoides borealis*
E - Least tern *Sterna antillarum*
T - Bald eagle *Haliaeetus leucocephalus*
T - Eastern indigo snake *Drymarchon corais couperi*
T - Gopher tortoise *Gopherus polyphemus*
E - Alabama red-bellied turtle *Pseudemys alabamensis*
T - Loggerhead sea turtle *Caretta caretta*
E - Kemp's ridley sea turtle *Lepidochelys kempii* (P)
T - Green sea turtle *Chelonia mydas* (P)
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
T - Flatwoods salamander *Ambystoma cingulatum* (P)
E - Louisiana quillwort *Isoetes louisianensis* (P)
C - Black pine snake *Pituophis melanoleucus lodingi*

Monroe

E - Gray bat *Myotis grisescens*
T - Red hills salamander *Phaeognathus hubrichti*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
E - Alabama sturgeon *Scaphirhynchus suttkusi*
E - Heavy pigtoe mussel *Pleurobema taitianum*
C - Alabama pearlshell *Margaritifera marrianae*
E - Louisiana quillwort *Isoetes louisianensis*

Montgomery

E - Wood stork *Mycteria americana*
T - Bald eagle *Haliaeetus leucocephalus*

Morgan

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalis*
E - Pink mucket pearly mussel *Lampsilis abrupta*
E - Ring pink mussel *Obovaria retusa*
E - Rough pigtoe mussel *Pleurobema plenum*
E - Leafy prairie clover *Dalea foliosa*
T - American hart's-tongue fern *Asplenium scolopendrium* var. *americana*
C - Fleshyfruit gladeceess *Leavenworthia crassa*

Perry

T - Bald eagle *Haliaeetus leucocephalus*

E - Red-cockaded woodpecker *Picoides borealis*
E - Cahaba shiner *Notropis cahabae*
E - Ovate clubshell *Pleurobema perovatum*

Pickens

E - Red-cockaded woodpecker *Picoides borealis*
T - Bald eagle *Haliaeetus leucocephalus*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
T - Alabama moccasinshell mussel *Medionidus acutissimus*
E - Flat pigtoe *Pleurobema marshallii*
T - Inflated heelsplitter *Potamilus inflatus*
E - Southern clubshell mussel *Pleurobema decisum*
E - Ovate clubshell mussel *Pleurobema perovatum*
E - Heavy pigtoe mussel *Pleurobema taitianum*
E - Stirrup shell mussel *Quadrula stapes*

Pike

Randolph

T - Bald eagle *Haliaeetus leucocephalus*
T - Little amphianthus *Amphianthus pusillus*

Russell

E - Shiny-rayed pocketbook mussel *Lampsilis subangulata*
E - Red-cockaded woodpecker *Picoides borealis*
C - Georgia rockcress *Arabis georgiana*

Shelby

E - Gray bat *Myotis grisescens*
E - Indiana bat *Myotis sodalist*
T - Bald eagle *Haliaeetus leucocephalus*
E - Cahaba shiner *Notropis cahabae*
T - Goldline darter *Percina aurolineata*
T - Painted rocksnail *Leptoxis taeniata*
E - Tulotoma snail *Tulotoma magnifica*
E - Southern clubshell mussel *Pleurobema decisum*
E - Triangular kidneyshell mussel *Ptychobranthus greenii*
E - Southern acornshell mussel *Epioblasma othcaloogensis* (P)
T - Fine-lined pocketbook mussel *Lampsilis altilis*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
T - Alabama moccasinshell mussel *Medionidus acutissimus*
E - Cylindrical lioplax (snail) *Lioplax cyclostomaformis*
E - Flat pebblesnail *Lepyrium showalteri*

- T - Round rocksnail *Leptoxis ampla*
- E - Tennessee yellow-eyed grass *Xyris tennesseensis*

St. Clair

- E - Tulotoma snail *Tulotoma magnifica*
- E - Southern acornshell mussel *Epioblasma othcaloogensis*
- E - Triangular kidneyshell mussel *Ptychobranhus greenii*
- E - Southern pigtoe mussel *Pleurobema georgianum*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Upland combshell mussel *Epioblasma metastriata*
- E - Southern clubshell mussel *Pleurobema decisum*
- E - Ovate Clubshell *Pleurobema perovatum*
- E - Alabama leather flower *Clematis socialis*

Sumter

- E - Wood stork *Mycteria Americana*
- T - Bald eagle *Haliaeetus leucocephalus*
- E - Ovate clubshell mussel *Pleurobema perovatum*
- T - Inflated heelsplitter mussel *Potamilus inflatus*
- E - Stirrup shell mussel *Quadrula stapes*
- E - Heavy pigtoe mussel *Pleurobema taitianum*
- T - Gopher tortoise *Gopherus polyphemus*

Talladega

- E - Red-cockaded woodpecker *Picoides borealis*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*
- E - Coosa moccasinshell mussel *Medionidus parvulus*
- E - Southern pigtoe mussel *Pleurobema georgianum*
- E - Southern clubshell *Pleurobema decisum*
- E - Triangular kidneyshell *Ptychobranhus greenii*
- E - Tulotoma snail *Tulotoma magnifica*
- T - Painted rocksnail *Leptoxis taeniata*
- T - Lacy elimia (snail) *Elimia crenatella*

Tallapoosa

- E - Red-cockaded woodpecker *Picoides borealis*
- T - Bald eagle *Haliaeetus leucocephalus*
- T - Fine-lined pocketbook mussel *Lampsilis altilis*

Tuscaloosa

- E - Red-cockaded woodpecker *Picoides borealis*
- E - Wood stork *Mycteria americana*

T - Bald eagle *Haliaeetus leucocephalus*
T - Flattened musk turtle *Sternotherus depressus*
E - Southern clubshell mussel *Pleurobema decisum*
E - Dark pigtoe mussel *Pleurobema furvum*
E - Ovate clubshell mussel *Pleurobema perovatum*
T - Alabama moccasinshell mussel *Medionidus acutissimus*
T - Inflated heelsplitter mussel *Potamilus inflatus*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
E - Mitchell's satyr butterfly *Neonympha mitchellii mitchellii*
C - Black Warrior waterdog *Necturus alabamensis*
C - White fringeless orchid *Platanthera integrilabia*

Walker

T - Flattened musk turtle *Sternotherus depressus*
E - Ovate clubshell mussel *Pleurobema perovatum*
E - Triangular kidneyshell mussel *Ptychobranhus greenii*
T - Fine-lined pocketbook mussel *Lampsilis altilis*
T - Mohr's Barbara's buttons *Marshallia mohrii*
C - Black Warrior waterdog *Necturus alabamensis*

Washington

E - Wood stork *Mycteria americana*
T - Gopher tortoise *Gopherus polyphemus*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
T - Inflated heelsplitter mussel *Potamilus inflatus*
E - Louisiana quillwort *Isoetes louisianensis* (P)
C - Black pine snake *Pituophis melanoleucus lodingi*

Wilcox

T - Bald eagle *Haliaeetus leucocephalus*
E - Wood stork *Mycteria americana* (P)
T - Red hills salamander *Phaenognathus hubrichti*
T - Gulf sturgeon *Acipenser oxyrinchus desotoi*
E - Alabama sturgeon *Scaphirhynchus suttkusi*
E - Heavy pigtoe mussel *Pleurobema taitianum* (P)
C - Alabama pearlshell *Margaritifera marrianae*
C - Georgia rockcress *Arabis georgiana*

Winston

T - Flattened musk turtle *Sternotherus depressus*
E - Red-cockaded woodpecker *Picoides borealis*
T - Orange-nacre mucket mussel *Lampsilis perovalis*
T - Alabama moccasinshell mussel *Medionidus acutissimus*
E - Coosa moccasinshell mussel *Medionidus parvulus*

E - Dark pigtoe mussel *Pleurobema furvum*
 E - Triangular kidneyshell mussel *Ptychobranthus greenii*
 T - Fine-lined pocketbook mussel *Lampsilis altilis*
 E - Ovate clubshell mussel *Pleurobema perovatum*
 T - Kral's water-plantain *Sagittaria secundifolia*
 T - Alabama streak-sorus fern *Thelypteris pilosa* var. *alabamensis*
 C - Rush darter *Etheostoma phytophilum*
 C - Black Warrior waterdog *Necturus alabamensis*
 C - White fringeless orchid *Platanthera integrilabia*

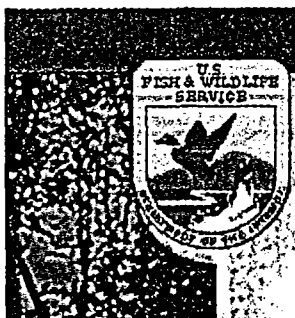
Notes:

- Bald eagles *Haliaeetus leucocephalus*, red-cockaded woodpeckers *Picoides borealis* and American peregrine falcons *Falco peregrinus anatum* may occur in any county, if suitable habitat exists.

Please send comments, questions, or corrections to dan_everson@fws.gov

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U.S. Fish & Wildlife Service

PANAMA CITY FLORIDA

ECOLOGICAL SERVICES & FISHERIES RESOURCES OFFICE

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Threatened, Endangered, and Species of Special Concern (In PDF format)

Bay County
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Franklin County
Gadsden County
Gulf County
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Jackson County
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STATE AND FEDERAL THREATENED, ENDANGERED, AND OTHER SPECIES OF CONCERN
 LIKELY TO OCCUR IN JACKSON COUNTY FLORIDA
 Compiled by U.S. Fish and Wildlife Service January 2006

Common Name	Scientific Name	Status State	Status FWS	Natural Communities
FISH:				
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	SSC	T CH	ESTUARINE: various MARINE: various habitats RIVERINE: alluvial and blackwater streams
Bluestripe shiner	<i>Cyprinella callitaenia</i>		ce	RIVERINE: alluvial stream
Shoal bass	<i>Micropterus sp. (undescribed)</i>	SSC		RIVERINE: alluvial stream
Bluenose shiner	<i>Pteronotropis welaka</i>	SSC		RIVERINE: blackwater, alluvial, and spring-run streams
AMPHIBIANS & REPTILES:				
Flatwoods salamander	<i>Ambystoma cingulatum</i>	SSC	T	PALUSTRINE: wet flatwoods, dome swamp, basin swamp, ruderal TERRESTRIAL: mesic flatwoods (reproduces in ephemeral wetlands within this community)
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T	ESTUARINE: tidal swamp PALUSTRINE: hydric hammock, wet flatwoods TERRESTRIAL: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal
Gopher tortoise	<i>Gopherus polyphemus</i>	SSC	ce	TERRESTRIAL: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal
Barbour's map turtle	<i>Graptemys barbouri</i>	SSC	ce	PALUSTRINE: floodplain stream, floodplain swamp RIVERINE: alluvial stream
Georgia blind salamander	<i>Haideotriton wallacei</i>	SSC	ce	SUBTERRANEAN: aquatic cave
Alligator snapping turtle	<i>Macroclmys temminckii</i>	SSC	ce	ESTUARINE: tidal marsh LACUSTRINE: river floodplain lake, swamp lake RIVERINE: alluvial stream, blackwater stream
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC	ce	LACUSTRINE: ruderal, sandhill upland lake TERRESTRIAL: sandhill, scrubby flatwoods, xeric hammock, ruderal
Suwannee cooter	<i>Pseudemys concinna suwanniensis</i>	SSC		RIVERINE: alluvial stream, blackwater stream, spring-fed stream
Gopher frog	<i>Rana capito</i>	SSC	ce	TERRESTRIAL: sandhill, scrub, scrubby flatwoods, xeric hammock (reproduces in ephemeral wetlands within these communities)
BIRDS:				
Bachman's sparrow	<i>Aimophila aestivalis</i>		ce	TERRESTRIAL: various, ruderal
Limpkin	<i>Aramus guarauna</i>	SSC		LACUSTRINE: various PALUSTRINE: various RIVERINE: various
Little blue heron	<i>Egretta caerulea</i>	SSC		ESTUARINE: marshes, shoreline PALUSTRINE: floodplains, swamps RIVERINE: shoreline

E=endangered, T=threatened, P=proposed, C=candidate, s/a=similar appearance, SSC=species of special concern, ce=consideration encouraged, CH=Critical Habitat

This is not an exhaustive list of where species do occur, but a guide to indicate areas that might require surveys if appropriate habitat exists. Please contact Florida Natural Areas Inventory (850-224-8207) for additional species location information.

STATE AND FEDERAL THREATENED, ENDANGERED, AND OTHER SPECIES OF CONCERN
 LIKELY TO OCCUR IN JACKSON COUNTY FLORIDA
 Compiled by U.S. Fish and Wildlife Service January 2006

Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Snowy egret	<i>Egretta thula</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Tricolored heron	<i>Egretta tricolor</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	E	ce	ESTUARINE: winters along coasts LACUSTRINE: various PALUSTRINE: various TERRESTRIAL: various, ruderal
Southeastern kestrel	<i>Falco sparverius paulus</i>	T	ce	ESTUARINE: various habitats PALUSTRINE: various habitats TERRESTRIAL: open pine forests, clearings, ruderal, various
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	ESTUARINE: marsh edges, tidal swamp, open water LACUSTRINE: swamp lakes, edges PALUSTRINE: swamp, floodplain RIVERINE: shoreline, open water TERRESTRIAL: pine and hardwood forests, clearings
Wood stork	<i>Mycteria americana</i>	E	E	ESTUARINE: marshes LACUSTRINE: floodplain lakes, marshes (feeding), various PALUSTRINE: marshes, swamps, various
Red-cockaded woodpecker	<i>Picoides borealis</i>	SSC	E	TERRESTRIAL: mature pine forests
Black Skimmer	<i>Rynchops niger</i>	SSC		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: ocean beaches, beach dune, ruderal. Nests common on rooftops.
MAMMALS:				
Gray bat	<i>Myotis grisescens</i>	E	E	PALUSTRINE: caves, various TERRESTRIAL: caves, various
Indiana bat	<i>Myotis sodalis</i>	E	E	PALUSTRINE: various TERRESTRIAL: various
Southeastern big-eared bat	<i>Plecotus rafinesquii</i>		ce	PALUSTRINE: various, floodplains TERRESTRIAL: pine and hardwood forests, ruderal, various
INVERTEBRATES:				
Fat threeridge (mussel)	<i>Amblema neislerii</i>		E	RIVERINE: main channels of small to large rivers; slow to moderate currents; various substrates (Panhandle watersheds: Apalachicola, Chipola)

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Rayed creekshell (mussel)	<i>Anodontooides radiatus</i>		ce	RIVERINE: Small to medium sized creeks in substrates of mud, sandy mud, or sand and gravel (Panhandle watersheds: Apalachicola, Chipola, Escambia, Choctawhatchee)
Chipola slabshell (mussel)	<i>Elliptio chipolaensis</i>		T	RIVERINE: main channel of the Chipola River and its larger tributaries; prefers muddy sand and sandy clay substrates, but also found in silty sand substrates (Panhandle watersheds: Chipola upstream of Dead Lake)
Purple bankclimber (mussel)	<i>Elliptoideus sloatianus</i>		T	RIVERINE: small to large rivers in slow to moderate currents over sand, sand mixed with mud, or gravel substrates (Panhandle watersheds: Apalachicola, Ochlockonee)
Southern sandshell	<i>Lampsilis australis</i>		C (E)	Riverine: found in small to medium-sized creeks and rivers in with slow to moderate currents over sandy substrates sometimes with some silt. Endemic to the Escambia, Yellow, and Choctawhatchee River drainages of Alabama and Florida
Shinyrayed pocketbook (mussel)	<i>Lampsilis subangulata</i>		E	RIVERINE: medium-sized creeks to mainstem rivers; clean or silty sand substrates, in slow to moderate currents (Panhandle watersheds: Chipola, Ochlockonee upstream of Lake Talquin)
Gulf moccasinshell (mussel)	<i>Medionidus penicillatus</i>		E	RIVERINE: medium-sized creeks to large rivers with sand and gravel substrates in slow to moderate currents (Panhandle watersheds: Chipola, Econfinia Creek)
Oval pigtoe (mussel)	<i>Pleurobema pyriforme</i>		E	RIVERINE: medium-sized creeks to small rivers; various substrates; slow to moderate currents (Panhandle watersheds: Chipola, Econfinia Creek, Ochlockonee)
tapered pigtoe	<i>Quincuncina burkei</i>		C (T)	Riverine: Small to medium-sized creeks to large rivers in stable sand or sand and gravel substrata, occasionally occurring in silty sand in slow to moderate current. Endemic to the Choctawhatchee River drainage of Alabama and Florida.
Sculptured pigtoe (mussel)	<i>Quincuncina infucata</i>		ce	RIVERINE: small streams to large rivers in sandy, muddy sand, or fine gravel substrates, pools, and rocky areas with swift current, often under debris (Panhandle watersheds: Apalachicola, Chipola)

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Downy rainbow (mussel)	<i>Villosa villosa</i>		ce	RIVERINE: small streams to large rivers in sand or muddy sand substrates (Panhandle watersheds: Apalachicola, Chipola, Escambia, Choctawhatchee, Ochlockonee, Suwannee)
PLANTS:				
Marianna columbine	<i>Aquilegia canadensis var australis</i>	E	ce	PALUSTRINE: floodplain forest TERRESTRIAL: bluff; soil over limestone
Sicklepod	<i>Arabis canadensis</i>	E		TERRESTRIAL: upland mixed forest, limestone outcrops
Apalachicola wild indigo	<i>Baptisia megacarpa</i>	E		PALUSTRINE: floodplain forest TERRESTRIAL: upland mixed forest, slope forest
Flyr's brickell-bush	<i>Brickellia cordifolia</i>	E	ce	TERRESTRIAL: upland hardwood forest, near streams
Buckthorn	<i>Bumelia lycioides</i>	E		PALUSTRINE: bottomland forest, dome swamp, floodplain forest TERRESTRIAL: upland hardwood forest
Buckthorn	<i>Bumelia thornei</i>	E	ce	PALUSTRINE: hydric hammock, floodplain swamp
Wood's poppy-mallow	<i>Callirhoe papaver</i>	E		TERRESTRIAL: upland mixed forest, roadsides; edge or understory
Sweet shrub	<i>Calycanthus floridus</i>	E		TERRESTRIAL: upland hardwood forest, slope forest, bluffs PALUSTRINE: bottomland forest, stream banks, floodplains
Canada honewort	<i>Cryptotaenia canadensis</i>	E		PALUSTRINE: floodplain forest, bottomland forest RIVERINE: alluvial stream bank
Florida anise	<i>Illicium floridanum</i>	T		PALUSTRINE: floodplain forest, baygall RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage slope
Mountain laurel	<i>Kalmia latifolia</i>	T		RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage stream banks
Southern red lily	<i>Lilium catesbaei</i>	T		PALUSTRINE: wet prairie, wet flatwoods, seepage slope TERRESTRIAL: mesic flatwoods, seepage slope; usually with grasses
West's flax	<i>Linum westii</i>	E	ce	PALUSTRINE: dome swamp, depression marsh, wet flatwoods, wet prairie, pond margins
Hummingbird flower	<i>Macranthera flammea</i>	E		PALUSTRINE: seepage slope, dome swamp edges, floodplain swamps RIVERINE: seepage stream banks TERRESTRIAL: seepage slopes
Ashe's magnolia	<i>Magnolia ashei</i>	E		TERRESTRIAL: slope and upland hardwood forest, ravines

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Pyramid magnolia	<i>Magnolia pyramidata</i>	E		TERRESTRIAL: slope forest
Green adder's-mouth	<i>Malaxis unifolia</i>	E		PALUSTRINE: floodplain forest TERRESTRIAL: slope forest, upland mixed forest
Barbara's buttons	<i>Marshallia obovata</i>	E		TERRESTRIAL: sandhill, upland mixed forest
Baldwyn's spiny-pod	<i>Matelea baldwyniana</i>	E	ce	TERRESTRIAL: bluff, upland mixed forest, bottomland forest, roadsides; calcareous soil
Florida spiny-pod	<i>Matelea floridana</i>	E	ce	TERRESTRIAL: upland mixed forest, upland hardwood forest
Allegheny-spurge	<i>Pachysandra procumbens</i>	E		TERRESTRIAL: upland mixed forest, bluff; calcareous soil
Crystal Lake nailwort	<i>Paronychia chartacea minima</i>	E	T	TERRESTRIAL: Karst sandhill lake margins
Purple cliff brake	<i>Pellaea atropurpurea</i>	E		TERRESTRIAL: upland glade
Eastern ninebark	<i>Physocarpus opulifolius</i>	E		RIVERINE: seepage stream banks
Hairy fever tree	<i>Pinckneya bracteata</i>	T		PALUSTRINE: creek swamps, titi swamps, bogs
Chapman's butterwort	<i>Pinguicula planifolia</i>	T	ce	PALUSTRINE: wet flatwoods, seepage slopes, bog, dome swamp, ditches; in water
Yellow fringed orchid	<i>Platanthera ciliaris</i>	T		PALUSTRINE: bogs, wet flatwoods TERRESTRIAL: Bluff
Yellow fringeless orchid	<i>Platanthera integra</i>	E	ce	PALUSTRINE: wet prairie, seepage slope TERRESTRIAL: mesic flatwoods
Snowy orchid	<i>Platanthera nivea</i>	T		PALUSTRINE: bogs
Orange azalea	<i>Rhododendron austrinum</i>	E		PALUSTRINE: bottomland forest RIVERINE: seepage stream bank TERRESTRIAL: slope forest, upland mixed forest
Heart-leaved willow	<i>Salix eriocephala</i>	E		PALUSTRINE: floodplain swamp, alluvial woodlands
Florida willow	<i>Salix floridana</i>	E	ce	PALUSTRINE: hydric hammock, bottomland forest RIVERINE: spring-run stream margins
Nettle-leaved sage	<i>Salvia urticifolia</i>	E		TERRESTRIAL: upland glade
Parrot pitcher plant	<i>Sarracenia psittacina</i>	T		PALUSTRINE: wet flatwoods, wet prairie, seepage slope
Decumbant pitcher plant	<i>Sarracenia purpurea</i>	T		PALUSTRINE: Bogs
Fringed campion	<i>Silene polypetala</i>	E	E	TERRESTRIAL: upland mixed forest, slope forest, and along utility corridors in appropriate habitats.
Gentian pinkroot	<i>Spigelia gentianoides</i>	E	E	TERRESTRIAL: mixed hardwood forest; rich humus
Rue anemone	<i>Thalictrum thalictroides</i>	T		TERRESTRIAL: bluff, slope forest; on limestone
Florida torreyia	<i>Torreya taxifolia</i>	E	E	TERRESTRIAL: slope forest, upland mixed forest, and ravines.

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Narrow-leaved trillium	<i>Trillium lancifolium</i>	E		PALUSTRINE: bottomland forest TERRESTRIAL: upland mixed forest, slope forest
Yellow-root	<i>Xanthorhiza simplicissima</i>	E		RIVERINE: seepage stream; sandy banks
Northern prickly ash	<i>Zanthoxylum americanum</i>	E		TERRESTRIAL: slope forest; calcareous soils

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
FISH				
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	SSC	T CH	ESTUARINE: various MARINE: various habitats RIVERINE: alluvial and blackwater streams
Bluestripe shiner	<i>Cyprinella callitaenia</i>		ce	RIVERINE: alluvial stream
Shoal bass	<i>Micropterus sp. (undescribed)</i>	SSC		RIVERINE: alluvial stream
Bluenose shiner	<i>Pteronotropis welaka</i>	SSC		RIVERINE: blackwater, alluvial, and spring-run streams
AMPHIBIANS & REPTILES				
Flatwoods salamander	<i>Ambystoma cingulatum</i>	SSC	T	PALUSTRINE: wet flatwoods, dome swamp, basin swamp, ruderal TERRESTRIAL: mesic flatwoods (reproduces in ephemeral wetlands within this community)
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T	ESTUARINE: tidal swamp PALUSTRINE: hydric hammock, wet flatwoods TERRESTRIAL: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal
Gopher tortoise	<i>Gopherus polyphemus</i>	SSC	ce	TERRESTRIAL: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal
Barbour's map turtle	<i>Graptemys barbouri</i>	SSC	ce	PALUSTRINE: floodplain stream, floodplain swamp RIVERINE: alluvial stream
Georgia blind salamander	<i>Haideotriton wallacei</i>	SSC	ce	SUBTERRANEAN: aquatic cave
Alligator snapping turtle	<i>Macroclermys temminckii</i>	SSC	ce	ESTUARINE: tidal marsh LACUSTRINE: river floodplain lake, swamp lake RIVERINE: alluvial stream, blackwater stream
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC	ce	LACUSTRINE: ruderal, sandhill upland lake TERRESTRIAL: sandhill, scrubby flatwoods, xeric hammock, ruderal
Suwannee cooter	<i>Pseudemys concinna suwanniensis</i>	SSC		RIVERINE: alluvial stream, blackwater stream, spring-fed stream
Gopher frog	<i>Rana capito</i>	SSC	ce	TERRESTRIAL: sandhill, scrub, scrubby flatwoods, xeric hammock (reproduces in ephemeral wetlands within these communities)
BIRDS				
Bachman's sparrow	<i>Aimophila aestivalis</i>		ce	TERRESTRIAL: various, ruderal
Limpkin	<i>Aramus guarauna</i>	SSC		LACUSTRINE: various PALUSTRINE: various RIVERINE: various
Little blue heron	<i>Egretta caerulea</i>	SSC		ESTUARINE: marshes, shoreline PALUSTRINE: floodplains, swamps RIVERINE: shoreline

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Snowy egret	<i>Egretta thula</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Tricolored heron	<i>Egretta tricolor</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	E	ce	ESTUARINE: winters along coasts LACUSTRINE: various PALUSTRINE: various TERRESTRIAL: various, ruderal
Southeastern kestrel	<i>Falco sparverius paulus</i>	T	ce	ESTUARINE: various habitats PALUSTRINE: various habitats TERRESTRIAL: open pine forests, clearings, ruderal, various
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	ESTUARINE: marsh edges, tidal swamp, open water LACUSTRINE: swamp lakes, edges PALUSTRINE: swamp, floodplain RIVERINE: shoreline, open water TERRESTRIAL: pine and hardwood forests, clearings
Wood stork	<i>Mycteria americana</i>	E	E	ESTUARINE: marshes LACUSTRINE: floodplain lakes, marshes (feeding), various PALUSTRINE: marshes, swamps, various
Red-cockaded woodpecker	<i>Picoides borealis</i>	SSC	E	TERRESTRIAL: mature pine forests
Black Skimmer	<i>Rynchops niger</i>	SSC		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: ocean beaches, beach dune, ruderal. Nests common on rooftops.
MAMMALS				
Gray bat	<i>Myotis grisescens</i>	E	E	PALUSTRINE: caves, various TERRESTRIAL: caves, various
Indiana bat	<i>Myotis sodalis</i>	E	E	PALUSTRINE: various TERRESTRIAL: various
Southeastern big-eared bat	<i>Plecotus rafinesquii</i>		ce	PALUSTRINE: various, floodplains TERRESTRIAL: pine and hardwood forests, ruderal, various
INVERTEBRATES				
Fat threeridge (mussel)	<i>Amblema neisleri</i>		E	RIVERINE: main channels of small to large rivers; slow to moderate currents; various substrates (Panhandle watersheds: Apalachicola, Chipola)

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Rayed creekshell (mussel)	<i>Anodontoides radiatus</i>		ce	RIVERINE: Small to medium sized creeks in substrates of mud, sandy mud, or sand and gravel (Panhandle watersheds: Apalachicola, Chipola, Escambia, Choctawhatchee)
Chipola slabshell (mussel)	<i>Elliptio chipolaensis</i>		T	RIVERINE: main channel of the Chipola River and its larger tributaries; prefers muddy sand and sandy clay substrates, but also found in silty sand substrates (Panhandle watersheds: Chipola upstream of Dead Lake)
Purple bankclimber (mussel)	<i>Elliptoideus sloatianus</i>		T	RIVERINE: small to large rivers in slow to moderate currents over sand, sand mixed with mud, or gravel substrates (Panhandle watersheds: Apalachicola, Ochlockonee)
Southern sandshell	<i>Lampsilis australis</i>		C (E)	Riverine: found in small to medium-sized creeks and rivers in with slow to moderate currents over sandy substrates sometimes with some silt. Endemic to the Escambia, Yellow, and Choctawhatchee River drainages of Alabama and Florida
Shinyrayed pocketbook (mussel)	<i>Lampsilis subangulata</i>		E	RIVERINE: medium-sized creeks to mainstem rivers; clean or silty sand substrates, in slow to moderate currents (Panhandle watersheds: Chipola, Ochlockonee upstream of Lake Talquin)
Gulf moccasinshell (mussel)	<i>Medionidus penicillatus</i>		E	RIVERINE: medium-sized creeks to large rivers with sand and gravel substrates in slow to moderate currents (Panhandle watersheds: Chipola, Econfinia Creek)
Oval pigtoe (mussel)	<i>Pleurobema pyriforme</i>		E	RIVERINE: medium-sized creeks to small rivers; various substrates; slow to moderate currents (Panhandle watersheds: Chipola, Econfinia Creek, Ochlockonee)
tapered pigtoe	<i>Quincuncina burkei</i>		C (T)	Riverine: Small to medium-sized creeks to large rivers in stable sand or sand and gravel substrata, occasionally occurring in silty sand in slow to moderate current. Endemic to the Choctawhatchee River drainage of Alabama and Florida.
Sculptured pigtoe (mussel)	<i>Quincuncina infucata</i>		ce	RIVERINE: small streams to large rivers in sandy, muddy sand, or fine gravel substrates, pools, and rocky areas with swift current, often under debris (Panhandle watersheds: Apalachicola, Chipola)

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Downy rainbow (mussel)	<i>Villosa villosa</i>		ce	RIVERINE: small streams to large rivers in sand or muddy sand substrates (Panhandle watersheds: Apalachicola, Chipola, Escambia, Choctawhatchee, Ochlockonee, Suwannee)
PLANTS				
Marianna columbine	<i>Aquilegia canadensis</i> var <i>australis</i>	E	ce	PALUSTRINE: floodplain forest TERRESTRIAL: bluff; soil over limestone
Sicklepod	<i>Arabis canadensis</i>	E		TERRESTRIAL: upland mixed forest, limestone outcrops
Apalachicola wild indigo	<i>Baptisia megacarpa</i>	E		PALUSTRINE: floodplain forest TERRESTRIAL: upland mixed forest, slope forest
Fly's brickell-bush	<i>Brickellia cordifolia</i>	E	ce	TERRESTRIAL: upland hardwood forest, near streams
Buckthorn	<i>Bumelia lycioides</i>	E		PALUSTRINE: bottomland forest, dome swamp, floodplain forest TERRESTRIAL: upland hardwood forest
Buckthorn	<i>Bumelia thornel</i>	E	ce	PALUSTRINE: hydric hammock, floodplain swamp
Wood's poppy-mallow	<i>Callirhoe papaver</i>	E		TERRESTRIAL: upland mixed forest, roadsides; edge or understory
Sweet shrub	<i>Calycanthus floridus</i>	E		TERRESTRIAL: upland hardwood forest, slope forest, bluffs PALUSTRINE: bottomland forest, stream banks, floodplains
Canada honewort	<i>Cryptotaenia canadensis</i>	E		PALUSTRINE: floodplain forest, bottomland forest RIVERINE: alluvial stream bank
Florida anise	<i>Illicium floridanum</i>	T		PALUSTRINE: floodplain forest, baygall RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage slope
Mountain laurel	<i>Kalmia latifolia</i>	T		RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage stream banks
Southern red lily	<i>Lilium catesbaei</i>	T		PALUSTRINE: wet prairie, wet flatwoods, seepage slope TERRESTRIAL: mesic flatwoods, seepage slope; usually with grasses
West's flax	<i>Linum westii</i>	E	ce	PALUSTRINE: dome swamp, depression marsh, wet flatwoods, wet prairie, pond margins
Hummingbird flower	<i>Macranthera flammea</i>	E		PALUSTRINE: seepage slope, dome swamp edges, floodplain swamps RIVERINE: seepage stream banks TERRESTRIAL: seepage slopes
Ashe's magnolia	<i>Magnolia ashei</i>	E		TERRESTRIAL: slope and upland hardwood forest, ravines

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Pyramid magnolia	<i>Magnolia pyramidata</i>	E		TERRESTRIAL: slope forest
Green adder's-mouth	<i>Malaxis unifolia</i>	E		PALUSTRINE: floodplain forest TERRESTRIAL: slope forest, upland mixed forest
Barbara's buttons	<i>Marshallia obovata</i>	E		TERRESTRIAL: sandhill, upland mixed forest
Baldwyn's spiny-pod	<i>Matelea baldwyniana</i>	E	ce	TERRESTRIAL: bluff, upland mixed forest, bottomland forest, roadsides; calcareous soil
Florida spiny-pod	<i>Matelea floridana</i>	E	ce	TERRESTRIAL: upland mixed forest, upland hardwood forest
Allegheny-spurge	<i>Pachysandra procumbens</i>	E		TERRESTRIAL: upland mixed forest, bluff; calcareous soil
Crystal Lake nailwort	<i>Paronychia chartacea minima</i>	E	T	TERRESTRIAL: Karst sandhill lake margins
Purple cliff brake	<i>Pellaea atropurpurea</i>	E		TERRESTRIAL: upland glade
Eastern ninebark	<i>Physocarpus opulifolius</i>	E		RIVERINE: seepage stream banks
Hairy fever tree	<i>Pinckneya bracteata</i>	T		PALUSTRINE: creek swamps, titi swamps, bogs
Chapman's butterwort	<i>Pinguicula planifolia</i>	T	ce	PALUSTRINE: wet flatwoods, seepage slopes, bog, dome swamp, ditches; in water
Yellow fringed orchid	<i>Platanthera ciliaris</i>	T		PALUSTRINE: bogs, wet flatwoods TERRESTRIAL: Bluff
Yellow fringeless orchid	<i>Platanthera integra</i>	E	ce	PALUSTRINE: wet prairie, seepage slope TERRESTRIAL: mesic flatwoods
Snowy orchid	<i>Platanthera nivea</i>	T		PALUSTRINE: bogs
Orange azalea	<i>Rhododendron austrinum</i>	E		PALUSTRINE: bottomland forest RIVERINE: seepage stream bank TERRESTRIAL: slope forest, upland mixed forest
Heart-leaved willow	<i>Salix eriocephala</i>	E		PALUSTRINE: floodplain swamp, alluvial woodlands
Florida willow	<i>Salix floridana</i>	E	ce	PALUSTRINE: hydric hammock, bottomland forest RIVERINE: spring-run stream margins
Nettle-leaved sage	<i>Salvia urticifolia</i>	E		TERRESTRIAL: upland glade
Parrot pitcher plant	<i>Sarracenia psittacina</i>	T		PALUSTRINE: wet flatwoods, wet prairie, seepage slope
Decumbant pitcher plant	<i>Sarracenia purpurea</i>	T		PALUSTRINE: Bogs
Fringed campion	<i>Silene polypetala</i>	E	E	TERRESTRIAL: upland mixed forest, slope forest, and along utility corridors in appropriate habitats.
Gentian pinkroot	<i>Spigelia gentianoides</i>	E	E	TERRESTRIAL: mixed hardwood forest; rich humus
Rue anemone	<i>Thalictrum thalictroides</i>	T		TERRESTRIAL: bluff, slope forest; on limestone
Florida torreya	<i>Torreya taxifolia</i>	E	E	TERRESTRIAL: slope forest, upland mixed forest, and ravines.

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Narrow-leaved trillium	<i>Trillium lancifolium</i>	E		PALUSTRINE: bottomland forest TERRESTRIAL: upland mixed forest, slope forest
Yellow-root	<i>Xanthorhiza simplicissima</i>	E		RIVERINE: seepage stream; sandy banks
Northern prickley ash	<i>Zanthoxylum americanum</i>	E		TERRESTRIAL: slope forest; calcareous soils

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Altamaha River Basin Management Plan 2003

Preface

This report was prepared by the Environmental Protection Division (EPD), Georgia Department Natural Resources (EPD), as required by O.C.G.A. 12-5-520 and as a public information document. It represents a synoptic extraction of the EPD files and, in certain cases, information has been presented in summary form from those files. The reader is therefore advised to use this condensed information with the knowledge that it is a summary document and more detailed information is available in the EPD files.

Comments or questions related to the content of this report are invited and should be addressed to:

Environmental Protection Division
Georgia Department of Natural Resources
Floyd Towers East
205 Butler Street, S.E.
Atlanta, Georgia 30334

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List of Acronyms and Abbreviations

Ac	acre	DNR	Georgia Department of Natural Resources
Ac-ft	acre-feet	DO	dissolved oxygen
ACCG	Association of County Commissioners of Georgia	EPA	U.S. Environmental Protection Agency
ACF	Apalachicola-Chattahoochee-Flint Basin	EPD	Georgia Environmental Protection Division
ACT/ACF	Alabama-Coosa-Tallapoosa/Apalachicola-Chattahoochee Flint Basin	EQIP	Environmental Quality Incentives Program
ADEM	Alabama Department of Environmental Management	E&SC	Erosion and Sedimentation Control Act
ARC	Atlanta Regional Commission	FEMA	Federal Emergency Management Agency
ARS	USDA Agricultural Research Service	FFY	Federal fiscal year
ASR	aquifer storage and recovery	FIP	Forestry Incentives Program
BMPs	best management practices	FSA	Farm Service Agency
BOD	biochemical oxygen demand	ft	feet
CAES	University of Georgia College of Agricultural and Environmental Sciences	ft ² /d	square feet per day
Cd	cadmium	ft ³ /s	cubic feet per second
CFR	Code of Federal Regulations	gal/m	gallons per minute
COE	U.S. Army Corps of Engineers	GDA	Georgia Department of Agriculture
CPUE	catch per unit effort (fishing)	GEMA	Georgia Emergency Management Agency
CRMP	Chattahoochee River Modeling Project	GFA	Georgia Forestry Association
CRP	Conservation Reserve Program	GFC	Georgia Forestry Commission
CSGWPP	Comprehensive State Ground Water Protection Plan	GMA	Georgia Municipal Association
CSMTF	Community Stream Management Task Force	GPC	Georgia Power Company
CSO	Combined Sewer Overflow	GPD	gallons per day
Cu	copper	GPM	gallons per minute
CWA	U.S. Clean Water Act	GSWCC	Georgia Soil and Water Conservation Commission
DCA	Georgia Department of Community Affairs	Hg	mercury
		HUC	Hydrologic unit code (USGS)
		IBI	Index of Biotic Integrity
		kg	kilogram

km ²	square kilometer	RBMP	River Basin Management Planning
kW	kilowatt	RBP	Rapid Bioassessment Protocol
LAS	land application system for wastewater	RC&D	Resource Conservation and Development Council
LUST	leaking underground storage tank	RDC	Regional Development Center
MCL	Maximum Contaminant Level for drinking water	RM	river mile
meq/l	milliequivalent	SCS	Soil Conservation Service (now NRCS)
mg/l	milligrams per liter	SMZs	Streamside Management Zones
MG	million gallons	SOCs	Synthetic Organic Chemicals
MGD	million gallons per day	STATSGO	State Soil Geographic Database (USDA)
mi ²	square miles	SWCD	Soil and Water Conservation District
ml	milliliter	TMDL	Total Maximum Daily Load, as specified in the CWA
MLMP	Major Lakes Monitoring Project	TTSI	Georgia combined lake trophic state index
MLRA	major land resource area	UGA	University of Georgia
MOU	memorandum of understanding	USACE	U.S. Army Corps of Engineers
MPN	most probable number (for quantification of fecal coliform bacteria)	USDA	U.S. Department of Agriculture
MSA	Atlanta Metropolitan Statistic Area	USEPA	U.S. Environmental Protection Agency
MS4	municipal separate stormwater system	USF&WS	U.S. Fish and Wildlife Service
M&I	municipal and industrial	USGS	U.S. Geological Survey
NFIP	National Flood Insurance Program	WET	whole effluent toxicity
ng/L	nanograms per liter	WHIP	Wildlife Habitat Incentives Program
NOI	notice of intent	WPCP	water pollution control plant
NPDES	National Pollution Discharge Elimination System	WRD	Georgia Wildlife Resources Division
NPS	nonpoint source	WRP	Wetland Reserve Program
NRCS	Natural Resources Conservation Service of USDA	WWTP	wastewater treatment plant
NSSP	National Shellfish Sanitation Program	Zn	zinc
NURE	National Uranium Resource Evaluation	µg/l	micrograms per liter
NWI	National Wetlands Inventory (USF&WS)	7Q10	7-day average low flow with a once-in-ten-year recurrence interval
Pb	lead		
PCB	polychlorinated biphenyl		
PFA	public fishing area		
ppm	parts per million; equivalent to mg/l		

Executive Summary

This document presents Georgia's management plan for the Altamaha River basin, which is being produced as a part of Georgia's River Basin Management Planning (RBMP) approach. The Georgia Environmental Protection Division (EPD) has developed this plan in cooperation with several other agency partners including the USDA Natural Resources Conservation Commission, Georgia Soil and Water Conservation Commission, Georgia Forestry Commission, U.S. Geological Survey, Georgia Geological Survey, and Georgia Wildlife Resources Division. The RBMP approach provides the framework for identifying, assessing, and prioritizing water resources issues, developing management strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply.

Purpose of the Basin Plan

The purpose of this plan is to provide relevant information on the characteristics of the Altamaha River basin, describe the status of water quality and quantity in the Altamaha River basin, identify present and future water resource demands, present and facilitate the implementation of water quality protection efforts, and enhance stakeholder understanding and involvement in basin planning.

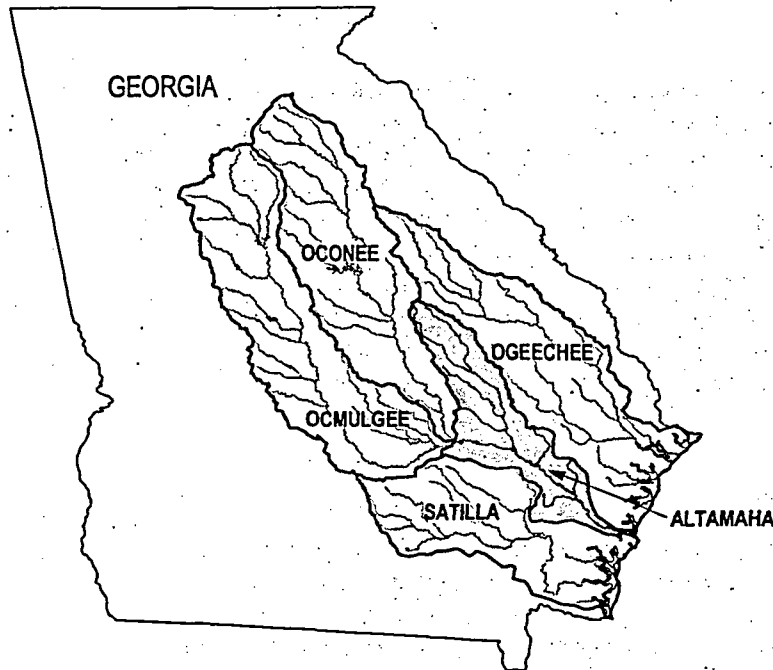
This Altamaha River Basin Management Plan includes strategies to address a number of different basinwide objectives. These include:

- Protecting water quality in lakes, rivers, streams, estuaries, and coastal waters through attainment of water quality standards and support for designated uses;
- Providing adequate, high quality water supply for municipal, agricultural, industrial, environmental, and other human activities;
- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems;
- Protecting human health and welfare through prevention of water-borne disease; minimization of risk from contaminated fish tissue, and reduction of risks from flooding; and
- Ensuring opportunities for economic growth, development, and recreation in the region.

Achieving these objectives is the responsibility of a variety of state and federal agencies, local governments, business, industry, and individual citizens. Coordination among these many partners can be challenging, and impacts of actions in one locale by one partner on conditions elsewhere in the basin are not always understood or considered. River Basin Management Planning is an attempt to bring together stakeholders in the basin to increase coordination and to provide a mechanism for communication and consideration of actions on a broad scale to support water resource objectives for the

entire basin. RBMP provides the framework to begin to understand the consequences of local decisions on basinwide water resources.

This river basin plan will serve as the road map for managing the water resources in the Altamaha River basin over the next five years. It contains useful information on the health of the Altamaha River basin and recommended strategies to protect the basin now and into the future.



Altamaha River Basin Characteristics

The Altamaha River basin is located in the southeast part of Georgia, occupying an area of approximately 2,850 square miles. The basin lies within the Coastal Plain physiographic province, which extends throughout the southeastern United States. The Altamaha River drains into the Atlantic Ocean.

Water Resources

The surface water resources of the basin are divided into two major watersheds or hydrologic units: the Altamaha River subbasin and the Ochopee River subbasin.

Biological Resources

The basin encompasses parts of two major land resource areas (Southern Coastal Plains and Atlantic Coast Flatwoods) providing many different ecosystem types. These ecosystems provide habitat for diverse species of aquatic and terrestrial wildlife. Several of the species are currently threatened or endangered.

Population and Land Use Characteristics

The major population centers in the Altamaha River basin include the cities of Wrightsville, Lyons, Reidsville, Hazlehurst, Jesup and Darien. The population is expected to increase at an average growth rate through 2050.

More than 44 percent of the basin is covered by forests and forestry-related activities account for a major part of the basin's economy. Agriculture is also a significant land use activity supporting a variety of animal operations and commodity production.

Local Governments and Planning Authorities

The local governments in the basin consist of counties and incorporated municipalities. The Altamaha basin includes part or all of 14 Georgia counties. These counties are members of three different Regional Development Centers.

Water Quantity Conditions

Surface water supplies in the basin include water in rivers, ponds, and reservoirs. Groundwater is the primary water source in the Altamaha River basin. In the Coastal Plain Province, aquifer yields are higher and groundwater withdrawals make up the majority of the total water budget.

The primary demands for water supply in the basin include municipal and industrial use, agricultural use, and recreation. The demand for drinking water is expected to remain stable in the near future due to average population growth rates. Agricultural water demand in the Altamaha River basin has increased over the last three decades and is expected to increase in the future.

Water Quality Conditions

The major environmental stressors that impair or threaten water quality in the Altamaha River basin include traditional chemical stressors, such as oxygen demanding substances, metals, and bacterial contamination, as well as less traditional stressors, such as stream channel modifications and alteration of physical habitat.

Significant potential sources of environmental stressors in the basin include point source discharges such as municipal and industrial wastewater and storm sewers; and nonpoint sources that result from diffuse runoff from urban and rural land uses. Based on EPD's 2000-2001 water quality assessment, urban runoff and rural nonpoint sources are now the major sources of failure to support designated uses of water bodies in the Altamaha basin.

Point Sources

Point sources are defined as the permitted discharges of treated wastewater to rivers and tributaries that are regulated under the National Pollutant Discharge Elimination System (NPDES). These permits are issued by EPD for wastewater discharges and storm water discharges.

Municipal discharges. There are currently four permitted major municipal treated wastewater discharges with flows greater than 1 MGD in the Altamaha River basin. There are also 14 minor public discharges. EPD monitors compliance of these permits and takes appropriate enforcement action for violations. As of the 2000-2001 water quality assessment, three stream segments (19 miles) were identified in which municipal discharges contributed to a failure to support designated uses. Total maximum daily loads (TMDLs) and implementation plans were finalized for these segments in 2002.

Industrial discharges. There are a number of industrial wastewater dischargers in the basin including one major and six minor facilities. As of the 2000-2001 water quality assessment, there were no stream segments identified in which industrial discharges contributed to a failure to support designated uses.

Permitted stormwater discharges. Urban stormwater runoff in the Altamaha basin has been identified as a source of water quality impairment. Urban runoff which is collected by storm sewers is now subject to NPDES permitting and control.

Nonpoint Sources

Nonpoint sources of pollution include a variety of pollutants that are carried across the ground with rainwater or snowmelt and are deposited in water bodies. The 2000-2001 water quality assessment results for the Altamaha basin indicate that urban and rural nonpoint sources contribute significantly to failure to support designated uses of water bodies. The major categories of nonpoint source pollution in the basin include the following:

- Urban, industrial, and residential sources, which may contribute stormwater runoff, unauthorized discharges, oxygen-demanding waste, oil and grease, nutrients, metals, bacteria, and sediments.
- Agricultural sources, which may contribute nutrients from animal wastes and fertilizers, sediment, herbicides/pesticides, and bacteria and pathogens.
- Forestry activities, which may contribute sediments and herbicides/pesticides.

Support of Designated Uses

Under Georgia regulations, designated uses and associated water quality standards provide goals for water quality protection. EPD assessed waters in the Altamaha basin and reported the results in the *Georgia 2002 305(b)/303(d) List*. The criteria listed most frequently in the 2002 list as contributing to not supporting or partially supporting status was dissolved oxygen, followed by fecal coliform bacteria and fish consumption issues.

Key Environmental Stressors

The major threats to water quality in the Altamaha River basin are summarized below.

Dissolved oxygen. The 2000-2001 water quality assessments indicated low dissolved oxygen was one of the most commonly listed causes of failure to fully support designated uses. Oxygen consuming substances may be discharged to streams from point and nonpoint sources. In general, nonpoint sources are the most significant sources at this time. Severe drought conditions across Georgia during the 1999-2002 period were a significant contributing factor to the low dissolved oxygen concentrations documented in the Altamaha River and its tributaries.

Fecal coliform bacteria. The 2000-2001 water quality assessments indicated that fecal coliform bacteria was commonly listed as a cause of failure to support designated uses. Fecal coliform bacteria may arise from point and nonpoint sources, such as wastewater treatment plants, agricultural nonpoint sources, leaking septic systems, and stormwater runoff. As point sources have been brought under control in the basin, nonpoint sources have become increasingly important as potential sources of fecal coliform bacteria.

Fish tissue contamination. Fish consumption issues for individual fish species are also a concern in the Altamaha River basin and contributed to the listing of a number of waters as not fully supporting designated uses. The fish consumption issues are associated with mercury primarily from air deposition.

Sediment loading and habitat degradation. A healthy aquatic ecosystem requires a healthy physical habitat. One major cause of disturbance to stream habitats is erosion and sedimentation. As sediment is carried into the stream, it can change the stream bottom, and may smother sensitive organisms. Turbidity associated with sediment loading also may potentially impair recreational and drinking water uses. Sediment loading is of greatest concern in developing areas and major transportation corridors. The rural areas of the basin are of lesser concern with the exception of rural unpaved road systems, areas where cultivated cropland exceeds 20 percent of the total land cover, and areas in which foresters are not following appropriate management practices.

Strategies for Water Supply

At this time, water quantity appears to be adequate for all uses in the Altamaha River basin. There are, however, several water quantity concerns in the Altamaha basin, including drought response planning and strategies for protection of the Floridan aquifer, which are of significance to decision makers.

Strategies for Water Quality

Water quality in the Altamaha River basin is generally good at this time, although problems remain to be addressed and proactive planning is needed to protect water quality into the future. Many actions have already been taken to protect water quality. Programs implemented by federal, state, and local governments, farmers, foresters, and other individuals have greatly helped to protect and improve water quality in the basin over the past 20 years.

The primary source of pollution that continues to affect waters of the Altamaha River basin results from nonpoint sources. These problems result from the cumulative effect of activities of many individual landowners or managers. Population is growing every year, increasing the potential risks from nonpoint source pollution. Growth is essential to the economic health of the Altamaha River basin, yet growth without proper land use planning and implementation of best management practices to protect streams and rivers can create harmful impacts on the environment.

Because there are many small sources of nonpoint loading spread throughout the watershed, nonpoint sources of pollution cannot effectively be controlled by state agency permitting and enforcement, even where regulatory authority exists. Rather, control of nonpoint loading will require the cooperative efforts of many partners, including state and federal agencies, individual landowners, agricultural and forestry interests, local county and municipal governments, and Regional Development Centers. A combination of regulatory and voluntary land management practices will be necessary to maintain and improve the water quality of rivers, streams, and lakes in the Altamaha River basin.

Key Actions by EPD. The Georgia EPD Water Protection Branch has responsibility for establishing water quality standards, monitoring water quality, river basin planning, water quality modeling, permitting and enforcement of point source NPDES permits, and developing Total Maximum Daily Loads (TMDLs) and implementation plans where ongoing actions are not sufficient to achieve water quality standards. Much of this work is regulatory. EPD is also one of several agencies responsible for facilitating, planning, and educating the public about management of nonpoint source pollution. Nonpoint source programs implemented by Georgia and by other states across the nation are voluntary in nature. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and groundwater resources for municipal and agricultural uses, which includes source water assessment and protection activities in compliance with the Safe Drinking Water Act.

Actions being taken by EPD at the state level to address water quality problems in the Altamaha River basin include the following:

- **Watershed Assessments and Watershed Protection Implementation Plans.** When local governments propose to expand an existing wastewater facility, or propose a new facility, EPD requires a comprehensive watershed assessment and development of a watershed protection implementation plan.
- **Total Maximum Daily Loads (TMDLs).** Where water quality sampling has documented standards violations and ongoing actions are not sufficient to achieve water quality standards, a TMDL will be established for a specific pollutant on the specific stream segment in accordance with EPA guidance. TMDLs were established for 303(d) listed waters in the Altamaha River basin in 2002. Implementation plans were also finalized in 2002. This work represents a significant step in advancing the watershed approach in Georgia. Work was done to develop a TMDL for each individual pollutant not achieving water quality standards. The TMDL was public noticed and comments were considered prior to finalizing the TMDL. In those situations where point sources caused the water quality problem, the results of the TMDL will be implemented through the NPDES permitting program. NPDES permit conditions will be modified to support the implementation of the TMDL. Where nonpoint sources were the cause of the problem, in many cases the EPD contracted with the local Regional Development Center (RDC) to develop an implementation plan to address the problem. Each RDC brought together local stakeholder groups familiar with the individual watersheds to provide input and insight in developing each TMDL implementation plan. In this manner the development of the plans can be locally led and implemented.
- **Source Water Protection.** Most of the public water supply in the Altamaha basin is drawn from groundwater. To provide for the protection of public water supplies, Georgia EPD is developing a Source Water Assessment Program in alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding EPA guidelines.
- **Fish Consumption Guidelines.** EPD and the Wildlife Resources Division work to protect public health by testing fish tissue and issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Key Actions by Resource Management Agencies. Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide non-regulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs. Agriculture in the Altamaha River basin is a mixture of livestock and poultry operations and commodity production. Key partners for controlling agricultural nonpoint source pollution are the Soil and Water Conservation Districts, Georgia Soil and Water Conservation Commission, and the USDA Natural Resources Conservation Service. These partners promote the use of environmentally-sound Best Management Practices (BMPs) through education, demonstration projects, and financial assistance.

One program, the Environmental Quality Incentive Program (EQUIP), authorized by the Farm Bill provides incentive payments and cost-sharing for conservation projects through 5- to 10-year contracts. An individual producer can receive as much as \$450,000 (federal cost share up to 50 percent) in EQUIP funds over 10 years for contracts initiated between FY 2002 and FY 2007.

Forestry is a major part of the economy in the Altamaha basin and commercial forestlands represent over 69 percent of the total basin land area. The Georgia Forestry Commission (GFC) is the lead agency for controlling silvicultural nonpoint source pollution. The GFC develops forestry practice guidelines, encourages BMP implementation, conducts education, investigates and mediates complaints involving forestry operations, and conducts BMP compliance surveys.

Key Actions by Local Governments. Addressing water quality problems resulting from nonpoint source pollution will primarily depend on actions taken at the local level. Particularly for nonpoint sources associated with urban and residential development, it is only at the local level that regulatory authority exists for zoning and land use planning, control of erosion and sedimentation from construction activities, and regulation of septic systems.

Local governments are increasingly focusing on water resource issues. In many cases, the existence of high quality water has not been recognized and managed as an economic resource by local governments. That situation is now changing due to a variety of factors, including increased public awareness, high levels of population growth in many areas resulting in a need for comprehensive planning, recognition that high quality water supplies are limited, and new state-level actions and requirements. The latter include:

- Requirements for Watershed Assessments and Watershed Protection Implementation Plans when permits for expanded or new municipal wastewater discharges are requested;
- Development of Source Water Protection Plans to protect public drinking water supplies;
- Requirements for local comprehensive planning, including protection of natural and water resources, as promulgated by the Georgia Department of Community Affairs.
- Development of TMDLs and the development of implementation plans by RDCs and local stakeholder groups.

In sum, it is the responsibility of local governments to implement planning for future development which takes into account management and protection of the water quality of rivers, streams, and lakes within their jurisdiction. One of the most important actions that local governments should take to ensure recognition of local needs while protecting water resources is to participate in the basin planning process, either directly or through Regional Development Centers.

Continuing RBMP in the Altamaha River Basin

This basin plan represents one step in managing the water resources in the Altamaha basin. EPD, its resource management agency partners, local governments, and basin stakeholders will need to work together to implement the plan in the coming months and years. Additionally, the basin planning cycle provides the opportunity to update management priorities and strategies every five years. Agencies and organizations with technical expertise, available resources, and potential implementation responsibilities are encouraged to continue to contribute to the planning and implementation processes. Other stakeholders can stay involved through working with state and local agencies, and participating in locally initiated watershed planning and TMDL implementation activities. An update of the Altamaha River basin plan is planned for 2007.

In This Section

- What Is the Purpose of This Plan?
- What's Inside?
- How Do I Use This Plan?
- What Is the Schedule of Activities for the Altamaha River Basin?
- How Do Stakeholders Get Involved in the Basin Planning Process?
- What's Next?

Section I

Introduction

What Is the Purpose of This Plan?

This document presents Georgia's river basin management plan for the Altamaha River, which is being produced as a part of Georgia's River Basin Management Planning (RBMP) approach. The purpose of this plan is to provide relevant information on the Altamaha River basin characteristics, describe the status of water quality and quantity in the Altamaha River basin, identify present and future water resource demands, present and facilitate the implementation of water protection efforts, and enhance stakeholder understanding and involvement in basin planning.

This plan has been produced by the Georgia Department of Natural Resources Environmental Protection Division (EPD), based on data and information gathered by EPD, other state and federal agencies, universities, utilities, consultants, and environmental groups. A basin team made up of representatives from the Georgia Soil and Water Conservation Commission (GSWCC), the Natural Resources Conservation Service (NRCS), Georgia Department of Natural Resources Wildlife Resources Division (WRD), Georgia Forestry Commission (GFC), and EPD's Water Resources Branch, Water Protection Branch, and Geologic Survey Branch compiled the information to generate the plan. The U.S. Geological Survey (USGS) and the EPD Geologic Survey Branch created the majority of the figures in this report using geographic information system technologies.

River Basin Management Planning

RBMP is designed to coordinate management of water quantity and quality within river basins by integrating activities across regulatory and non-regulatory programs (Appendix A). The RBMP approach provides the framework for identifying, assessing, and prioritizing water resources issues, developing management strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply. RBMP includes opportunities for stakeholders in the state's river basins to participate in developing and implementing

river basin management plans. These plans will benefit from the collective experience and combined resources of a variety of stakeholders.

Initial Efforts for the Altamaha River Basin

Begun in 1993, RBMP is a new approach to the management of Georgia's water resources. This is the first river basin management plan produced under RBMP for the Altamaha River (Figure 1-1).

What's Inside?

This plan is organized into the following sections:

Executive Summary

The executive summary provides a broad perspective on the condition of the basin and the management strategies recommended to protect and enhance the Altamaha River basin's water resources.

1.0 Introduction

The introduction provides a brief description of Georgia's River Basin Management Planning approach, the planning cycle for the Altamaha River basin, opportunities for stakeholder involvement, and a description of how to use this document.

2.0 River Basin Characteristics

This chapter provides a description of the basin and its important characteristics, including boundaries, climate, physiography and geology, geochemistry, soils, surface water resources, groundwater resources, biological resources, population and land use, local government and jurisdictions, and water use classifications.

3.0 Water Quantity

This chapter describes current surface and groundwater availability, as well as forecasts for future demand. This chapter also includes sections on historic, present and possible proposed permitting activities pertaining to water availability.

4.0 Environmental Stressors

This chapter describes the major stressors in the basin that may impair water or habitat quality. The stressors are divided into point sources (i.e., NPDES permitted discharges) and nonpoint sources.

5.0 Assessment

This chapter provides an assessment of water quality and quantity in the streams, lakes, estuaries, and groundwater along with an assessment of the basin's biological integrity. The data sources and analysis techniques for these assessments are also discussed.

6.0 Concerns and Priority Issues

This chapter summarizes and prioritizes the issues of concern that were identified through the assessment in Chapter 5.

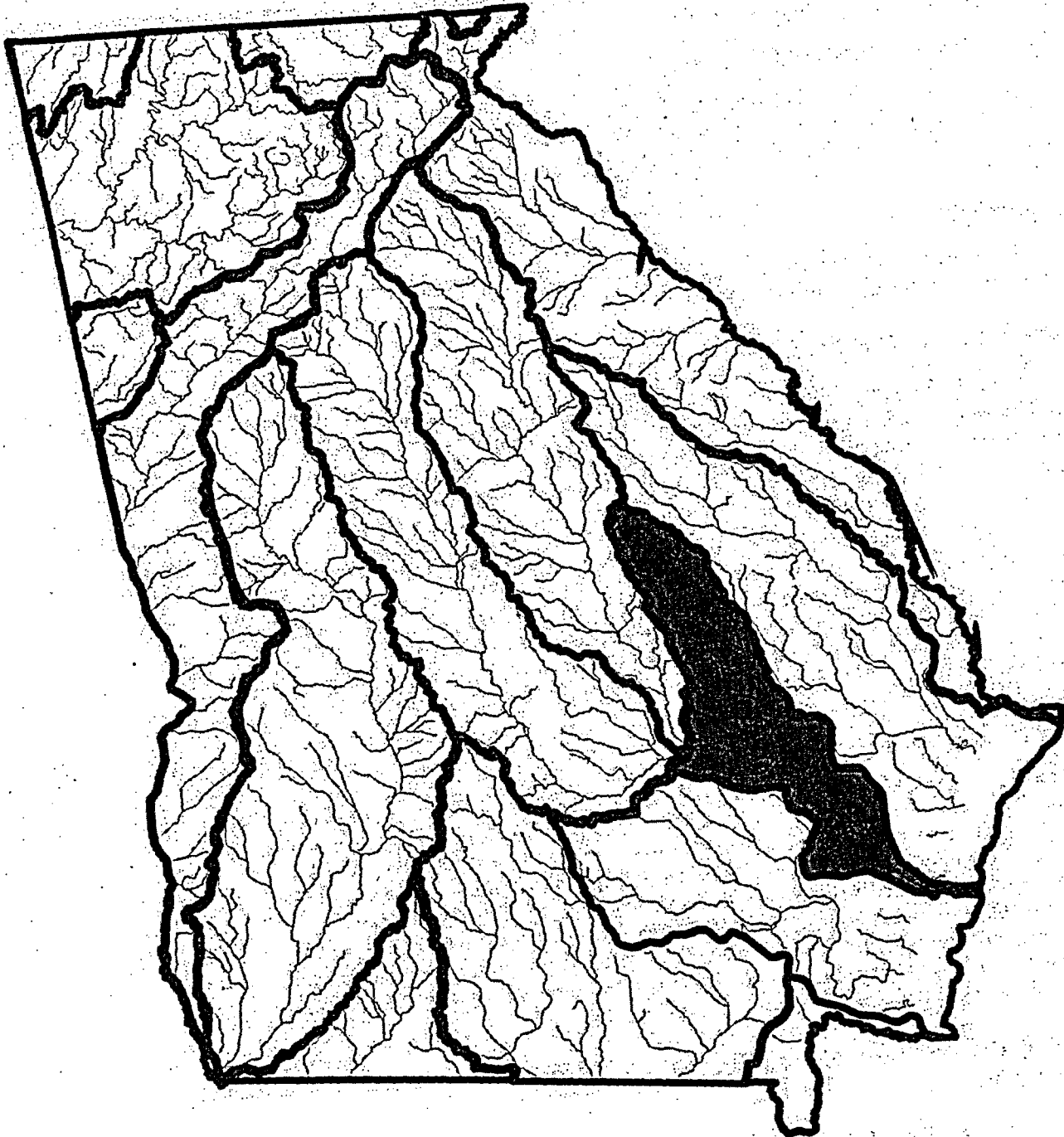


Figure I-1. The Altamaha River Basin

7.0 Implementation Strategies

This chapter presents strategies for addressing the issues of concern in the order that they appear on the priority list in Chapter 6 with a description of each issue, goals and objectives of management, overview of alternatives considered, and descriptions of recommended options for implementation.

8.0 Future Issues and Challenges

This chapter discusses long-range goals to set the stage for further improvements in managing water resources and water quality. Due to limited resources (data, time, funding, etc.), some issues will be addressed in future iterations of each basin planning cycle.

Appendices

The appendices contain technical information for those interested in specific details involved in the planning process.

How Do I Use This Plan?

This river basin plan will serve as the road map for managing the water resources in the Altamaha River basin. It contains useful information on the health of the Altamaha River basin and recommended strategies to protect the basin now and in the future. The document can be used as a reference tool for watershed conditions in the basin, as well as a planning guide for implementing key guide actions throughout the basin cycle.

Chapter 7 contains the key management strategies that have been identified to address the priority issues and concerns in the basin. The earlier chapters show the reader how the issues were identified and where the specific stressors in the basin occur. Each chapter in this river basin plan builds upon the previous ones. For example, the recommended management strategies in Chapter 7 were formulated based on the priority concerns identified in Chapter 6. Similarly, the priority issues in Chapter 6 were derived as a result of the assessment in Chapter 5.

Links to Other Chapters

Because issues are discussed across several chapters, an explanatory paragraph at the beginning of chapters 4, 5, 6, and 7 will alert the reader that an issue may be discussed elsewhere. For example, Chapter 4 discusses stressors to the water body from various point and nonpoint sources. Chapter 5 provides an assessment summary of water quality and water quantity based on the sources of environmental stressors. Next, Chapter 6 combines the assessment information from Chapter 5 to identify priority issues for the development of management strategies. Finally, Chapter 7 provides general goals and strategies to address the most significant existing and future water quality and quantity issues within the Altamaha basin.

What Is the Schedule of Activities for the Altamaha River Basin?

The schedules of activities for the first two Altamaha River basin cycles, i.e., 1998-2003 and 2003-2008, are provided in Figures 1-2 and 1-3.

Step	Action	Months	Year	
1. Organize Basin Team		Jan-Mar	1998	
2. Review Basin Planning Goals and Objectives		Apr-Jun	1998	
3. Compile and Review Preliminary Information/Data		Jul-Sep	1998	← Stakeholder Meeting
4. Develop Strategic Information Collection Plan		Oct-Dec	1998	
5a. Implement Monitoring Plan		Jan-Mar	1999	
5b. Compile Detailed Information/Data		Apr-Jun	1999	
		Jul-Sep	1999	
		Oct-Dec	1999	
		Jan-Mar	2000	
		Apr-Jun	2000	
6. Analyze and Evaluate Detailed Information		Jul-Sep	2000	
		Oct-Dec	2000	
		Jan-Mar	2001	
		Apr-Jun	2001	
7. Update Basin Assessment and Priority Issues List		Jul-Sep	2001	
8. Develop Strategies for Priority Issues		Oct-Dec	2001	
		Jan-Mar	2002	
		Apr-Jun	2002	
		Jul-Sep	2002	
		Oct-Dec	2002	
9. Prepare/Update Draft River Basin Plan		Jan-Mar	2003	
10. Agency and Public Review/Hearings		Apr-Jun	2003	← Stakeholder Meetings
		Jul-Sep	2003	
11. Finalize River Basin Plan		Oct-Dec	2003	
12. Implement River Basin Plan				

Figure I-2. Altamaha River Basin Planning Schedule, 1st Cycle, 1998-2003

Step	Action	Months	Year
1. Organize Basin Team		Jan-Mar	2003
2. Review Basin Planning Goals and Objectives		Apr-Jun	
3a. Compile Preliminary Information/Data		Jul-Sep	
3b. Review Preliminary Information/Data		Oct-Dec	
4. Develop Strategic Information Collection Plan		Jan-Mar	2004
5a. Implement Monitoring Plan		Apr-Jun	
5b. Compile Detailed Information/Data		Jul-Sep	
		Oct-Dec	
6. Analyze and Evaluate Detailed Information		Jan-Mar	2005
		Apr-Jun	
7. Update Basin Assessment and Priority Issues List		Jul-Sep	
8. Develop Strategies for Priority Issues		Oct-Dec	
		Jan-Mar	2006
		Apr-Jun	
		Jul-Sep	
		Oct-Dec	
9. Prepare/Update Draft River Basin Plan		Jan-Mar	2007
10. Agency and Basin Team Review		Apr-Jun	
11. Finalize River Basin Plan		Jul-Sep	
12. Implement River Basin Plan		Oct-Dec	
		Jan-Mar	2008
		Apr-Jun	
		Jul-Sep	
		Oct-Dec	

Figure I-3. Altamaha River Basin Planning Schedule, 2nd Cycle, 2003-2008

How Do Stakeholders Get Involved in the Basin Planning Process?

A major goal of RBMP is to involve interested citizens and organizations in plan development and implementation. This is intended to improve the identification and prioritization of water quality and quantity problems, maximize the efficient use of resources and expertise, create better and more cost-effective management strategies, and be responsive to stakeholder perceptions and needs. The opportunities for stakeholders to get involved in river basin management planning include the following:

Support the Basin Team

Every basin planning cycle begins with the organization of the basin team. Members of the basin team are from EPD programs and branches and other interested governmental partners (e.g., the Department of Community Affairs, GFC, GSWCC, NRCS, and WRD). Emphasis is placed on technical knowledge, available resources, and potential implementation responsibilities. Other agencies may act as partners in the RBMP process, contributing resources and expertise, while not being directly involved in Basin Team activities. Support and provide input to the agency that represents your interests.

Support the Local Advisory Committee

The local advisory committees provide advice and counsel to EPD during river basin management plan development, representing a forum for involving local stakeholders. These local advisory committees form a link between EPD and the regulated community and local watershed interests.

The committees consist of local people representing a variety of stakeholder interests including local governments, agriculture, industry, forestry, environmental groups, landowners, and citizens. Committee members and chairs are appointed by the EPD Director following a nomination process at the beginning of the initial river basin planning cycle. The committees meet periodically during the planning cycle, and provide input to EPD in the creation of river basin management plans. Meetings are called at the discretion of the chairman of the local advisory committee, and all meetings are open to the public. Table 1-1 lists the members of the Altamaha River Basin Local Advisory Committee serving for the first planning cycle.

Participate in Stakeholder Forums

While River Basin Advisory Committees operate at the major basin level, there is an opportunity under RBMP for more localized stakeholder forums to play an important role in the creation and implementation of water resources management strategies. Some strategies, such as best management practices (BMPs) to control pollutant runoff from urban, agricultural or forestry areas, are best managed at the city, county, or subwatershed level. These local forums might already exist in the form of conservation districts or watershed associations, be associated with watershed groups convened by a Regional Development Center to develop TMDL implementation plans or may be created as an outgrowth of RBMP.

Attend a Stakeholder Meeting

The RBMP approach includes stakeholder meetings, which provide the opportunity for the general public to learn about the status of water-related issues and management activities in their river basin, as well as contribute input that can influence basin management planning.

Figure 1-2 shows the timing of stakeholder meetings that have been held as part of the Altamaha basin RBMP cycle. EPD hosted an initial stakeholder meeting in Jesup, Georgia in late 1998 to invite and encourage stakeholder input early in the planning process for the Altamaha River basin. Focused monitoring in the Altamaha River basin was conducted in 1999. The data was assessed in 2000 and waters not meeting water quality standards were identified. Total maximum daily loads (TMDLs) were drafted and public noticed for waters not meeting water quality standards in June 2001. Input was considered, changes made as appropriate, and the TMDLs were finalized and approved by the U.S. Environmental Protection Agency in early 2002. The Regional Development Commissions (RDCs) in the Altamaha River basin initiated the development of TMDL Implementation Plans. Stakeholder meetings were coordinated by the RDCs to solicit input on the problem areas and support in completing the implementation plans. The plans are scheduled for completion in August 2003.

Table I-I. Altamaha River Basin Local Advisory Committee Members

Mr. Jack Amason Sea Garden Seafoods, Inc. P.O. Box 181 Meridan, Georgia 31319	Mr. Jenson Folsen Route 3, Box 5080 Glenville, Georgia 30427	Commissioner Gerald DeWitt City of Jesup P.O. Box 427 Jesup, Georgia 31598
Mr. Collie W. Williams Georgia Power P.O. Box 387 Jesup, Georgia 31598	Ms. Christi Lambert The Nature Conservancy Altamaha River Bioreserve P.O. Box 484 Darien, Georgia 31305	Mr. Carlton L. Windsor Superintendent Georgia Region Southeast Forest Resources Rayonier P.O. Box 528 198 South Macon Street Jesup, Georgia 31598
Mr. Bill Warthen 1204 Loop Road Vidalia, Georgia 30474	Heart of Georgia —Altamaha RDC 5405 Oak Street Eastman, Georgia 31023	Coastal Georgia RDC P.O. Drawer 1917 Brunswick, GA 31521

What's Next?

This draft plan will be reviewed by governmental partners, the Altamaha River Basin Advisory Committee, and the public. Public meetings will be held to solicit comments and recommendations regarding the river basin management plan. Following the review, appropriate modifications will be made to the plan, and the final plan will be submitted for review and acceptance by the Board of the Georgia Department of Natural Resources. After approval and an initial implementation period, partners will enter into the next 5-year cycle iteration to evaluate and update the plan as necessary.

In This Section

- River Basin Description
- Population and Land Use
- Local Governments and Planning Authorities
- Water Use Classifications

Section 2

River Basin Characteristics

This section describes the following major characteristics of the Altamaha River basin:

- *River basin description (Section 2.1): the physical features and natural processes of the basin.*
- *Population and land use (Section 2.2): the sociological features of the basin, including the types of human activities that might affect water quality and water resource use.*
- *Local governments and planning authorities (Section 2.3): identification and roles of the local authorities within the basin.*
- *Water use classifications (Section 2.4): description of water use classifications and baseline goals for management of waters within the basin as defined in the state regulatory framework.*

2.1 River Basin Description

This section describes the important geographical, geological, hydrological, and biological characteristics of the Altamaha River basin.

The physical characteristics of the Altamaha River basin include its location, physiography, soils, climate, surface water and groundwater resources, and natural water quality. These physical characteristics influence the basin's biological habitats and the ways people use the basin's land and water resources.

2.1.1 River Basin Boundaries

The Altamaha River basin is located in the Vidalia Upland and Barrier Island Sequence Districts of Georgia's Coastal Plain Province. The Altamaha River basin is flanked by the Ocmulgee and Oconee River Basins to the west, the Satilla River Basin to the south, and the Ogeechee River Basin to the east (Figure 2-1). The Altamaha River begins at the confluence of the Oconee and Ocmulgee Rivers. The Altamaha Basin extends eastward to include the drainage area of the south-flowing Ochoopee River. From that point, the basin extends in a southeasterly direction and is joined by several smaller

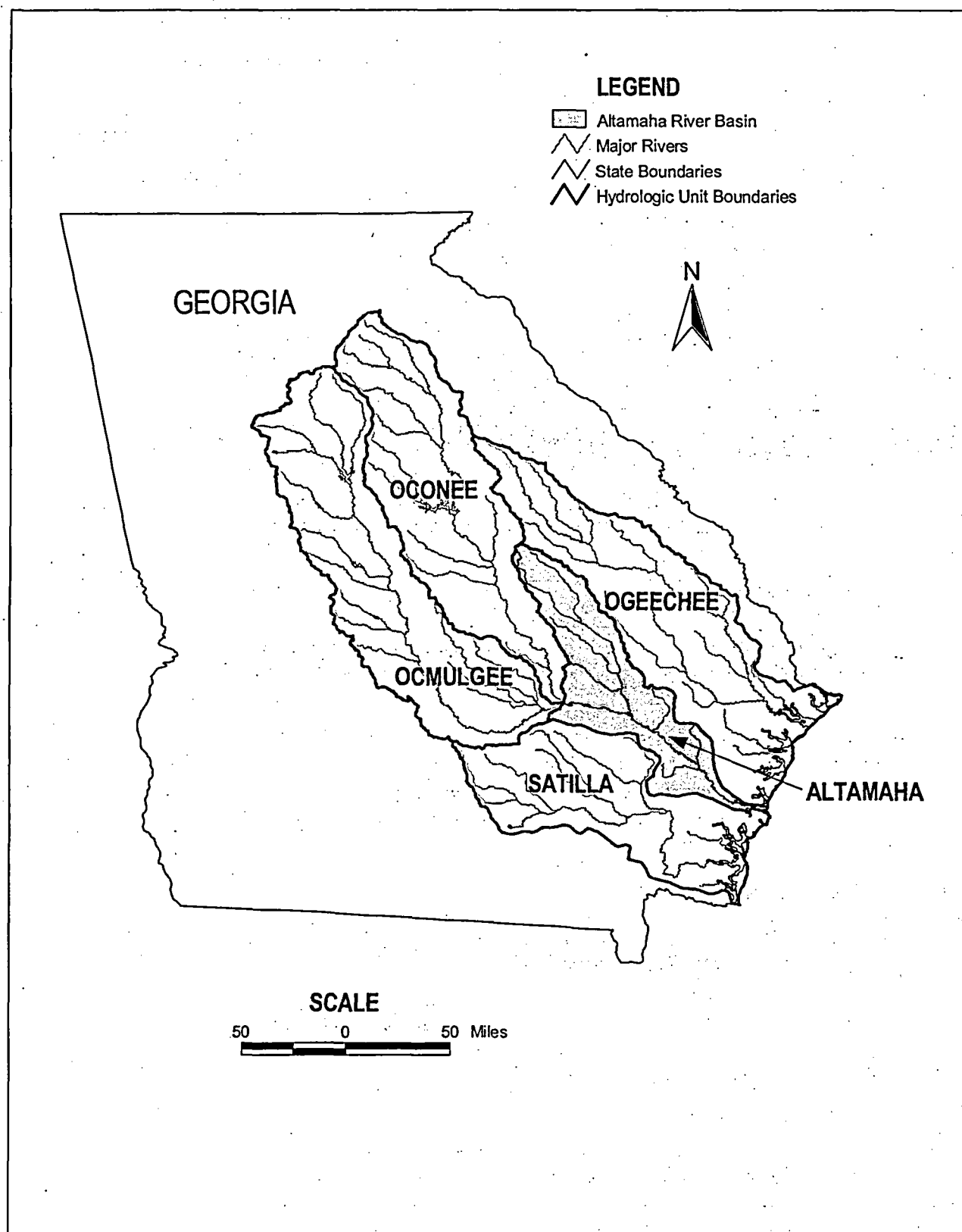


Figure 2-1. Location of the Altamaha River Basin

streams, including Mushmellon, Penholoway, and Doctors Creeks. Along the Glynn County-McIntosh County line west of the Georgia coast, the Altamaha River floodplain widens to form Penholoway River, and Clayhole Swamps. The river then diverges into two channels at the western end of Cambers Island and the waters pass eastward through tidal marshland until they enter the Atlantic Ocean at Altamaha Sound. The Altamaha River basin is located entirely in the State of Georgia and drains approximately 2,850 square miles.

The U.S. Geological Survey (USGS) has divided the Altamaha River basin into two subbasins, or Hydrologic Unit Codes (HUCs; see Table 2-1). These HUCs are referred to repeatedly in this report to distinguish conditions in different parts of the Altamaha River basin. Figure 2-2 shows the location of these subbasins and the associated counties within each subbasin.

Table 2-1. Hydrologic Unit Codes (HUCs) of the Altamaha River Basin in Georgia

03070106	Altamaha River Subbasin
03070107	Ochoopee River Subbasin

2.1.2 Climate

Mild winters and hot summers characterize the Altamaha River basin climate. Mean annual precipitation ranges from 40 to 52 inches per year. Precipitation occurs chiefly as rainfall, and only rarely in the upper portion of the basin, as snowfall. Rainfall is evenly distributed throughout the year, but a distinct dry season generally occurs from mid-summer to late fall. Rainfall is usually greatest in March and least in October. The mean annual temperature is about 60 degrees Fahrenheit (Journey and Atkins, 1996; citing Peck et al., 1992; Schneider et al., 1965; and Carter and Stiles, 1983).

2.1.3 Physiography, Geology, and Soils

Physiography

The Altamaha River basin is contained entirely within the Coastal Plain Physiographic Province, which extends throughout the southeastern United States. Waters from the Ocmulgee and Oconee Rivers, whose confluence forms the westernmost part of the Altamaha River basin, however, originate in the Georgia Piedmont and flow southward across the northern and central parts of the Georgia Coastal Plain.

The gently sloped physiography of the Altamaha basin reflects a geologic history of repeated periods of Tertiary and Quaternary marine transgressions and regressions across the southeastern Coastal Plain Province. Glaciers, which influenced the physiography of much of North America, never extended to the southeastern United States, but climatic effects associated with Pleistocene continental glaciation probably influenced regional ecological settings and erosion rates.

Coastal Plain streams typically meander across wide floodplains, and they exhibit extreme sinuosity, particularly near the Atlantic coast. Several Georgia Coastal Plain streams, including the Altamaha exhibit asymmetrical floodplain profiles. These rivers are contained within floodplains that have steep bluff-like features resembling cut banks along their southern and western edges and wide low-lying, swampy floodplain regions with oxbow lakes and stranded meanders along the northern and eastern sides of the rivers.

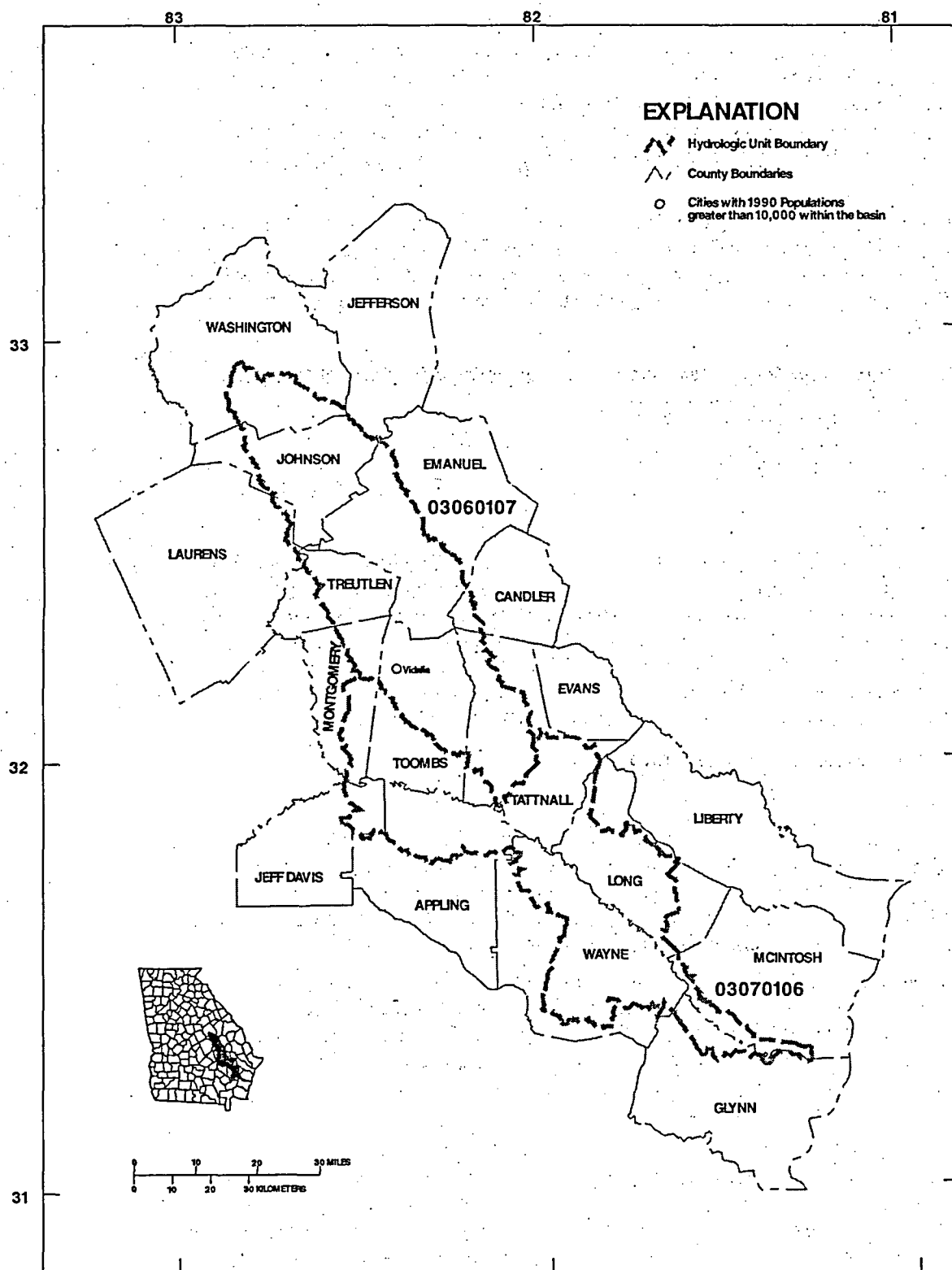


Figure 2-2. Hydrologic Units and Counties of the Altamaha River Basin

Geology

The following is a summary of the general geologic factors that appear to influence the background stream sediment geochemistry and stream hydrogeochemistry.

The Altamaha River basin is located entirely within the Coastal Plain Physiographic Province. Tertiary and Quaternary sedimentary deposits underlie the basin. Approximately 90 percent of the Coastal Plain sediments exposed in the basin are sands and clays. The rest consists of Quaternary alluvium.

Because of significant differences in chemical composition, porosity, permeability, and origin of the different rock units within the Coastal Plain, these rock units and the stream sediments derived from these rock units can significantly influence differences in the stream hydrogeochemistry. Although each rock unit may exert an effect on stream sediment geochemistry and stream hydrogeochemistry, of greater importance is the regional geologic grouping of rocks of similar compositions, porosity, permeability, and origin.

The younger Eocene and Oligocene sediments in parts of the Oconee and Ocmulgee basins upstream from the Altamaha River basin are calcareous, and can have a greater effect on surface and groundwaters than the older Coastal Plain sediments to the north. The entire Altamaha River basin is underlain by poorly sorted, pebbly, argillaceous, micaceous sands, and sandy clays that are Miocene and younger in age. These sediments appear to have little effect on the quality of surface and groundwaters, but the generally acidic waters derived from "black water" tributaries and swampy regions of the Altamaha floodplain can influence surface water chemistry.

Extensive erosion of Piedmont soil and saprolite and Coastal Plain soil and unconsolidated sedimentary materials caused by unsophisticated agricultural practices during the 1800s and early 1900s contributed a vast quantity of sediment into stream valleys, choking the streams and raising the streams' base level. As modern conservation practices stabilized erosion, streams began to reestablish grade and cut into the thick accumulations of sediments, remobilizing them into the major rivers. In the Piedmont regions of the Ocmulgee and Oconee River Basins that lie north of the Altamaha River basin, much of the remobilized sediment was re-deposited into man-made reservoirs. The Altamaha River basin, however, contains no impoundments, so these materials are currently being transported downstream to the Atlantic coast.

Soils within the Altamaha River basin are common to the lower Coastal Plain Province of Georgia. They range from well-drained to poorly drained. Physical composition, porosity, and permeability are the primary factors related to water retention, although local relief and the depth of the water table are also important considerations. In the upper part of the Altamaha Basin, the soils are primarily poorly sorted, locally pebbly and gravel-bearing sands with a minor clay component that are interlayered with discontinuous lenses of clay. These materials are weathering products derived from Piedmont igneous and metamorphic rocks to the north that were transported in an extensive fluvial system that occupied south Georgia during Miocene time. In the lower regions of the Altamaha Basin, the soils are derived from a coastal terrestrial and marine geologic environment made up of alternating bands of beach and lagoon deposits that parallel the modern Georgia coast. The beach deposits are sand dominant and well-drained, whereas the lagoon materials are clay, silt, and fine sand dominant with a rich organic component.

Well-drained soils in the Altamaha River basin generally occupy the higher ground. These soils include Norfolk, Lakeland, and Lynchburg Series materials that produce good crops of tobacco, corn, peanuts, and soybeans. Poorly drained soils typically lie in the lowlands, and are dark colored with a sandy top layer. These soils include the Bladen, Leon, and Rains series that are best suited for pasture land and timber production.

Soils

The Altamaha River watershed crosses two Major Land Resource Areas (MLRAs) (Figure 2-3). Soils vary widely within the watershed, and even within each of the MLRAs in the watershed. Some general trends in landscapes and soil properties can be recognized as the watershed is traversed from northwest to southeast: (1) clay content of the soils decreases, (2) sand content increases, (3) slope gradient decreases, (4) depth to water table decreases (soils become wetter), and (5) floodplains become more prominent.

About 70 percent of the watershed is in the Southern Coastal Plain MLRA. The north end of the Coastal Plain section of the watershed is characterized by mostly red, well-drained soils that have a sandy surface layer and a loamy or clayey subsoil. Water tables are not evident in most of these soils, except in depressions and along flood plains. The major part of the Coastal Plain section of the watershed is dominated by yellow and brown, well-drained soils that have sandy surface and subsurface layers and a loamy or clayey subsoil. Many of these soils have a perched water table at various depths during wet seasons. Areas of wetter soils are scattered throughout this area. Significant areas of sandier soils occur near the rivers and larger streams, especially along the eastern side of the flood plain. The southernmost end of the Coastal Plain section of the watershed is less dissected, with gentler slopes than the northern section. Soils in this area are mostly moderately well-drained to poorly drained and generally have thick sandy surface and subsurface layers overlying a loamy subsoil. Flood plain soils are mostly sandy, but range from sandy to clayey. These soils are predominantly poorly drained.

About 30 percent of the watershed is in the Atlantic Coast Flatwoods MLRA. The landscapes in this area are generally much less sloping than in the Coastal Plain MLRA. Most soils are nearly level. Seasonal high water tables are much higher in the soil profile during wet seasons of the year in most areas. This section of the watershed is dominated by sandy soils that have a characteristic layer in which organic materials have accumulated in a complex with iron and aluminum. Some of these soils are underlain by a loamy subsoil. Drier, sandy ridges are found along the eastern side of the Altamaha River. A few small areas are more dissected by streams than is typical for the MLRA. These areas have better drained soils with perched water tables, similar to soils found in the Coastal Plain MLRA. Flood plain soils range from sandy to clayey, and are poorly or very poorly drained, often having significant accumulations of organic materials near the surface. The southeastern end of the watershed has soils that formed in tidal influenced marine deposits. These soils have high contents of silt and clay, are continuously saturated with water, and have a high salt content.

2.1.4 Surface Water Resources

The major surface water resources of the Altamaha River basin are the Altamaha and Ochopee Rivers. The Altamaha River is formed by the confluence of the Ocmulgee and Oconee Rivers 137 miles above the mouth and flows in a southeasterly direction across the Coastal Plain until it empties into the Atlantic Ocean near Darien, Georgia. Several smaller streams, including Bullards, Cobb, Tenmile, Mushmellon, Goose, Penholoway, and Doctors Creeks contribute to the flow, but the major volume of water entering the Altamaha basin is via the Oconee and Ocmulgee River basins. Stream networks within each HUC are shown in Figures 2-4 and 2-5.

River slopes of less than 1.5 feet per mile are not observed on the Altamaha River until it reaches the final 130 miles of its length, all of which is below the 100-foot elevation. Above the limit of tidal action, the river has an average slope of 0.7 foot per

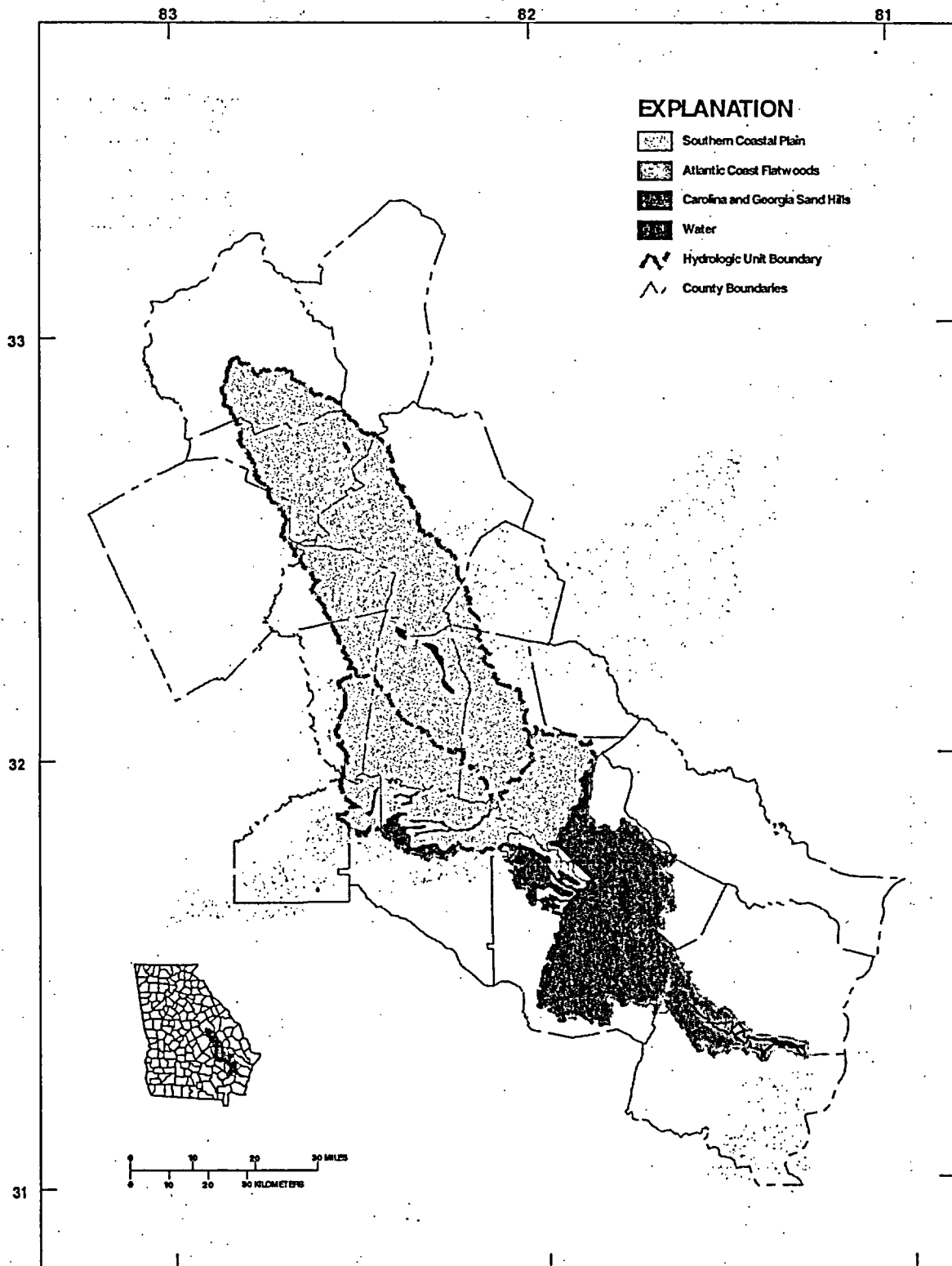


Figure 2-3. Major Land Resource Areas in the Altamaha River Basin

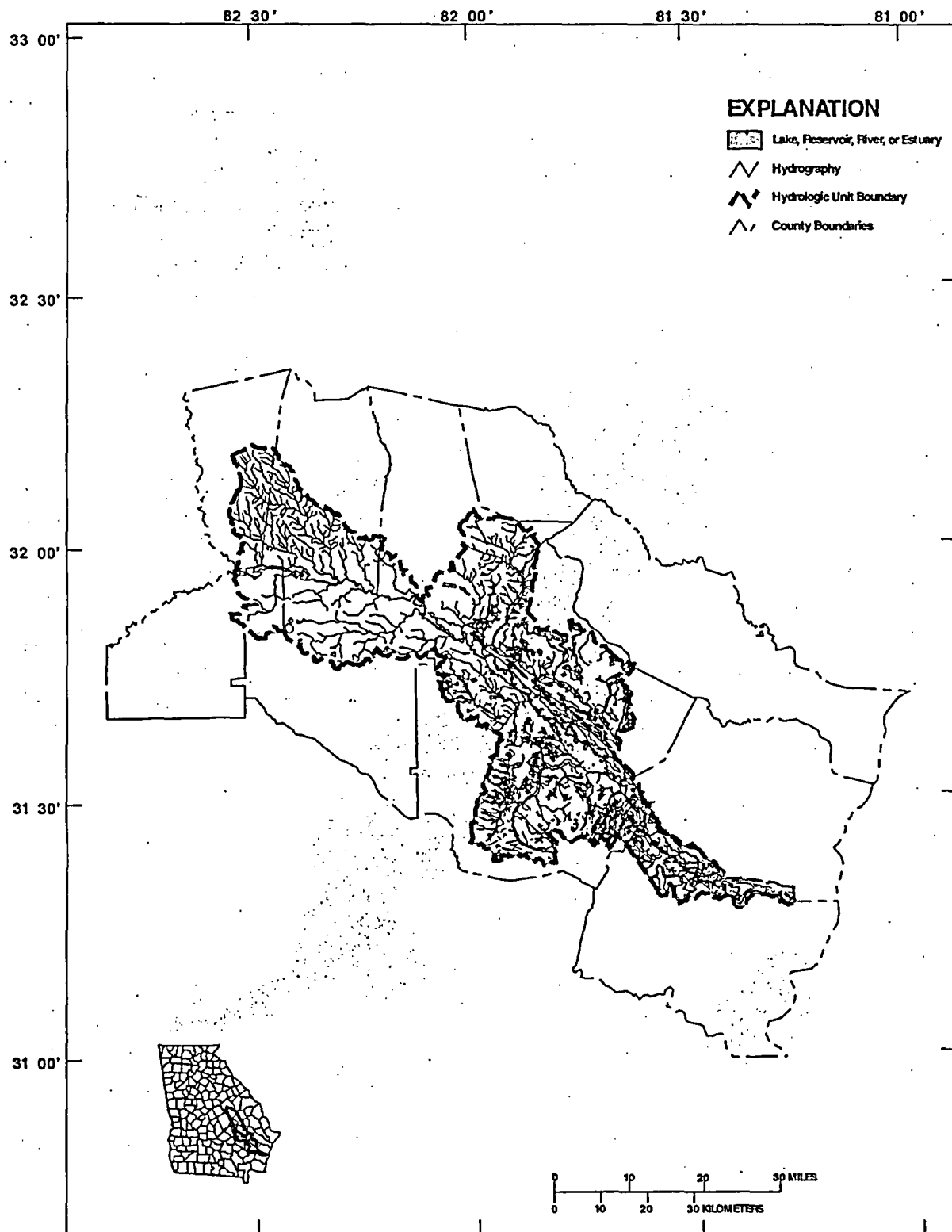


Figure 2-4. Hydrography, Altamaha River Basin, HUC 03070106

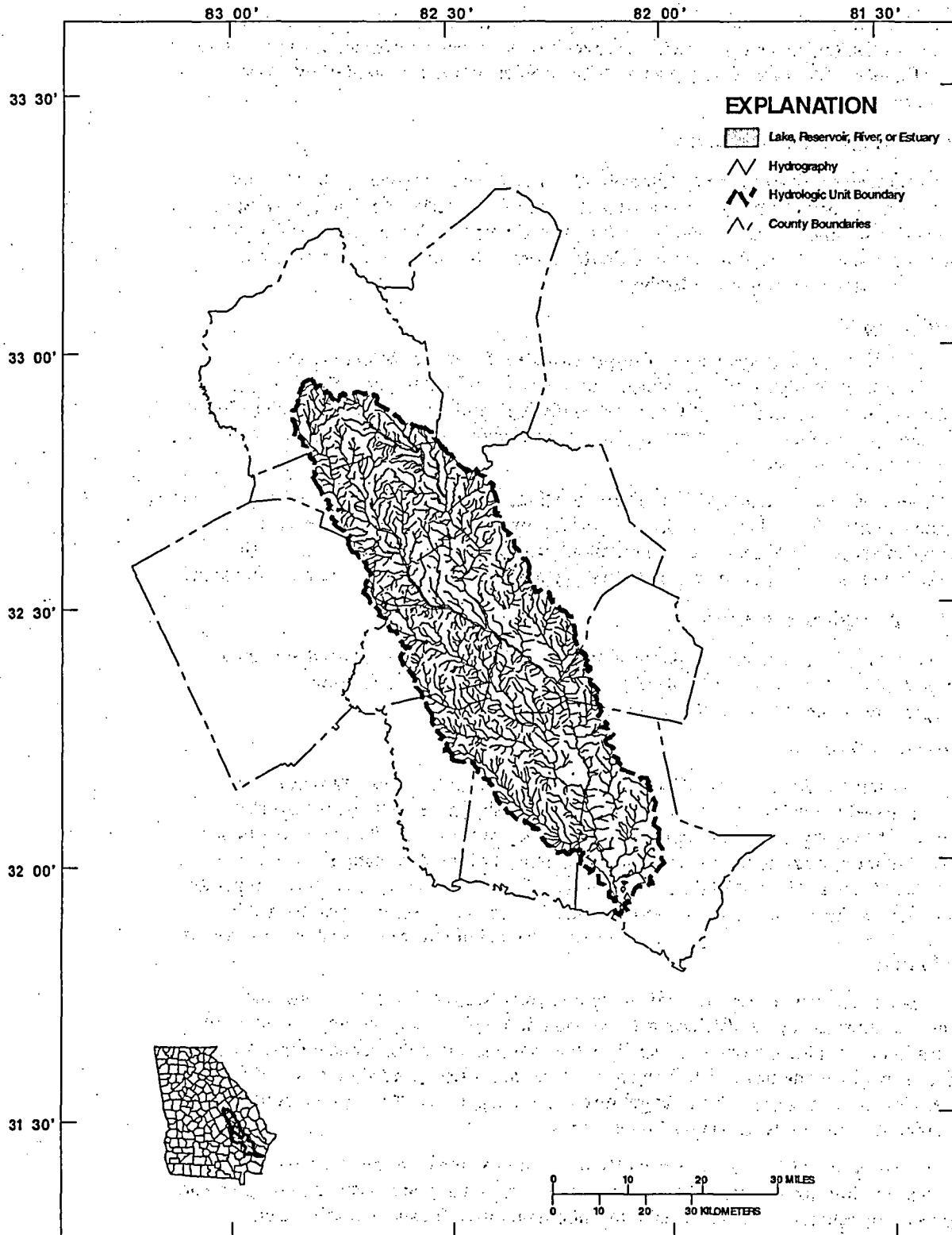


Figure 2-5. Hydrography, Altamaha River Basin, HUC 03070107

mile and the flood plain is about 89 miles long and varies in width from one to four and one-half miles. On the coast, saltwater wedges can be detected upstream nearly as far as tidal influences. The latter extend some 30 to 35 miles up the river under low flow conditions.

2.1.5 Groundwater Resources

Groundwater resources in the Altamaha River basin are supplied by the Floridan aquifer system, one of the most productive groundwater reservoirs in the United States. The system supplies about 50 percent of the groundwater used in the state. It is used as a major water source throughout most of South Georgia. A more detailed description of the Floridan aquifer system is provided below.

Floridan Aquifer

The Floridan aquifer system consists primarily of limestone, dolostone, and calcareous sand. It is generally confined, but is semi-confined to unconfined near its northern limit. Wells in this aquifer are generally high yielding (typically 1,000 to 5,000 gallons per minute) and are extensively used for irrigation, municipal supplies, industry, and private domestic supply.

The Floridan aquifer underlies most of the Altamaha River basin. The thickness of the Floridan aquifer in the Altamaha basin increases toward the Atlantic Coast where, in Glynn County, it is 400 feet thick. Throughout most of the Altamaha basin, the Floridan aquifer consists of the Eocene Ocala Limestone and the Oligocene Suwannee Limestone.

2.1.6 Biological Resources

The Altamaha River basin supports a diverse and rich mix of terrestrial and aquatic habitats and is home to several federally and state-protected species. Some of the biological resources of the basin are summarized below.

Terrestrial Habitats

The Altamaha River is one of Georgia's few remaining free flowing streams and contains excellent habitat for numerous freshwater fish species. The river traverses portions of two physiographic regions on its journey to the ocean. The headwaters begin in the Piedmont Region, but the majority (95 percent) of the Altamaha River basin lies in the Lower Coastal Plain Mixed Forest Province. The Outer Coastal Plain is a temperate rainforest (or temperate evergreen forest or laurel forest) ecoregion characterized by lower species diversity, but a greater abundance of individuals than equatorial or tropical rainforests.

Common species of trees include evergreen oaks and species of the laurel and magnolia families. Typically these habitats include a well-developed lower stratum of vegetation consisting of tree ferns, small palms, shrubs, and herbaceous plants. At the higher elevations, the trunks and branches of trees are often covered in moss. At the lower elevations, trees such as Evangeline oaks, baldcypress and others are covered by the epiphyte commonly known as Spanish moss.

The lower reaches of the Altamaha River basin flow through the extensive coastal marshes and interior swamps of Georgia's coastal region and are dominated by gum and cypress. The upland areas are covered by subclimax pine forests, which have an understory of grasses and sedges referred to as savannas. Undrained shallow depressions in savannas form upland bogs or pocosins, in which evergreen shrubs predominate.

Fauna

Terrestrial Fauna

The habitat diversity in this region supports a wide variety of wildlife. Although small numbers of black bears may be found in isolated areas, the white-tailed deer is the only large indigenous mammal in this region. Populations of feral hogs have become quite prevalent and their destructive foraging habits have made them a nuisance species in agricultural locales. Small mammals that are common to the basin include raccoons, opossums, flying squirrels, rabbits and numerous species of ground-dwelling rodents.

The bobwhite quail, eastern wild turkey and mourning dove are the primary game birds. Migratory non-game bird species, as well as waterfowl are numerous in this region. The red-cockaded woodpecker, which inhabits mature longleaf pine stands, is a federally-listed endangered species.

Fish Fauna

The diverse fish fauna of the Altamaha River basin includes 74 species representing 25 different families. The largest group of species in the Altamaha River basin belongs to the sunfish family, Centrarchidae. Other families with large numbers of species are the sucker family (Cyprinidae) and the catfish family (Ictaluridae). In a 1983 survey conducted by the Fisheries Section of the Georgia Department of Natural Resources on the Altamaha River, channel catfish comprised 26 percent of the total sample by number. The Altamaha River offers excellent fishing for redbreast sunfish, largemouth bass, bluegill, redear sunfish, black crappie, flathead catfish, and channel catfish.

Flathead catfish are an exotic species, which was introduced into the Altamaha River system in the late 1970s. During the late 1980s and early 1990s the abundance of flathead catfish increased dramatically. Current fisheries data obtained from annual electrofishing efforts indicate that the dominant catfish species has switched from the channel catfish to the flathead catfish. The large increase in the abundance of flatheads resulted in a significant decline in the abundance of some native species, such as the bullhead catfishes and redbreast sunfish.

Several anadromous fish species are found within the Altamaha River. American shad, hickory shad, blueback herring, Atlantic sturgeon and shortnose sturgeon all ascend the river in the spring to spawn. American shad are commercially important species and the Altamaha River supports the largest commercial shad harvest of Georgia's rivers. Historically, Atlantic and shortnose sturgeon were also harvested commercially from the Altamaha River. However, the decline in abundance of these two species has led to the listing of the shortnose sturgeon as an endangered species and the closure of the commercial fishery for both species.

2.2 Population and Land Use

2.2.1 Population

Since 1975, the population of the Altamaha River basin has risen from 77,000 to 88,200. Population distribution in the basin at the time of the 1990 census is shown by census blocks in Figure 2-6. The region's population growth has been slow by state standards, which has resulted in Altamaha's share of Georgia's population dropping from 1.5 percent in 1975 to 1.3 percent in 1995. This downward trend is expected to continue to the end of this decade, after which the Altamaha's share of Georgia's population is expected to stabilize. As with most of the country, the fastest growing portion of the population in the basin over the next 25 years will be the over-55-year-old category

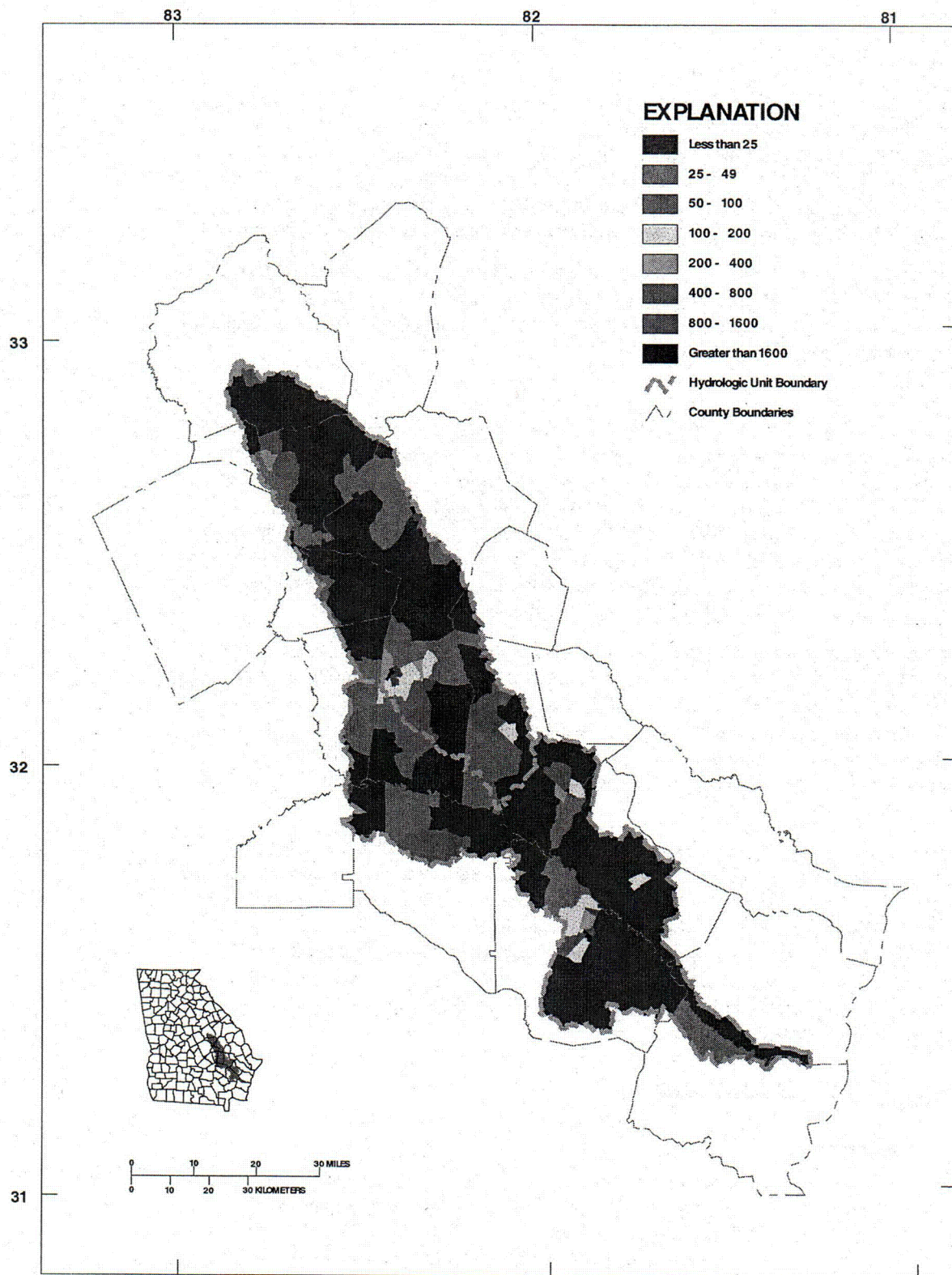


Figure 2-6. Population Density in the Altamaha River Basin

(DRI/McGraw-Hill, 1996). Population centers in the Altamaha watershed include the development surrounding Vidalia, Reidsville, Jesup and Darien.

2.2.2 Employment

In 1975, the Altamaha River basin employed 19,000 people and accounted for only 1.1 percent of Georgia's non-farm employment. Over the last two decades, the Altamaha basin has watched its employment rise at an average annual rate of 2.3 percent to take 1995's employment level to 29,100. (DRI/McGraw-Hill, 1996).

2.2.3 Land Cover and Use

Land use/land cover classification was determined for the Altamaha River basin based on high-altitude aerial photography for 1972-76 from the U.S. Geological Survey. Subsequently in 1991 land cover data were developed based on interpretation of Landsat TM satellite image data obtained during 1988-90, leaf-off conditions. These two coverages differ significantly. Aerial photography allows identification of both land cover and land uses. Satellite imagery, however, detects primarily land cover, and not land use, such that a forest and a wooded subdivision may, for instance, appear similar. Satellite interpretation also tends to be less accurate than aerial photography.

The 1972-76 classification (Figures 2-7 and 2-8) indicates that 58 percent of the basin land area was forest, 0.6 percent wetlands, and 1 percent urban.

The 1988-90 land cover interpretation showed 44 percent of the basin in forest cover, 17 percent in wetlands, 1.4 percent in urban land cover, and 19 percent in agriculture (Figures 2-9 and 2-10). Statistics for 15 landcover classes in the Georgia portion of the Altamaha River basin for the 1988-90 coverage are presented in Table 2-2 (GA DNR, 1996).

Table 2-2. Land Cover Statistics for the Altamaha Basin

Class Name	Percent	Acres
Open Water	1.0	18,605
Clear Cut/Young Pine	18.1	329,044
Pasture	7.3	133,458
Cultivated/Exposed Earth	11.4	207,073
Low Density Urban	1.1	19,900
High Density Urban	0.3	5,619
Emergent Wetland	1.2	22,634
Scrub/Scrub Wetland	0.8	13,870
Forested Wetland	14.5	264,477
Coniferous Forest	17.0	309,748
Mixed Forest	13.2	239,700
Hardwood Forest	13.5	245,226
Salt Marsh	0.2	2,751
Brackish Marsh	0.4	6,613
Tidal Flats/Beaches	0.0	248
Total	100.0	1,819,966

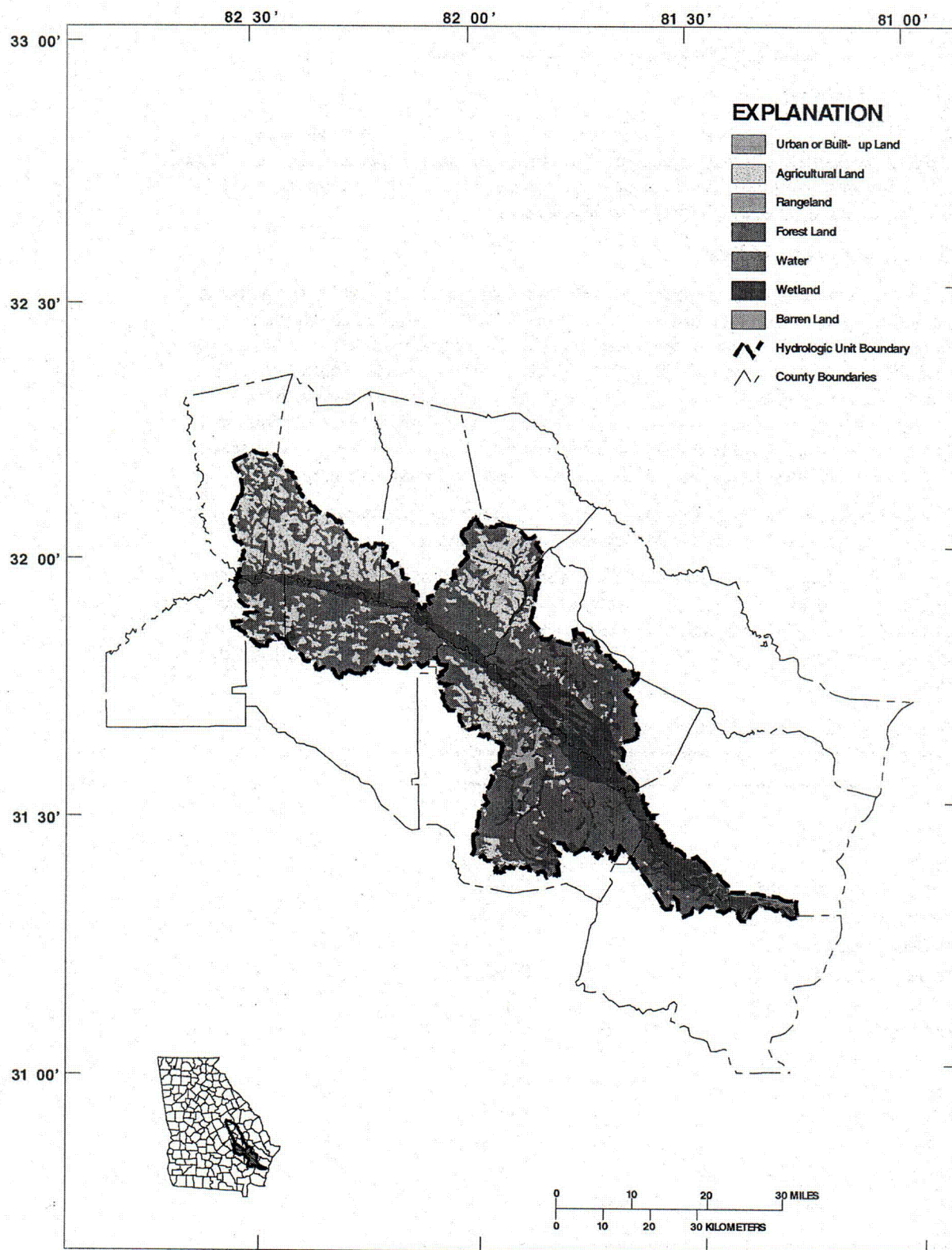


Figure 2-7. Land Use, Altamaha River Basin, HUC 03070106, USGS 1972-76 Classification Updated with 1990 Urban Areas

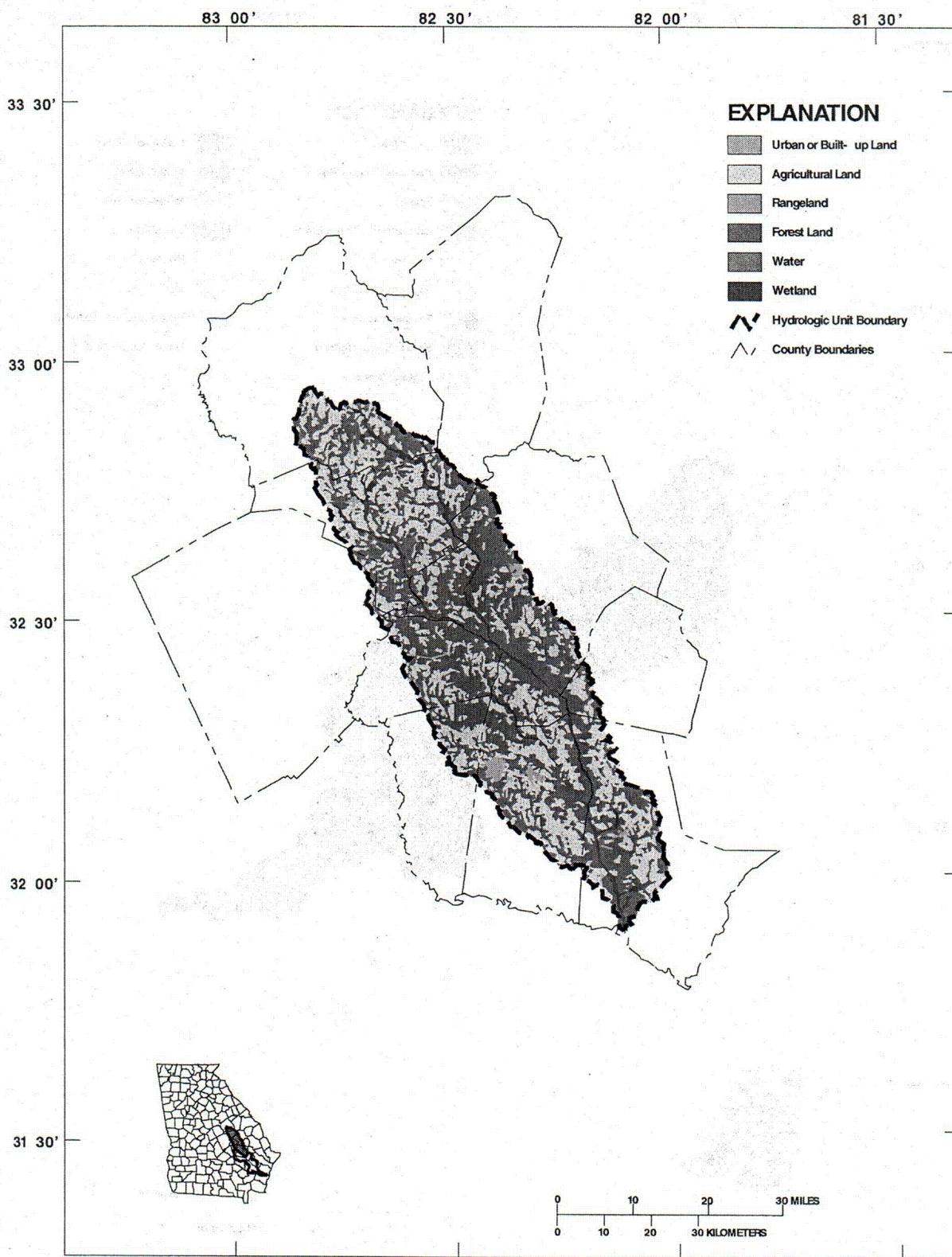


Figure 2-8. Land Use, Altamaha River Basin, HUC 03070107, USGS 1972-76 Classification Updated with 1990 Urban Areas

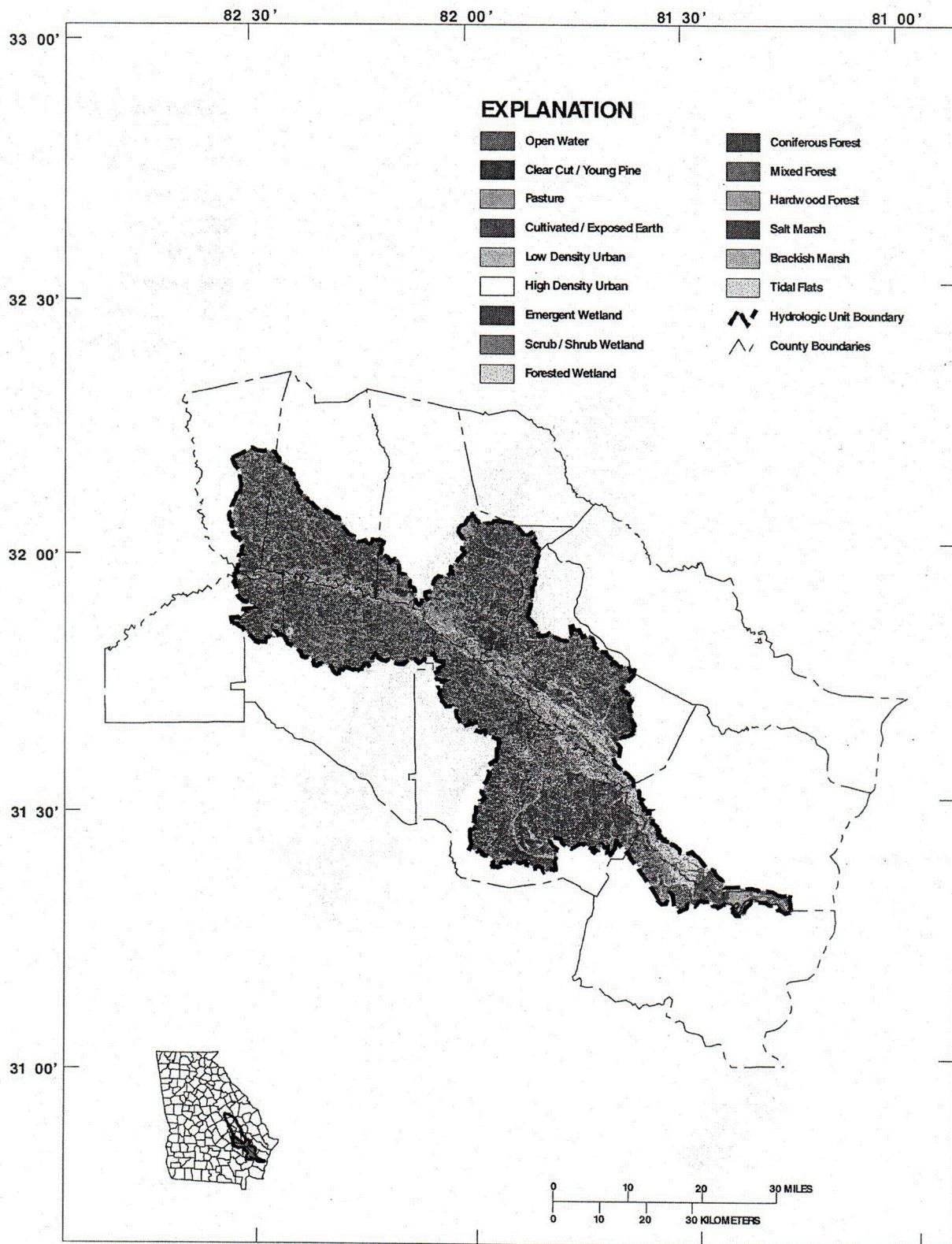


Figure 2-9. Land Cover 1990, Altamaha River Basin HUC 03070106

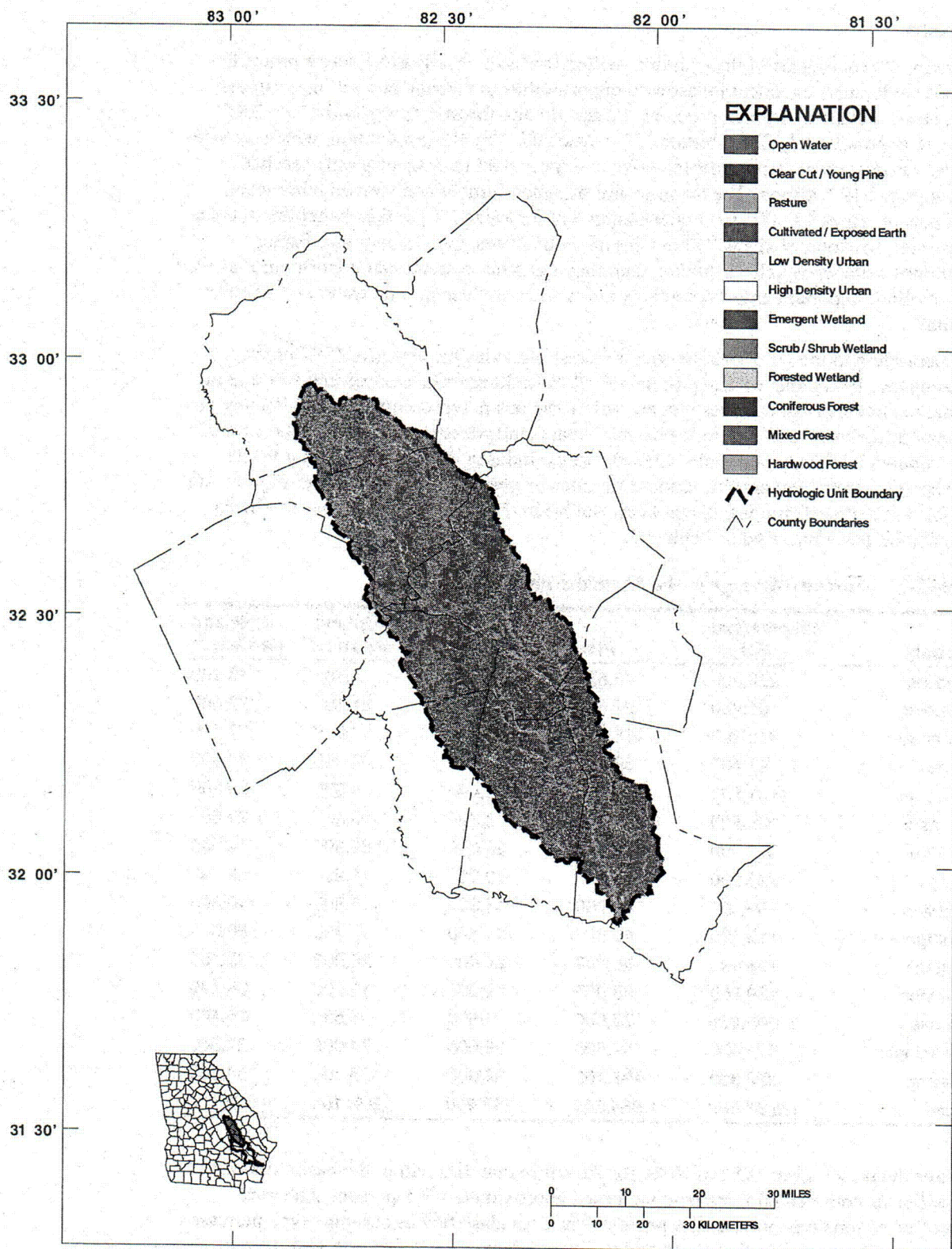


Figure 2-10. Land Cover 1990, Altamaha River Basin HUC 03070107

Forestry

Forestry is a major part of the economy within the basin. Markets for forest products afford landowners excellent investment opportunities to manage and sell their timber, pine straw, naval stores, etc., products. Statewide, the forest industry output for 2002 grew to approximately \$30.5 billion. The value added by this production, which includes wages, profits, interest, rent, depreciation and taxes paid into the economy reached a record high \$19.5 billion. The manufacture of paper, lumber and various other wood products provides 177,000 job opportunities for Georgians, as well as benefiting them as consumers of wood products. Other benefits of the forest include hunting, fishing, aesthetics, wildlife watching, hiking, camping and other recreational opportunities as well as providing important environmental benefits such as clean air and water and wildlife habitat.

According to the US Forest Service's Forest Statistics for Georgia, 1997 report (Thompson, 1997), there are approximately 2,951,800 acres of commercial forest land contained in the entire counties that are within the basin, representing approximately 68 percent of the total land area in the basin. Private landowners account for 66 percent of the commercial forest ownership while the forest industry companies account for 31 percent. Governmental entities account for about 3 percent of the forestland. Figure 2-11 depicts silvicultural land use in the Altamaha basin. Forestry acreage in the Altamaha River basin is summarized in Table 2-3.

Table 2-3. Forestry Acreage in the Altamaha River Basin

County	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Appling	222,000	145,800	23,800	5,800	40,100
Candler	91,800	27,600	13,800	21,100	22,800
Emanuel	312,300	155,000	54,000	39,800	57,400
Glynn	147,400	88,400	10,700	5,200	31,400
Jeff Davis	151,600	101,100	20,400	4,900	20,300
Johnson	138,800	75,600	18,300	13,800	29,600
Laurens	312,200	153,400	20,000	62,500	74,300
Long	232,500	121,300	10,900	11,200	89,100
McIntosh	150,700	73,700	17,300	16,800	40,600
Montgomery	113,400	49,500	24,700	11,700	26,600
Tattnall	198,400	86,400	24,400	26,200	60,100
Toombs	139,600	68,000	22,000	15,500	34,100
Treutlen	103,400	77,000	5,500	5,500	15,400
Washington	315,400	144,600	59,500	74,000	37,300
Wayne	322,300	197,100	32,600	25,100	54,000
Total	2,951,800	1,564,500	357,900	339,100	633,100

For the period from 1982 to 1989, for the entire counties within the basin, the area classified as commercial forestland increased approximately 3.5 percent. The area classified as pine type increased 4 percent. The area classified as oak-pine type increased 4 percent. The area classified as upland hardwood decreased 11 percent, and the area classified as bottomland hardwood increased 1.6 percent.

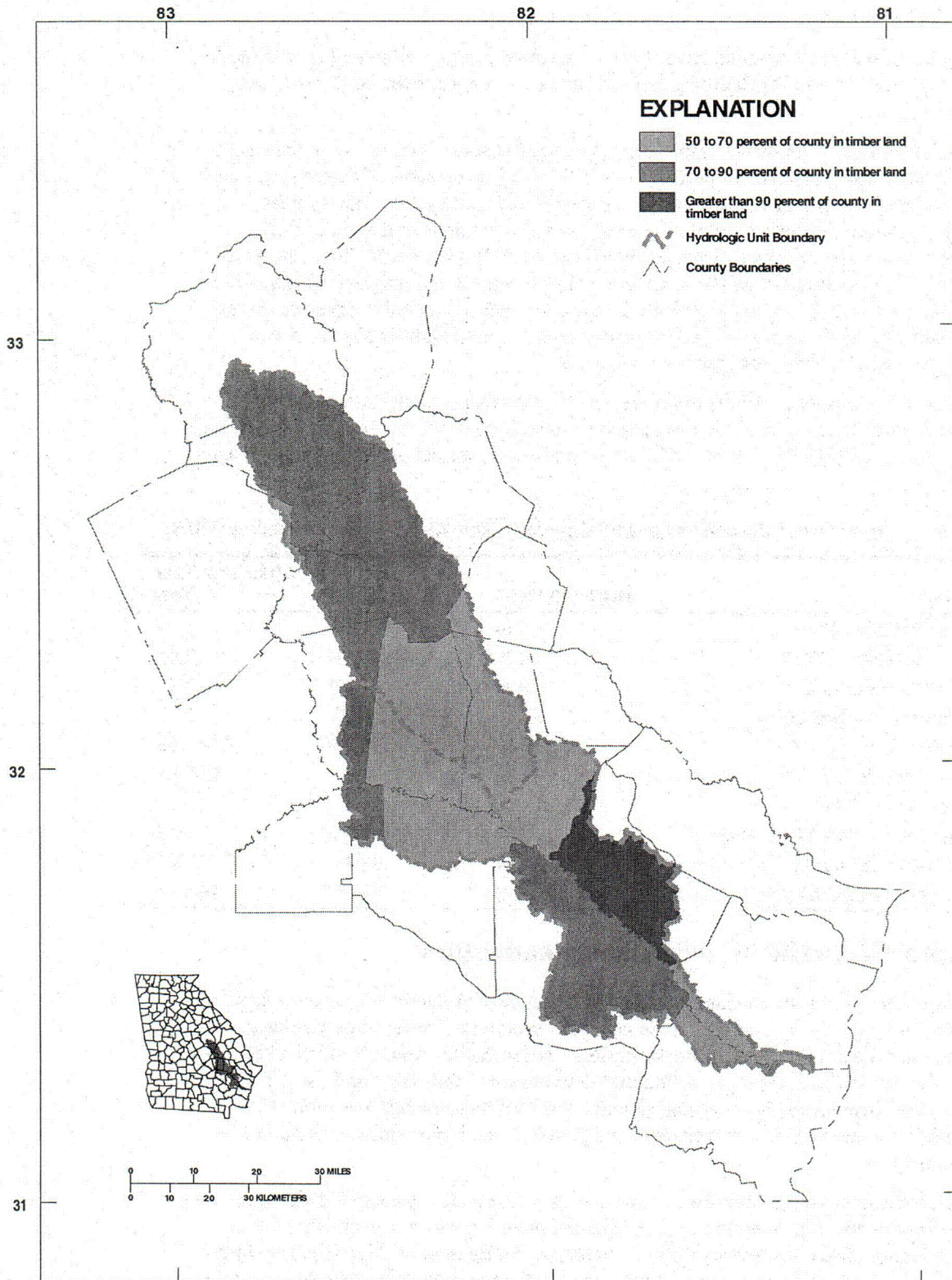


Figure 2-II. Silvicultural Land in the Altamaha River Basin

Agriculture

Agriculture in the Altamaha River basin is a varied mixture of animal operations and commodity production. Agricultural land comprises some 9 percent of the land use within the basin.

Total farmland in the basin, approximately 288,000 acres (Figure 2-12), has declined steadily since 1982. Almost 40 percent of this farmland is in pasture. The remaining 60 percent is dedicated to growing cotton, peanuts, tobacco, and small grain (wheat, sorghum, soybean, millet). Commodity producers applied an average of 25 million gallons per day of supplemental irrigation to over 48,000 acres during 2000. Jefferson, Emmanuel, and Laurens Counties contain the largest number of irrigated acreage in the basin. Irrigation application, along with the number of acres actually harvested among these crops, varies from year to year in response to market conditions, government subsidy and conservation programs, and weather.

Livestock and poultry production is relatively less intense in the Altamaha River basin than other river basins across Georgia. Approximately 46,000 head of cattle, 8,700 head of swine, and 9,500,000 broilers and layers are raised on animal operations in the basin (Table 2-4).

Table 2-4. Agricultural Operations in the Altamaha River Basin (data supplied by NRCS)

Element	HUC 03070106	HUC 03070107	Altamaha Basin Total
Number of Farms (1997)	954	1,167	2,121
Dairy Cattle (Head 2000)	1,896	118	2,014
Beef Cattle (Head 2000)	16,404	27,350	43,754
Hogs and Pigs (Head 2000)	3,831	4,897	8,728
Boilers (Thousands, 1997)	6,076,367	3,088,256	9,164,623
Layers (Thousands, 1997)	199,334	132,677	332,010
Irrigated Acres (1998)	24,309	24,310	48,619
Irrigated Water Use (MGD 2000)	10.46	14.85	25.31
Harvested Cropland (Acres 1997)	79,084	93,844	172,927
Total Agriculture Acres (1997)	129,682	158,058	287,740

2.3 Local Governments and Planning Authorities

Many aspects of basin management and water quality protection depend on decisions regarding zoning, land use, and land management practices. These are particularly important for the control of nonpoint pollution – pollution that arises in stormwater runoff from agriculture, urban or residential development, and other land uses. The authority and responsibility for planning and control of these factors lies with local governments, making local governments and jurisdictions important partners in basin management.

The Department of Community Affairs (DCA) is the state's principal department with responsibilities for implementing the coordinated planning process established by the Georgia Planning Act. Its responsibilities include promulgation of minimum standards for preparation and implementation of plans by local governments, review of local and regional plans, certification of qualified local governments, development of a state plan, and provision of technical assistance to local governments. Activities under the Planning Act are coordinated with the Environmental Protection Division (EPD), Regional Development Centers (RDCs), and local governments.

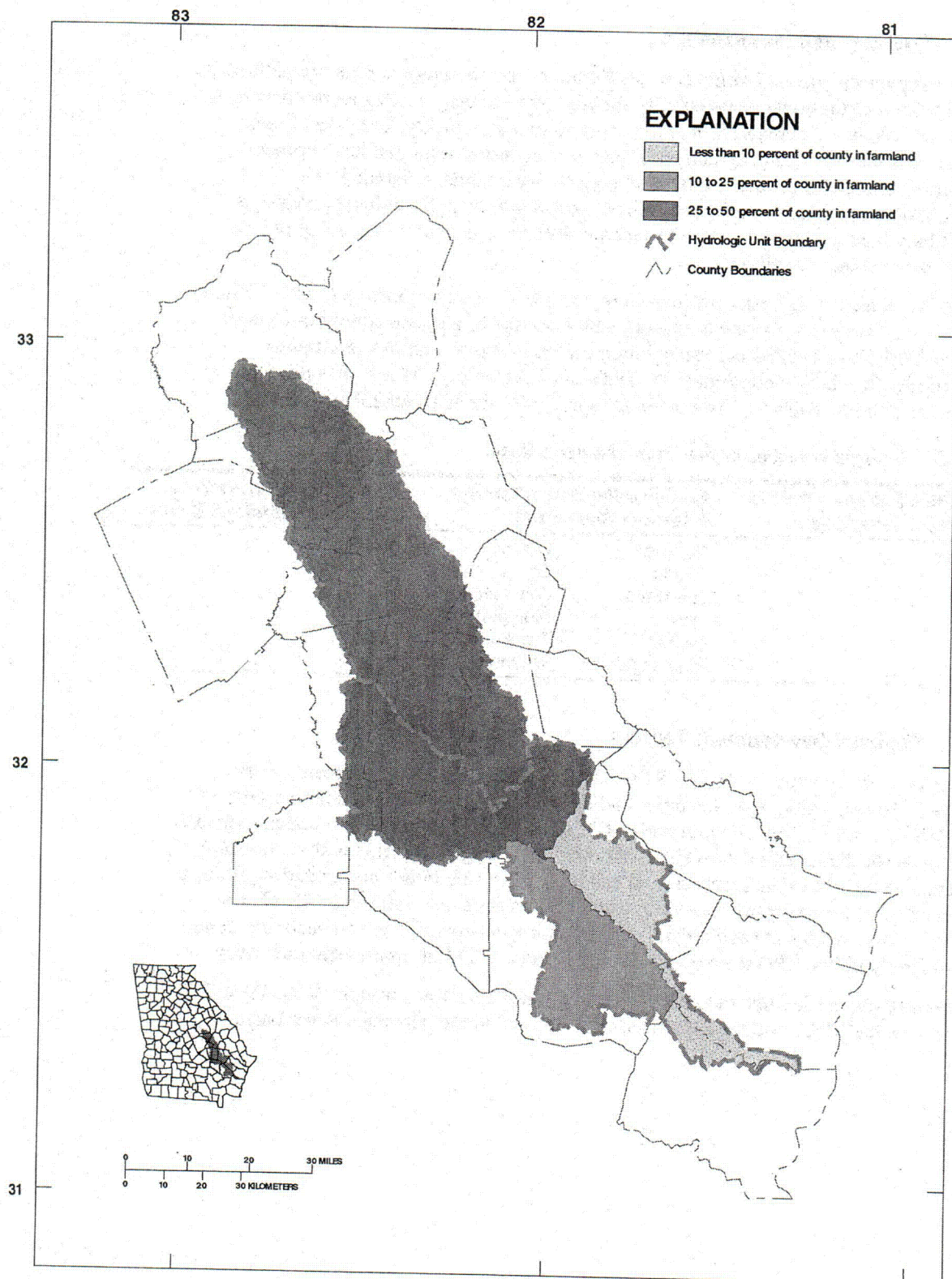


Figure 2-12. Agricultural Land in the Altamaha River Basin

2.3.1 Counties and Municipalities

Local governments in Georgia consist of counties and incorporated municipalities. As entities with constitutional responsibility for land management, local governments have a significant role in the management and protection of water quality. The role of local governments includes enacting and enforcing zoning, stormwater and development ordinances; undertaking water supply and wastewater treatment planning; and participating in programs to protect wellheads and significant groundwater recharge areas. Many local governments are also responsible for operation of water supply and wastewater treatment facilities.

The Altamaha River basin includes all or part of 14 Georgia counties (Table 2-5 and Figure 2-2); however, only one is entirely within the basin, and one county has a small fraction (<20 percent) of its land area within the basin. Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-6 lists the municipalities in the Altamaha River basin.

Table 2-5. Georgia Counties in the Altamaha River Basin

Counties Entirely within the Altamaha River Basin	Counties Partially within the Altamaha River Basin	Counties with Less Than 20% Area within the Basin
Toombs	Appling Emanuel Jeff Davis Long Tattnall Washington	Candler Glynn Johnson Montgomery Treutlen Wayne McIntosh

2.3.2 Regional Development Centers

Regional Development Centers (RDCs) are agencies of local governments, with memberships consisting of all the cities and counties within each RDC's territorial area. There are currently 17 RDCs in Georgia. RDCs facilitate coordinated and comprehensive planning at local and regional levels, assist their member governments with conformity to minimum standards and procedures, and can have a key role in promoting and supporting management of urban runoff, including watershed management initiatives. RDCs also serve as liaisons with state and federal agencies for local governments in each region and are working with the EPD to coordinate development of TMDL implementation plans.

Funding sources include members' dues and funds available through DCA. Table 2-7 summarizes the RDCs and the associated counties within the Altamaha River basin.

Table 2-6. Georgia Municipalities in the Altamaha River Basin

HUC 03070106 – Altamaha River Subbasin				
Adrian	Johnson Corner	Meeks	Pringle	Vidalia
Collins	Kibbee	Normantown	Reidsville	Wesley
Covena	Kite	Norristown	Santa Claus	Wrightsville
Donovan	Lexsy	Nunez	Scott	Zaidee
Harrison	Lyons	Oak Park	Stillmore	
Higgston	McGregor	Ohoopee	Tarrytown	
HUC 03070107 – Ohoopee River Subbasin				
Alston	Doctortown	Graham	Madray Springs	Sharps Spur
Broadhurst	Donald	Grangerville	McKinnon	St. Simons
Cedar Crossing	Everett	Hazlehurst	Mendes	Uvalda
Charlotteville	Gardi	Jesyp	Midway	
Darien	Glennville	Ludowici	Mount Pleasant	

Table 2-7. Regional Development Centers in the Altamaha River Basin

Regional Development Center	Member Counties with Land Area in the Altamaha Basin
Heart of Georgia-Altamaha	Appling, Candler, Emanuel, Jeff Davis, Johnson, Long, Montgomery, Tattnall, Toombs, Treutlen, Wayne
Central Savannah River Area	Washington
Coastal Georgia	Glynn, Long, McIntosh

2.4 Water Use Classifications

2.4.1 Georgia's Water Use Classification System

The Board of Natural Resources was authorized through the Rules and Regulations for Water Quality Control promulgated under the Georgia Water Quality Control Act of 1964, as amended, to establish water use classifications and water quality standards for the surface waters of the state.

The water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. Georgia was the second state in the nation to have its water use classifications and standards for intrastate waters approved by the federal government in 1967. For each water use classification, water quality standards or criteria were developed which established a framework to be used by the Water Quality Control Board and later the Environmental Protection Division in making water use regulatory decisions.

The water use classification system was applied to interstate waters in 1972 by the EPD. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-8 provides a summary of water use classifications and criteria for each use.

Congress made changes in the CWA in 1987 that required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, the Board of Natural Resources adopted 31 numeric standards for protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a summary of toxic substance standards that apply to all waters in Georgia. Water quality standards are discussed in more detail in Section 5.2.1.

Table 2-8. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

Use Classification ¹	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams) ²		pH	Temperature (other than trout streams) ²	
	30-Day Geometric Mean ³ (#/100 mL)	Maximum (#/100 mL)	Daily Average (mg/L)	Minimum (mg/L)	Std. Units	Maximum Rise (°F)	Maximum (°F)
Drinking Water Requiring Treatment	1,000 (Nov-Apr) 200 (May-Oct)	4,000 (Nov-Apr)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 (Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing ⁴	1,000 (Nov-Apr) 200 (May-Oct)	4,000 (Nov-Apr)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

1. Improvements in water quality since the water use classifications and standards were originally adopted in 1972 provided the opportunity for Georgia to upgrade all stream classifications and eliminate separate use designations for "Agriculture," "Industrial," "Navigation," and "Urban Stream" in 1993.
2. Standards for Trout Streams for dissolved oxygen are an average of 6.0 mg/L and a minimum of 5.0 mg/L. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2 deg. F is allowed in Secondary Trout Streams.
3. Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: the geometric mean of 2 and 18 is the square root of 36.
4. Standards are the same as fishing with the exception of dissolved oxygen, which is site specific.

In the latter 1960s through the mid-1970s there were many water quality problems in Georgia. Many stream segments were classified for the uses of navigation, industrial, or urban stream. Major improvements in wastewater treatment over the years have allowed the stream segments to be raised to the uses of fishing or coastal fishing which include more stringent water quality standards. The final two segments in Georgia were upgraded as a part of the triennial review of standards completed in 1989. All of Georgia's waters are currently classified as either fishing, recreation, drinking water, wild river, scenic river, or coastal fishing.

2.4.2 Water Use Classifications for the Altamaha River Basin

Waters in the Altamaha River basin are classified as fishing, recreation, drinking water, or wild and scenic. Most of the waters are classified as fishing. Those waters explicitly classified in Georgia regulations are shown in Table 2-9; all waters not explicitly classified are classified as fishing.

Table 2-9. Altamaha River Basin Waters Classified in Georgia Regulations¹

Waterbody	Segment Description	Use Classification
Altamaha River	All littoral waters on the ocean side of St. Simons, Sea, and Sapelo Islands	Recreation

¹ Rules and Regulations for Water Quality Control, Chapter 391-3-6(13). Waters within the Altamaha River basin not explicitly classified and listed above are classified as Fishing.

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In This Section

- Drinking Water Supply
- Surface Water Quantity
- Groundwater Quantity

Section 3

Water Quantity

This section addresses water quantity issues (availability and use), while water quality in the Altamaha basin is the subject of Section 4. Water use in the Altamaha River basin is measured by estimates of freshwater withdrawn from groundwater and surface water. Uses of water include both consumptive and nonconsumptive uses.

Groundwater is the primary water source in the Coastal Plain Province of the Altamaha River basin. Principal aquifers of the Coastal Plain include the Upper Brunswick and Lower Brunswick aquifers, the Floridan aquifer system, the Claiborne and Clayton aquifers, and the Cretaceous aquifer system.

The Floridan aquifer system supplies most of the groundwater used in the Altamaha basin. This system consists primarily of limestone, dolostone and calcareous sand. It is generally confined, but is semiconfined to unconfined near its northern limit. Wells in this aquifer system are generally high-yielding and are extensively used for irrigation, municipal supplies, industry, and private domestic supply.

Water use in the Altamaha River basin is expected to increase in the future due to average population growth and farming.

In the following sections, water availability is discussed from a number of viewpoints. First, the important topic of drinking water is presented, which includes both surface and groundwater supplies. Then, general surface water availability is presented, followed by groundwater availability.

3.1 Drinking Water Supply

3.1.1 Drinking Water Supplies in the Altamaha River Basin

A public water system pipes water for human consumption and has at least 15 service connections or regularly serves at least 25 individuals 60 or more days out of the year. Public water system sources include surface water pumped from rivers and creeks or groundwater pumped to the surface from wells or naturally flowing from springs. Unlike

other basins in Georgia, the main source of drinking water in the Altamaha basin is provided by groundwater. There are three different types of public water systems: community, non-community non-transient, and non-community transient.

Types of Public Water Systems

A community public water system serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Examples of community water systems are municipalities, such as cities, counties, and authorities which serve residential homes and businesses located in the areas. Other types of community public water systems include rural subdivisions or mobile home parks which have a large number of homes connected to a private public water system, usually a small number of wells.

A non-community non-transient public water system serves at least 25 of the same persons over six months per year. Examples of non-community non-transient systems are schools, office buildings, and factories which are served by a well.

A non-community transient public water system does not meet the definition of a non-community non-transient system. A non-community transient public water system provides piped water for human consumption to at least 15 service connections or which regularly serves at least 25 persons at least 60 days a year. Examples of a non-community transient are highway rest stops, restaurants, motels, and golf courses.

Private domestic wells serving individual houses are not covered by the state's public water system regulations. However, the regulations for drilling domestic wells are set by the Water Well Standards Act and the local health department is responsible for insuring water quality.

In the Altamaha River basin there are no community public water systems utilizing surface water and groundwater.

3.1.2 Drinking Water Demands

Over the next few years it is estimated that there will be an increase in the use of groundwater from the Altamaha River basin.

3.1.3 Drinking Water Permitting

The Rules for Safe Drinking Water (391-3-5) adopted under the Georgia Safe Drinking Water Act of 1997, require any person who owns and/or operates a public water system to obtain a permit to operate a public water system from the Environmental Protection Division. The permitting process has three phases: Inquiry and Discovery, Technical Review, and Permitting. During these phases the owners must provide a detailed description of the project; demonstrate the reliability of the water source; render engineering plans and specifications prepared by a professional engineer demonstrating the construction integrity of wells, treatment and distribution; conduct preliminary water sample testing; and provide legal documentation including an application to operate a public water system. Permits contain specific conditions the owner must meet for different types of public water systems, including a list of approved water sources, filter rates, disinfection and treatment requirements, compliance with sample testing schedule, and number of allowed service connections. Permits are issued for 10 years and are renewable.

3.2 Surface Water Quantity

3.2.1 Surface Water Supply Sources

The Altamaha River basin encompasses 2,870 square-miles in southeast Georgia. Formed by the confluence of the Ocmulgee and Oconee Rivers near Lumber City in

Telfair County, the Altamaha River flows southeasterly 125 miles emptying into the Atlantic Ocean near Darien.

The principal surface water resources are the Altamaha River and the Ochoopee River. The lower portion of the basin contains the Altamaha River (average annual flow 14,300 cfs). The upper portion is drained by the Ochoopee River (average annual flow 1,200 cfs), which flows southeast joining the Altamaha River about 12 miles below Reidsville. Some of the other larger tributaries across the basin include Penholoway Creek, Beards Creek, Pendleton Creek, and the Little Ochoopee River.

3.2.2 Surface Water Supply Demands and Uses

Municipal and Industrial Demand

Municipal and Industrial (M&I) water demands include public supplied needs such as residential, commercial, and industrial, and other demands such as distribution system losses.

Currently, the Altamaha River basin has one surface water withdrawal permit. Surface water withdrawal permits are for users equal to or greater than 100,000 gallons per day. Users below this amount of surface water are not required to have a permit for their withdrawals.

Agricultural Water Demand

Agricultural surface water demand in the Altamaha River Basin is considerable. Irrigated crops are grown throughout Emmanuel, Johnson, and Tattnall Counties. Other counties in the basin also contain lesser amounts of irrigated acreage.

The demands on surface water resources for agricultural activities include irrigation for crops, nursery, and turf; drinking water for livestock and poultry; and to a much lesser extent, water for aquacultural purposes.

Irrigated Acreage

The total water demand from agriculture, including both surface water and groundwater demand, may be estimated using a variety of agricultural data collected by multiple sources. NRCS has attempted to combine this information for the purpose of estimating current and future agricultural water use in the basin. Table 3-1 shows historical irrigated acreage in the basin from 1974 to 1998.

Irrigated acres in the Altamaha River basin grew from 3,756 in 1974 to a maximum for the basin of 48,551 in 1998. Assuming growth rates continue as observed in the Altamaha River basin between 1982 and 1998, there will be approximately 69,000 acres under irrigation by 2020.

Table 3-1. Irrigated Acres in the Altamaha River Basin, 1974-1998

Year	HUC 03070106	HUC 03070107	Basin Total
1974	1,906	1,850	3,756
1978	7,928	9,865	17,793
1979	9,503	14,431	23,934
1980	12,006	13,291	25,298
1981	14,283	16,273	30,556
1982	15,209	21,529	36,738
1984	16,845	23,513	40,358
1986	15,829	25,094	40,923
1989	16,822	25,442	42,264
1992	20,166	27,691	47,857
1995	22,204	26,000	48,204
1998	24,241	24,310	48,551

USDA-NRCS estimates based on county level data extrapolated to the basin.

Water Demand

Agricultural water demand is dependent upon a number of variables that include, but are not limited to, irrigated acreage, cropping mix and patterns, soil characteristics, climatic conditions, type of animal operation, best management practices, and market conditions. Water use in the Altamaha River basin reflects the influence of these variables (Table 3-2). No distinct trend can be observed; however, from 1980 to 2000 there was a increase of 12 MGD from 14.12 MGD in 1980 to 26.77 MGD in 2000.

Table 3-2. Historical Agricultural Water Use (MGD) in the Altamaha River Basin, 1980-2000

Year	HUC 03070106	HUC 03070107	Basin Total
1980	6.02	8.09	14.12
1985	6.10	9.13	15.23
1987	7.10	9.98	17.08
1990	5.49	6.39	11.89
1995	11.90	13.68	25.57
2000	11.56	15.21	26.77

USDA-NRCS estimates based on county level data extrapolated to the basin.

Approximately 97.5 percent of the agricultural water used in 2000 was for irrigation purposes (26.10 MGD). The remaining 2.5 percent (.67 MGD) was used for animal operations.

Future agricultural water demand is expected to increase slightly within the basin to 36.7 MGD by the year 2020 on a projected 69,000 acres under irrigation by that time. Table 3-3 shows the projected increase in agricultural water demand in the basin through the year 2020. The reader should note that significant increases in irrigated acreage will have the potential to result in a much higher demand.

Table 3-3. Projected Water Use in the Altamaha River Basin, 2005-2020

Year	Projected Water Use (MGD)
2005	29.2
2010	31.7
2015	34.2
2020	36.7

Power Generation Water Demand

There are no hydropower facilities in the Altamaha basin.

Navigational Water Demand

There is some commercial navigation in the lower portion of the Altamaha River, particularly in the intracoastal waterway.

Recreation

Recreation activities in the Altamaha River basin include fishing, camping, boating, swimming, picnicking, and other activities.

Waste Assimilation Water Demand

Water quantity, wastewater treatment, and wastewater discharge permitting are addressed in Section 4. However, it should be noted that the guidelines for discharge of treated effluent into the rivers and streams of the Altamaha River basin assume that sufficient surface water flow will be available to assimilate waste and ensure that water quality criteria will be met.

Environmental Water Demands

EPD recognizes the importance of maintaining suitable aquatic habitat in Georgia's lakes and streams to support viable communities of fish and other aquatic organisms.

A significant issue that is receiving increasing attention from EPD is the minimum stream flow policy. EPD's current minimum stream flow policy is to protect the lowest 7-day average flow, which would have occurred during any 10-year period for a stream (commonly called the 7Q10). EPD is considering increasing the minimum flow requirement under recommendations of the Wildlife Resources Division.

3.2.3 Surface Water Withdrawal Permitting

The 1977 Surface Water Amendments to the Georgia Water Quality Control Act of 1964 require all non-agricultural users of more than 100,000 GPD on a monthly average (from any Georgia surface water body) to obtain a permit for this withdrawal from EPD. These users include municipalities, industries, military installations, and all other non-agricultural users. The statute stipulates that all pre-1977 users who could establish the quantity of their use prior to 1977 would be "grandfathered" for that amount of withdrawal. There is only one surface water withdrawal permit in the Altamaha River basin – a permit for the Southern Nuclear Operating Company Plant Hatch in Appling County for a withdrawal from the Altamaha River of 103.6 mgd (24-hour maximum) and 85.0 mgd (monthly average).

Applicants are required to submit details relating to the source of withdrawals, demand projections, water conservation measures, low flow protection measures (for non-grandfathered withdrawals), and raw water storage capacities. EPD issued permit identifies the source of withdrawal, the monthly average and maximum 24-hour withdrawal, the standard and special conditions under which the permit is valid, and the

expiration date of the permit. The standard conditions section of the permit generally defines the reporting requirements (usually annual submission of monthly average withdrawals); the special conditions section of the permit usually specifies measures the permittee is required to undertake so as to protect downstream users and instream uses (e.g., waste assimilation, aquatic habitat). The objective of these permits is to manage and allocate water resources in a manner that both efficiently and equitably meets the needs of all the users.

Farm Irrigation Permits

The 1988 Amendments to the Water Quality Control Act establish the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned surface water permitting statute, the lower threshold is 100,000 GPD; however users of less water may apply for and be granted a permit. With two exceptions, farm use is defined as irrigation of any land used for general farming, aquaculture, pasture, turf production, orchards, nurseries, watering for farm animals and poultry, and related farm activities. One relevant exception is that the processing of perishable agricultural products is not considered a farm use.

Applicants for these permits who can establish that their use existed prior to July 1, 1988, and when these applications are received prior to July 1, 1991, are "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Generally, agricultural users are not required to submit any water use reports.

In the Altamaha River basin, a total of 1,079 surface and/or groundwater permits have been issued.

3.2.4 Flooding and Floodplain Management

The Altamaha River basin was unaffected by the massive flooding that occurred in parts of Georgia in 1994, however, many counties within the Altamaha, Ocmulgee, and Oconee basins were included in Federal Disaster Declaration #1209 as a result of the 1998 floods.

Floodplain development is a constant concern, because development within floodplain areas can increase flood levels, thereby increasing the number of people and the amount of property at risk. The term "floodplain management" is often used as a synonym for program or agency-specific projects and regulations. It is in fact quite a broad concept. Floodplain management is a continuous process of making decisions about whether flood plains are to be used for development and how they are to be developed.

Floodplain Management Activities

To increase understanding and maintain a working knowledge of floodplain management, Georgia's Floodplain Management Office periodically conducts training workshops throughout the state for local officials. The workshops cover the related aspects of the National Flood Insurance Program (NFIP), administration and enforcement of local flood ordinance, the effects of floodplain management on flood insurance rates and flood hazard mitigation.

The Floodplain Management Office also participates in the annual Governor's Severe Weather conference. The purpose of this conference is to increase awareness and preparedness regarding all types of severe weather—flooding, hurricanes, tornadoes, thunderstorms and ice storms. Flooding is the number one natural disaster in Georgia according to the Georgia Emergency Management Agency (GEMA), coordinator of the conference. The conference is an opportunity for emergency managers, public safety personnel, medical professionals, elected officials and other interested persons to gather and discuss means to better protect against loss of lives and property.

EPD is also working with a new initiative called "Project Impact." Project Impact works with state and local governments across the country to build communities that are more likely to withstand the ravages of natural disasters. Project Impact's goal is to erase the ceaseless damage-repair-damage cycle by implementing preventive measures before disaster occurs.

3.3 Groundwater Quantity

3.3.1 Groundwater Sources

The Altamaha River basin is in the Coastal Plain physiographic province. The Coastal plain area lies south of the fall line and is a region underlain by alternating layers of sand, clay and limestone that generally deepen and thicken to the southeast. The main groundwater source in most of the basin is the Floridan aquifer system. This aquifer system delivers tremendous amounts of water quickly, leading to very heavy municipal, industrial and agricultural usage from this source.

3.3.2 Groundwater Supply Demands

Municipal and Industrial Uses

Municipal and Industrial (M&I) water demands include public supplied and private supplied residential, commercial, governmental, institutional, manufacturing and other demands such as distribution system losses.

Municipal and Industrial groundwater users equal to or greater than 100,000 gallons per day are required to obtain permits from the Georgia EPD. Users below this amount of groundwater are not required to have a permit for their withdrawals.

Agricultural Water Demand

Agricultural surface water demand in the Altamaha River Basin is considerable. Irrigated crops are grown throughout Emmanuel, Johnson, and Tattnall Counties. Other counties in the basin also contain lesser amounts of irrigated acreage.

The demands on surface water resources for agricultural activities include irrigation for crops, nursery, and turf; drinking water for livestock and poultry; and, to a much lesser extent, water for aquacultural purposes.

3.3.3 Groundwater Supply Permitting

Nonagricultural Permits

The Georgia Ground Water Use Act of 1972 requires permits from EPD for all non-agricultural users of groundwater of more than 100,000 GPD. General information required of the applicant includes location (latitude and longitude), past, present, and expected water demand, expected unreasonable adverse effects on other users, the aquifer system from which the water is to be withdrawn, and well construction data. The permits issued by EPD stipulate both the allowable monthly average and annual average withdrawal rates, standard and special conditions under which the permit is valid, and the expiration date of the permit. Groundwater use reports are generally required of the applicant on a semi-annual basis. The objective here is the same as with surface water permits.

Farm Irrigation Permits

The 1988 Amendments to the Ground Water Use Act establishes the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned groundwater permitting statute, the lower threshold is 100,000 GPD; however

users of less water may apply and be granted a permit. A total of 1,079 surface and/or groundwater agricultural withdrawal permits have been issued.

Applicants for these permits who could establish that their use existed prior to July 1, 1988, and when their applications were received prior to July 1, 1991, were "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Presently, agricultural users are not required to submit any water use reports; however, recent legislation will institute a metering and reporting program.

Excessive Groundwater Withdrawals

Excessive groundwater withdrawal can lead to lowering or drawdown of the water table. Localized groundwater drawdowns are generally discovered only after the fact of permitting has occurred and withdrawal operations begun. To avoid such a possibility, if an application for a very large use of groundwater is received, the Water Resources Management Program of the Georgia EPD can take certain steps to possibly contain drawdown effects. Modeling the hydrogeologic impact of such a large user may be required of the potential permittee. If this computer analysis indicates no unreasonable impact on existing users, such a water use permit may be approved. Another recommended possibility is a negotiated reduction in permit amounts to a more moderate amount of withdrawal, with lessened impacts. Prior to full scale production of a well field, well pumping tests run at or near actual production rates can be required. These may give the permittee and the EPD some real idea of the amount of water that may be pumped safely, without endangering other users or drawing down the aquifer too greatly. Permit withdrawal limits may then be set at some safer yield which is determined by these pumping tests. These tests may also indicate that proposed pumping amounts may require more wells drilled to spread out the ultimate production impact on the aquifer.

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In This Section

- Sources and Types of Environmental Stressors
- Summary of Stressors Affecting Water Quality

Section 4

Water Quality: Environmental Stressors

Sections 4, 5, 6, and 7 are closely linked, providing the foundation for the water quality concerns in the basin, identifying the priority issues based on these concerns, and finally, recommending management strategies to address these concerns. Therefore, the reader will probably want to flip back and forth between sections to track specific issues.

This section describes the important environmental stressors that impair or threaten water quality in the Altamaha River basin. Section 4.1 first discusses the major sources of environmental stressors. Section 4.2 then provides a summary of individual stressor types as they relate to all sources. These include both traditional chemical stressors, such as metals or oxygen demanding waste, and less traditional stressors, such as modification of the flow regime (hydromodification) and alteration of physical habitat.

4.1 Sources and Types of Environmental Stressors

Environmental stressors are first catalogued by type of source in this section. This is the traditional programmatic approach, and it provides a match to regulatory lines of authority for permitting and management. Assessment requires an integration of stressor loads across all sources, as described in Section 4.2.

4.1.1 Point Sources and Non-discharging Waste Disposal Facilities

Point sources are defined as discharges of treated wastewater to the river and its tributaries regulated under the National Pollutant Discharge Elimination System (NPDES). These are divided into two main types – permitted wastewater discharges, which tend to be discharged at relatively stable rates, and permitted stormwater discharges, which tend to be discharged at highly irregular, intermittent rates, depending on precipitation. Nondischarging waste disposal facilities, including land application

systems and landfills, which are not intended to discharge treated effluent to surface waters, are also discussed in this section.

NPDES Permitted Wastewater Discharges

The EPD NPDES permit program regulates municipal and industrial waste discharges, monitors compliance with limitations, and takes appropriate enforcement action for violations. For point source discharges, the permit establishes specific effluent limitations and specifies compliance schedules that must be met by the discharger. Effluent limitations are designed to achieve water quality standards in the receiving water and are reevaluated periodically (at least every 5 years).

Municipal Wastewater Discharges

Municipal wastewater treatment plants are among the most significant point sources regulated under the NPDES program in the Altamaha River basin, accounting for the majority of the total point source effluent flow (exclusive of cooling water). These plants collect, treat, and release large volumes of treated wastewater. Pollutants associated with treated wastewater include pathogens, nutrients, oxygen-demanding waste, metals, and chlorine residuals. Over the past several decades, Georgia has invested more than \$96.0 million in construction and upgrade of municipal water pollution control plants in the Altamaha River basin. These upgrades have resulted in significant reductions in pollutant loading and consequent improvements in water quality below wastewater treatment plant outfalls. As of the 1999-2001 water quality assessment, 14 miles of rivers/streams were identified in which municipal discharges contributed to not fully supporting designated uses, all of which are being addressed through the NPDES permitting process.

Table 4-1 displays the major municipal wastewater treatment plants with permitted discharges of 1 million gallons per day (MGD) or greater in the Altamaha River basin. Major and minor municipal wastewater treatment plans are shown geographically in Figure 4-1. In addition, there are discharges from a variety of smaller wastewater treatment plants, including both public facilities (small public water pollution control plants, schools, marinas, etc.) and private facilities (package plants associated with non-sewered developments and mobile home parks) with less than a 1 MGD flow. These minor discharges might have the potential to cause localized stream impacts, but they are relatively insignificant from a basin perspective. A complete list of permitted dischargers in the Altamaha River basin is presented in Appendix C.

Table 4-1. Major Municipal Wastewater Treatment Plant Discharges with Permitted Monthly Flow Greater than 1 MGD in the Altamaha River Basin

NPDES Permit No.	Facility Name	County	Receiving Stream	Permitted Monthly Avg. Flow
<i>HUC 03070106</i>				
GA0037982	Glennville	Tattnall	Brickyard Br	2.0
GA0026000	Jesup WPCP	Wayne	Altamaha River	2.5
<i>HUC 03070107</i>				
GA0020346	Swainsboro WPCP	Emanuel	Crooked Creek	3.0
GA0025488	Vidalia WPCP	Toombs	Swift Creek	1.88

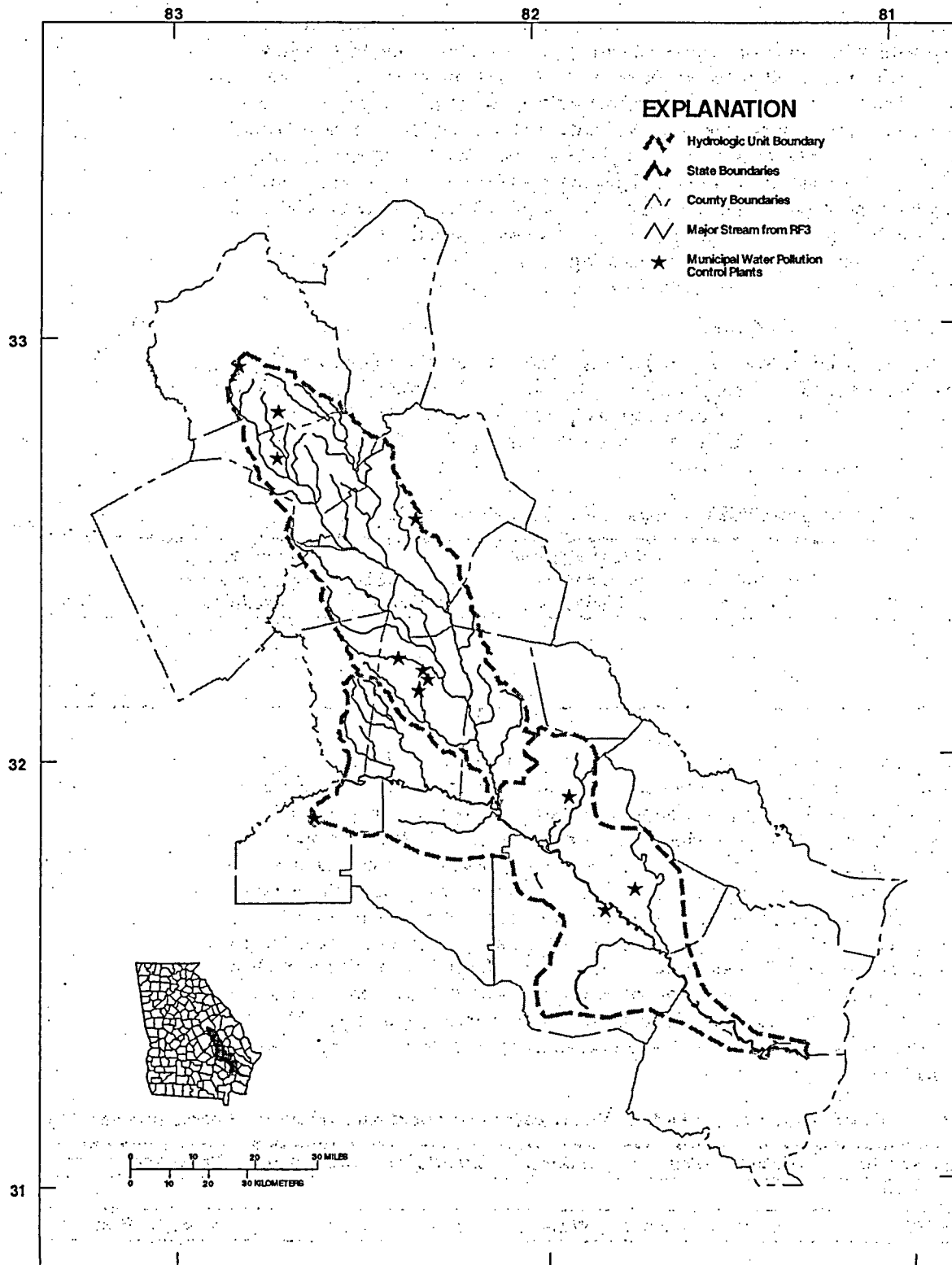


Figure 4-1. Location of Municipal Wastewater Treatment Plants in the Altamaha River Basin

Most urban wastewater treatment plants also receive industrial process and non-process wastewater, which can contain a variety of conventional and toxic pollutants. The control of industrial pollutants in municipal wastewater is addressed through pretreatment programs. The major publicly owned wastewater treatment plants in this basin have developed and implemented approved local industrial pretreatment programs. Through these programs, the wastewater treatment plants are required to establish effluent limitations for their significant industrial dischargers (those which discharge in excess of 25,000 gallons per day of process wastewater or are regulated by a Federal Categorical Standard) and to monitor the industrial user's compliance with those limits. The treatment plants are able to control the discharge of organics and metals into their sewerage system through the controls placed on their industrial users.

Industrial Wastewater Discharges

Industrial and federal wastewater discharges are also significant point sources regulated under the NPDES program. There are a total of 19 permitted municipal, state, federal, private, and industrial wastewater and process water discharges in the Altamaha River basin, as summarized in Table 4-2 and shown in Figures 4-2 and 4-3. The complete permit list is summarized in Appendix C.

Table 4-2. Summary of NPDES Permits in the Altamaha River Basin

HUC	Major Municipal Facilities	Major Industrial and Federal Facilities	Minor Public Facilities	Minor Private and Industrial Facilities	Total
03070106	2	1	2	6	11
03070107	2	0	6	0	8
<i>Total</i>	<i>4</i>	<i>1</i>	<i>8</i>	<i>6</i>	<i>19</i>

The nature of industrial discharges varies widely compared to discharges from municipal plants. Effluent flow is not usually a good measure of the significance of an industrial discharge. Industrial discharges can consist of organic, heavy oxygen-demanding waste loads from facilities such as pulp and paper mills; large quantities of noncontact cooling water from facilities such as power plants; pit pumpout and surface runoff from mining and quarrying operations, where the principal source of pollutants is the land-disturbing activity rather than the addition of any chemicals or organic material; or complex mixtures of organic and inorganic pollutants from chemical manufacturing, textile processing, metal finishing, etc. Pathogens and chlorine residuals are rarely of concern with industrial discharges, but other conventional and toxic pollutants must be addressed on a case-by-case basis through the NPDES permitting process. Table 4-3 lists the major industrial and federal wastewater treatment plants with discharges into the Altamaha River basin in Georgia.

Table 4-3. Major Industrial and Federal Wastewater Treatment Facilities in the Altamaha River Basin

NPDES Permit No.	Facility Name	County	Description	Flow (Mgd)	Receiving Stream
<i>HUC 03070106</i>					
GA0003620	Rayonier Inc. Jesup	Wayne	Industry	67	Altamaha River

There are also minor industrial discharges that may have the potential to cause localized stream impacts, but are relatively insignificant from a basin perspective.

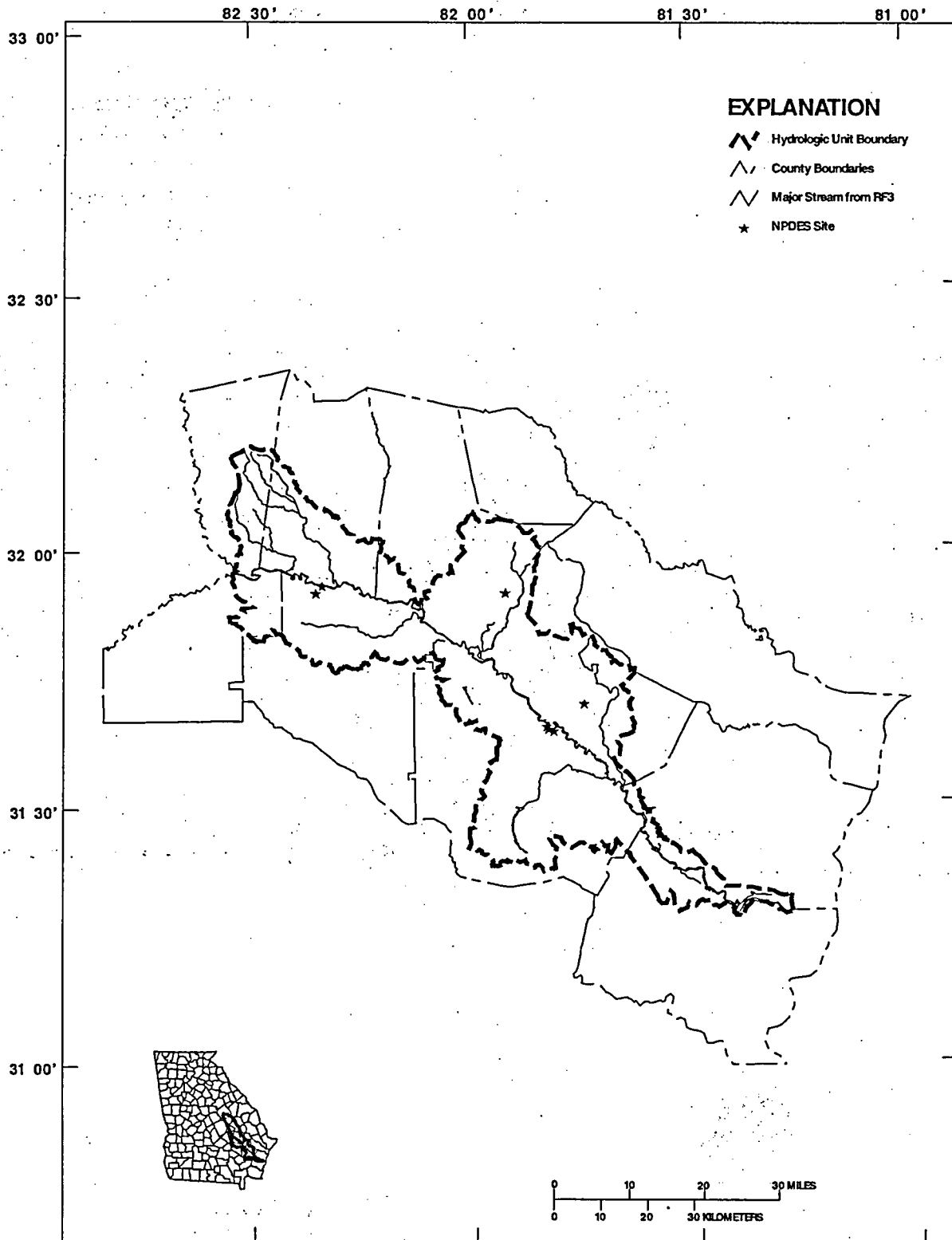


Figure 4-2. NPDES Sites Permitted by GAEPD, Altamaha River Basin, HUC 03070106

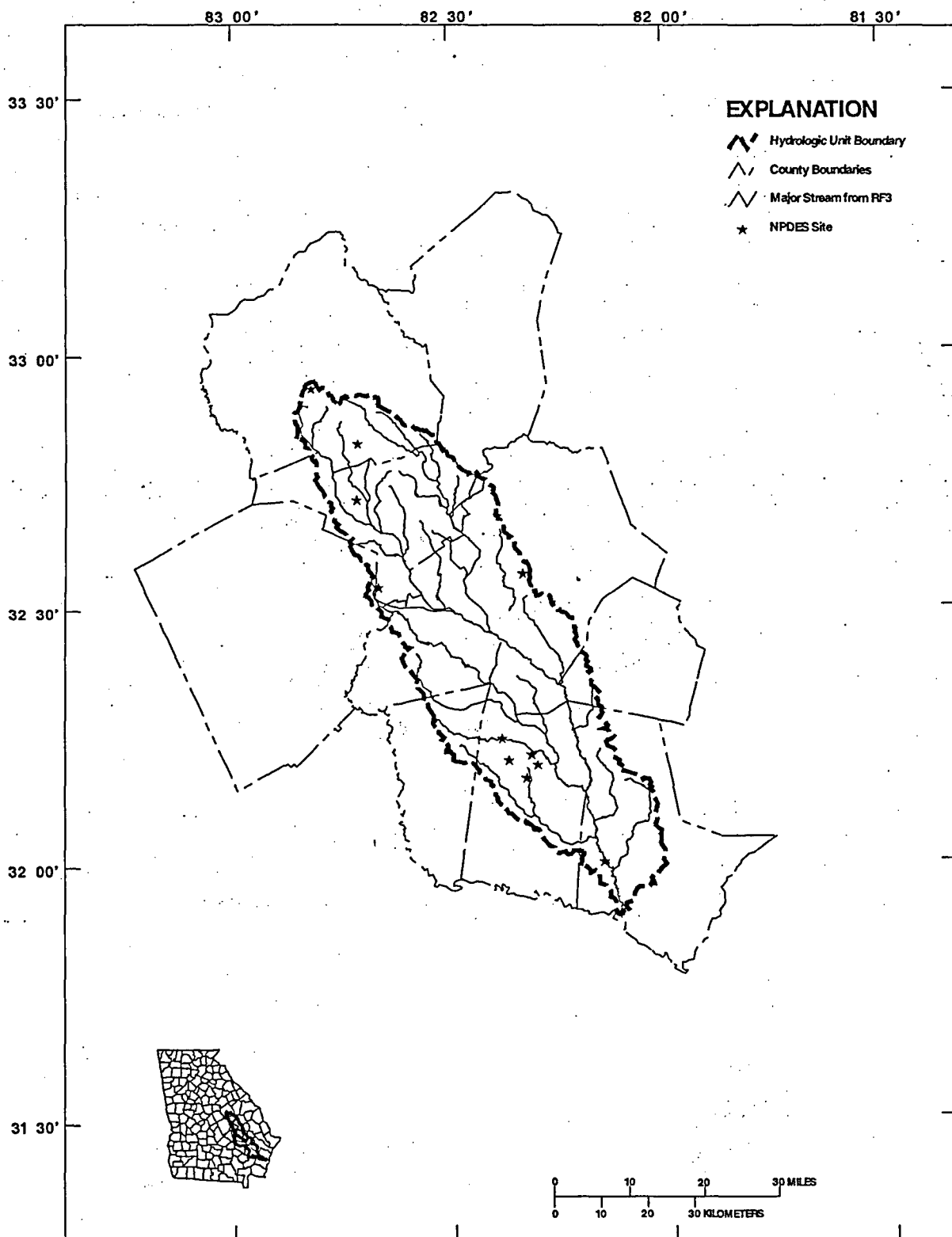


Figure 4-3. NPDES Sites Permitted by GAEPD, Altamaha River Basin, HUC 03070107

Combined Sewer Overflows

Combined sewers are sewers that carry both stormwater runoff and sanitary sewage in the same pipe. Most of these combined sewers were built at the turn of the century and were present in most large cities. At that time both sewage and stormwater runoff were piped from the buildings and streets to the small streams that originated in the heart of the city. When these streams were enclosed in pipes, they became today's combined sewer systems. As the cities grew, their combined sewer systems expanded. Often new combined sewers were laid to move the untreated wastewater discharge to the outskirts of the town or to the nearest waterbody.

In later years wastewater treatment facilities were built and smaller sanitary sewers were constructed to carry the sewage (dry weather flows) from the termination of the combined sewers to these facilities for treatment. However, during wet weather, when significant stormwater is carried in the combined system, the sanitary sewer capacity is exceeded and a combined sewer overflow (CSO) occurs. The surface discharge is a mixture of stormwater and sanitary waste. Uncontrolled CSOs thus discharge raw diluted sewage and can introduce elevated concentrations of bacteria, BOD, and solids into a receiving water body. In some cases, CSOs discharge into relatively small creeks.

CSOs are considered a point source of pollution and are subject to the requirements of the Clean Water Act. Although CSOs are not required to meet secondary treatment effluent limits, sufficient controls are required to protect water quality standards for the designated use of the receiving stream. In its 1990 session, the Georgia Legislature passed a CSO law requiring all Georgia cities to eliminate or treat CSOs.

There are no known combined sewer overflows in the Altamaha River basin.

NPDES Permitted Stormwater Discharges

Urban stormwater runoff in the Altamaha basin has been identified as a source of stressors from pollutants such as oxygen-demanding waste (BOD) and fecal coliform bacteria. Stormwater may flow directly to streams as a diffuse, nonpoint process, or may be collected and discharged through a storm sewer system. Some storm sewer systems are now subject to NPDES permitting and are discussed in this section. Contributions from nonpoint stormwater are discussed in later sections.

Pollutants typically found in urban stormwater runoff include pathogens (such as bacteria and viruses from human and animal waste), heavy metals, debris, oil and grease, petroleum hydrocarbons and a variety of compounds toxic to aquatic life. In addition, the runoff often contains sediment, excess organic material, fertilizers (particularly nitrogen and phosphorus compounds), herbicides, and pesticides which can upset the natural balance of aquatic life in lakes and streams. Stormwater runoff may also increase the temperature of a receiving stream during warm weather, which potentially threatens valuable trout fisheries in the Altamaha River basin. All of these pollutants, and many others, influence the quality of stormwater runoff. There are also many potential problems related to the quantity of urban runoff, which can contribute to flooding and erosion in the immediate drainage area and downstream.

Municipal Stormwater Discharges

In accordance with Federal Phase I stormwater regulations, the state of Georgia has issued individual area wide NPDES municipal separate storm sewer system (MS4) permits to 58 cities and counties in municipal areas with populations greater than 100,000 persons. No Phase I municipalities drain to the Altamaha River basin. Of the 86 cities and counties affected by the Phase II stormwater regulations, none are in the Altamaha River Basin.

Industrial Stormwater Discharges

Industrial sites often have their own stormwater conveyance systems. The volume and quality of stormwater discharges associated with industrial activity is dependent on a number of factors, such as the industrial activities occurring at the facility, the nature of the precipitation, and the degree of surface imperviousness (hard surfaces). These discharges are of intermittent duration with short-term pollutant loadings that can be high enough to have shock loading effects on the receiving waters. The types of pollutants from industrial facilities are generally similar to those found in stormwater discharges from commercial and residential sites; however, industrial facilities have a significant potential for discharging at higher pollutant concentrations, and may include specific types of pollutants associated with a given industrial activity.

EPD has issued one general permit regulating stormwater discharges for 10 of 11 federally regulated industrial subcategories. The general permit for industrial activities requires the submission of a Notice of Intent (NOI) for coverage under the general permit; the preparation and implementation of a stormwater pollution prevention plan; and, in some cases, analytical testing of stormwater discharges from the facility. As with the municipal stormwater permits, implementation of site-specific best management practices is the preferred method for controlling stormwater runoff. As of May 2003, approximately 41 NOIs had been filed for the Altamaha River basin.

The 11th federally regulated industrial subcategory (construction activities) is covered under NPDES General Permit No. GAR100000. This general permit regulates stormwater discharges associated with construction activity at sites and common developments disturbing more than five acres. The general permit requires the submission of a Notice of Intent (NOI) to obtain coverage under the permit, the preparation and implementation of an Erosion, Sedimentation, and Pollution Control Plan, and the preparation and implementation of a Comprehensive Monitoring Program which provides for monitoring of turbidity levels in the receiving stream(s) and/or stormwater outfalls(s) during certain rain events. The general permit became effective on August 1, 2000 and will be renewed in 2003 to include construction sites between one and five acres.

Nondischarging Waste Disposal Facilities

Land Application Systems (LASs)

In addition to permits for point source discharges, EPD has developed and implemented a permit system for land application systems (LASs). LASs for final disposal of treated wastewaters have been encouraged in Georgia and are designed to eliminate surface discharges of effluent to waterbodies. LASs are used as an alternative to advanced levels of treatment or as the only alternative in some environmentally sensitive areas.

When properly operated, an LAS should not be a source of stressors to surface waters. The locations of LASs are, however, worth noting because of the (small) possibility that a LAS could malfunction and become a source of stressor loading. Also, it is possible that contaminants, such as nutrients, could be transported offsite via groundwater and this potential source should be considered in watershed assessments where nutrient sensitive waters are located downstream.

A total of 171 municipal and 54 industrial permits for land application systems were in effect in Georgia in 2003. Municipal and other wastewater land application systems within the Altamaha Basin are listed in Table 4-4. The locations of all LASs within the basin are shown in Figures 4-4 and 4-5. Also, it is possible that contaminants, such as nutrients, could be transported offsite via groundwater and this potential source should be considered in watershed assessments where nutrient sensitive waters are located downstream.

Table 4-4. Wastewater Land Application Systems in the Altamaha River Basin

Facility Name	County	Permit No.	Permitted Flow (Mgd)
Crider Poultry Emanuel	Emanuel	GA01-300	1
Reidsville LAS	Tattnall	GA02-255	0.18
Reidsville Sherwood Forest	Tattnall	GA02-058	0.5
Screven LAS	Wayne	GA02-140	0.1
Stillmore LAS	Emanuel	GA02-075	0.05
Swainsboro LAS	Emanuel	GA02-257	1.86
Uvalda LAS	Montgomery	GA02-040	0.15
Vidalia LAS	Toombs	GA02-100	1.8

Landfills

Permitted landfills are required to contain and treat any leachate or contaminated runoff prior to discharge to any surface water. The permitting process encourages either direct connection to a publicly owned treatment works (although vehicular transportation is allowed in certain cases) or treatment and recirculation on-site to achieve a no-discharge system. Direct discharge in compliance with NPDES requirements is allowed but is not currently practiced at any landfills in Georgia. Groundwater contaminated by landfill leachate from older, unlined landfills represents a potential threat to waters of the state. Groundwater and surface water monitoring and corrective action requirements are in place for all landfills operated after 1988 to identify and rededicate potential threats. The provisions of the Hazardous Sites Response Act address threats posed by older landfills as releases of hazardous constituents are identified. All new municipal solid waste landfills are required to be lined and to have a leachate collection system installed.

EPD's Land Protection Branch is responsible for permitting and compliance of municipal and industrial Subtitle D landfills. The location of permitted landfills within the basin is shown in Figures 4-6 and 4-7.

4.1.2 Nonpoint Sources

The pollution impact on Georgia's streams has radically shifted over the last two decades. Streams are no longer dominated by untreated or partially treated sewage discharges, which had resulted in little or no oxygen and little or no aquatic life. The sewage is now treated, oxygen levels have recovered, and healthy fisheries have followed. Industrial discharges have also been placed under strict regulation. However, other sources of pollution are still affecting Georgia's streams. These sources are referred to as *nonpoint sources*. Nonpoint sources are diffuse in nature. Nonpoint source pollution can generally be defined as the pollution caused by rainfall or snowmelt moving over and through the ground. As water moves over and through the soil, it picks up and carries away natural pollutants and pollutants resulting from human activities, finally depositing them in lakes, rivers, wetlands, coastal waters, or groundwater. Habitat alteration (e.g., removal of riparian vegetation) and hydrological modification (e.g., channelization, bridge construction) can also cause adverse effects on the biological integrity of surface waters and are also treated as nonpoint sources of pollution.

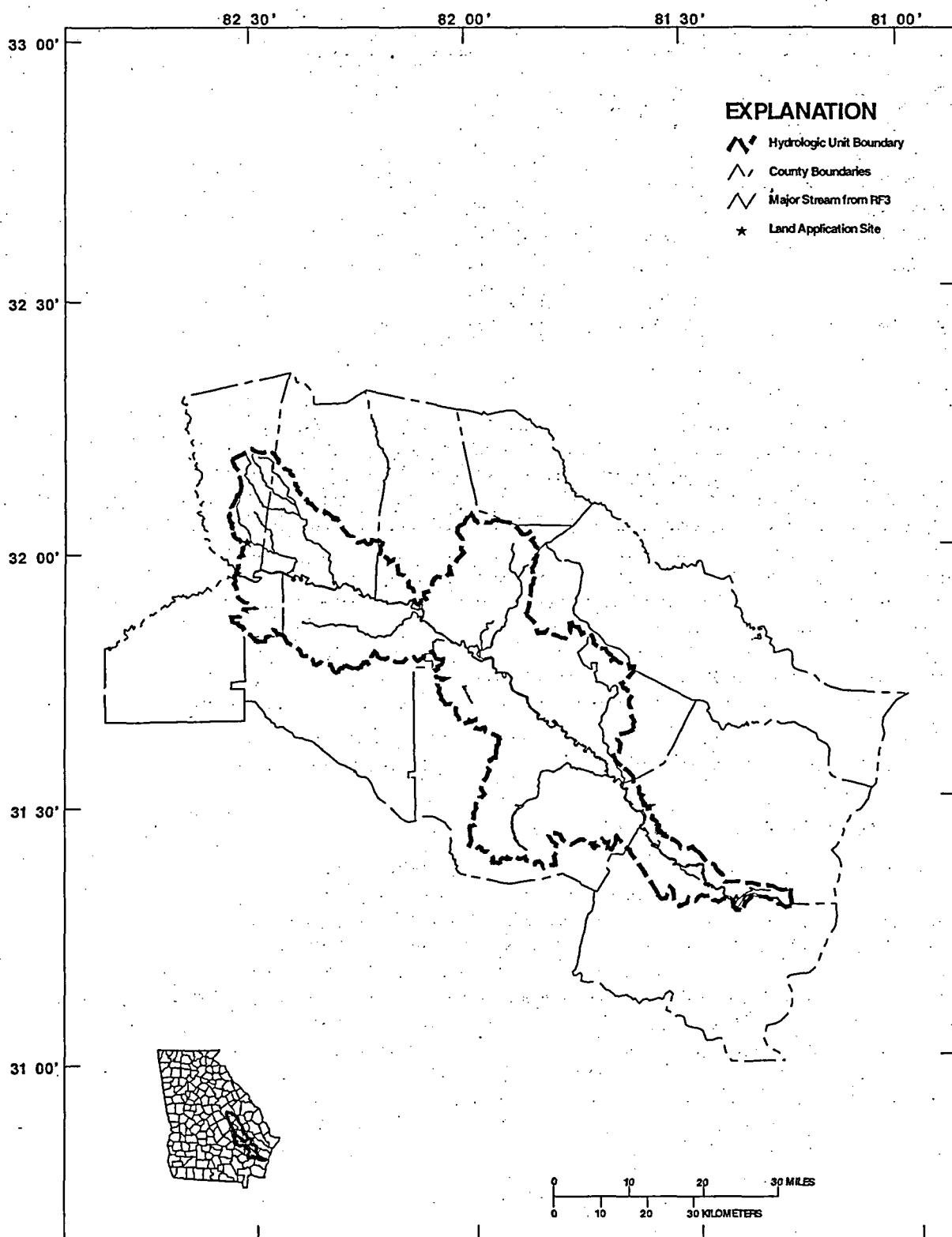


Figure 4-4. Land Application Systems, Altamaha River Basin, HUC 03070106

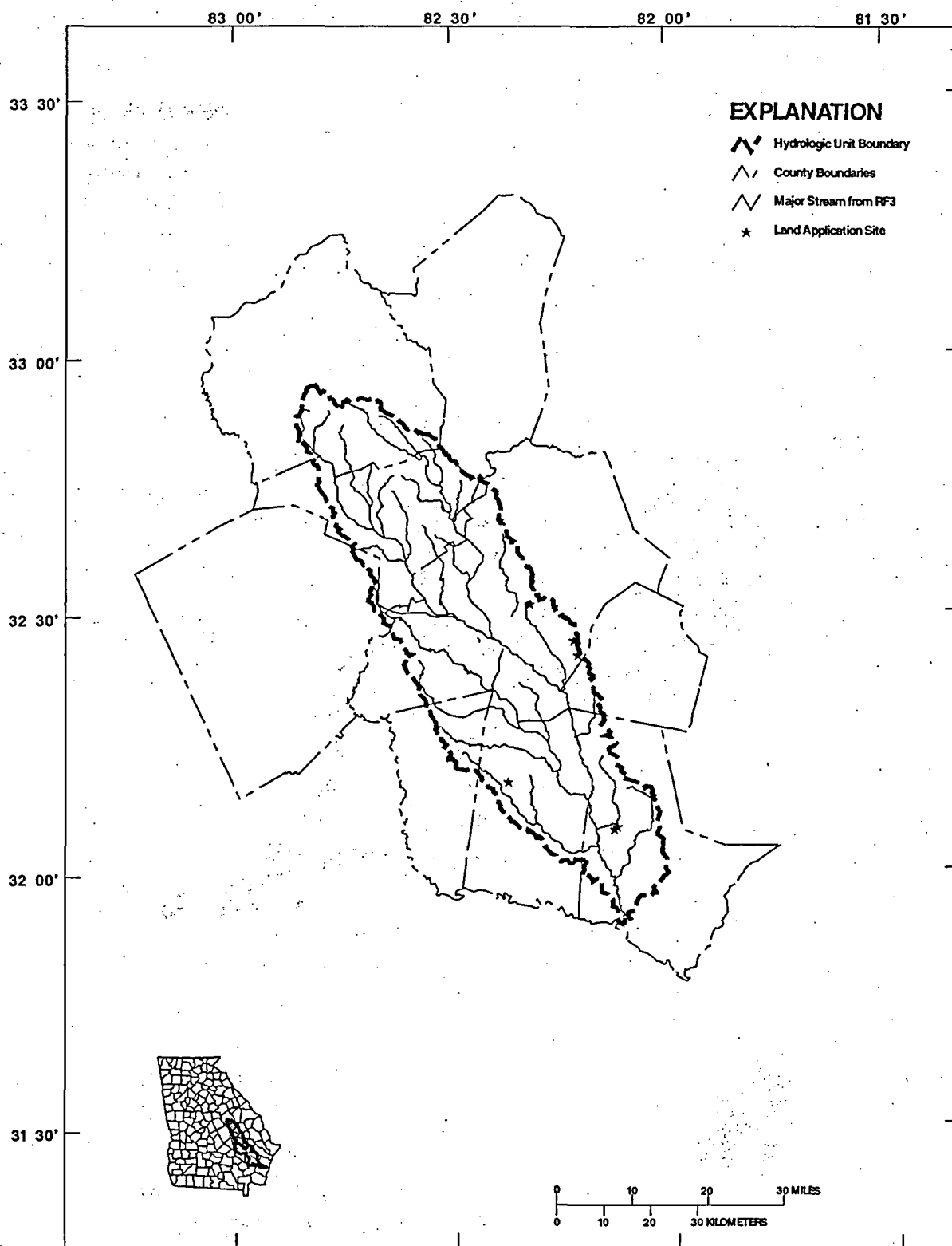


Figure 4-5. Land Application Systems, Altamaha River Basin, HUC 03070107

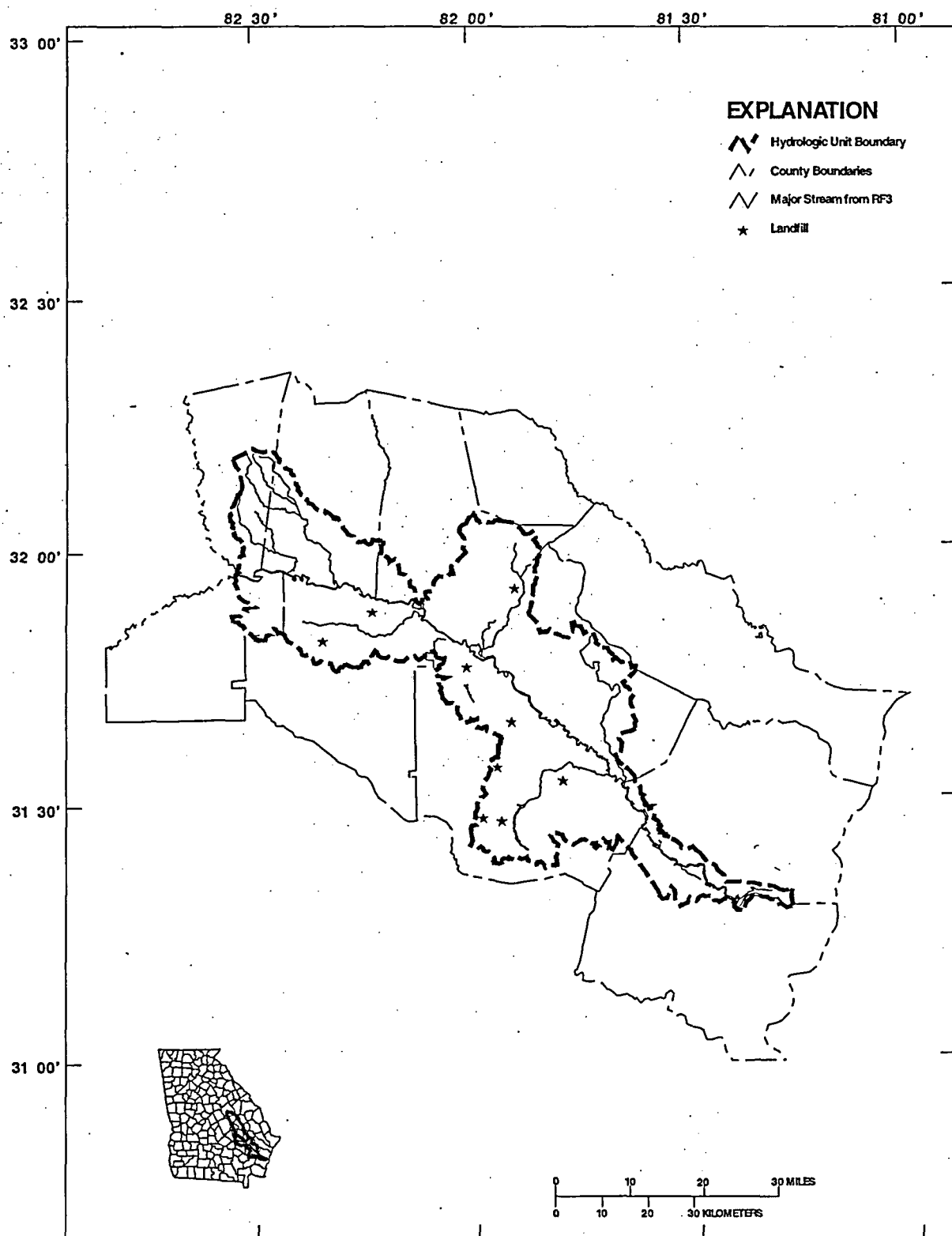


Figure 4-6. Landfills, Altamaha River Basin, HUC 03070106

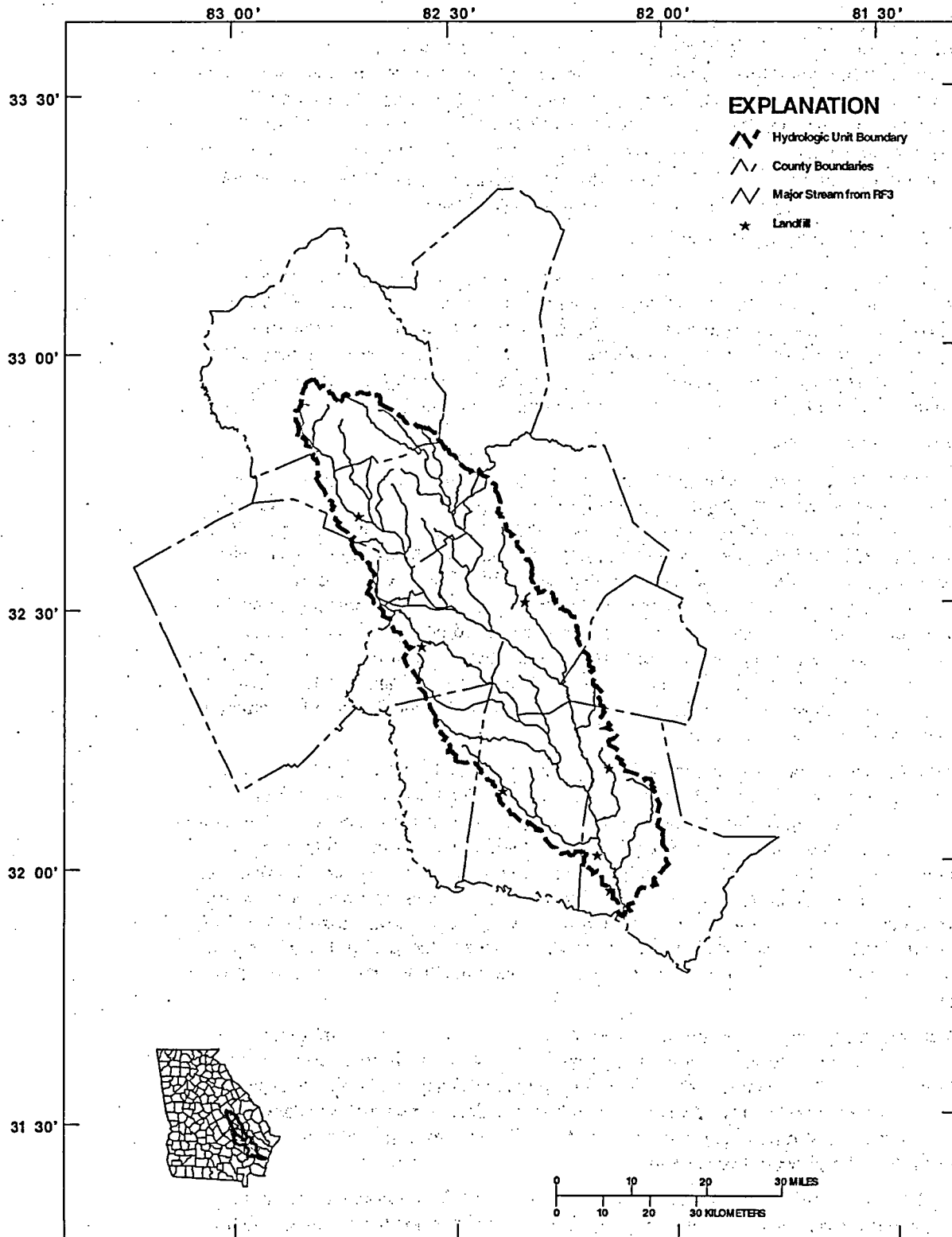


Figure 4-7. Landfills, Altamaha River Basin, HUC 03070107

Nonpoint pollutant loading comprises a wide variety of sources not subject to point source control through NPDES permits. The most significant nonpoint sources are those associated with precipitation, washoff, and erosion, which can move pollutants from the land surface to water bodies. Both rural and urban land uses can contribute significant amounts of nonpoint pollution. A review of the 2000-2001 (EPD, 2002) water quality assessment results for the Altamaha basin indicates that urban runoff and rural nonpoint sources contribute significantly to lack of full support for designated uses. The major categories of stressors for nonpoint sources are discussed below.

Nonpoint Sources from Agriculture

Agricultural operations can contribute stressors to water bodies in a variety of ways. Tillage and other soil-disturbing activities can promote erosion and loading of sediment to water bodies unless controlled by management practices. Nutrients contained in fertilizers, animal wastes, or natural soils may be transported from agricultural land to streams in either sediment-attached or dissolved forms. Loading of pesticides and pathogens is also of concern for various agricultural operations.

Sediment and Nutrients

Sediment is the most common pollutant resulting from agricultural operations. It consists mainly of mineral fragments resulting from the erosion of soils, but it can also include crop debris and animal wastes. Excess sediment loads can damage aquatic habitat by smothering and shading food organisms, altering natural substrate, and destroying spawning areas. Runoff with elevated sediment concentrations can also scour aquatic habitat, causing significant impacts on the biological community. Excess sediment can also increase water treatment costs, interfere with recreational uses of water bodies, create navigation problems, and increase flooding damage. In addition, a high percentage of nutrients lost from agricultural lands, particularly phosphorus, are transported attached to sediment. Many organic chemicals used as pesticides or herbicides are also transported predominantly attached to sediment.

Agriculture can be a significant source of nutrients, which can lead to excess or nuisance growth of aquatic plants and depletion of dissolved oxygen. The nutrients of most concern from agricultural land uses are nitrogen (N) and phosphorus (P), which may come from commercial fertilizer or land application of animal wastes. Both nutrients assume a variety of chemical forms, including soluble ionic forms (nitrate and phosphate) and less-soluble organic forms. Less soluble forms tend to travel with sediment, whereas more soluble forms move with water. Nitrate-nitrogen is very weakly adsorbed by soil and sediment and is therefore transported entirely in water. Because of the mobility of nitrate-nitrogen, the major route of nitrate loss is to streams by interflow or groundwater in deep seepage.

Phosphorus transport is a complex process that involves different components of phosphorus. Soil and sediment contain a pool of adsorbed phosphorus, which tends to be in equilibrium with the phosphorus in solution (phosphate) as water flows over the soil surface. The concentrations established in solution are determined by soil properties and fertility status. Adsorbed phosphorus attached to soil particles suspended in runoff also equilibrates with phosphorus in solution.

In 1993, the Soil Conservation Service (SCS, now NRCS) completed a study to identify hydrologic units in Georgia with a high potential for nonpoint source pollution problems resulting from agricultural land uses (SCS, 1993). This study concluded that there is not a major statewide agricultural pollution problem in Georgia. However, the assessment shows that some watersheds have sufficient agricultural loading to potentially impair their designated uses, based on estimates of transported sediments, nutrients, and animal wastes from agricultural lands (Table 4-5).

Table 4-5. Estimated Loads from Agricultural Lands by County (SCS, 1993)

County	Percent of Area In Basin	Sediment (tons)	Sediment (ppm)	Nitrogen (tons)	Nitrogen (ppm)	Phosphorus (tons)	Phosphorus (ppm)
Appling	37%	49,984	14.1	174	0.05	60	0.019
Candler	9%	45,074	31.1	141	0.14	51	0.051
Emanuel	48%	91,292	31.1	247	0.12	95	0.047
Glynn	11%	359	1.2	8	0.03	3	0.009
Jeff Davis	23%	16,706	7.4	112	0.06	30	0.016
Johnson	83%	52,700	26.9	202	0.16	64	0.051
Laurens	2%	100,069	26.8	296	0.12	108	0.044
Long	68%	2,351	6.9	36	0.11	9	0.027
Mcintosh	13%	211	2.0	33	0.25	13	0.102
Montgomery	51%	32,710	25.4	92	0.14	36	0.040
Tattnall	81%	57,928	26.7	311	0.17	85	0.047
Toombs	100%	55,174	27.5	217	0.19	68	0.059
Treutlen	62%	16,644	21.6	46	0.10	18	0.039
Washington	20%	94,776	35.3	265	0.12	101	0.046
Wayne	65%	13,973	7.9	51	0.03	18	0.012

Note: Mass estimates are based on the whole county. Concentration estimates are average event runoff concentration from agricultural lands.

Animal Waste

In addition to contributing to nutrient loads, animal waste may contribute high loads of oxygen-demanding chemicals and bacterial and microbial pathogens. The waste may reach surface waters through direct runoff as solids or in its soluble form. Soluble forms may reach groundwater through runoff, seepage, or percolation and reach surface waters as return flow. As the organic materials decompose, they place an oxygen demand on the receiving waters, which may adversely affect fisheries, and cause other problems with taste, odor, and color. When waters are contaminated by waste from mammals, the possible presence of pathogens that affect human health is of concern. In addition to being a source of bacteria, cattle waste might be an important source of the infectious oocysts of the protozoan parasite *Cryptosporidium parvum*.

Pesticides

Pesticides applied in agricultural production can be insoluble or soluble and include herbicides, insecticides, miticides, and fungicides. They are primarily transported directly through surface runoff, either in dissolved forms or attached to sediment particles. Some pesticides can cause acute and chronic toxicity problems in the water or throughout the entire food chain. Others are suspected human carcinogens, although the use of such pesticides has generally been discouraged in recent years.

The major agricultural pesticides/herbicides use within the basin include 2,4-d, Prowl, Blazer/Basagran/Trifluralin/Treflan/Trilin, Aatrex/Atizine, Gramoxone, Classic, Lexone/Sencor, and Lasso (alachlor) (compiled from the Georgia Herbicide Use Survey summary (Monks and Brown, 1991)). Since 1990, the use of alachlor in Georgia has decreased dramatically because peanut wholesalers no longer buy peanuts with alachlor.

Nonherbicide pesticide use is difficult to estimate. According to Stell et al. (1995), pesticides other than herbicides are currently used only when necessary to control some type of infestation (nematodes, fungi, and insects). Other common non-herbicide pesticides include chlorothalonil, aldicarb, chlorpyrifos, methomyl, thiodicarb, carbaryl, acephate, fonofos, methyl parathion, terbufos, disulfoton, phorate, triphenyltin hydroxide

(TPTH), and synthetic pyrethroids/pyrethrins. Application periods of principal agricultural pesticides span the calendar year in the basin. However, agricultural pesticides are applied most intensively and on a broader range of crops from March 1 to September 30 in any given year.

It should be noted that past uses of persistent agricultural pesticides that are now banned might continue to affect water quality within the basin, particularly through residual concentrations present in bottom sediments. A survey of pesticide concentration data by Stell et al. (1995) found that two groups of compounds had concentrations at or above minimum reporting levels in 56 percent of the water and sediment analyses. The first group included DDT and metabolites, and the second group included chlordane and related compounds (heptachlor, heptachlor epoxide) – while dieldrin was also frequently detected. The USEPA now bans all of these pesticides for use in the United States, but they might persist in the environment for long periods of time.

Nonpoint Sources from Urban, Industrial, and Residential Lands

Water quality in urban waterbodies is affected by both point source discharges and diverse land use activities in the drainage basin (i.e., nonpoint sources). One of the most important sources of environmental stressors in the Altamaha River basin, particularly in the developed and rapidly growing areas is diffuse runoff from urban, industrial, and residential land uses (jointly referred to as “urban runoff”). Nonpoint source contamination can impair streams that drain extensive commercial and industrial areas due to inputs of stormwater runoff, unauthorized discharges, and accidental spills. Wet weather urban runoff can carry high concentrations of many of the same pollutants found in point source discharges, such as oxygen-demanding waste, suspended solids, synthetic organic chemicals, oil and grease, nutrients, lead and other metals, and bacteria. The major difference is that urban runoff occurs only intermittently, in response to precipitation events.

The characteristics of nonpoint urban sources of pollution are generally similar to those of NPDES permitted stormwater discharges (these are discussed in the previous section). Nonpoint urban sources of pollution include drainage from areas with impervious surfaces, but also include less highly developed areas with greater amounts of pervious surfaces such as lawns, gardens, and septic tanks, all of which may be sources of nutrient loading.

There is little site-specific data available to quantify loading in nonpoint urban runoff in the Altamaha River basin, although estimates of loading rates by land use types have been widely applied in other areas.

Pesticides and Herbicides from Urban and Residential Lands

Urban and suburban land uses are also a potential source of pesticides and herbicides through application to lawns and turf, roadsides, and gardens and beds. Stell et al. (1995) provide a summary of usage in the Atlanta Metropolitan Statistic Area (MSA). The herbicides most commonly used by the lawn-care industry are combinations of dicamba, 2,4-D, mecoprop (MCP), 2,4-DP, and MCPA, or other phenoxy-acid herbicides, while most commercially available weed control products contain one or more of the following compounds: glyphosate, methyl sulfometuron, benefin (benfluralin), bensulide, acifluorfen, 2,4-D, 2,4-DP, or dicamba. Atrazine was also available for purchase until it was restricted by the State of Georgia on January 1, 1993. The main herbicides used by local and state governments are glyphosate, methyl sulfometuron, MSMA, 2,4-D, 2,4-DP, dicamba, and chlorsulfuron. Herbicides are used for pre-emergent control of crabgrass in February and October, and in the summer for post-emergent control. Data from the 1991 Georgia Pest Control Handbook (Delaplane, 1991) and a survey of CES and SCS personnel conducted by Stell et al. indicate that several insecticides could be considered ubiquitous in urban/suburban use, including chlorpyrifos, diazinon, malathion,

acephate, carbaryl, lindane, and dimethoate. Chlorothalonil, a fungicide, is also widely used in urban and suburban areas.

Other Urban/Residential Sources

Urban and residential stormwater also potentially includes pollutant loads from a number of other terrestrial sources:

Septic Systems. Poorly sited and improperly operating septic systems can contribute to the discharge of pathogens and oxygen-demanding pollutants to receiving streams. This problem is addressed through septic system inspections by the appropriate County Health Department, extension of sanitary sewer service and local regulations governing minimum lot sizes and required pump-out schedules for septic systems.

Leaking Underground Storage Tanks. The identification and remediation of leaking underground storage tanks (LUSTs) is the responsibility of the EPD Land Protection Branch. Petroleum hydrocarbons and lead are typically the pollutants associated with LUSTs.

Nonpoint Sources from Forestry

According to the US Forest Service's Forest Statistics for Georgia, 1997 report (Thompson, 1997) there are approximately 1,370,600 acres subject to silvicultural activities on an annual basis in Georgia (Table 4-6). This does not include natural disturbances such as weather, insects, animals, wildfire, or disease. According to this same report, there are approximately 66,340 acres undergoing a final harvest annually within the Altamaha Basin.

Table 4-6. Silvicultural Activities in Georgia

Treatment Type	Total Acres	Public	Forest Industry	Private
Final Harvest	445,600	8,000	133,200	304,400
Partial Harvest	97,200	3,500	9,200	84,500
Thinning	87,600	2,600	33,600	51,400
Stand Improvement	22,600	4,400	4,600	13,600
Site Preparation	230,800	2,600	115,600	112,700
Artificial Regeneration	308,300	3,100	116,400	188,800
Other	178,500	7,000	18,300	153,200
Total	1,370,600	31,200	430,900	908,600

Silvicultural operations may serve as sources of stressors, particularly excess sediment loads to streams, when Best Management Practices (BMPs) are not followed. From a water quality standpoint, forest roads pose the greatest potential threat of any of the typical forest practices. It has been documented that 90 percent of the sediment that entered streams from a forestry operation was directly related to either poorly located or poorly constructed roads and stream crossings. If BMPs are not adhered to, the potential impact to water quality from erosion and sedimentation is increased.

Silviculture is also a potential source of pesticides/herbicides. According to Stell et al. (1995), pesticides are mainly applied during site preparation after clear-cutting and during the first few years of new forest growth. Site preparation occurs on a 25-year cycle on most pine plantation land, so the area of commercial forest with pesticide application in a given year is relatively small. The herbicides glyphosate (Accord), sulfometuron methyl (Oust), hexazinone (Velpar), imazapyr (Arsenal), and metsulfuron methyl (Escort) account for 95 percent of the herbicides used for site preparation to control grasses, weeds, and broadleaves in pine stands. Dicamba, 2,4-D, 2,4-DP (Banvel),

triclopyr (Garlon), and picloram (Tordon) are minor use chemicals used to control hard to kill hardwoods and kudzu. The use of triclopyr and picloram has decreased since the early 1970s.

Most herbicides are not mobile in the soil and are targeted to plants, not animals. Applications made following the label and in conjunction with BMPs should pose little threat to water quality.

Chemical control of insects and diseases is not widely practiced except in forest tree nurseries, which is a very minor land use. Insects in pine stands are controlled by chlorpyrifos, diazinon, malathion, acephate, carbaryl, lindane, and dimethoate. Diseases are controlled using chlorothalonil, dichloropropene, and mancozeb. There are 10 commercial forest tree nurseries within the basin. Seven are located in Wayne County, two are in Tattnall County and one is in Johnson County.

According to the Georgia 1998-1999 water quality assessment, no streams were identified in the basin as impacted due to commercial forestry activities. However there are three stream segments listed for poor fish communities because of sedimentation from possible nonpoint sources that could include forestry operations.

Atmospheric Deposition

Atmospheric deposition can be a significant source of nitrogen and acidity in watersheds. Nutrients from atmospheric deposition, primarily nitrogen, are distributed throughout the entire basin in precipitation. The primary source of nitrogen in atmospheric deposition is nitrogen oxide emissions from combustion of fossil fuels. The rate of atmospheric deposition is a function of topography, nutrient sources, and spatial and temporal variations in climatic conditions.

Atmospheric deposition can also be a source of certain mobile toxic pollutants, including mercury, PCBs, and other organic chemicals.

4.1.3 Flow and Temperature Modification

Many species of aquatic life are adapted to specific flow and temperature regimes. In addition, both flow and temperature affect the dissolved oxygen balance in water, and changes in flow regime can have important impacts on physical habitat.

Thus, flow and temperature modifications can be important environmental stressors. They also interact with one another to affect the oxygen balance: flow energy helps control re-aeration rate, while water temperature controls the solubility of dissolved oxygen, and higher water temperatures reduce oxygen solubility and thus tend to reduce dissolved oxygen concentrations. Further, increased water temperature increases the rate of metabolic activity in natural waters, which in turn may increase oxygen consumption by aquatic species.

4.1.4 Physical Habitat Alteration

Many forms of aquatic life are sensitive to physical habitat disturbances. Probably the major disturbing factor is erosion and loading of excess sediment, which changes the nature of the stream substrate. Thus, any land use practices that cause excess sediment input can have significant impacts.

Physical habitat disturbance is also evident in many urban streams. Increased impervious cover in urban areas can result in high flow peaks, which increase bank erosion. In addition, construction and other land-disturbing activities in these areas often provide an excess sediment load, resulting in a smothering of the natural substrate and physical form of streams with banks of sand and silt.

4.2 Summary of Stressors Affecting Water Quality

Section 4.1 described the major sources of loads of pollutants (and other types of stressors) to the Altamaha basin. What happens in a river is often the result of the combined impact of many different types of loading, including point and nonpoint sources. For instance, excess concentrations of nutrients may result from the combined loads of wastewater treatment plant discharges, runoff from agriculture, runoff from residential lots, and other sources. Accordingly, Section 4.2 brings together the information contained in Section 4.1 to focus on individual stressor types, as derived from all sources.

4.2.1 Nutrients

All plants require certain nutrients for growth, including the algae and rooted plants found in lakes, rivers, and streams. Nutrients required in the greatest amounts include nitrogen and phosphorus. Some loading of these nutrients is needed to support normal growth of aquatic plants, an important part of the food chain. Too much loading of nutrients can, however, result in an overabundance of algal growth with a variety of undesirable impacts. The condition of excessive nutrient-induced plant production is known as eutrophication, and waters affected by this condition are said to be eutrophic. Eutrophic waters often experience dense blooms of algae, which can lead to unaesthetic scums and odors and interfere with recreation. In addition, overnight respiration of living algae, and decay of dead algae and other plant material, can deplete oxygen from the water, stressing or killing fish. Eutrophication of lakes typically results in a shift in fish populations to less desirable, pollution-tolerant species. Finally, eutrophication may result in blooms of certain species of blue-green algae which have the capability of producing toxins.

For freshwater aquatic systems, the nutrient in the shortest supply relative to plant demands is usually phosphorus. Phosphorus is then said to be the "limiting nutrient" because the concentration of phosphorus limits potential plant growth. Control of nutrient loading to reduce eutrophication thus focuses on phosphorus control.

Point and nonpoint sources to the Altamaha also discharge large quantities of nitrogen, but nitrogen is usually present in excess of amounts required to match the available phosphorus. Nitrogen (unlike phosphorus) is also readily available in the atmosphere and groundwater, so it is not usually the target of management to control eutrophication in freshwater. The bulk of the nitrogen in fresh-water systems is found in three ionic forms – ammonium (NH_4^+), nitrite (NO_2^-), or nitrate (NO_3^-). Nitrite and nitrate are more readily taken up by most algae, but ammonia is of particular concern because it can be toxic to fish and other aquatic life. Accordingly, wastewater treatment plant upgrades have focused on reducing the toxic ammonia component of nitrogen discharges, with corresponding increase in the nitrate fraction.

Sources of Nutrient Loading

The major sources of nutrient loading in the Altamaha basin are wastewater treatment facilities, urban runoff and stormwater, and agricultural runoff. Concentrations found in the streams and rivers of the Altamaha basin represent a combination of a variety of point and nonpoint source contributions.

Point source loads can be quantified from permit and effluent monitoring data, but nonpoint loads are difficult to quantify. Rough estimates of average nutrient loading rates from agriculture are available; however, nonpoint loads from urban/residential sources in the basin have not yet been quantified. The long-term trends in phosphorus within the Altamaha River basin can be obtained by examining results from EPD long-term trend monitoring stations. The trend in instream total phosphorus concentrations at one site in

the Altamaha River are shown in Figure 4-8. In general, phosphorus concentrations have declined over time as a result of improvements in wastewater treatment technology.

4.2.2 Oxygen Depletion

Oxygen is required to support aquatic life, and Georgia water quality standards specify minimum and daily average dissolved oxygen concentration standards for all waters. Violations of water quality standards for dissolved oxygen were the most commonly listed cause of nonsupport of designated uses in Georgia's 2002 303(d) list based primarily on water quality data collected as part of the focused monitoring in the Altamaha River basin in 1999. The data identified dissolved oxygen impairments for 23 stream segments and indicated that these impairments occurred during, and were limited to, summer months, low flow and high temperature conditions. Stream flows during the periods of impairment were at, or below, 7Q10 (the minimum 7-day average flow that occurs once in 10 years on the average), which is consistent with the 3-year drought experienced in Georgia during 1998-2000. All of the impairments occurred in small, headwater streams where the drainage areas are relatively small and dry weather flows are low, or zero. TMDLs finalized for each stream segment in 2002 concluded that the main influence on dissolved oxygen was natural conditions with point sources affecting a small number of the segments. Trends in instream dissolved oxygen concentrations at one site in the Altamaha River basin are shown in Figure 4-9. All waters in the Altamaha basin have a state water quality standard of 4.0 mg/L. As shown in Figure 4-9, dissolved oxygen concentrations are usually above this standard.

4.2.3 Metals

No violations of water quality standards for metals were detected in the Altamaha River basin during the 1999 sampling.

4.2.4 Fecal Coliform Bacteria

Violations of the standard for fecal coliform bacteria were the second most commonly listed cause of nonsupport of designated uses in the Georgia 2002 303(d) list. Fecal coliform bacteria are monitored as an indicator of fecal contamination and the possible presence of human bacterial and protozoan pathogens in water. Fecal coliform bacteria may arise from many of the different point and nonpoint sources discussed in Section 4.1.

Human waste is of greatest concern as a potential source of bacteria and other pathogens. One primary function of wastewater treatment plants is to reduce this risk through disinfection.

Trends in instream fecal coliform concentrations at one site in the Altamaha River basin are shown in Figure 4-10.

As point sources have been brought under control, nonpoint sources have become increasingly important as potential sources of fecal coliform bacteria. Nonpoint sources may include:

- Agricultural nonpoint sources, including concentrated animal operations and spreading and/or disposal of animal wastes.
- Runoff from urban areas transporting surface dirt and litter, which may include both human and animal fecal matter, as well as a fecal component derived from sanitary sewer overflows.
- Urban and rural input from failed or ponding septic systems.
- Wildlife.

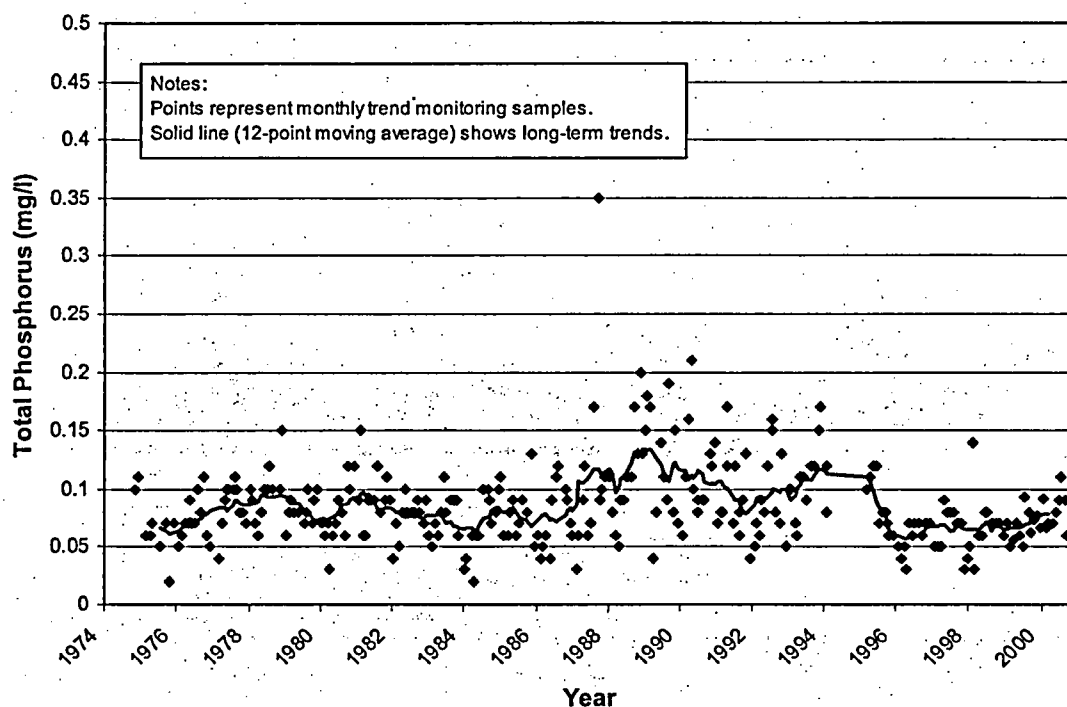


Figure 4-8. Total Phosphorus Concentrations, Altamaha River Six Miles Downstream from Doctortown, GA

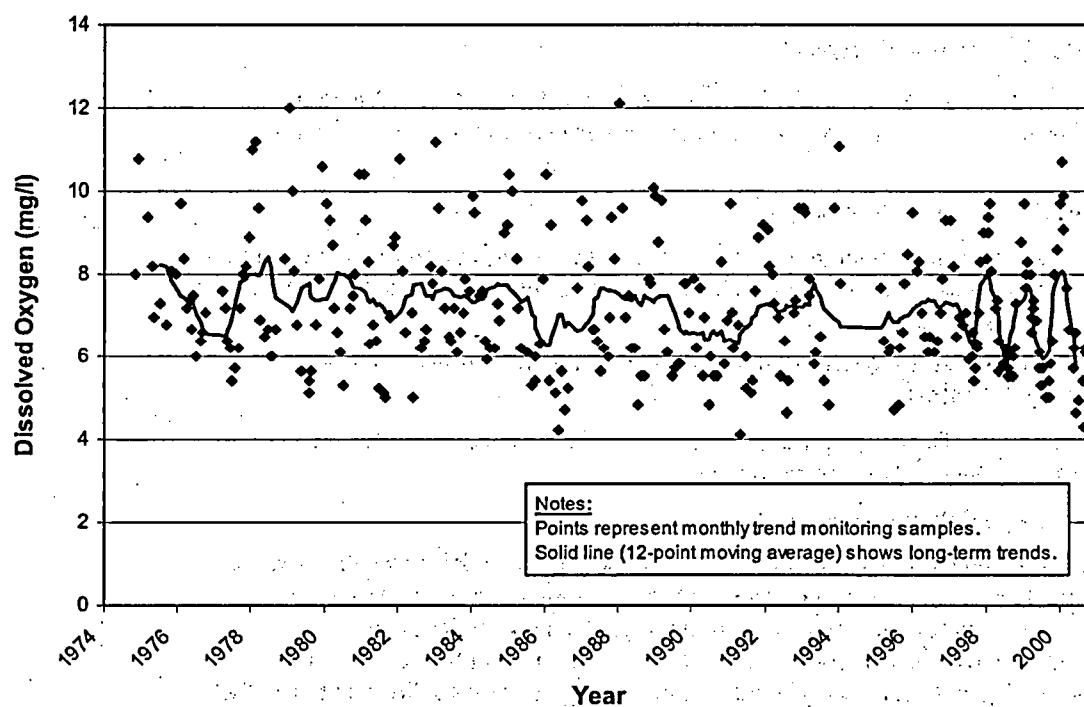


Figure 4-9. Dissolved Oxygen Concentrations, Altamaha River Six Miles Downstream from Doctortown, GA

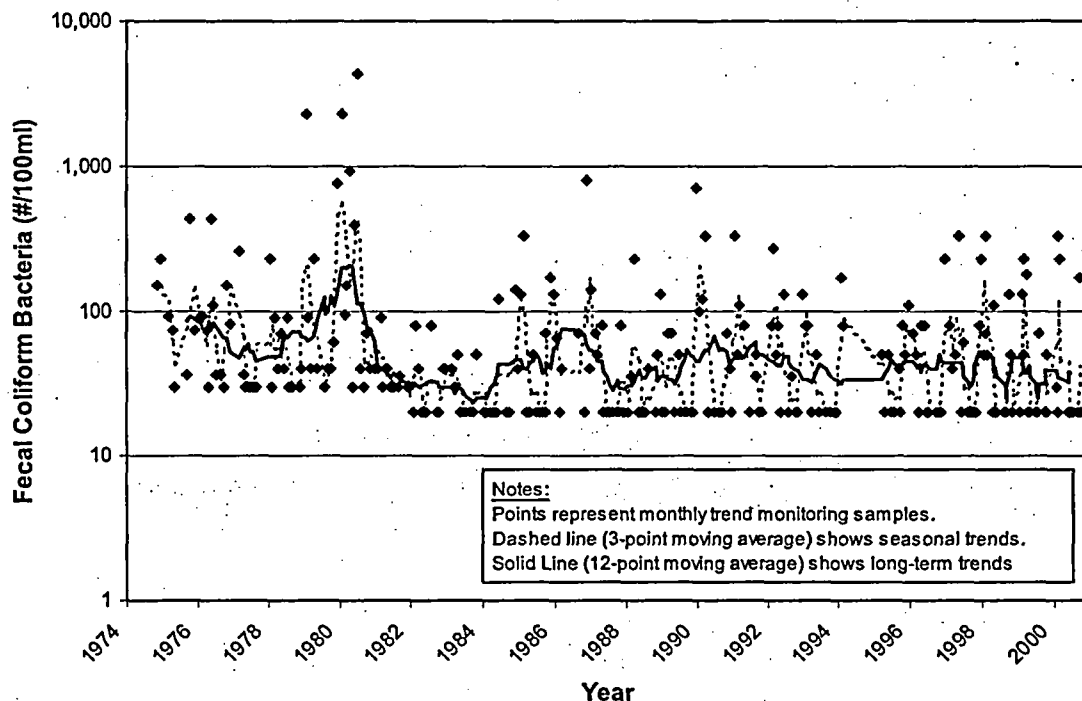


Figure 4-10. Fecal Coliform Bacteria Concentrations, Altamaha River Six Miles Downstream from Doctortown, GA

4.2.5 Synthetic Organic Chemicals

Synthetic organic chemicals (SOCs) include pesticides, herbicides, and other man-made toxic chemicals. SOCs may be discharged to waterbodies in a variety of ways, including:

- Industrial point source discharges.
- Wastewater treatment plant point source discharges, which often include industrial effluent as well as SOCs from household disposal of products such as cleaning agents and insecticides.
- Nonpoint runoff from agricultural and silvicultural land with pesticide and herbicide applications.
- Nonpoint runoff from urban areas, which may load a variety of SOCs such as horticultural chemicals and termiticides.

Illegal disposal and dumping of wastes.

SOCs were not detected in the surface waters of the Altamaha River basin in problem concentrations. It should be noted, however, that most monitoring has been targeted to waters located below point sources where potential problems were suspected. Agricultural sources were potentially important in the past, particularly from cotton production in the Coastal Plain, but the risk has apparently greatly declined with a switch to less persistent pesticides. Recent research by the USGS (Hippe et al., 1994; Stell et al., 1995) suggests pesticide/herbicide loading in urban runoff and stormwater may be of greater concern than agricultural loading, particularly in streams of the metropolitan Atlanta area.

4.2.6 Stressors from Flow Modification

Stress from flow modification is primarily associated with stormflow in smaller streams associated with development and increased impervious area.

4.2.7 Sediment

Erosion and discharge of sediment can have a number of adverse impacts on water quality. First, sediment can carry attached nutrients, pesticides, and metals into streams. Second, sediment is itself a stressor. Excess sediment loads can alter habitat, destroy spawning substrate, and choke aquatic life, while high turbidity also impairs recreational and drinking water uses. Sediment loading is of concern throughout the basin, but is of greatest concern in the developing urban areas and major transportation corridors. The rural areas are of lesser concern with the exception of rural unpaved road systems and areas where cultivated cropland exceeds 20 percent of the total land cover. It should also be noted that much of the sediment may be legacy sediment from farm practices in the past.

4.2.8 Habitat Degradation and Loss

In many parts of the Altamaha basin, support for native aquatic life is potentially threatened by degradation of aquatic habitat. Habitat degradation is closely tied to sediment loading, and excess sediment is the main threat to habitat in rural areas with extensive land-disturbing activities, as well as in urban areas where increased flow peaks and construction can choke and alter stream bottom substrates. A second important type of habitat degradation in the Altamaha basin is loss of riparian tree cover, which can lead to increased water temperatures.

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In This Section

- Assessment of Water Quantity
- Assessment of Water Quality

Section 5

Assessments of Water Quantity and Quality

This section provides an evaluation of the current conditions in the Altamaha River basin, in terms of both water quantity (Section 5.1) and water quality (Section 5.2) issues. The assessment results are then combined with the evaluation of environmental stressors from Section 4 to produce a listing of Concerns and Priority Issues in Section 6.

5.1 Assessment of Water Quantity

General information about water quantity issues in the Altamaha basin is taken from the "Georgia Environmental Protection Water Availability and Use Report, Altamaha River Basin," "The Regional Economic Forecast of Population and Employment Comprehensive Study, Volume 1," and updated from other Georgia Environmental Protection Division sources where available.

5.1.1 Municipal and Industrial Water Uses

Water use in the basin is almost exclusively groundwater for municipal and industrial supplies.

Overview of Surface Public Water Systems

Most surface water system plants in the State of Georgia are facilities that utilize conventional treatment which includes coagulation, flocculation, sedimentation, filtration, and disinfection. There are a number of small package plants which use the same treatment but on a smaller scale. Intakes located in urban areas with upstream development or in rural areas with large amounts of agriculture upstream have higher amounts of sediments (turbidity) in the rivers, streams and creeks that provide the raw surface water. These waters are prone to sudden erosion and sedimentation problems, also known as flashing, during hard rain storms which increases the amount of sediment (dirt, mud, and sand) in the water. Water with excess sediment or turbidity can clog intakes (also known as muddying) and filters requiring more sophisticated treatment and higher cost. Many plants have reservoirs to store large amounts of water and to settle out excess sediment (turbidity). Often taste and odor problems come from natural sources of

iron and manganese or algae blooms in shallow surface water. However, algae blooms can also indicate an increase in the level of nutrients in the water.

5.1.2 Agriculture

As stated in Section 3.2.2, water demand for agricultural use in the Altamaha River basin is considerable. Irrigated crops are grown in Emmanual, Johnson, Tattnall and other counties of the basin. In 2000, approximately 97 percent of the agricultural water used was for irrigation purposes (24.26 MGD). The remaining 3 percent was used for animal operations. Future agricultural water demand is expected to increase slightly within the basin to 32.19 MGD by the year 2020.

5.1.3 Recreation

Recreation activities in this basin include boating, swimming, fishing and picnicking.

5.1.4 Hydropower

There are no hydropower facilities in the Altamaha basin.

5.1.5 Navigation

There is some limited commercial navigation in the Altamaha basin.

5.1.6 Waste Assimilation Capacity

Water quality, wastewater treatment, and wastewater discharge permitting are addressed in Section 4. However, it should be noted that the guidelines for discharge of treated effluent into the rivers and streams of the Altamaha River basin assume that sufficient surface water flow will be available to assimilate waste and ensure that water quality criteria will be met.

5.1.7 Assessment of Ground Water

At present, sufficient quantities of groundwater remain available for users in the Altamaha basin in Georgia. There are no general policy limits on new groundwater permits throughout the basin, even though most users are withdrawing water from the Floridan aquifer. Agricultural irrigation withdrawals are the main use of groundwater.

Problems have been noted with the Floridan aquifer in the Flint River basin to the west and in the entire coastal area to the east. EPD has had to implement severe policy restrictions on Floridan aquifer users in both these contiguous areas. Such limiting policies are not soon anticipated for the Altamaha River basin, though groundwater studies are being planned.

5.2 Assessment of Water Quality

This assessment of water quality is generally consistent with Georgia's water quality assessments for CWA Section 305(b) reporting to EPA. It begins with a discussion of (1) water quality standards, (2) monitoring programs, and (3) data analyses to assess compliance with water quality standards and determine use support. Following this introductory material, detailed assessment results by subbasin are presented in Section 5.2.4.

5.2.1 Water Quality Standards

Assessment of water quality requires a baseline for comparison. A statewide baseline is provided by Georgia's water quality standards, which contain water use classifications, numeric standards for chemical concentrations, and narrative requirements for water quality.

Georgia's water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. The water use classification system was applied to interstate waters in 1972 by EPD. Table 5-1 provides a summary of water use classifications and basic water quality criteria for each water use. Georgia also has general narrative water quality standards, which apply to all waters. These narrative standards are summarized in Table 5-2.

In addition to the basic water quality standards shown above, Congress made changes in the Clean Water Act in 1987 that required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. In order to comply with these requirements, in 1989 the Board of Natural Resources adopted 31 numeric standards for protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a complete list of the toxic substance standards that apply to all waters in Georgia. Georgia has adopted all numeric standards for toxic substances promulgated by the USEPA. Georgia is also developing site-specific standards for major lakes where control of nutrient loading is required to prevent problems associated with eutrophication.

Table 5-1. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

Use Classification ¹	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams) ²		pH	Temperature (other than trout streams) ²	
	30-Day Geometric Mean ³ (#/100 mL)	Maximum (#/100 mL)	Daily Average (mg/L)	Minimum (mg/L)	Std. Units	Maximum Rise (°F)	Maximum (°F)
Drinking Water Requiring Treatment	1,000 (Nov-Apr) 200 (May-Oct)	4,000 (Nov-Apr)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 (Coastal)	—	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing ⁴	1,000 (Nov-Apr) 200 (May-Oct)	4,000 (Nov-Apr)	5.0	4.0	6.0-8.5	5	90
Wild River Scenic River	No alteration of natural water quality						
	No alteration of natural water quality						

- Improvements in water quality since the water use classifications and standards were originally adopted in 1972 provided the opportunity for Georgia to upgrade all stream classifications and eliminate separate use designations for "Agriculture," "Industrial," "Navigation," and "Urban Stream" in 1993.
- Standards for Trout Streams for dissolved oxygen are an average of 6.0 mg/L and a minimum of 5.0 mg/L. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2 deg. F is allowed in Secondary Trout Streams.
- Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: the geometric mean of 2 and 18 is the square root of 36.
- Standards are the same as fishing with the exception of dissolved oxygen, which is site specific.

Table 5-2. Georgia Narrative Water Quality Standards for All Waters (Excerpt from Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.03 - Water Use Classifications and Water Quality Standards)

- (5) General Criteria for All Waters. The following criteria are deemed to be necessary and applicable to all waters of the State:
- (a) All waters shall be free from materials associated with municipal or domestic sewage, industrial waste or any other waste which will settle to form sludge deposits that become putrescent, unsightly or otherwise objectionable.
 - (b) All waters shall be free from oil, scum and floating debris associated with municipal or domestic sewage, industrial waste or other discharges in amounts sufficient to be unsightly or to interfere with legitimate water uses.
 - (c) All waters shall be free from material related to municipal, industrial or other discharges which produce turbidity, color, odor or other objectionable conditions which interfere with legitimate water uses.
 - (d) All waters shall be free from toxic, corrosive, acidic and caustic substances discharged from municipalities, industries or other sources, such as nonpoint sources, in amounts, concentrations or combinations which are harmful to humans, animals or aquatic life.
 - (e) All waters shall be free from turbidity which results in a substantial visual contrast in a waterbody due to man-made activity. The upstream appearance of a body of water shall be observed at a point immediately upstream of a turbidity-causing man-made activity. The upstream appearance shall be compared to a point which is located sufficiently downstream from the activity so as to provide an appropriate mixing zone. For land disturbing activities, proper design, installation and maintenance of best management practices and compliance with issued permits shall constitute compliance with [this] Paragraph...

5.2.2 Surface Water Quality Monitoring

EPD's monitoring program integrates physical, chemical, and biological monitoring to provide information for water quality and use attainment assessments and for basin planning. EPD monitors the surface waters of the state to:

- collect baseline and trend data,
- document existing conditions,
- study impacts of specific discharges,
- determine improvements resulting from upgraded water pollution control plants,
- support enforcement actions,
- establish wasteload allocations for new and existing facilities,
- verify water pollution control plant compliance,
- document water use impairment and reasons for problems causing less than full support of designated water uses, and
- develop Total Maximum Daily Loads.

EPD used a variety of monitoring tools to collect information for water quality assessments and basin planning. These tools include trend/basin/TMDL monitoring, intensive surveys, lake, coastal, biological, fish tissue, toxic substance monitoring, and facility compliance sampling. Each of these is briefly described in the following sections.

Trend/Basin/TMDL Monitoring

Long term monitoring of streams at strategic locations throughout Georgia, trend or ambient monitoring, was initiated by EPD during the late 1960s. This work was and continues to be accomplished to a large extent through cooperative agreements with federal, state, and local agencies that collect samples from groups of stations at specific,

fixed locations throughout the year. The cooperating agencies conduct certain tests in the field and send stream samples to EPD for additional laboratory analyses. Although there have been a number of changes over the years, much of the routine chemical trend monitoring is still accomplished through similar cooperative agreements.

Today EPD contracts with the United States Geological Survey (USGS) for the statewide trend sampling work and with the Columbus Water Works for samples on the Chattahoochee below Columbus. In addition to monthly stream sampling, a portion of the work with the USGS involves continuous monitoring at several locations across the state. EPD associates also collect water samples for toxic substance analyses, as well as macroinvertebrate samples to characterize the biological community at selected locations as a part of the trend monitoring effort. In 2000 EPD added two sampling teams, one stationed in Brunswick and one in Atlanta. The Brunswick sampling team conducts sampling at locations across south Georgia in the Ochlockonee, Suwannee, Satilla, Altamaha, Savannah and Ogeechee River basins. The Atlanta sampling team conducts monthly sampling across the Coosa, Tallapoosa, Chattahoochee, Flint, Oconee and Ocmulgee River basins. The work of the two sampling teams adds significantly to the number of locations sampled each year which compliments the rotating basin monitoring program. WRD associates assess fish communities as a part of the monitoring effort. Additional samples used in the assessment were collected by other federal, state and local governments, universities, contracted Clean Lakes projects and utility companies.

Focused Monitoring in the Altamaha River Basin

In 1995, EPD adopted and implemented significant changes to the strategy for trend monitoring in Georgia. The changes were implemented to support the River Basin Management Planning program. The number of fixed stations statewide was reduced in order to focus resources for sampling and analysis in a particular group of basins in any one year in accordance with the basin planning schedule. Sampling focus was placed on the Altamaha, Ocmulgee, and Oconee River basins during 1999.

Figure 5-1 shows the focused monitoring network for the Altamaha River basin used in 1999. During this period, statewide trend monitoring was continued at a number of station locations statewide and at continuous monitoring locations. The remainder of the trend monitoring resources were devoted to the Altamaha, Ocmulgee, and Oconee River basins. As a result, more sampling was conducted in the focus river basins. Increasing the resolution of the water quality monitoring improves the opportunity to identify impaired waters, as well as the causes of impairment.

Intensive Surveys

Intensive surveys complement long-term fixed station monitoring to focus on a particular issue or problem over a shorter period of time. Several basic types of intensive surveys are conducted, including model calibration surveys and impact studies. The purpose of a model calibration survey is to collect data to calibrate a mathematical water quality mode. Models are used for wasteload allocations and/or TMDLs and as tools for use in making regulatory decisions. Impact studies are conducted when information on the cause-and-effect relationships between pollutant sources and receiving waters is needed. In many cases biological information is collected along with chemical data for use in assessing environmental impacts.

Lake Monitoring

EPD has maintained monitoring programs for Georgia's public access lakes for many years. In the late 1960s, a comprehensive statewide study was conducted to assess fecal coliform levels at public beaches on major lakes in Georgia as the basis for water use

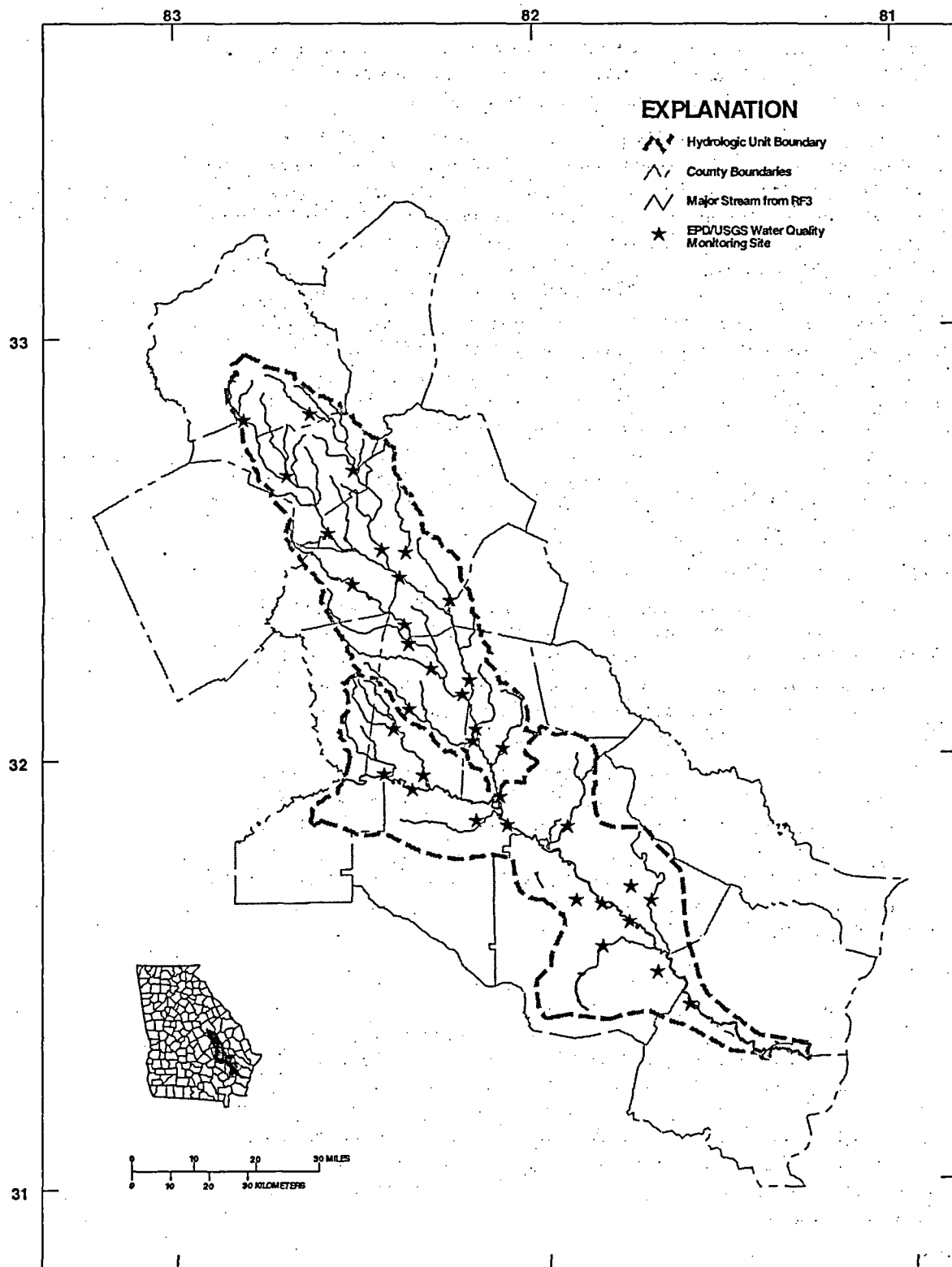


Figure 5-1. Altamaha River Basin Trend Monitoring Network Station Locations

classifications and establishment of water quality standards for recreational waters. In 1972, EPD staff participated in the USEPA National Eutrophication Survey, which included 14 lakes in Georgia. A post-impoundment study was conducted for West Point Lake in 1974. Additional lake monitoring continued through the 1970s. The focus of these studies was primarily problem/solution-oriented and served as the basis for regulatory decisions. In the 1990s, EPD conducted Clean Lakes Phase I Diagnostic – Feasibility studies on several major lakes. The study results were used as the basis for establishing lake-specific water quality standards.

Trophic Condition Monitoring

In 1980-1981, EPD conducted a statewide survey of public access freshwater lakes. The study was funded in part by USEPA Clean Lakes Program funds. The survey objectives were to identify freshwater lakes with public access, assess each lake's trophic condition, and develop a priority listing of lakes as to need for restoration and/or protection. In the course of the survey, data and information were collected on 175 identified lakes in 340 sampling trips. The data collected included depth profiles for dissolved oxygen, temperature, pH, specific conductance, and Secchi disk transparency and chemical analyses for chlorophyll *a*, total phosphorus, nitrogen compounds, and turbidity.

Fish Tissue Monitoring

The DNR conducts fish tissue monitoring for toxic chemicals and issues fish consumption guidelines as needed to protect human health. It is not possible for the DNR to sample fish from every stream and lake in the state. However, high priority has been placed on the 26 major reservoirs that make up more than 90 percent of the total lake acreage. These lakes will continue to be sampled as part of the River Basin Management Planning 5-year rotating schedule to track trends in fish contaminant levels. The DNR has also made sampling fish in rivers and streams downstream of urban and/or industrial areas a high priority. In addition, DNR will focus attention on areas that are frequented by a large number of anglers.

The program includes testing of fish tissue samples for the 43 substances listed in Table 5-3. The test results have been used to develop consumption guidelines, which are updated annually and provided to fishermen when they purchase fishing licenses. As of 2003, PCBs, mercury, dieldrin, and DDT residues (DDD and DDE) have been found in fish at concentrations that could create risk to human health from fish consumption. Guidelines are listed in one location each for dieldrin and DDD/DDE; however there are guidelines for PCBs and mercury throughout Georgia. In the Altamaha River basin, there are guidelines for mercury only.

In general, levels of PCBs are decreasing as time passes. PCBs are no longer produced in the U.S., but they do not break down easily and remain in aquatic sediments for years. Mercury is a naturally occurring metal that does not break down. While low background levels are normal, concentrations of mercury have increased since the late 1800s. It is not known whether the increase is due to municipal and industrial sources, fossil fuel use, or nonpoint sources. There is evidence that mercury is transported great distances in the upper atmosphere, and the pool of airborne mercury is both a byproduct of waste incineration and some industrial processes, and natural sources such as volcanoes.

In 1994, EPD began utilizing a "risk-based" approach to develop fish consumption guidelines for the state's waters. The EPD's guidelines are based on the use of USEPA potency factors for carcinogenicity and reference doses for noncancer toxicity, whichever is most protective. Inputs used in the derivation of guidelines include a 1×10^{-4} risk level for cancer, a 30-year exposure duration, 70 kg as body weight for an adult, and 70 years as the lifetime duration. A range of possible intakes from a low of 3g/day to a high of

30 g/day is evaluated and one of four different recommendations made: no restriction, limit consumption to one meal per week, limit consumption to one meal per month, or do not eat. Recommendations are made specific to fish species and size classes.

Table 5-3. Parameters for Fish Tissue Testing

Antimony	a-BHC	Heptachlor
Arsenic	b-BHC	Heptachlor Epoxide
Beryllium	d-BHC	Toxaphene
Cadmium	g-BHC (Lindane)	PCB-1016
Chromium, Total	Chlordane	PCB-1221
Copper	4,4-DDD	PCB-1232
Lead	4,4-DDE	PCB-1242
Mercury	4,4-DDT	PCB-1248
Nickel	Dieldrin	PCB-1254
Selenium	Endosulfan I	PCB-1260
Silver	Endosulfan II	Methoxychlor
Thallium	Endosulfan Sulfate	HCB
Zinc	Endrin	Mirex
Aldrin	Endrin Aldehyde	Pentachloroanisole
		Chlorpyrifos

Toxic Substance Stream Monitoring

EPD has focused resources on the management and control of toxic substances in the state's waters for many years. In the 1970s and 1980s wherever discharges were found to have toxic impacts or to include toxic pollutants, EPD incorporated specific limitations on toxic pollutants in NPDES discharge permits.

In 1983 EPD intensified toxic substance stream monitoring efforts. This expanded toxic substance stream monitoring project included facility effluent, stream, sediment, and fish sampling at specific sites downstream of selected industrial and municipal discharges. From 1983 through 1991, 10 to 20 sites per year were sampled as part of this project. This work was used as the foundation for additional limitations in NPDES permits designed to implement the toxic substance standards adopted in the late 1980s. Monitoring for toxic substances is now accomplished as needed as a part of the river basin monitoring programs.

Facility Compliance Sampling

In addition to surface water quality monitoring, EPD conducts evaluations and compliance sampling inspections of municipal and industrial water pollution control plants. Compliance sampling inspections include the collection of 24-hour composite samples, as well as evaluation of the permittee's sampling and flow monitoring requirements.

EPD staff conducted more than 350 sampling inspections statewide in 1999. The results were used, in part, to verify the validity of permittee self-monitoring data and as supporting evidence, as applicable, in enforcement actions. Also, sampling inspections can lead to identification of illegal discharges. In 1999, this work was focused on facilities in the Altamaha, Ocmulgee, and Oconee River basins in support of the basin planning process.

Aquatic Toxicity Testing

In 1982, EPD incorporated aquatic toxicity testing into selected industrial NPDES permits. In January 1995, EPD issued approved NPDES Reasonable Potential Procedures, which further delineated required conditions for conducting whole effluent toxicity (WET) testing for municipal and industrial discharges. All major permitted discharges (flow greater than 1 MGD) are required to have WET tests run with each permit reissuance. Certain minor dischargers are also subject to this requirement if EPD determines that aquatic toxicity is a potential issue.

5.2.3 Data Analysis

Assessment of Use Support – General Procedures

EPD assesses water quality data to determine if water quality standards are met and if the waterbody supports its classified use. Depending on the frequency with which standards are not met, the waterbody is said to be supporting, partially supporting, or not supporting the designated use (see Box 5-1).

Appendix D includes lists of streams and rivers in the basin for which data have been collected and assessed. The lists include information on the location, data source, designated water use classification, and where standards are exceeded, additional information is provided on the criterion violated, potential cause, actions planned to alleviate the problem, and estimates of stream miles affected. The lists are further coded to indicate status of each waterbody under several sections of the CWA. Different sections of the CWA require states to assess water quality (Section 305(b)), to list waters still requiring TMDLs (Section 303(d)), and to document waters with nonpoint source problems (Section 319).

The assessed waters are described in three categories: waters supporting designated uses, waters partially supporting designated uses, and waters not supporting designated uses. Waters were placed on the partially supporting list if:

- The chemical data (dissolved oxygen, pH, temperature) indicated an excursion of a water quality standard in 11 percent to 25 percent of the samples collected.
- Fish consumption:
 - (a) For all contaminants other than mercury, a fish consumption guideline for limited fish consumption was in place for the waterbody.
 - (b) For mercury, the Trophic-Weighted Residue Value was greater than 0.3 mg/kg but less than 2 mg/kg (see Box 5-2).

Generally, a stream reach was placed on the not supporting list if:

- The chemical data (dissolved oxygen, pH, temperature) indicated an excursion of a water quality standard in greater than 25 percent of the samples collected.
- Acute or chronic toxicity tests documented or predicted toxicity at low stream flow (7Q10) due to a municipal or industrial discharge to the waterbody.
- Fish consumption:
 - (a) For all contaminants other than mercury, a fish consumption guideline for no consumption or a commercial fishing ban was in place for the waterbody.
 - (b) For mercury, the Trophic-Weighted Residue Value was greater than or equal to 2 mg/kg (see Box 5-2).

Additional specific detail is provided in Box 5-1 on analysis of data for fecal coliform bacteria, metals, toxicity, dissolved oxygen, pH, temperature, fish/shellfish consumption guidelines, and biotic data.

Box 5-1: Analysis of Data for Fecal Coliform Bacteria, Metals, Toxicity, Dissolved Oxygen, pH, Temperature, Fish/Shellfish Consumption Guidelines, and Biotic Data

Fecal Coliform Bacteria

Georgia water quality standards establish a fecal coliform criterion of a geometric mean (four samples collected over a 30-day period) of 200 MPN/100 mL for all waters in Georgia during the recreational season of May through October. This is the year-round standard for waters with the water use classification of recreation. For waters classified as drinking water, fishing, or coastal fishing, for the period of November through April, the fecal coliform criterion is a geometric mean (four samples collected over a 30-day period) of 1000 per 100 mL and not to exceed 4000 per 100 mL for any one sample. The goal of fecal coliform sampling in the Altamaha River basin focused monitoring in 1999 was to collect four samples in a 30-day period in each of four quarters. If one geometric mean was in excess of the standard then the stream segment was placed on the partial support list. If more than one geometric mean was in excess of the standard the stream segment was placed on the not support list.

In some cases the number of samples was not adequate to calculate geometric means. In these cases, the USEPA recommends the use of a review criterion of 400 per 100 mL to evaluate sample results. This bacterial density was used to evaluate data for the months of May through October and the maximum criterion of 4000 per 100 mL was used in assessing the data from the months of November through April. Thus, where geometric mean data was not available, waters were deemed not supporting uses when 26 percent of the samples had fecal coliform bacteria densities greater than the applicable review criteria (400 or 4000 MPN/100 mL) and partially supporting when 11 to 25 percent of the samples were in excess of the review criterion.

Metals

Since data on metals from any one given site are typically infrequent, using the general evaluation technique of 26 percent excursion to indicate nonsupport and 11 to 25 percent excursion to indicate partial support was not meaningful. Streams were placed in the nonsupporting category if multiple excursions of state criteria occurred and the data were based on more than four samples per year. With less frequent sampling, streams with excursions were placed on the partially supporting list. In addition, an asterisk appears beside metals data in those cases where there is a minimal database. Data were collected in the winter and the summer seasons in 1999 for comparison to water quality standards. Clean techniques were used. If one of the samples was in excess of the standard, the stream segment was placed on the partial support list. This approach is in accordance with US EPA guidance, which suggests any single excursion of a metals criterion be listed.

Toxicity Testing/Toxic Substances

Data from EPD toxicity testing of water pollution control plant effluents were used to predict toxicity in the receiving waterbody at critical, 7Q10 low flows. Effluent data for metals were used to designate either partial support or nonsupport based on whether instream corroborating metals data were available. When instream metals data were available, the stream was determined to be not supporting if a metal concentration exceeded stream standards; when instream data were not available, the stream was listed as partially supporting.

Dissolved Oxygen, pH, Temperature

When available data indicated that these parameters were out of compliance with state standards more than 25 percent of the time, the waters were evaluated as not supporting the designated use. Between 11 percent and 25 percent noncompliance resulted in a partially supporting evaluation.

Fish/Shellfish Consumption Guidelines – Mercury

Risk to human health from consuming fish with mercury residues was assessed using a protocol that evaluates species and size classes in different trophic levels that are sought by fishermen. Mercury concentrations in fish tissue were used to calculate the Trophic-Weighted Residue Value for each waterbody. If the Value is greater than 0.3 mg/kg (mg of mercury per kilogram of fish tissue, wet weight) but less than 2.0 mg/kg, a waterbody was placed in the partially supporting category. If the Value is greater than or equal to 2.0 mg/kg, a waterbody was placed in the not supporting category. See Box 5-2 for more details.

Fish/Shellfish Consumption Guidelines – Contaminants Other than Mercury

A waterbody was included in the not supporting category when a recommendation for "no consumption" of fish, a commercial fishing ban, or a shell fishing ban based on actual data was in effect. A waterbody was placed in the partially supporting category if a guideline for restricted consumption of fish had been issued for the waters.

Biotic Data

A "Biota Impacted" designation for "Criterion Violated" indicates that studies showed a modification of the biotic community. Communities used were fish. Studies of fish populations by the DNR Wildlife Resources Division used the Index of Biotic Integrity (IBI) to identify affected fish populations. The IBI values were used to classify the population as Excellent, Good, Fair, Poor, or Very Poor. Stream segments with fish populations rated as "Poor" or "Very Poor" were included in the partially supporting list.

Box 5-2: Mercury in Fish Tissue – New Method for Assessment of Impairment

Fish consumption guidelines provide site-specific information on safe consumption levels to sport anglers and their families, and have an important role in educating the public about concepts of environmental science and toxicology. They have also been used as a basis for assessing the impairment of rivers and lakes under Section 305(b) of the Federal Clean Water Act (CWA). Until 2002, all bodies of water with fish consumption guidelines were also included in the 305(b) list of impaired waters. EPD developed fish consumption guidelines based on a risk-based method, using USEPA potency factors and reference doses, and methodology consistent with that developed by the USEPA. Under this approach, guidelines are determined for individual fish species and for size classes of fish within a species. If a reduced consumption or do not eat guideline, or commercial fishing ban existed for a fish species in a waterbody, that waterbody was also assessed as not fully supporting its designated use, and therefore was placed on the 305(b)/303(d) list.

In 2001, USEPA promulgated a new human health criterion for methylmercury in fish tissue (USEPA, 2001). Methylmercury accounts for the majority of mercury in fish tissue, and is the most toxic form. The criterion was developed using new information in the USEPA 1997 Mercury Study Report to Congress and the 2000 Human Health Methodology (USEPA, 2000), and incorporated national dietary patterns of consumption across different fish trophic levels into the risk assessment. EPD developed a protocol based on the USEPA criterion, and used it to assess mercury levels in fish tissue. In December 2002, EPD adopted as a human health standard for total mercury in fish tissue, 0.3 mg/kg wet weight as a waterbody Trophic-Weighted Residue Value.

The protocol method considers trophic levels of fish instead of individual species. Trophic level is a term used by environmental scientists to assign an animal's place in the food chain. Animals that consume plants (called herbivores) have a low trophic level, while animals that consume other animals (carnivores) have a higher trophic level. The largest predatory animals in the food chain occupy the highest trophic level. Trophic levels are important for assessing exposure to contaminants because of a process known as bioaccumulation. Bioaccumulation occurs as animals consume food containing contaminants, and results in higher concentrations of contaminants at higher trophic levels. For instance, very small fish consume plants and plankton that have absorbed mercury from the water. The mercury accumulates in tissue throughout their lives. Larger fish eat small fish, and the mercury in the small fish is absorbed in the tissue of the larger fish. The end result is that very low concentrations of mercury in the environment get magnified in the largest animals in a food chain. The protocol summarizes data across trophic levels weighted by averages of public consumption to arrive at a number called the Trophic-Weighted Residue Value.

By assessing concentrations of mercury in fish tissue by trophic level, and by accounting for the percentage of fish from each trophic level that people typically eat, a measure of risk can be calculated for an entire water body at one time. The new protocol for evaluating mercury in fish tissue has been applied only to assessment of use support under the Clean Water Act. Georgia continues to publish fish consumption guidelines to the general public using the previous method for mercury – in other words, the guidelines are developed for individual species and size classes as they have been in the past.

At first this might seem contradictory, but the public fish consumption guidelines given to fishermen have a different purpose than the method used to assess whether a water body is impaired. The public fish consumption guidelines give people specific information for species and sizes, and meal frequencies for each. On the other hand, the assessment protocol for mercury is designed to inform regulatory decision-making for water bodies as a whole, using a water quality standard based on bioaccumulation. As an example, one lake had ten guidelines, nine of which were "no restriction." The restriction was for the largest size class of largemouth bass, and for the least restrictive meal limit (one meal per week). The majority of fish had no contaminant concentrations above any level of concern. Overall, the risk of eating fish from this lake was lower than the threshold value, so it was no longer listed as being impaired on the 305(b)/303(d) list (which would have resulted in the long term commitment of significant resources). However, the guideline remained on the public fish consumption guidelines based on data for that one size class of largemouth bass.

5.2.4 Assessment of Water Quality and Use Support

This section provides a summary of the assessment of water quality and support of designated uses for streams and major lakes in the Altamaha River basin. Most of these results were previously summarized in the Georgia 2002 305(b)/303(d) listing (Georgia DNR, 2003). Results are presented by HUC. A geographic summary of assessment results is provided by HUC in Figures 5-2 and 5-3.

Altamaha River Subbasin (HUC 03070106)

Appendix D summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 2002).

Monitoring data was collected from 15 stations located within this subbasin during 1999. Of those, one is sampled monthly each year and the remaining were sampled only during 1999 as part of the focused trend monitoring strategy described in Section 5.2.2. The following assessment is based on data primarily from 1999.

Two mainstem segments of the Altamaha River were assessed as fully supporting the water use classification of fishing. Criteria affecting use support are discussed in the following subsections for this HUC.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture. There are two stream segments listed in this subbasin as not fully supporting designated water uses due to poor fish communities likely due to sedimentation.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in one Altamaha River segment and five tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. The exceedances may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes. The source of fecal coliform bacteria on one tributary segment was attributed to a municipal water pollution control plant.

Low Dissolved Oxygen

The water use classification of fishing was not fully supported in eight tributaries due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Natural conditions may contribute to or be the cause of low dissolved oxygen in many streams in the Altamaha River basin.

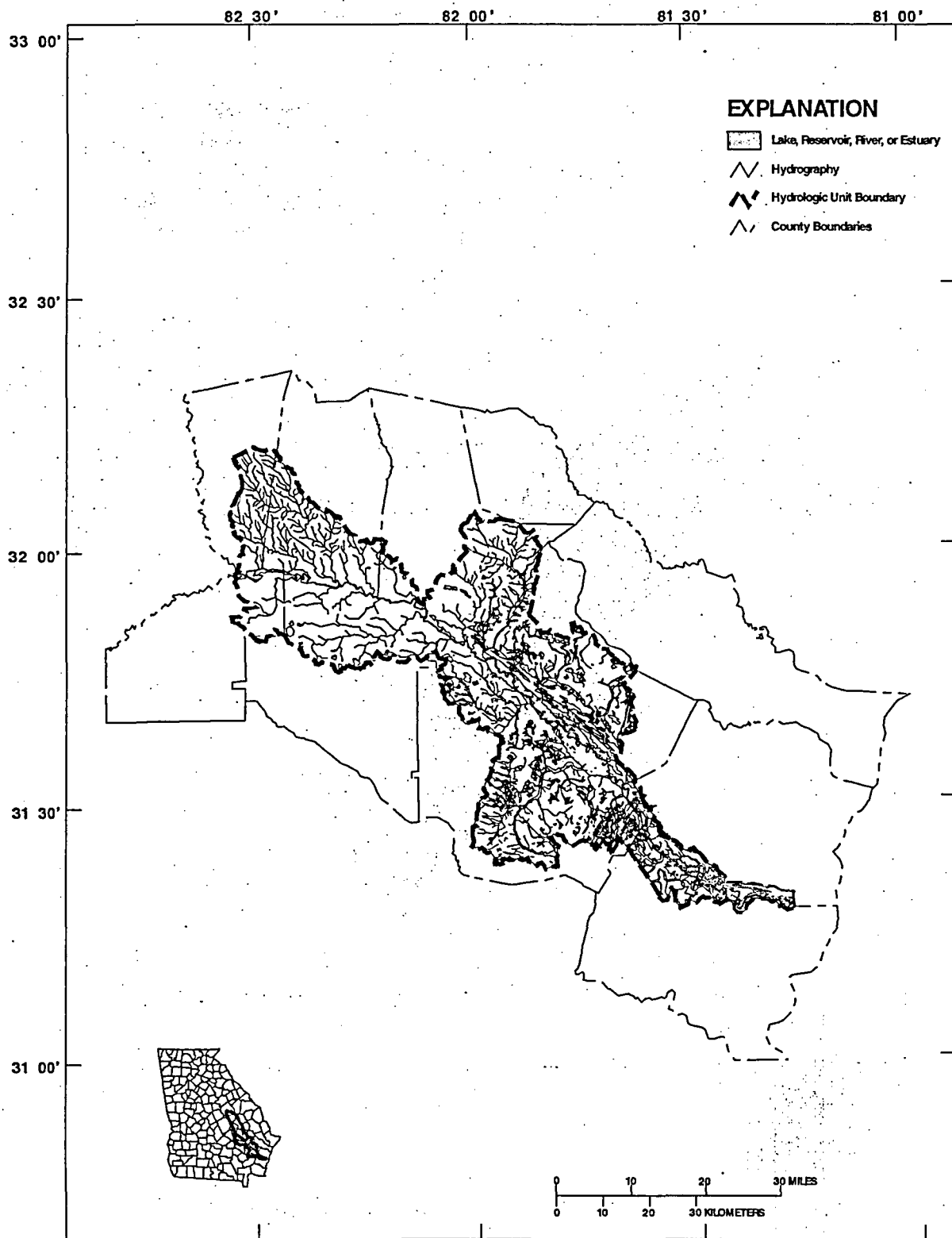


Figure 5-2. Assessment of Water Quality Use Support in the Altamaha River Basin, HUC 03070106

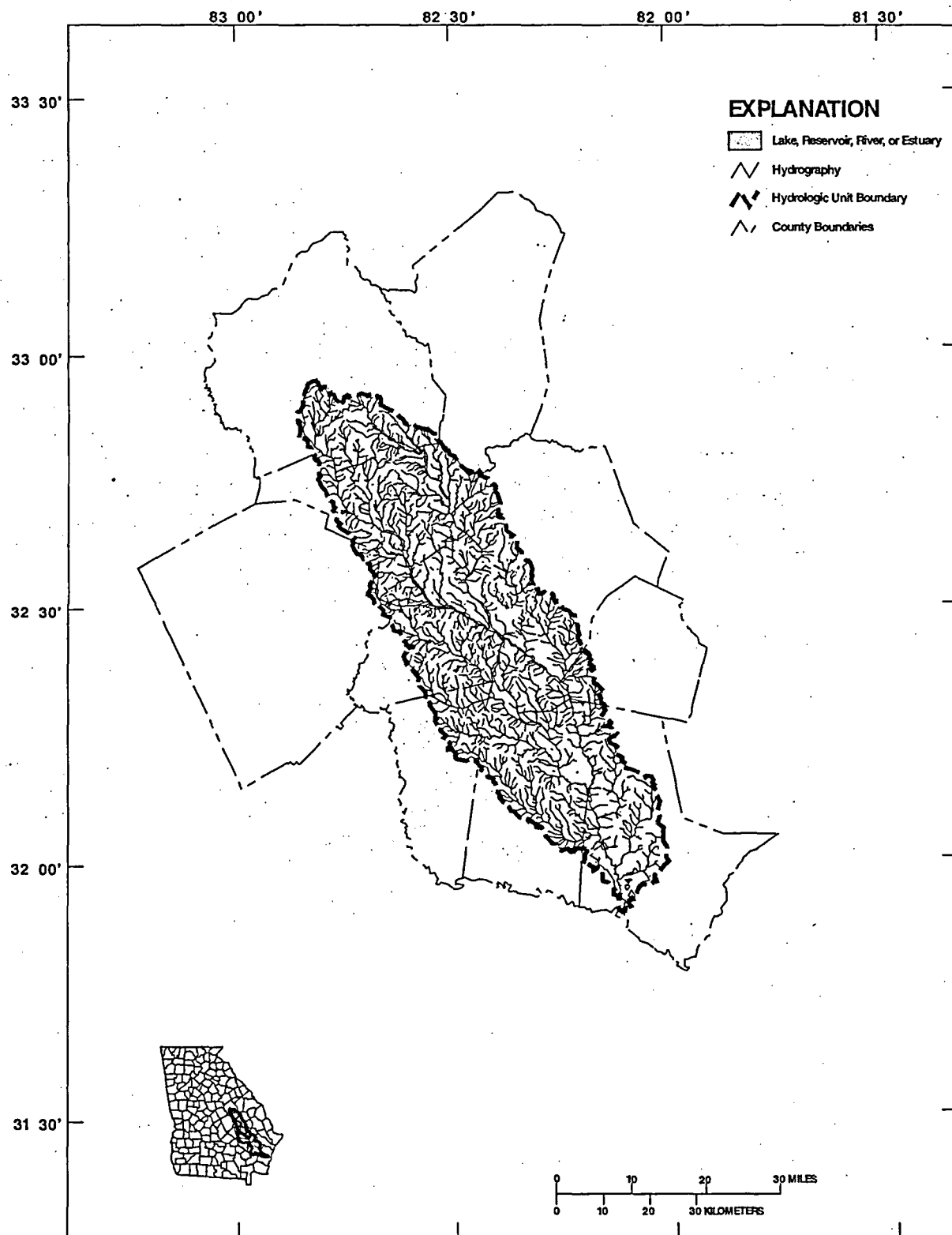


Figure 5-3. Assessment of Water Quality Use Support in the Altamaha River Basin, HUC 03070107

Ohoopsee River Subbasin (HUC 03070107)

Appendix D summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 2002).

Monitoring data was collected from 20 stations located within this subbasin during 1999. All were sampled only during 1999 as part of the focused trend monitoring strategy described in Section 5.2.2. The following assessment is based on data primarily from 1999.

One tributary segment (9 miles in length) was assessed as fully supporting the water use classification of fishing. Criteria affecting use support are discussed in the following subsections for this HUC.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture. There is one stream segment listed in this subbasin as not fully supporting designated water uses due to poor fish communities likely due to sedimentation.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in three Ohoopsee River segments and nine tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in four Ohoopsee River segments and one lake based on fish consumption issues related to mercury residues in fish tissue. The assessment is based on the Trophic-Weighted Residue Value being in excess of 0.3 mg of mercury per kilogram of fish tissue (see Box 5-2 in Section 5 for details).

Low Dissolved Oxygen

The water use classification of fishing was not fully supported in two Ohoopsee River segments and thirteen tributary segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures.

References

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United States Environmental Protection Agency. 1997. Mercury study report to Congress. Volumes I-VII. December 1997.

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In This Section

- Identified Basin Planning and Management Concerns
- Priorities for Water Quality Concerns
- Priorities for Water Quantity Concerns

Section 6

Concerns and Priority Issues

The assessments in Section 5 present a number of water quality and quantity concerns within the Altamaha River basin. This section aggregates the assessment data to identify priority issues for development of management strategies.

6.1 Identified Basin Planning and Management Concerns

Sections 4 and 5 identified both site-specific and generalized sources of water quality stressors. Some issues are limited to specific segments, but a number of water quality concerns apply throughout the basin. The criterion listed most frequently in the Georgia 2002 305(b)/303(d) List as contributor to not supporting or partial supporting status in streams and rivers was dissolved oxygen, followed by fecal coliform bacteria and fish consumption issues. One lake was listed as not fully supporting due to fish consumption issues. Low dissolved oxygen conditions coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Fecal coliform bacteria are attributed to nonpoint sources or urban runoff and fish consumption issues are primarily associated with mercury as a result of air deposition and possibly naturally occurring sources. Three segments were also listed for biota impacts, which are due primarily to nonpoint sources such as urban runoff, development, and/or agriculture.

Within some individual stream reaches, other sources may be of greater importance (e.g., WPCP effluent); however, urban runoff and general nonpoint sources represent a basinwide concern. Population growth and development pressure in parts of the basin will tend to increase the importance of urban runoff as a stressor of concern. For such widespread concerns, basinwide management strategies will be needed.

Major water quality and quantity concerns for the Altamaha River basin are summarized by geographic area in terms of the concerns and sources of these concerns in Table 6-1. Table 6-2 summarizes the pollutants identified as causing impairment of designated uses in the basin; however, not all identified concerns are related to pollutant loads. Ongoing control strategies are expected to result in support of designated uses in a number of waters. In other waters, however, the development of additional management strategies may be required or implemented in order to achieve water quality standards.

Table 6-1. Summary of Concerns in the Altamaha River Basin

Stressors of Concern	Potential Source of the Stressor by HUC	
	HUC 03070106	HUC 03070107
Dissolved Oxygen	Natural Inputs, Urban and Rural NPS	Natural Inputs, Urban and Rural NPS, WPCP Effluent
Fecal Coliform Bacteria	Multiple Source Potential	Multiple Source Potential
Fish Consumption Guidelines		Nonpoint Mercury
Erosion and Sedimentation	Urban and Rural NPS	Urban and Rural NPS
Drought Conditions	Lack of Rainfall	Lack of Rainfall

Table 6-2. Summary of Pollutants Causing Water Quality Impairment in the Altamaha River Basin

Use Classification of Waterbody Segments	Pollutants Causing Impairment by HUC	
	HUC 03070106	HUC 03070107
Fishing (Support for Aquatic Life)	Low DO, Sediment	Low DO, Sediment
Fishing (Fish Consumption)		Mercury
Fishing (Secondary Contact Recreation)	Fecal Coliform	Fecal Coliform

In the following pages, priority water quality and quantity concerns are presented by Hydrologic Unit. For some water quality and quantity concerns, problem statements are identical for each HUC, while others differ between HUCs. Detailed strategies for addressing these concerns are then supplied in Section 7.

Each concern is listed in the form of a "Problem Statement" which summarizes the linkage between stressor sources and water quality impacts. The order in which concerns are listed for each HUC should not be considered to be significant. Prioritization of basin concerns requires consensus among all stakeholders, and has not been finalized; however, short-term water quality action priorities for EPD are summarized in Section 6.2.

6.1.1 Problem Statements

Altamaha River Subbasin (HUC 03070106)

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture. There are two stream segments listed in this subbasin as not fully supporting designated water uses due to poor fish communities likely due to sedimentation.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in one Altamaha River segment and five tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. In general, the exceedances may be attributed to a

combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes. The source of fecal coliform bacteria on one tributary segment was attributed to a municipal water pollution control plant.

Low Dissolved Oxygen

The water use classification of fishing was not fully supported in eight tributary stream segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Natural conditions may contribute to or be the cause of low dissolved oxygen in many streams in the Altamaha River basin.

Ohoopsee River Subbasin (HUC 03070107)

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture. There is one stream segment listed in this subbasin as not fully supporting designated water uses due to poor fish communities likely due to sedimentation.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in three Ohoopsee River segments and nine tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in four Ohoopsee River segments and one lake based on fish consumption issues related to mercury residues in fish tissue. The assessment is based on the Trophic-Weighted Residue Value being in excess of 0.3 mg of mercury per kilogram of fish tissue (see Box 5-2 in Section 5 for details).

Low Dissolved Oxygen

The water use classification of fishing was not fully supported in two Ohoopsee River segments and thirteen tributary segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Natural conditions may contribute to or be the cause of low dissolved oxygen in many streams in the Altamaha River basin.

6.2 Priorities for Water Quality Concerns

6.2.1 Short-Term Water Quality Action Priorities for EPD

Section 6.1 identifies known priority concerns for which management and planning are needed in the Altamaha River basin. Because of limited resources, and, in some cases, limitations to technical knowledge, not all of these concerns can be addressed at the same level of detail within the current 5-year cycle of basin management. It is therefore necessary to assign action priorities for the short-term based on where the greatest return for available effort can be expected.

Current priorities for action by EPD (2002) are summarized in Table 6-3 and discussed below. These reflect EPD's assessment of where the greatest short-term return can be obtained from available resources. The priorities were public noticed and approved by the USEPA as part of the Georgia CWA 303(d) listing process in 2001-2002 and discussed in the report, *Water Quality in Georgia, 2000-2001*.

Table 6-3. EPD's Short-Term Priorities for Addressing Waters Not Fully Supporting Designated Use

Priority	Type
1	Segments where ongoing pollution control strategies are expected to result in achieving support of designated uses; active special projects.
2	Segments with multiple data points that showed metals or other toxic substances in excess of water quality standards and segments in which dissolved oxygen is an issue.
3	Waters for which urban runoff and generalized nonpoint sources have resulted in violations of standards for fecal coliform bacteria, pH, and/or impairment of biological resources, and waters for which fish consumption guidelines are in place due to air deposition of mercury.

Assigning Priorities for Stream Segments

For several waters in the Altamaha River basin and other river basins around the state, currently planned control strategies are expected to result in attainment of designated uses. EPD resources will be directed to ensure that the ongoing pollution control strategies are implemented as planned and water quality improvements are achieved. These waters on the Georgia 2002 305(b)/303(d) List are identified as active 305(b) waters, and are the highest priority waters, as these segments will continue to require resources to complete actions and ensure standards are achieved. These stream segments have been assigned priority one (see Appendix D).

Second priority was allocated to segments in which dissolved oxygen concentration was an issue.

Third priority was assigned to waters where air deposition, urban runoff or general nonpoint sources caused issues with fish consumption, biota, and/or fecal coliform bacteria standards violations. Waters added to the Georgia 303(d) list by EPA were also assigned to third priority. Several issues helped forge the rationale for priorities. First, strategies are currently in place to address the significant water quality problems in the Altamaha River basin and significant resources will be required to ensure that these actions are completed. Second, many of the waters for which no control strategy is currently in place are listed due to fish consumption issues or as a result of exceedance of fecal coliform bacteria due to urban runoff or nonpoint sources. At the present time, the efficacy of the standards for fecal coliform bacteria is in question in the scientific community, as described in Section 4.2. Also, there is no national strategy in place to address air deposition of mercury, thought to be the source of mercury that contributes to the fish tissue issues.

The EPD finalized total maximum daily loads (TMDLs) for waters on the 2002 303(d) list in the Altamaha River basin in 2003. The waters with final TMDLs are identified in Appendix D with a "3" in the column labeled 303(d). Implementation plans for each of the TMDLs are to be completed in 2003.

6.2.2 General Long-Term Priorities for Water Quality Concerns

Long-term priorities for water quality management in the Altamaha River basin will need to be developed by EPD and all other stakeholders during the next iteration of the basin management cycle. Long-term priorities must seek a balance between a number of different basinwide objectives. These objectives include:

- Protecting water quality in lakes, rivers, streams, and estuaries through attainment of water quality standards and support for designated uses;
- Providing adequate, high quality water supply for municipal, agricultural, industrial, and other human activities;
- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems;
- Protecting human health and welfare through prevention of water-borne disease; minimization of risk from contaminated fish tissue, and reduction of risks from flooding; and
- Ensuring opportunities for economic growth, development, and recreation in the region.

6.3 Priorities for Water Quantity Concerns

Drought conditions during the 1998-2000 period impacted the southeast region of the state which includes the Altamaha River basin. According to EPD's 1998-2000 Georgia Drought Report, rainfall shortages in this region amounted to almost 23 inches. The report summarizes the environmental, economic, and social impacts of the drought; evaluates the management actions implemented by state and local authorities during the drought; and presents a clear set of recommendations for improving drought preparedness and response.

The recommendations include the following:

1. **Emergency Relief:** The State of Georgia should provide emergency grants and loans to assist local governments with critical or threatened water supplies.
2. **Water Conservation:** The State of Georgia must develop a comprehensive water conservation plan to address a wide range of water conserving measures that can be implemented to reduce water demand in Georgia.
3. **Agricultural Water Use:** The State of Georgia must develop an effective method to evaluate consumptive use of water for agricultural irrigation and implement programs for reducing water use while protecting the prosperity of farmers and agricultural communities. (Note: Starting in FY04 the GSWCC will embark on a program to provide irrigation audits and a follow-up metering program of Georgia's 21,000 agricultural permit holders, of which about 1,079 permits are in the Altamaha River basin.)
4. **State Water Plan:** The State of Georgia must perform a detailed review of existing water policy and laws and develop a comprehensive state water plan that will provide the framework and support for effective management of Georgia's water resources.
5. **State Drought Plan:** The State of Georgia must continue developing a comprehensive drought plan and drought management process in order to implement appropriate drought response, preparedness and mitigation measures in future droughts. (Note: A State Drought Plan was adopted on March 26, 2003.)

In addition to the drought concern, the Altamaha River basin counties of Emanuel, Toombs and Appling down to the coast are part of the area implementing the Interim Strategy for the Floridan aquifer. While the basin is not directly impacted with salt water intrusion (which threatens Brunswick and Savannah), the Rayonier Mill near Jesup in Wayne County is the largest permitted groundwater use in Georgia.

6.3.1 Priorities for Competing Demands

With regard to the priority to be placed on meeting competing demands for future water use, the EPD (in conjunction with a broad group of stakeholders from north, central, and southwest Georgia) has established a set of "guiding principles" which will be followed in developing the state's position regarding the allocation of water. These principles are partially based upon the prioritization given to meeting categories of water needs under Georgia law (i.e., municipal needs are the first priority, and agricultural water needs are second; all other water needs follow these two). The principles are summarized below:

1. Municipal (M&I) demands have the highest priority.
2. Agriculture needs must be satisfied.
3. Minimum instream flow rates must be met in order to preserve water quality.
4. If other demands (e.g., industrial, recreation, hydropower, navigation, and environment) can not be met under conditions of water shortage, efforts will be made to optimize the mix of economic and environmental values.

References

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Georgia Environmental Protection Division. 1997. Interim Strategy for Managing Salt Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia.

Georgia Environmental Protection Division. 2000. 1998-2000 Georgia Drought Report.

In This Section

- “Big Picture” Overview for the Altamaha River Basin
- General Basinwide Management Strategies
- Targeted Management Strategies

Section 7

Implementation Strategies

This section builds on the priority issues identified in Section 6 and proposes strategies to address the major water quality problems in the Altamaha River basin.

Georgia’s Mission Statement for river basin management planning is “to develop and implement a river basin planning program to protect, enhance, and restore the waters of the state of Georgia that will provide for effective monitoring, allocation, use, regulation, and management of water resources.” Associated with this mission are a variety of goals which emphasize the coordinated planning necessary to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality, habitat, and recreation. For the Altamaha basin, these goals will be implemented through a combination of a variety of general strategies, which apply across the basin and across the state, and targeted or site-specific strategies. Section 7.1 describes the big-picture management goals for the Altamaha River basin. Section 7.2 describes the general and basinwide implementation strategies most relevant to the Altamaha River. Targeted strategies for specific priority concerns within each subbasin, as identified in Section 6, are then presented in 7.3.

7.1 “Big Picture” Overview for the Altamaha River Basin

This Altamaha River basin Management Plan includes strategies to address a number of different basinwide objectives. These include:

- Protecting water quality in lakes, rivers, streams, estuaries, and coastal waters through attainment of water quality standards and support for designated uses.

- Providing an adequate, high quality water supply for municipal, agricultural, industrial, and other human activities.
- Preserving a habitat suitable for the support of healthy aquatic and riparian ecosystems.
- Protecting human health and welfare through prevention of water-borne disease; minimization of risk from contaminated fish tissue, and reduction of risks from flooding.
- Ensuring opportunities for economic growth, development, and recreation in the region.

Achieving these objectives is the responsibility of a variety of state and federal agencies, local governments, business, industry, and individual citizens. Coordination between partners is difficult, and impacts of actions in one locale by one partner on conditions elsewhere in the basin are not always understood or considered. River Basin Management Planning (RBMP) is an attempt to bring together stakeholders in the basin to increase coordination and to provide a mechanism for communication and consideration of actions on a broad scale to support water resource objectives for the entire basin. RBMP provides the framework to begin to understand the consequences of local decisions on basinwide water resources.

RBMP, begun in 1993, is changing the way EPD and other state agencies coordinate business. At the same time, local government comprehensive planning requirements require a higher degree of effort and awareness by local governments to address resource protection and planning for the future.

This plan presents general broad-scale goals and strategies for addressing the most significant existing and future water quality and quantity issues within the Altamaha basin. The basin plan provides a whole-basin framework for appropriate local initiatives and controls, but cannot specify all the individual local efforts which will be required. The basin plan will, however, provide a context and general management goals for the local-scale plans needed to address local-scale nonpoint loads in detail. EPD expects local governments and agencies to take the initiative to develop local strategies consistent with the basin-scale strategies presented in this plan.

A number of concerns identified in this plan will affect planning and decision-making by local governments, state agencies, and business interests. Detailed strategies for addressing identified concerns are presented in Section 7.4. This section provides an overview of the key "big picture" issues and planning opportunities in the Altamaha River basin.

7.1.1 Water Quality Overview

As discussed in Section 5, water quality in the Altamaha River basin is generally good at this time, although problems remain to be addressed and proactive planning is needed to protect water quality into the future. Many actions have already been taken to protect water quality. Programs implemented by federal, state, and local governments, farmers, foresters, and other individuals have greatly helped to protect and improve water quality in the basin over the past 20 years. Streams are no longer dominated by untreated or partially treated sewage or industrial discharges, which resulted in little oxygen and impaired aquatic life. For the most part, local government and industrial wastewaters are properly treated, oxygen levels have returned, and fish have followed.

The primary source of pollution that continues to affect waters of the Altamaha River basin results from nonpoint sources. Key types of nonpoint source pollution impairing or potentially threatening water quality in the Altamaha River basin include sediment, bacteria and oxygen demanding substances from urban and rural nonpoint sources, and nonpoint sources of mercury (particularly air deposition) which accumulates in fish

tissue. These problems result from the cumulative effect of activities of many individual landowners or managers. Population is growing every year, increasing the potential risks from nonpoint source pollution. Growth is essential to the economic health of the Altamaha River basin, yet growth without proper land use planning and implementation of best management practices to protect streams and rivers can create harmful impacts on the environment.

Because there are so many small sources of nonpoint loading spread throughout the watershed, nonpoint sources of pollution cannot effectively be controlled by state agency permitting and enforcement, even where regulatory authority exists. Rather, control of nonpoint loading will require the cooperative efforts of many partners, including state and federal agencies, individual landowners, agricultural and forestry interests, local county and municipal governments, and Regional Development Centers. A combination of regulatory and voluntary land management practices will be necessary to maintain and improve the water quality of rivers, streams, and lakes in the Altamaha River basin.

Key Actions by EPD

The Georgia EPD Water Protection Branch has responsibility for establishing water quality standards, monitoring water quality, river basin planning, water quality modeling, permitting and enforcement of point source NPDES permits, and developing Total Maximum Daily Loads (TMDLs), where ongoing actions are not sufficient to achieve water quality standards. Much of this work is regulatory. EPD is also one of several agencies responsible for facilitating, planning, and educating the public about management of nonpoint source pollution. Nonpoint source programs implemented by Georgia and by other states across the nation are voluntary in nature. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and groundwater resources for municipal and agricultural uses, which includes source water assessment and protection activities in compliance with the Safe Drinking Water Act.

Actions being taken by EPD at the state level to address water quality problems in the Altamaha River basin include the following:

- **Watershed Assessments and Watershed Protection Implementation Plans.** When local governments propose to expand an existing wastewater facility or propose a new facility, EPD requires a comprehensive watershed assessment and development of a watershed protection plan. The watershed assessment includes monitoring and assessment of current water quality and land use in the watershed and evaluation of the impacts of future land use changes. A watershed protection plan includes specific strategies such as land use plans and local actions designed to ensure that existing problems are being addressed and that future development will be conducted in a way to prevent water quality standards violations.
- **Total Maximum Daily Loads (TMDLs).** Where water quality sampling has documented standards violations and ongoing actions are not sufficient to achieve water quality standards, a TMDL will be established for a specific pollutant on the specific stream segment in accordance with EPA guidance. The TMDL will specify the allowable loading of a pollutant from both point and nonpoint sources. The EPD will coordinate the development of TMDL implementation plans with local RDCs and other stakeholders, particularly in those situations where the source of the pollutant is a nonpoint source. In those cases where the cause of the problem is a municipal or industrial water pollution control plant discharge, the EPD will coordinate needed improvements directly with the owner of the treatment facility through the NPDES permitting process.
- **Source Water Protection.** The public water supply in the Altamaha basin is drawn from surface and groundwater. To provide for the protection of public water supplies, Georgia EPD developed a Source Water Assessment Program in

alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding recent EPA initiatives. This new initiative will result in assessments of threats to drinking water supplies and, ultimately, local Source Water Protection Plans. Recent "Criteria for Watershed Protection" (a subsection of the Rules for Environmental Planning Criteria) produced by the Department of Community Affairs set minimum guidelines for protection of watersheds above "governmentally owned" water supply intakes.

- **Fish Consumption Guidelines.** EPD and the Wildlife Resources Division work to protect public human health by testing fish tissue and issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Key Actions by Resource Management Agencies

Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide non-regulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs.

Agriculture in the Altamaha River basin is primarily restricted to livestock and poultry operations. Key partners for controlling agricultural nonpoint source pollution are the Soil and Water Conservation Districts, the Georgia Soil and Water Conservation Commission, and the USDA Natural Resources Conservation Service. These partners promote the use of environmentally sound best management practices (BMPs) through education, demonstration projects, and financial assistance. In addition to incentive payments and cost-sharing for BMPs, three major conservation programs from USDA will be available to producers and rural landowners. These are the Conservation Reserve Program, which protects highly erodible and environmentally sensitive land; the Wetland Reserve Program, designed to protect, restore, and enhance wetlands with cost-share incentives; and the Wildlife Habitat Incentives Program, which will help landowners develop and improve wildlife habitat.

Forestry is a major part of the economy in the Altamaha basin. The Georgia Forestry Commission (GFC) is the lead agency for controlling silvicultural nonpoint source pollution. The GFC develops forestry practice guidelines, encourages BMP implementation via University of Georgia sponsored educational workshops and demonstrations, conducts education, investigates and mediates complaints involving forestry operations, and conducts biennial statewide BMP compliance surveys. The State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of foresters involved in unresolved complaints where the lack of BMP implementation has resulted in water quality violations.

Key Actions by Local Governments

Addressing water quality problems resulting from nonpoint source pollution will primarily depend on actions taken at the local level. Particularly for nonpoint sources associated with urban and residential development, it is only at the local level that regulatory authority exists for zoning and land use planning, control of erosion and sedimentation from construction activities, and regulation of septic systems.

Local governments are increasingly focusing on water resource issues. In many cases, the existence of high quality water has not been recognized and managed as an economic resource by local governments. That situation is now changing due to a variety of factors, including increased public awareness, high levels of population growth in many areas resulting in a need for comprehensive planning, recognition that high quality water supplies are limited, and new state-level actions and requirements. The latter include:

- Requirements for Watershed Assessments and Watershed Protection Implementation Plans when permits for expanded or new municipal wastewater discharges are requested.
- Development of Source Water Protection Plans to protect public drinking water supplies.
- Requirements for local comprehensive planning, including protection of natural and water resources, as promulgated by the Georgia Department of Community Affairs.

In sum, it is the responsibility of local governments to implement planning for future development that takes into account management and protection of the water quality of rivers, streams, and lakes within their jurisdiction.

7.1.2 Water Quantity Overview

In addition to protecting water quality, it is essential to plan for water supply in the Altamaha River basin. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and groundwater resources for municipal and agricultural uses, and is responsible for ensuring sufficient instream flows are available during a critical drought condition to meet permitted withdrawal requirements without significant impact to the environment. The withdrawal permit process must not overuse the available resources. The Water Resources Branch is also responsible for regulation of public water systems for compliance with the Safe Drinking Water Act, and regulation of dams for compliance with the Safe Dams Act.

In response to the severe drought conditions in Georgia during the 1998-2000 period, EPD developed the 1998-2000 Georgia Drought Report (GAEPD, 2000) that summarizes the drought impacts and provides an objective assessment of the state's vulnerability and mitigation efforts; evaluates the management actions implemented by state and local authorities during the drought of 1998-2000; and presents a set of recommendations for improving drought preparedness and response. Among the recommendations included in the report are for the state to develop an effective method to evaluate consumptive use of water for agricultural irrigation, and implement programs for reducing water use while protecting the prosperity of farmers and agricultural communities. Starting in FY04 the GSWCC will embark on a program to provide irrigation audits and a follow-up metering program of Georgia's 21,000 agricultural permit holders, of which about 1,079 permits are in the Altamaha River basin.

The coastal counties of Emanuel, Toombs and Appling down to the coast are part of the area implementing the Interim Strategy for Managing Salt Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia. Regionally, too much groundwater is being withdrawn and aquifer levels are decreasing. While the Altamaha River basin was not directly impacted with salt water intrusion (which threatens Brunswick and Savannah), the largest permitted groundwater user in the state is in Wayne County.

7.2 General Basinwide Management Strategies

There are many statewide programs and strategies that play an important role in the maintenance and protection of water quality in the Altamaha basin. These general strategies are applicable throughout the basin to address both point and nonpoint source controls.

7.2.1 General Surface Water Protection Strategies

Antidegradation

The State of Georgia considers all waters of the state as high quality and applies a stringent level of protection for each waterbody. Georgia Rules and Regulations for

Water Quality Control, Chapter 391-3-6-03(2)(b) contains specific antidegradation provisions as follows:

(b) Those waters in the State whose existing quality is better than the minimum levels established in standards on the date standards become effective will be maintained at high quality; with the State having the power to authorize new developments, when it has been affirmatively demonstrated to the State that a change is justifiable to provide necessary social or economic development and provided further that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. All requirements in the Federal Regulations, 40 C.F.R. 131.12, will be achieved before lowering of water quality is allowed for high quality water.

The antidegradation review process is triggered at such time as a new or expanded point source discharge is proposed that may have some effect on surface water quality. Such proposals are reviewed to determine if the new discharge is justifiable to provide necessary social or economic development and that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses.

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no-discharge" land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Water Supply Watershed Protection Strategy

As population continues to increase within the Altamaha River basin, it will become ever more important to protect the water quality of already developed raw water sources. EPD is acting in concert with the Department of Community Affairs to produce a set of guidelines which define, among other things, measures that local governments are encouraged to take to protect drinking water sources. The guidelines are entitled Rules for Environmental Planning Criteria, and establish environmental protection criteria for five environmental categories: water supply watersheds, groundwater recharge areas, mountains, river corridors and wetlands. The *Criteria for Watershed Protection* (a subsection of the Rules for Environmental Planning Criteria) set minimum guidelines for protection of watersheds above "governmentally owned" water supply intakes. The degree of protection depends upon the size of the watershed; watersheds with drainage areas of less than 100 square miles are subject to more strict criteria as summarized below:

- Impervious surface densities limited to 25 percent over the entire watershed.
- Buffer/setback requirements equal to 100/150 feet within a 7 mile radius of the intake and 50/75 feet outside the 7 mile radius.
- A reservoir management plan (including 150 foot buffer around the perimeter of the reservoir).

Watersheds with drainage areas of 100 square miles or more are subject to less strict criteria as summarized below:

- An intake on a flowing stream (as opposed to being located within a reservoir) shall have no specified minimum criteria.

- An intake with a water supply reservoir shall have a minimum of 100 feet natural buffer within a 7 mile radius of the reservoir, and no impervious cover constructed within a 150 foot setback area on both banks of the stream.

EPD is also actively working toward meeting the national goal that, by the year 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs (SWPP) in place under both wellhead protection and watershed protection programs. EPD intends to accomplish this goal by developing and implementing a source water assessment program (SWAP) in alignment with EPA's initiatives.

EPA approved EPD's Source Water Assessment and Protection Implementation Plan for Public Drinking Water Sources on April 24, 2000. The Plan specifies how source water assessment areas are to be delineated, lists potential contaminants of concern needing to be identified in the delineated areas, provides methodology for determining the susceptibility of a public water supply source and provides the basis for preparing local individual source water protection plans for public water supply systems. EPA has given the Drinking Water Program (DWP) the flexibility to help complete the local source water protection plans for contracted public water systems and provide financial and technical assistance to help develop long range source water protection strategies for the public water system. The Source Water Assessment program builds upon EPD's other assessment and prevention programs, including the Well Head Protection Program, the Vulnerability Assessment and Waiver Program and the River Basin Management Plans, by soliciting active public participation from the local communities and assisting in the preparation of the local water system's protection plan.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act (CWA) establishes the TMDL, or total maximum daily load, process as a tool to implement water quality standards. Georgia is required by the CWA to identify and list waterbodies where water quality standards are not met following the application of technology based controls, and to establish TMDLs for the listed stream segments. The USEPA is required to approve or disapprove Georgia's 303(d) list of waters and TMDLs.

The most recent requirement for 303(d) list submittal occurred in 2002. Georgia public noticed and submitted a draft 303(d) list package to the EPA in November 2001. The public and EPA reviewed the draft 303(d) list package and provided comments. Georgia reviewed the input, made appropriate changes and submitted a final 303(d) listing package to the EPA in March 2002. EPA approved the Georgia list in April 2002.

Georgia's 2002 303(d) listing is based on the Georgia 305(b) water quality assessments. The 305(b) assessment is presented in the report *Water Quality in Georgia, 2000-2001*. The 305(b) assessment tables for the Altamaha River basin are reorganized by HUC and presented in Appendix D of this report. The tables provide a code indicating the 303(d) listing status of assessed segments within the Altamaha River basin. An "X" in the 303(d) column indicates the segment is on the Georgia 2002 303(d) list. A complete explanation of the codes in the 303(d) column is given below:

- 1 Segments identified as not supporting or partially supporting designated uses where actions have been taken and compliance with water quality standards achieved. These segments are not part of the Georgia 303(d) list.
- 2 Segments identified as not supporting or partially supporting designated uses where existing enforceable state, local, or federal requirements are expected to lead to attainment of water quality standards within two years without additional control strategies. These segments are not part of the Georgia 303(d) list.

- 3 Segments where TMDLs have been completed and approved by EPA. These waters are not part of the Georgia 303(d) list.
- X Waters on the Georgia 303(d) list. These segments are assessed as not supporting or partially supporting designated uses, and may require additional controls to achieve designated uses. These segments make up the Georgia 303(d) list.

TMDLs were written for nearly all of the listed segments during the current cycle of basin planning. Coordination and development of TMDL implementation plans is scheduled for 2003.

7.2.2 Management of Permitted Point Sources

The strategies in this section strive to minimize adverse effects from municipal, industrial, and concentrated discharges. Permitted discharges of treated wastewater are managed via the National Pollutant Discharge Elimination system (NPDES) permit program. The NPDES permit program provides a basis for regulating municipal and industrial discharges, monitoring compliance with effluent limitations, and initiating appropriate enforcement action for violations. EPD has formulated general strategies for a number of types of environmental stressors under the NPDES program.

Analysis of Alternatives

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no discharge," land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Permit Issuance/Reissuance Strategies

During the basin plan implementation phase, issues identified in the written basin plan pertaining to point source discharges will be assessed. The assessment will include such things as 1) identified point source discharge problem areas, 2) data evaluations, 3) wasteload allocations and/or TMDLs with identified problem point sources, and 4) toxic pollutants identified with point source discharges. Permits associated with identified problems will be evaluated to determine if a reopening of the permit is appropriate to adequately address the problem.

Watershed Assessment Requirements

A watershed assessment is generally initiated when, due to growth and development, a local government sees a need to increase the hydraulic capacity of an existing wastewater treatment facility (or propose a new facility) and contacts EPD for a NPDES permit modification. If an antidegradation review demonstrates that it is not feasible to handle the additional capacity needs with a land treatment or other no discharge system, the community may pursue an increase in its surface water discharge. The initial step in this

Box 7-1: A Guide to Understanding TMDLs

A Total Maximum Daily Load, or TMDL, is a regulatory tool that provides a framework for helping stakeholders resolve water quality issues in waterbodies with persistent problems. Literally, it is a calculation of the maximum amount of a pollutant that a waterbody can receive and still comply with standards and attain its designated use. However, it is used only under certain circumstances, and has implications far beyond the arithmetic of the numbers that go into it. This guide will provide a brief history of TMDLs, an explanation of the technical aspects, and information regarding implementation.

Background

Section 303(d) of the Clean Water Act provides a mechanism for achieving water quality standards where technology-based controls alone are insufficient. It requires states to identify waterbodies that do not achieve designated uses after application of technology to point sources, and put the waterbodies on a list (which has come to be called the 303(d) list). States then develop TMDLs, and allocate the pollutant load to point sources and nonpoint sources. These sources would then be required to reduce their loads to the specified target, either through new permit limits for point sources or best management practices for nonpoint sources.

Technical Aspects

TMDLs are often difficult to understand at first. Even so, the components and methodology can be unraveled, explained, and understood.

The terms of the TMDL equation and definitions are as follows (EPA, 1991):

$$\text{TMDL} = \text{sum of WLA} + \text{sum of LA} + \text{MOS}$$

Term	Definition	Description
WLA	Wasteload Allocation	A portion of the TMDL allocated to a point source.
LA	Load Allocation	A portion of the TMDL assigned to a nonpoint source or natural background sources in the present or future.
MOS	Margin of Safety	TMDLs are required to contain an appropriate margin of safety. The margin of safety is a way to account for the uncertainty inherent in the calculations and modeling that went into developing the loading capacity and the allocations. This may be an explicit portion of the TMDL or it may be incorporated implicitly through use of conservative assumptions.

Note: WLA and LA are expressed as "sum of WLA" and "sum of LA." As an example, if there were three point source dischargers, "sum of WLA" would be the sum of all three wasteload allocations, one for each discharger.

While the literal definition of TMDL is "total maximum daily load," the regulations allow it to be expressed in other forms. For instance, it may not be a daily load; fecal coliform bacteria TMDLs are generally expressed in monthly or annual terms. The guiding requirements are that the TMDL must be quantifiable, and it must be designed to achieve water quality standards. It must also have a margin of safety (implicit or explicit), and account for seasonal variation.

Box 7-1 Continued on Next Page

Box 7-1 Continued...

Implementation

While a TMDL is essentially just a set of numbers, the conditions under which it is invoked and the requirements it produces make it a tool for water quality regulation. TMDLs directly limit the allocations that can be made to point source dischargers requiring NPDES permits, such as wastewater treatment plants. This might limit future expansion of industry or wastewater treatment in a region. Most TMDLs, however, are needed because the waterbody has nonpoint sources of pollution that contribute to the failure to support a designated use. Agricultural operations, forestry operations, construction sites, suburban housing developments, and urban centers are all potential sources of various kinds of nonpoint source pollution. Pollutants are even transmitted long distances in the air and are deposited and washed off of land surfaces. In many cases, these sources must be addressed through urban land use planning efforts and/or voluntary actions (often supported by the directed use of funding, such as agricultural cost-share programs) to implement best management practices.

TMDL implementation plans will be produced and then acted upon. As the science used to create TMDLs improves, TMDLs may be revised. It will be a dynamic process, both for determining load allocations and for finding the actions needed to meet them and achieve the overarching goal of having clean water that achieves compliance with water quality standards and supports designated uses.

process is the completion of a watershed assessment, which is the first step towards assuring that all water quality standards will be maintained throughout a watershed during both critical dry and wet weather conditions in response to both point and nonpoint source loads.

The watershed assessment is actually a study, an assessment, and a plan. It is about collecting data and learning relationships between what is going on in a watershed and how these activities (land uses, etc.) impact water quality, then using this knowledge to develop both short and long term plans designed to ensure the attainment of water quality standards. The assessment should address current conditions and consider projected land use changes. Only when it can be demonstrated that water quality standards will be maintained, can EPD prepare a defensible permit for a proposed new or expanded wastewater treatment facility in accordance with the EPD 303(d) permitting strategy. The assessment should include a detailed plan to address both current water quality and biological problems and any predicted future water quality and biological problems. Key components of such a plan may be adopted by EPD as "special conditions" of the pertinent new or modified NPDES permit.

Facility Construction/Improvements

EPD has promoted continuing improvement in the quality of return flows from permitted point sources in the basin. Upgrading wastewater treatment facilities is a significant strategy to meet effluent limits from discharges. In the past 10 years, various upgrades and improvements have been made to industrial and municipal treatment systems throughout the Altamaha River basin. The funding for these projects has come from state and federal construction grants and loans and the citizens of local municipalities.

Domestic Wastewater Systems

The collecting, treating and disposing of wastewater in Georgia is regulated by a number of environmental laws that are administered by various agencies in local and state government. When a local government or private concern (owner) identifies a need for a wastewater treatment and disposal system it is imperative that thorough and adequate planning takes place.

Wastewater systems that discharge treated wastewater to a surface stream must be permitted through the Georgia National Pollution Discharge Elimination System (NPDES) and meet all the requirements of that system. In Georgia, with very few exceptions, surface discharge permits will only be issued to publicly owned systems.

Wastewater systems that do not result in a discharge to surface waters, such as slow rate land treatment systems and urban reuse systems (no discharge), are permitted through the State of Georgia's land application system (LAS) permitting process. Both publicly and privately owned systems can apply for and receive LAS permits.

Chlorine

If a chlorine limit is not already required in an NPDES permit, all major municipal wastewater facilities (i.e., those with design flows greater than or equal to 1.0 million gallons per day [MGD]) are required to meet a chronic toxicity-based chlorine limitation when the permit comes up for routine reissuance. The limitation is calculated based on a maximum instream concentration of 0.011 mg/l, the facility's design flow, and the 7Q10 low flow of the receiving stream. No facilities are given a limitation higher than 0.5 mg/l as this is deemed to be an operationally achievable number even if a facility does not have dechlorination equipment installed. Facilities which are given a limitation more stringent than 0.5 mg/l which do not already have dechlorination equipment installed, are given up to a 2-year schedule in which to meet the limitation. All discharging facilities that are upgrading are required to meet a chlorine limitation as part of the upgrade, based on the same criteria noted above.

Ammonia

Ammonia in effluents poses a problem both as a source of toxicity to aquatic life and as an oxygen-demanding waste. New facilities and facilities proposed for upgrade are required to meet ammonia limits for toxicity if those limits are more stringent than instream dissolved oxygen based limits. Existing facilities are not required to meet ammonia limits based on calculated toxicity unless instream toxicity has been identified through toxicity testing.

Metals/Priority Pollutants/Aquatic Toxicity

Major municipal and industrial facilities are required to conduct and submit results of periodic priority pollutant scans and aquatic toxicity tests to EPD as part of their permit monitoring requirements or upon submittal of a permit application for permit reissuance. The data are assessed in accordance with the Georgia Rules and Regulations for Water Quality Control. The results of the assessments can be used to trigger either additional priority pollutant monitoring, a toxicity reduction evaluation or permit limits for certain parameters.

Color

The state's narrative water quality standard for color requires that all waters shall be free from material related to discharges that produce color that interferes with legitimate water uses. EPD's color strategy will address this standard for industrial and municipal discharges by implementing permit limits and/or color removal requirements. EPD requires new facilities or discharges to prevent any noticeable color effect on the receiving stream. EPD requires existing facilities with color in their effluent to collect upstream and downstream color samples when their NPDES permit is reissued. The facility must conduct an assessment of the sources of color. Also, a color removal evaluation may be required at permit reissuance. EPD will also target facilities for color removal requirements based on significant citizen complaints of discoloration in streams.

Phosphorus

EPD establishes phosphorus control strategies where needed to address water bodies where water quality is limited by excess phosphorus loading. At the present time, there are no data to suggest phosphorus loading problems in the Altamaha River basin.

Temperature

Permits issued for facilities which discharge to primary trout streams are required to have no elevation of natural stream temperatures. Permits issued for facilities which discharge to secondary trout streams are required not to elevate the receiving stream more than 2 degrees Fahrenheit. There are no trout streams in the Altamaha River basin.

Storm Water Permitting

The Water Quality Act of 1987 requires permits to be issued for certain types of stormwater discharges, with primary focus on stormwater runoff from industrial operations and large urban areas. The USEPA promulgated Storm Water Regulations on November 16, 1990. The GAEPD subsequently received delegation from the USEPA in January 1991 to issue NPDES Permits for regulating stormwater in Georgia. GAEPD has developed and implemented a stormwater strategy that assures compliance with the federal regulations.

Phase I of the federal regulations set specific application submittal requirements for large (population 250,000 or more) and medium (population 100,000 to 250,000) municipal separate storm sewer systems (MS4). The GAEPD has determined that the metropolitan Atlanta area is a large municipal system as defined in the regulations. Clayton, Cobb, DeKalb, Fulton, and Gwinnett Counties and all interlaying incorporated cities were required to comply with the application submittal target dates for a large municipal area. Forty-six stormwater permits have been issued to the Atlanta area municipalities.

Augusta, Macon, Savannah, Columbus and the counties surrounding these cities were identified as medium municipal systems as defined in the stormwater regulations. Twelve stormwater permits have been issued to the medium municipal systems in Georgia. The stormwater permits for large and medium municipal systems require the submittal of annual reports to GAEPD. Each year, the GAEPD reviews the annual reports from the large and medium municipalities. Among other things, the annual report includes a detailed description of the municipality's implementation of its Storm Water Management Program. The GAEPD provides comments on the annual reports to the MS4 permittees, noting areas of noncompliance and recommending improvements to the local Storm Water Management Programs.

On December 8, 1999 USEPA promulgated the Phase II Rules for Storm Water. Phase II requires NPDES permitting and the development of Storm Water Management Programs for a large number of smaller cities and counties. Construction sites from 1-5 acres and municipally-owned industrial facilities will also be regulated.

Significant progress has been made in the implementation of the Phase II Storm Water Rule concerning small municipal separate storm sewer systems (MS4s). GAEPD has evaluated the 2000 census data and determined a list of local governments whose jurisdictions resided within the Urbanized Areas in the state. As required by federal regulations, GAEPD also determined a waiver process, and a process to designate additional MS4s based on designation criteria. The total number of Phase II MS4s in Georgia is 86.

The General NPDES Storm Water Permit for Small MS4s was issued in December 2002. The small MS4s submitted their Notice of Intent forms in March 2003 to apply for coverage under the general permit.

The GAEPD has issued general permits for the 11 industrial subcategories defined in the Phase I Federal Storm Water Regulations. During 1993, the GAEPD issued a general NPDES permit that regulates the discharge of stormwater from 10 categories of industrial activity. This permit was reissued in 1998 and will be reissued again in 2003. As of May 2003, approximately 41 NOIs had been filed for the Altamaha River basin.

A second general NPDES permit that would regulate stormwater discharges from construction activities was issued by GAEPD and subsequently appealed in 1992, 1994, 1995, 1996 and 1999. Settlement negotiations involving the regulated community who filed the three petitions, several environmental organizations, GAEPD, and a professional facilitator began in October 1999. After months of negotiation, GAEPD issued a revised general NPDES permit GAR-100000 for construction activities on June 12, 2000. The permit became effective on August 1, 2000. This permit currently regulates construction activity which results in land disturbances of five acres or greater. The construction permit requires permittees to implement best management practices, conduct inspections and sample stormwater leaving their site after certain rainfall events. There is a three-tiered permitting structure to differentiate between permittees' responsibilities which allows for easier enforcement. Georgia EPD has received approximately 20,000 Notice of Intent applications since the permit issuance in 2000. The construction general permit will be reissued in July 2003 to include construction sites between one and five acres.

The GAEPD will continue to regulate stormwater runoff from industrial and urban areas as a part of the point-source permitting process to protect water quality.

7.2.3 Nonpoint Source Management

The strategies in this section address sources of environmental stressors which are not subject to NPDES permitting and typically originate from diffuse or nonpoint sources associated with land uses. Most strategies that address nonpoint source concerns are not regulatory in nature, but involve a variety of approaches such as technical assistance and education to prevent and reduce nonpoint source pollution in the basin. Strong stakeholder involvement will be essential to effectively implement many of these strategies.

Georgia Nonpoint Source Management Program

Georgia's initial *Nonpoint Source Assessment Report* and *Nonpoint Source Management Program* were completed in compliance with the Clean Water Act of 1987 and approved by the U.S. Environmental Protection Agency in January 1990. The biennial report, *Water Quality in Georgia*, as required by Section 305(b) of Public Law 92-500, serve as the current process for updating the *Nonpoint Source Assessment Report*.

The state's *Nonpoint Source Management Program* combines regulatory and non-regulatory approaches, in cooperation with other state and federal agencies, local and regional governments, state colleges and universities, businesses and industries, nonprofit organizations and individual citizens. The state's *Nonpoint Source Management Program* was updated and approved by the U.S. Environmental Protection Agency in September 2000. This revision was intended to satisfy the requirements for funding under Section 319(b) of the Clean Water Act of 1987 and to delineate short- and long-term goals and implementation strategies. Just as important, it was designed to be an information resource for the wide range of stakeholders across the state who are involved in the prevention, control and abatement of nonpoint sources of pollution. It has been developed as an inventory of the full breadth of nonpoint source management (regulatory and non-regulatory) in Georgia, including activities which are currently underway or planned for in the time period FFY 2000 through FFY 2004.

The state's *Nonpoint Source Management Program* focuses on the comprehensive categories of nonpoint sources of pollution identified by the U.S. Environmental Protection Agency: Agriculture, Silviculture, Construction, Urban Runoff, Resource Extraction, Land Disposal, Hydrologic/Habitat Modification and Other Nonpoint Sources. The Georgia Environmental Protection Division solicited participation from state and federal agencies; local and regional governments, state colleges and universities, businesses and industries, and nonprofit organizations with significant programs directed towards nonpoint source management. The state's *Nonpoint Source Management*

Program comprehensively describes a framework for stakeholder coordination and cooperation and serves to implement a strategy for employing effective management measures and programs to control nonpoint source pollution statewide.

Agricultural Nonpoint Source Control Strategies

Agricultural nonpoint source pollution continues to be managed and controlled with a statewide non-regulatory approach. This approach uses cooperative partnerships with various agencies and a variety of programs. A brief description of these agencies and outline of their functions and programs is provided below.

Soil and Water Conservation Districts (SWCDs)

Georgia's SWCDs were formed by Act No. 339 of the Georgia General Assembly on March 26, 1937. Their role is to provide leadership in the protection, conservation, and improvement of Georgia's soil, water, and related resources. This is accomplished through promotion efforts related to the voluntary adoption of agricultural best management practices (BMPs).

Georgia Soil and Water Conservation Commission (GSWCC)

Georgia's SWCDs receive no annual appropriations and are not regulatory or enforcement agencies. Therefore, the GSWCC was also formed in 1937 to support the SWCDs. GSWCC has been designated as the administering or lead agency for agricultural nonpoint source (NPS) pollution prevention in the state. The GSWCC develops NPS water quality programs and conducts educational activities to promote conservation and protection of land and water resources devoted to agricultural uses. Primary functions of the GSWCC are to provide guidance and assistance to the Soil and Water Conservation Districts and provide education and oversight for the Georgia Erosion and Sedimentation Act.

There are a number of other agricultural agencies administering programs to address water quality and natural resource management issues. Resource Conservation and Development (RC&D) Councils are organized groups of local citizens supported by the USDA involved in a program to encourage economic development, as well as the wise conservation of natural and human resources. The University of Georgia College of Agricultural and Environmental Sciences (CAES) conducts an education and outreach campaign that encourages producers to increase productivity using environmentally sound techniques. This is accomplished through a number of programs like Farm-A-Syst, Well Water Testing, Nutrient Management, Soil and Water Laboratory Analysis, and informational material on a wide range of subjects. Georgia's Department of Agriculture (GDA) administers a wide variety of insect and plant disease control programs to help regulate the use of pesticides. GDA also inspects irrigation system requirements, such as check valves and back flow prevention devices, for protection of groundwater. The Agricultural Research Service (ARS) conducts research designed to improve the effectiveness of agricultural conservation techniques and promote sustainability. The Natural Resources Conservation Service (NRCS), along with the Farm Services Agency (FSA) and through local Soil and Water Conservation Districts, administers Farm Bill Programs that provide technical and financial incentives to producers to implement agricultural BMPs. The Agricultural Water Use Coordinating Committee, through individual members, regularly applies for, and receives, funds under section 319(h) of the Clean Water Act to perform best management practices and demonstration projects throughout the state. The Georgia Soil and Water Conservation Commission has provided state leadership with many of these efforts.

Collectively, these programs will serve to address resource concerns related to agricultural land uses in a coordinated fashion over the next five years until the second iteration of the River Basin Management Planning Cycle. Much of the information regarding opportunities to participate under this voluntary approach to complying with

water quality standards is disseminated through commodity commissions and organizations such as the Farm Bureau Federation, Agribusiness Council, Cattlemen's Association, Milk Producers Association, Pork Producers Association, Poultry Federation, and other agricultural support industries.

Prioritization Activities under the Farm Bill

The 1996 Farm Bill provides a number of programs, and processes, designed to address those environmental stressors related to nonpoint sources from Agriculture which were identified in section 4.1.2. A new flagship conservation program, the Environmental Quality Incentives Program (EQIP), will provide the lion's share of funding for technical, educational, and financial assistance. The USDA Natural Resources Conservation Service (NRCS) has leadership for EQIP and works with the USDA Farm Service Agency (FSA) to set policies, priorities, and guidelines. These two agencies take recommendations from local work groups and a State Technical Committee, comprised of resource professionals from a variety of disciplines, when addressing actual and potential resource impairments associated with agricultural land uses.

EQIP provides incentive payments and cost-sharing for conservation practices through 5- to 10-year contracts. Producers may receive federal cost-sharing up to 50 percent of the average cost of certain conservation practices such as terraces, grassed waterways, filter strips, buffer strips, manure management facilities, animal waste utilization, and 46 other conservation practices important to improving and maintaining the health of natural resources in an area. An individual producer can receive as much as \$450,000 in EQIP funds over 10 years for contracts initiated between FY 2002 and FY 2007 to implement needed conservation practices.

A majority of funds allocated to Georgia (65 percent) will be spent in priority areas where there are serious and critical environmental needs and concerns. High priority is given to areas where state and local governments offer financial and technical assistance, and where agricultural improvements will help meet water quality and other environmental objectives.

The remaining 35 percent of funds allocated to Georgia can be extended outside priority areas to other parts of the state. Eligibility is limited to persons who are engaged in agricultural productions. Eligible land includes cropland, pastureland, forestland, and other farm lands.

In addition to EQIP there are three major conservation programs from USDA that will be available to producers, and rural landowners. The first is the Conservation Reserve Program (CRP), which protects highly erodible and environmentally sensitive land with grass, trees, and other long-term cover. The Wetland Reserve Program (WRP) is a voluntary program designed to protect, restore, and enhance wetlands with cost-share incentives. Also, the Wildlife Habitat Incentives Program (WHIP) will help landowners develop and improve habitats for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife.

Forestry Nonpoint Source Control Strategies

In 1977, the Governor's Silviculture Task Force was convened to develop a forestry Water Quality program that included the development of silvicultural Best Management Practices (BMPs). Spearheaded by the Georgia Forestry Commission (GFC), this Task Force was composed of 14 conservation and environmental representatives, University of Georgia professionals, and USFS personnel. As a result, BMPs were developed in 1981. The Task Force also prepared a report that recommended a voluntary (exempt from state and local Erosion & Sediment Control permitting) approach to the implementation of BMPs and the designation of the GFC as the lead agency for implementing the Silviculture portion of the State Water Quality Management Plan. Their main roles are BMP education, forestry complaint investigation, and BMP implementation monitoring.

In January 1999, the BMPs were revised to reflect changes in new laws and advances in technology.

The GFC Forestry Nonpoint Source Control Program is managed by a statewide coordinator and appointed foresters serving as district coordinators from each of the 12 GFC districts. The statewide and district coordinators conduct educational workshops, training programs and field demonstrations for the forest community (i.e., landowners, land management and procurement foresters, consulting foresters, timber buyers, loggers, site preparation contractors). From 1981 through June 2002, GFC foresters have conducted 1,580 BMP programs for 54,134 people in the forestry community. They have provided BMP advice in 67,678 plans covering over 4 million acres statewide. Over 75,000 BMP manuals have been distributed.

Working with the University of Georgia School of Forest Resources, the Georgia Forestry Association, member companies of the American Forest & Paper Association (AF&PA), and the Southeastern Wood Producers Association (SWPA), the GFC provides BMP education for the AF&PA's Sustainable Forestry Initiative (SFI) that provides education to the 1,500 loggers in the state. The initial course, started in December 1995, is a three-day workshop in which the participants are provided instruction on forest soils, wetlands, wildlife impacts, endangered species, BMPs, OSHA, and business management. Loggers are required to complete this course in order to deliver their products to participating mills and wood yards. In addition they are required to obtain 12 hours of continuing logger education every 2 years.

The GFC investigates and mediates complaints involving forestry operations. Since 1981, the GFC has investigated 1,304 complaints statewide. Non-compliance cases are turned over to the GAEPD for enforcement under the Georgia Water Quality Control Act. Fines and penalties can range up to \$50,000 per day. The State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of professional foresters involved in unresolved complaints where the lack of BMP implementation has resulted in state water quality or federal wetlands requirement violations.

In addition, the GFC conducts BMP implementation and compliance surveys to assess the implementation rates and effectiveness of BMPs. Statewide BMP surveys were conducted in 1991, 1992, 1998, and in 2002. Another survey is planned for 2004 and every two years after.

The GFC has established procedures for installing water control structures in the 25,000 miles of annual firebreaks to reduce soil erosion and sedimentation.

As a result of the federal Total Maximum Daily Load (TMDL) program, the GFC began a monthly BMP Assurance Examination Program in January 2003. The GFC will identify active forestry operations and conduct at least one examination per field once a month resulting in approximately 45 sites per month. The purpose is to get on the site early enough to provide BMP information to landowners and to provide advice to loggers or forest operators in order to prevent potential problems from occurring. The GFA, SWPA, and AF&PA member companies, who are now tracking wood compliance on private landowners, support this program.

Additional requirements are imposed within the National Forest areas of Georgia. Each National Forest produces and regularly updates a Land and Resource Management Plan to guide timber harvest and other activities. These plans establish long-range goals and objectives; specific management prescriptions and the vicinity in which they will occur; standards and guidelines on how management prescriptions will be applied; and monitoring procedures to assure the Plan is followed. There are no National Forests in the Altamaha Basin.

There are eight Georgia DNR Wildlife Management areas in the basin encompassing approximately 85,500 acres. These areas are managed for timber and wildlife and are under the supervision of a DNR or forest industry forester.

Urban Nonpoint Source Control Strategies

The 1990 report of the Community Stream Management Task Force, *We All Live Downstream*, established a road map for urban nonpoint source management in Georgia. The Task Force recognized two major impediments to effectively managing the quality of urban water bodies. The first is the division between 1) statutory responsibilities for management of water quality, granted to EPD, and 2) local government's Constitutional responsibility for management of the land activities which affect urban water bodies. The second impediment is the widespread nature of the nonpoint sources and the variety of activities which may contribute to impacts from urban runoff. They concluded that management of urban nonpoint source pollution would require "...a cooperative partnership between layers of government, the private sector, and the general public. The development of such a partnership will require a strong impetus to accept new institutional roles and make the structural changes necessary to support and sustain the stream management process."

EPD has a primary role in facilitating the management of urban runoff, and is responsible for administering and enforcing a variety of permit programs, including permitting of discharges. In addition to these regulatory activities, EPD seeks to assist in development of local solutions to water quality problems; provides technical information on the water resources of the state; and administers grant programs, with funds from various sources to support nonpoint source planning and assessment, implementation of BMPs, and regional or local watershed management initiatives. EPD also conducts a variety of outreach and educational activities addressing urban runoff in general, regulatory requirements, and cooperative or non-regulatory approaches.

For urban runoff, activities of the Nonpoint Source Management Program interact strongly with point source controls for combined sewers and storm sewers, both of which discharge urban runoff through point conveyances. While the state continues to have an important regulatory role, aspects of the cooperative intergovernmental partnerships envisioned by the Task Force have emerged and are being strengthened. EPD is implementing programs which go beyond traditional regulation, providing the regulated community with greater flexibility and responsibility for determining management practices. Current activities for urban surface runoff control include the following:

- Implement local nonpoint source (NPS) management programs, streambank and stream restoration activities.
- Develop and disseminate local watershed planning and management procedures.
- Implement state and local Erosion and Sedimentation Control Programs.
- Prepare and disseminate technical information on best management practices and nonpoint source monitoring and assessment.
- Implement NPS education programs for grades K through 12 through Project WET (Water Education for Teachers), as described in Section 7.2.6.
- Implement the Georgia Adopt-A-Stream Program, as described below in Section 7.2.6.
- Identify and evaluate resources to support urban watershed planning and management.

Erosion and Sediment Control

The Georgia Erosion and Sedimentation Act was signed into law in 1975 and has been amended several times since that date, most recently 2001. The legislative intent of

the Act was to establish a comprehensive and statewide soil, erosion and sedimentation control program to protect and conserve air, land and water resources through the adoption and implementation of local ordinances and programs which regulate certain land disturbing activities generally associated with urban development. EPD implements the program where there is no local ordinance. The Act requires an erosion and sedimentation control plan and a land disturbing activity permit for sites greater than 1.1 acres. Erosion and Sedimentation control plans must be reviewed and approved by the Soil and Water Conservation District or by the local issuing authority before the land disturbing activity permit can be issued. Buffers of 25 feet for warm water streams and 50 feet for trout streams are required by the Act for the protection of water quality. The Act provides for a variance from these buffers under certain circumstances. Variances can only be issued by EPD. Procedures and criteria for obtaining a stream buffer variance are outlined in DNR's Erosion and Sedimentation Control Rules and Regulations and become part of the Land Disturbing Activity Permit. The Act provides for monetary penalties of up to \$2,500 per day, enforced by EPD or by the local issuing authority.

7.2.4 Floodplain Management

Floodplain Management Strategies

Floodplain Management in the State of Georgia is administered under federal regulations and local ordinances. The federal statutes are found in Title 44 of the Code of Federal Regulations Parts 59-79. As a condition of participation in the National Flood Insurance Program (NFIP), local political jurisdictions voluntarily adopt Flood Damage Prevention Ordinances, which are based on federal regulations, to enforce and administer floodplain development. Georgia's Floodplain Management Office does not issue permits for floodplain development.

Georgia's Floodplain Management Office, located within the Department of Natural Resources, Environmental Protection Division, serves as liaison between the Federal Emergency Management Agency (FEMA) and local communities participating in the NFIP. However, Georgia's Floodplain Management Office has no regulatory authority. Participation by the local communities in the NFIP is a requirement for the federal government to make flood insurance available to all property owners. Through workshops, newsletters, technical assistance and community visits, the Floodplain Management Office assists local governments to maintain compliance with NFIP requirements. The Floodplain Management Office also provides technical data, floodplain maps, and training workshops to various public and private entities involved in floodplain management and floodplain determinations. In addition, the Floodplain Management Office reviews all state-funded and federal-funded projects for development in designated Special Flood Hazard Areas. A major thrust of the Floodplain Management Office is to increase the number of political jurisdictions participating in the NFIP, thereby increasing the number of flood insured structures in Georgia.

River Care 2000 Program

Georgia also has strategies to protect and manage riparian floodplain areas. Of particular relevance is River Care 2000, a conservation program which Governor Miller established in September 1995. One key objective of this program is acquisition of river-corridor lands for purposes of protection and to forestall unwise development in flood-prone areas. The Coordinating Committee has approved procedures for three types of projects: Riverway Demonstration Projects, which improve public access to a river with scenic and recreation uses, and protect natural and historic resources by acquiring and managing land in the river corridor; Significant Sites, which are tracts of land which DNR will acquire and operate as a traditional state public-use facility: wildlife management or public fishing area, park or historic site, natural area, or greenway; and Restoration Sites, which are tracts of land on which the state will identify, acquire, and manage to reduce nonpoint source water pollution.

The River Care 2000 program is also charged with assessing important river resources throughout the state and identifying more effective management tools for river corridors. The program recently released a statewide assessment of resources associated with rivers throughout the state (GA DNR, 1998).

7.2.5 Wetland Management Strategies

The loss of wetlands, because of the associated adverse impacts to flood control, water quality, aquatic wildlife habitat, rare and endangered species habitat, aesthetics, and recreational benefits, has become an issue of increasing concern to the general public as they become better informed of the values and functions of wetlands. There is a lack of accurate assessments for current and historic wetland acreage, but, regardless of the method used to measure total acreage or wetland losses, Georgia still retains the highest percentage of pre-colonial wetland acreage of any southeastern state.

Efforts to Track No Net Loss of Wetlands

While the 1993 Federal Administration Wetlands Plan calls for a concerted effort by EPA and other federal agencies to work cooperatively toward achieving a no overall net loss of wetlands in the short term and a net increase in the quantity of the nation's wetlands in the long run, there have been no statutory or executive level directives to carry out this policy. Achievement of the goal of no net loss is dependent upon limited changes to regulations, memoranda of understanding, cooperative agreements, and other partnerships between federal, state, and local governments, conservation organizations, and private citizens.

All dredge and fill activities in freshwater wetlands are regulated in Georgia by the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act. The majority of wetland alterations occur under nationwide or general permits, which include permits for bridge building, minor road crossing fills, and fills of less than 10 acres above the "headwaters" point of non-tidal streams where the annual average flow is less than 5 cubic feet per second. The COE and EPA carry out enforcement in freshwater wetlands. Normal, established, ongoing agricultural and silvicultural operations are exempted from permitting under Section 404 regulations. However, agriculture is regulated by the Swampbuster provisions under the Farm Bill and Section 404 and landowners cannot convert forested wetlands to agricultural uses (including ponds) without first securing a COE permit. Silvicultural operations cannot convert wetlands to non-wetlands via major ditching nor convert certain bottomland hardwood wetlands to pine stands via mechanical site preparation without first securing a COE permit.

The COE may require wetland mitigation activities in association with permitting, including creation, restoration, and protection of wetlands. COE may also require wetland restoration in case of violations.

Land Acquisition

The Department of Natural Resources (DNR), Wildlife Resources Division (WRD), began a land acquisition program in 1987 to acquire 60,000 acres of additional lands for Wildlife Management Areas (WMAs) and Public Fishing Areas (PFAs). This initiative was funded by \$30 million of 20-year obligation bonds to be paid off by hunting and fishing license increases and WMA permit fees.

Beginning in 1990 Governor Zell Miller initiated Preservation 2000, a \$60 million program to acquire 100,000 acres of lands to be used for wildlife and fisheries management, parks and recreation, natural area preservation, and general conservation. Additional wetlands acquisition occurs as part of the River Care 2000 initiative discussed above.

7.2.6 Stakeholder Involvement/Stewardship Strategies

Effective nonpoint source management must address the numerous activities of individuals, businesses, industries, and governments which can adversely affect urban and rural waters. In many cases, these groups are unaware of the potential impacts of their activities or corrective actions which may be taken. Stakeholder involvement and stewardship are essential to address these major challenges.

Georgia has chosen a two-pronged approach to encourage stewardship via education and citizen monitoring. EPD is the lead agency in these education and citizen monitoring programs, but, like other aspects of the state's nonpoint source management effort, cooperative efforts with local governments and community-based groups are critical to their implementation. Outreach and education, including citizen monitoring, lays the groundwork for behavior change and is often an important pre-requisite for effective implementation of BMPs and comprehensive watershed management programs.

General goals for stakeholder involvement and stewardship strategies are:

- Generate local support for nonpoint source management through public involvement and monitoring of streams and other water bodies and of results of management actions.
- Increase individuals' awareness of how they contribute to nonpoint source pollution problems and implement appropriate strategies to motivate behavior change and actions to address those problems.
- Provide the educational tools, assistance, and support for addressing NPS problems to target audiences across the state.

Georgia Adopt-A-Stream

The *Georgia Adopt-A-Stream Program* is a citizen monitoring and stream protection program with two staff positions in the Georgia EPD and five Regional Training Centers, a network of college-based training centers located statewide. This network of training centers allows the Georgia Adopt-A-Stream Program to be accessible to all areas of the state. The Regional Training Centers ensure that volunteers are trained consistently and that the monitoring data is professionally assessed for quality assurance and quality control.

Stakeholder involvement and stewardship are essential to implementing Georgia's River Basin Management Planning (RBMP) approach to water resource management. The Georgia Adopt-A-Stream Program objectives support the RBMP strategies for stakeholder involvement and stewardship in the following ways: (1) increase individual's awareness of how they contribute to nonpoint source pollution problems, (2) generate local support for nonpoint source management through public involvement and monitoring of waterbodies, and (3) provide educational resources and technical assistance for addressing nonpoint source pollution problems statewide.

Currently, more than 10,000 volunteers participate in 200 individual and 40 community-sponsored Adopt-A-Stream Programs. Volunteers conduct cleanups, stabilize streambanks, monitor waterbodies using biological and chemical methods, and evaluate habitats and watersheds at over 260 sites throughout the state. These activities lead to a greater awareness of water quality and nonpoint source pollution, active cooperation between the public and local governments in protecting water resources, and the collection of basic water quality data. The Georgia Adopt-A-Stream Program focuses on what individuals and communities can do to protect from nonpoint sources of pollution.

Volunteers are offered different levels of involvement. Each level involves an education and action component on a local waterbody. The introductory level consists of setting up a project (i.e., identifying a stream segment, lake, estuary or wetland,

identifying partners, registering with the Georgia Adopt-A-Stream Program), evaluating land use and stream conditions during a watershed walk, conducting quarterly visual operations and cleanups, and public outreach activities. Volunteers create a "Who to Call for Questions or Problems" list so that if something unusual is noted, immediate professional attention can be obtained. Advanced levels of involvement include biological monitoring, chemical monitoring, habitat improvement or riparian restoration projects.

In addition, the *Georgia Adopt-A-Stream Program* and *Keep Georgia Beautiful Program* coordinate *Rivers Alive*, Georgia's annual volunteer river clean up event held throughout the month of October that targets cleanups of streams, rivers, lakes and wetlands statewide. The mission of *Rivers Alive* is to create awareness of and involvement in the preservation of Georgia's water resources.

Rivers Alive 2002 included 120 local cleanup events and attracted more than 17,000 volunteers statewide. During October 2002, volunteers removed more than 300,000 pounds of trash and garbage from 780 miles of the state's waterways. Previous river clean up events in Georgia have been successful but pale in comparison to the success that has been achieved by *Rivers Alive 2002*. Organizers and volunteers receive free t-shirts, watershed posters and signs, press releases and public service announcements. Additional information about *Rivers Alive* is available on the website, <http://www.riversalive.org>.

The Georgia Adopt-A-Stream Program provides volunteers with additional resources such as the *Getting to Know Your Watershed and Visual Stream Survey*, *Biological and Chemical Stream Monitoring*, *Adopt-A-Wetland*, *Adopt-A-Lake*, and *Adopt-A-Stream Teacher's Guide* manuals, PowerPoint presentations, and promotional and instructional training videos. In addition, a bi-monthly newsletter is published and distributed to over 3,000 volunteers statewide with program updates, workshop schedules, and information about available resources. Additional information about the Georgia Adopt-A-Stream Program is available on the *Rivers Alive* website, <http://www.riversalive.org/aas.htm>.

In addition, the Georgia Adopt-A-Stream Program activities have been correlated to the Georgia Quality Core Curriculum (QCC) Science Standards for grades K-12 and certified teachers in Georgia participating in Georgia Adopt-A-Stream Program training workshops will receive Staff Development Unit (SDU) credits. Additional information about the QCC correlations and SDU credits and the Georgia Adopt-A-Stream QuickTime Training Videos are available on the National Science Center's website, <http://tech.nscdiscovery.org/ee/aas.htm>.

The Georgia Adopt-A-Stream Program has partnered with the Environmental Education Alliance of Georgia to conduct an annual conference and awards ceremony. The 2003 conference, *Environmental Education - Connecting Communities and Classrooms*, was held in Savannah, Georgia with over 250 participants. Additional information about the annual conference and awards ceremony are available on the website, <http://www.eealliance.org>.

Georgia Project WET (Water Education for Teachers) Program

A report outlining a plan for nonpoint source education in Georgia was completed in 1994. The Georgia Urban Waterbody Education Plan and Program delineated nonpoint source education strategies for seven target audiences: general public, environmental interest organizations, civic associations, educators, business associations, local government officials and state government officials. In October 1996, the Project WET (Water Education for Teachers) curriculum was selected as the most appropriate water science and nonpoint source education curriculum for the state. The Project WET curriculum is an interdisciplinary water science and education curriculum that can be easily integrated into the existing curriculum of a school, museum, university pre-service

class, or a community organization. The goals of the Georgia Project WET Program are to facilitate and to promote awareness, appreciation, knowledge and stewardship of water resources through the development and dissemination of classroom ready (K-12) teaching aids.

The success of the Georgia Project WET Program has been phenomenal. Since 1997, over 200 Project WET facilitators have been trained in Georgia with more than 4,500 formal and non-formal educators implementing the Project WET curriculum statewide with a substantial number of students – over 675,000 students annually!

The Georgia Project WET Program continues to be nationally recognized as a model program for its training strengths and techniques – specifically, the use of the arts in environmental education. The Georgia Project WET Program and the Georgia Center for the Book offer educators in Georgia the opportunity to participate in the *River of Words*, an international poetry and art contest for students (K-12). This contest provides students with the opportunity to explore their own watersheds and to learn their “ecological” addresses through poetry and art. National winners are selected by the former U.S. Poet Laureate, Robert Hass, and the International Children’s Art Museum. Annually, only eight students are selected as National Grand Prize Winners to be honored at the Library of Congress in Washington, DC. Additional information about *River of Words* is available on the website, <http://www.riverofwords.org>.

Over 30,000 entries were submitted to the *River of Words 2003* contest and one of the eight National Grand Prize Winners was from Georgia! Since 1997, 11 students from Georgia have been recognized as National Grand Prize Winners and an additional 81 students have been selected as National Finalists and Merit Winners.

The students’ original poetry and art are returned from the international competition and are on display in the *Georgia River of Words Exhibition* statewide. The Georgia Project WET Program offers a guidebook for educators with specific information about Georgia’s watersheds and several nature centers throughout Georgia offer *River of Words* field trips and workshops for students and educators.

The Georgia Project WET Program provides educators with additional resources such as the Enviroscope Nonpoint Source, Wetlands and Groundwater Flow Models – demonstration tools used to emphasize the impacts of nonpoint source pollution to surface and groundwaters, scripted theatrical performances and costumes, and promotional and instructional training videos. In addition, the newsletter, *Dragonfly Gazette*, and the *Georgia River of Words Art and Poetry Journal* are published and distributed to over 4,500 educators statewide and nationally.

The Georgia Project WET Program has partnered with the Environmental Education Alliance of Georgia to conduct an annual conference and awards ceremony. The 2003 conference, *Environmental Education – Connecting Communities and Classrooms*, was held in Savannah, Georgia with over 250 participants. Additional information about the Georgia Project WET Program and the annual conference and awards ceremony are available on the website, <http://www.eealliance.org>.

7.2.7 Groundwater Protection Strategies

In 1984, EPD developed its first management plan to guide the management and protection of Georgia’s groundwater quantity and quality. The current version, Georgia Geologic Survey Circular 11, published in 1996, is the basis of Georgia’s application to be certified by U.S. EPA for a Comprehensive State Ground Water Protection Plan (CSGWPP). The goal of Georgia’s groundwater management plan is:

... to protect human health and environmental health by preventing and mitigating significant groundwater pollution. To do this, Georgia will assess, protect, and, where practical, enhance the quality of groundwaters to levels

necessary for current and projected future uses for public health and significant ecological systems.

The goal recognizes that not all groundwater is of the same value. The division's goal is primarily preventive, rather than curative; but it recognizes that nearly all groundwater in the state is usable for drinking water purposes and should remain so. EPD pursues this goal through a policy of anti-degradation by which groundwater resources are prevented from deteriorating significantly, preserving them for present and future generations. Selection of this goal means that aquifers are protected to varying degrees according to their value and vulnerability, as well as their existing quality, current use, and potential for future use.

EPD has adequate legal authority to prevent groundwater from being significantly polluted and to cleanup groundwater in the unlikely event pollution were to occur. Extensive monitoring has shown that incidents of groundwater pollution or contamination are uncommon in Georgia; no part of the population is known to be at risk.

In general, the prevention of groundwater pollution includes: (1) the proper siting, construction, and operation of environmental facilities and activities through a permitting system; (2) implementation of environmental planning criteria by incorporation in land use planning by local government; (3) implementation of a Wellhead Protection Program for municipal drinking water wells; (4) detection and mitigation of existing problems; (5) development of other protective standards, as appropriate, where permits are not required; and (6) education of the public to the consequences of groundwater contamination and the need for groundwater protection.

Ground water pollution is prevented in Georgia through various regulatory programs (administered by the state's Department of Natural Resources) which regulate the proper siting, construction, and operation of the following:

- Public water supply wells, large irrigation wells and industrial wells withdrawing more than 100,000 gallons per day.
- Injection wells of all types.
- Oil and gas wells (including oil and gas production).
- Solid waste handling facilities.
- Hazardous waste treatment/storage/disposal facilities.
- Municipal and industrial land treatment facilities for waste and wastewater sludge.
- Municipal and industrial discharges to rivers and streams.
- Storage/concentration/burial of radioactive wastes.
- Underground storage tanks.

EPD prevents the contamination of groundwater used for municipal drinking water through an EPA-approved Wellhead Protection Program. As a result of this program, certain new potentially polluting facilities or operations are restricted from wellhead protection areas, or are subject to higher standards of operation and/or construction. EPD also encourages local governments to adhere to the *Criteria for the Protection of Groundwater Recharge Areas* (a section of the Rules for Environmental Planning Criteria), which define higher standards for facility siting, operation, and cleanup in significant groundwater recharge areas. The most stringent guidelines of these criteria pertain to those recharge areas with above average groundwater pollution susceptibility indexes.

Moreover, EPD has legal authority under the Georgia Water Quality Control Act to clean up groundwater pollution incidents. Additional cleanup authority occurs as special

trust funds established to clean up leaking underground storage tanks, abandoned hazardous waste sites, and scrap tire dumps.

Most laws providing for protection and management of groundwater are administered by EPD. Laws regulating pesticides are administered by the Department of Agriculture, environmental planning by the Department of Community Affairs; and on-site sewage disposal, by the Department of Human Resources. EPD has established formal Memoranda of Understanding (MOU) with these agencies. The Georgia Groundwater Protection Coordinating Committee was established in 1992 to coordinate groundwater management activities between the various departments of state government and the several branches of EPD.

7.3 Targeted Management Strategies

This section describes specific management strategies that are targeted to address concerns and priority issues for the Altamaha River basin which were described in Section 6. Strategies are presented for each issue of concern, with divisions by geographic area and/or HUC Unit as appropriate. For each of the identified concerns, the management strategy consists of five components: a problem statement (identical to that given in Section 6), general goals, ongoing efforts, identified gaps and needs, and strategies for action. The purpose of these statements is to provide a starting point for key participants in the subbasin to work together and implement strategies to address each priority concern. In some cases, a strategy may simply consist of increased monitoring; in other situations, the stakeholders in the subbasin will need to develop innovative solutions to these water quality issues. While EPD will continue to provide technical oversight, conduct monitoring surveys as needed, and evaluate data on a basinwide scale, locally-led efforts in the subbasins will be required to help to monitor, assess, restore, and maintain water quality throughout the Altamaha River basin.

7.3.1 Low Dissolved Oxygen

Problem Statement

Water use classification for fishing was not fully supported in 23 water body segments due to excursions of the water quality standards for dissolved oxygen. These excursions are primarily attributed to nonpoint sources and to natural conditions.

Altamaha River Subbasin (HUC 03070106)

The water use classification of fishing was not fully supported in eight tributary stream segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Natural conditions may contribute to or be the cause of low dissolved oxygen in many streams in the Altamaha River basin.

Ochoopee River Subbasin (HUC 03070107)

The water use classification of fishing was not fully supported in two Ochoopee River segments and thirteen tributary segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen concentrations coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. Natural conditions may contribute to or be the cause of low dissolved oxygen in many streams in the Altamaha River basin.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

General ongoing efforts as well as a summary of the dissolved oxygen TMDLs in the Altamaha River basin are discussed.

A. General Efforts

TMDLs have been completed for the stream segments on the Georgia 2002 303(d) list. TMDL implementation plans will be developed in 2003.

Local Soil and Water Conservation Districts and RC&D Councils are working with producers to utilize animal waste according to Nutrient Management Plans through their Lagoon Pumpout Program.

B. Dissolved Oxygen TMDLs

EPD established TMDLs for 23 stream segments (Table 7-1) that did not meet the dissolved oxygen (DO) criteria for their designated uses (see Box 7-1 for background information about TMDLs). These streams are all designated "Fishing" and are regulated by the following DO water quality standards:

A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for water supporting warm water species of fish. 391-3-6-0.03 (c) (1) (GAEPD, 2002).

If natural, background DO concentrations occur below this standard, a stream reach is required to be at or above 90 percent of the background DO concentrations, based on the EPA natural water quality standard (USEPA, 1986). Modeling was used to estimate the amount of daily loading that can occur without violating the Georgia DO standards.

Sources Considered in TMDLs

Nine point sources were identified in seven of the twenty-three segments. These sources included several ponds and wastewater treatment facilities, and four of these sources contributed significantly to low DO concentrations. Nonpoint sources included mixed land use, forests, and wetlands. Leaf litter decomposition and wetlands with naturally low DO concentrations were considered significant nonpoint sources. Runoff from mixed land uses, including agriculture, had a minor effect on DO in the Altamaha basin.

TMDL Methods and Results

GAEPD developed the TMDLs with the steady state Georgia DOSag model. EPD chose a low flow, high temperature steady state because all measured DO standard violations occurred during low flow, high temperature conditions. The models were calibrated with 1999 water quality data for the Altamaha Basin (supplemented with 2000 sediment oxygen demand measurements from other streams in southern Georgia). Since natural DO concentrations were consistently below the numeric standard, GAEPD designed the TMDLs to achieve at least 90 percent of natural DO concentrations during the 7Q10 flow. Several conservative modeling assumptions were used for an implicit margin of safety. Seasonality was not a factor since DO violations occurred only during summer months.

A TMDL was reported for each listed stream segment (Table 7-1). Load reductions were recommended for four point sources, and no load reductions were recommended for nonpoint sources. These load reductions will ensure compliance with water quality standards even during periods of very low flows.

TMDL Implementation

Point sources will be regulated through the NPDES permitting system. GAEPD will continue to work with local governments, agricultural, and forestry agencies (e.g. Natural Resources Conservation Service, the Regional Development Councils, the Georgia Soil

and Water Conservation Commission, and the Georgia Forestry Commission) to educate public and encourage the use of best management practices for improving DO concentrations. GAEPD will work with local RDCs to develop TMDL Implementation Plans in 2003.

Identified Gaps and Needs

Low dissolved oxygen concentrations in this part of the state are often due to natural environmental conditions. Work is needed to continue to identify and characterize natural background dissolved oxygen concentrations in this area.

General Strategies for Action

Low dissolved oxygen concentrations in the streams in the Altamaha River basin coincided primarily with low or zero flows, slow stream velocities, shallow water depths and high temperatures. EPD will address point and nonpoint sources as appropriate in TMDL implementation plans.

Specific Management Objectives

Maintain dissolved oxygen concentrations adequate to support aquatic life and meet water quality standards.

Action Plan

- EPD will assess use support in the listed waters and develop TMDL implementation plans to address point source issues.
- Local governments will implement stormwater management strategies, manage operations of water pollution control plants and participate in development of TMDL implementation plans.
- WRD will continue work to study habitat requirements for fish populations.
- NRCS will continue BMP implementation.
- Local S&WC Districts and RC&D Councils will continue Lagoon Pumpout Program.
- RDCs will help coordinate development of TMDL implementation plans.

Method for Tracking Performance

A re-evaluation of the status of the listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Altamaha River basin in 2003-2007.

7.3.2 Fecal Coliform Bacteria

Problem Statement

The water use classification of fishing was not fully supported in 18 stream segments due to exceedances of the water quality standards for fecal coliform bacteria. These water quality exceedances are found throughout the Altamaha River basin and are primarily attributed to urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources, and/or animal wastes. A common strategy is proposed for addressing fecal coliform bacteria throughout the basin. However, achieving standards in individual stream segments will depend on the development of site specific local management plans.

Altamaha River Subbasin (HUC 03070106)

The water use classification of fishing was not fully supported in one Altamaha segment and five tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of WPCP effluent, urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources

and/or animal wastes. The source of fecal coliform bacteria in one tributary segment was attributed to a municipal water pollution control plant.

Ohoopsee River Subbasin (HUC 03070107)

The water use classification of fishing was not fully supported in three Ohoopsee River segments and nine tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

General Goals

Meet water quality standards to support designated water uses. Increase public awareness of fecal coliform bacteria pollution through coordinated education and outreach efforts.

Ongoing Efforts

General ongoing efforts as well as a summary of the fecal coliform bacteria TMDLs in the Altamaha River basin are discussed.

A. General Efforts

EPD administers and enforces a variety of permit programs designed to facilitate the management of urban runoff, including both point and nonpoint source controls. EPD's Nonpoint Source Program regulates municipal and industrial stormwater discharges through the National Pollutant Discharge Elimination System (NPDES) permitting process. Sanitary sewer overflows are managed through EPD's Permitting Compliance and Enforcement Program. Animal wastes in Georgia are addressed through the Memorandum of Agreement (MOA) with NRCS and SWCC and through recently adopted rules designed to regulate Concentrated Animal Feeding Operations (CAFOs) for swine. This includes a requirement for certain operations to obtain individual NPDES permits. TMDLs have been completed for all stream segments on the Georgia 2002 303(d) list except for one segment of the Altamaha River. TMDL implementation plans will be developed in 2003.

Table 7-1. Dissolved Oxygen TMDLs in the Altamaha River Basin

Stream Name	Segment Description ¹	Hydrologic Unit	Length (miles)	Use Support ²	TMDL (lbs/day) ³
Alex Creek	Mason Cowpen Branch to Altamaha River	03070106	3	NS	34
Big Cedar Creek	Little Cedar Creek to Ohoopsee River	03070107	3	NS	29
Cobb Creek	Oconee Creek to Altamaha River	03070106	13	NS	160
Doctors Creek	U/S Jones Creek	03070106	5	NS	85
Jacks Creek	U.S. Hwy. 1 to Ohoopsee River	03070107	9	NS	63
Jones Creek	Still Creek to Doctors Creek	03070106	11	NS	131
Little Ohoopsee River (upper)	Gully Branch to Neeley Creek	03070107	14	NS	58
Little Ohoopsee River (middle)	Neeley Creek to Sardis Creek	03070107	15	NS	122
Little Ohoopsee River (lower)	Sardis Creek to Ohoopsee River	03070107	18	PS	177
Milligan Creek	Uvalda to Altamaha River	03070106	11	NS	172
Oconee Creek	Headwaters to Cobb Creek	03070106	11	NS	81
Ohoopsee River (upper)	Neels Creek to Little Ohoopsee River	03070107	18	PS	213
Ohoopsee River (lower)	Little Ohoopsee River to U.S. Highway 292	03070107	23	PS	496
Pendleton Creek (upper)	Sand Hill Lake to Reedy Creek	03070107	7	PS	71
Pendleton Creek (lower)	Wildwood Lake to Tiger Creek	03070107	12	PS	78
Penholoway River	Little Creek to Altamaha River	03070106	13	NS	141
Rocky Creek (lower)	Little Rocky Creek to Ohoopsee River	03070107	11	NS	87
Rocky Creek (upper)	Ga. Hwy. 130 to Little Rocky Creek	03070107	10	NS	36
Swift Creek	Old Normantown Rd. to Pendleton Creek	03070107	5	NS	413
Ten Mile Creek	Little Ten Mile Creek to Altamaha River	03070106	13	NS	93
Thomas Creek	D/S CR203 to Ohoopsee River	03070107	12	PS	37
Tiger Creek	Little Creek to Pendleton Creek	03070107	16	NS	54
Yam Grandy Creek	D/S Crooked Creek	03070107	3	NS	27

1. See Appendix D for designated uses.

2. NS = Not supporting designated use; PS = Partially supporting designated use

3. Refers to lbs/day of oxygen demanding material

In addition to regulatory activities, EPD assists in the development of local solutions to water quality problems by administering grant programs and providing technical assistance to various regional and local watershed management initiatives. EPD also conducts a variety of outreach and public education programs addressing urban runoff in general, point and nonpoint source pollution, BMP implementation, regulatory requirements, and cooperative or non-regulatory approaches.

The Georgia Department of Human Resources (DHR) Division of Public Health - Environmental Services has promulgated new rules (O.C.G.A Chapter 290.5.26) developed to regulate the design, operation, and maintenance of on-site sewage management systems. DHR subsequently formed the Onsite Sewage Management Systems Technical Review Committee in 1999. The Committee's function is to make recommendations to the department regarding the approval of new systems, assist the Department with the development and revision of standards and guidelines for new technology, assist with the adoption of periodic updates to the Manual for On-Site Sewage Management Systems, and serve as the final authority in contested interpretation issues regarding the Rules and the Manual for On-site Sewage Management Systems.

Agriculture is making progress in controlling bacterial loads. Considerable effort has been directed toward animal confinement areas. Georgia universities and agricultural agencies or groups are conducting several agricultural efforts with statewide implementations. Sustainable Agriculture and Farm-A-Syst Training will be scheduled within the basin. The University of Georgia and ARS have proposals for assessing nutrient and fecal coliform bacteria reducing BMPs on 10 farms that will have statewide implications. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs), which are comprised of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their areas. The LWGs develop proposals for the USDA or other funding sources to address identified resource concerns.

The University of Georgia College of Agriculture and Environmental Sciences' Animal Waste Awareness in Research & Extension (AWARE) program conducts research on animal waste management and provides public education through Southeast Sustainable Animal Waste Workshops and a variety of Internet publications.

Local Soil and Water Conservation Districts (SWCDs) and Resource Conservation and Development (RC&D) Councils are working with producers to utilize animal waste according to Nutrient Management Plans through their Lagoon Pumpout Program.

B. Fecal Coliform Bacteria TMDLs

TMDLs were established for stream segments (Table 7-2) on the 303(d) list impacted by fecal coliform bacteria (see Box 7-1 for background information about TMDLs).

Sources Considered in TMDLs

Nonpoint sources had the greatest impact on fecal coliform bacteria loading in the Altamaha River basin, while most point sources did not significantly impact fecal coliform bacteria loading. Point sources were identified in three listed segments: Big Cedar Creek, Ohoopsee River, and Swift Creek; nonpoint sources occurred in all 16 segments. Leaking sewer collection systems were considered a major urban nonpoint source. Most rural nonpoint sources involved wash off of fecal coliform bacteria from land surfaces during storm events, including the following:

- Wildlife feces deposition.
- Livestock feces deposition during grazing.
- Manure application to land surfaces.

- Livestock feces deposition directly in streams.
- Septic tank failure.

TMDL Modeling Methods and Results

The TMDLs were developed with the Hydrologic Simulation Program FORTAN (HSPF) watershed model. This model simulated the seasonal and geographic variation of FC loading and stream concentrations over 10 years. A 30-day critical period was determined during which the highest simulated violation of the standard occurred (geometric mean of at least four samples in a 30-day period no greater than 200 counts/100 mL from May through October). Calculating the TMDLs with a critical period ensured that each stream would meet this standard during any month over the simulated 10-year period.

Simulated loading over the 30-day critical period was adjusted so that the geometric mean of the concentrations (the n^{th} root of the product of n concentrations) at each segment's outlet was less than or equal to 180 counts/100mL (i.e., a 10 percent margin of safety). The TMDLs were calculated as the sum of point and nonpoint source loads over the 30-day critical period. A TMDL was reported for each listed stream segment (Table 7-2).

TMDL Implementation

EPD will work with the Regional Development Centers (RDCs) on the development of TMDL Implementation Plans in 2003.

Table 7-2. Fecal Coliform Bacteria TMDLs in the Altamaha River Basin

Stream Name	Segment Description ¹	Hydrologic Unit	Length (miles)	Use Support ²	TMDL (#/30 days)
Big Cedar Creek	Little Cedar Creek to Ohoopsee River	03070107	3	NS	2.36E+11
Doctors Creek	Upstream of Jones Creek	03070106	5	NS	2.08E+11
Goose Creek	U/S Rd. S1922 to Little Goose Creek	03070106	8	PS	1.61E+11
Jacks Creek	U.S. Highway 1 to Ohoopsee River	03070107	9	NS	3.61E+11
Little Ohoopsee River	Sardis Creek to Ohoopsee River	03070107	18	PS	1.16E+13
Milligan Creek	Uvalda to Altamaha River	03070106	11	NS	1.63E+11
Oconee Creek	Headwaters to Cobb Creek	03070106	11	NS	1.01E+11
Ohoopsee River	Dyers Creek to Big Cedar Creek	03070107	15	NS	3.56E+11
Ohoopsee River	Little Ohoopsee River to US Highway 292	03070107	23	PS	4.11E+14
Ohoopsee River	Neels Creek to Little Ohoopsee River	03070107	18	PS	5.92E+10
Pendleton Creek	Sand Hill Lake to Reedy Creek	03070107	7	PS	1.97E+12
Pendleton Creek	Wildwood Lake to Tiger Creek	03070107	12	PS	2.05E+12
Rocky Creek	Ga. Hwy. 130 to Little Rocky Creek	03070107	10	NS	1.17E+12
Swift Creek	Old Normantown Rd. to Pendleton Creek	03070107	5	NS	7.12E+11
Tiger Creek	Little Creek to Pendleton Creek	03070107	16	NS	7.63E+10
Yam Grandy Creek	D/S of Crooked Creek	03070107	3	NS	1.66E+12

1. See Appendix D for designated uses.

2. NS = Not supporting designated use; PS = Partially supporting designated use

Identified Gaps and Needs

Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal bacterial loads may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform bacteria sources. Sanitary sewer leaks and overflows may be a source of fecal coliform bacteria as well.

Many fecal coliform bacteria reducing practices are relatively expensive and the percentage of reduction is often unknown. Many landowners are reluctant to spend today's dollars for long term amortization in uncertain future markets. Agricultural BMPs, cost share dollars (Farm Bill), and grants (Section 319) should be concentrated in priority watersheds with sufficient technical workforce to implement BMPs through long term agreements or contracts to reduce fecal coliform loading. Additional efforts should be directed toward increasing public awareness of fecal coliform bacteria pollution, with an emphasis on potential sources and BMPs. State and basinwide coordination between agencies and organizations providing public education and technical assistance may help to extend outreach efforts.

Strategies for Action

Separate strategies are needed to address nonpoint fecal coliform bacteria loadings for urban and rural sources.

A. General Strategies for Urban Sources

Addressing urban runoff will be a complex task, and will require implementation of watershed pollution control programs by local governments. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five-year phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy reevaluation scheduled for 2007 in accordance with the statewide RBMP management cycle. In addition, TMDLs have been developed for all stream segments on the 303(d) list except for one segment of the Altamaha River. EPD will be coordinating the development of TMDL implementation plans with RDCs in 2003.

Specific Management Objectives

Stakeholders should work together to encourage and facilitate local watershed planning and management to ensure that designated water uses are supported.

Agricultural agencies will provide technical and educational assistance to producers for the purpose of facilitating agricultural BMP implementation.

Management Option Evaluation

Integrated management options will be proposed, implemented, and evaluated by local governments.

Action Plan

TMDLs have been completed for 16 stream segments on the Georgia 2002 303(d) list. TMDL implementation plans will be completed in 2003.

EPD assesses use support in listed stream segments and encourages local efforts to address nonpoint source pollution. EPD will continue to ensure that all permitted sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, focusing on both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention toward current and future nonpoint source issues in their watersheds and to have them consider ways to prevent or

control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.

EPD will continue to administer the NPDES and Permitting and Compliance and Enforcement (PCEP) Programs and encourage local planning to address management on a basinwide scale. Local governments will continue to operate and maintain their sewer systems and wastewater treatment plants, monitor land application systems, develop and implement regulations, zoning and land use planning, and implement local watershed initiatives and monitoring programs. EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdiction.

DHR will continue to regulate on-site sewage management systems and will work to educate local governments and citizen groups about the need for proper design, construction, and maintenance of septic systems to protect water quality. DHR will also utilize the criteria presented in the Growth Planning Act for septic system setbacks from high value waters. Local municipalities should work with the local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.

EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams. Citizen groups will implement Adopt-A-Stream programs, and work with local governments in implementing watershed initiatives.

Method for Tracking Performance

EPD tracks point source discharges through inspections and evaluations of self-monitoring data. An evaluation of the status of listed water bodies will be made coincident with the next iteration of the RBMP cycle for the Altamaha River basin in 2007.

B. General Strategies for Rural Sources

Agricultural cost share dollars (Farm Bill), grants (Section 319), and loans (Clean Water Act State Revolving Fund) need to be concentrated in priority watersheds with sufficient technical workforce to implement BMPs through long-term agreements or contracts.

Specific Management Objectives

Stakeholders should work together to encourage and facilitate local watershed planning and management to ensure that designated water uses are supported.

Agricultural agencies will provide technical and educational assistance to producers for the purpose of facilitating agricultural BMP implementation.

Management Option Evaluation

Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods will be used.

Action Plan

EPD will assess use support in listed streams, encourage local planning efforts, and regulate point sources under the NPDES program. EPD will continue to ensure that all permitted sources remain in compliance with fecal coliform bacteria limits. EPD will also continue assessment of Land Application Systems. TMDLs have been completed for 16 stream segments on the Georgia 2002 303(d) list. EPD will be coordinating the development of TMDL implementation plans with RDCs in 2003. GSWCC and local SWCDs and RC&D councils, with assistance from NRCS, will continue to support adoption of BMPs for animal waste handling and will follow up on complaints related to

fecal coliform bacteria associated with agriculture. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill will be targeted to areas of apparent water quality impact, including rural streams which may contain excessive fecal coliform loads from animal and cropland operations.

Local SWCDs will convene Local Work Groups to identify resource concerns and develop proposals for funding to address these concerns.

The DHR will continue to regulate on-site sewage management systems and will work to educate local governments and citizen groups about the need for proper design, construction, and maintenance of septic systems to protect water quality. The DHR will also utilize the criteria presented in the Growth Planning Act for septic system setbacks from high value waters. Local municipalities should work with the local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.

The University of Georgia will provide on-farm assistance to local producers through their Farm-A-Syst Program.

EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams. Citizen groups will implement Adopt-A-Stream programs and work with local governments in implementing watershed initiatives.

Method for Tracking Performance

Agricultural agencies will track rates of BMP implementation for cropland and animal operations. An evaluation of the status of listed water bodies will be made coincident with the next iteration of the RBMP cycle for the Altamaha River basin in 2007.

7.3.3 Fish Consumption Guidelines

Problem Statement

The water use classifications were not fully supported in several water body segments and one lake due to fish consumption guidelines for mercury. There are no known point source discharges or other identifiable anthropogenic sources of mercury in these watersheds. Mercury may be present in fish due to mercury content in the natural soils, from municipal or industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport and deposition.

Ochoopee River Subbasin (HUC 03070107)

The water use classification of fishing was not fully supported in four Ochoopee River segments and one lake based on fish consumption issues related to mercury residues in fish tissue. The assessment was based on the Trophic-Weighted Residue Value being in excess of 0.3 mg of mercury per kilogram of fish tissue. See Box 5-2 in Section 5 for details regarding assessment of mercury in fish tissue.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

General ongoing efforts as well as a summary of the mercury TMDLs in the Altamaha River basin are discussed.

A. General Efforts

DNR has monitored fish and issued fish consumption guidelines. There are no known point source discharges or other identifiable anthropogenic sources of mercury in the Altamaha River basin watersheds. Ongoing efforts will focus on continued monitoring of residue levels and issuance of updated consumption guidelines. Phase 1 TMDLs for

mercury have been completed for the Ochoopee River and Sand Hill Lake. A TMDL implementation plan will be developed in 2003.

The Altamaha River is a coastal plain blackwater swamp system. This system is characterized by a high content of organic carbon (organic ligand humic substances), low alkalinity and pH, and naturally lower dissolved oxygen content. Blackwater systems have been found to have physico-chemical characteristics that provide both a sink for the accumulation of mercury from atmospheric deposition or other sources, and an environment conducive to the methylation of mercury. As a result, baseline mercury residues found in fish tissues are higher than that found in other waterbodies having a different chemistry.

B. Mercury TMDLs

EPA established mercury TMDLs for Sand Hill Lake and four segments of the Ochoopee River in February 2002 (Table 7-3; see Box 7-1 for background information about TMDLs). Georgia requires that fish tissue concentrations remain at or below 0.3 mg of mercury per kg of tissue (GAEPD, 2002). USEPA converted this tissue standard to an ambient water quality standard specific to the Ochoopee River using measured mercury concentrations, fish consumption rates, and related factors.

Table 7-3. Mercury TMDLs in the Altamaha River Basin

Stream Name	Segment Description	Hydrologic Unit	Extent	Use Support	TMDL
Ochoopee River	GA Hwy 147 to confluence with Altamaha River	3070107	13 mi	PS	3.77 kg/yr
Ochoopee River	Hwy 292 to Hwy 147	3070107	12 mi	PS	3.77 kg/yr
Ochoopee River	Little Ochoopee River to US Highway 292	3070107	23 mi	PS	3.77 kg/yr
Ochoopee River	Neels Creek to Little Ochoopee	3070107	18 mi	PS	3.77 kg/yr
Sand Hill Lake	Treutlen County	3070107	650 ac	PS	3.77 kg/yr

Sources Considered in TMDLs

USEPA estimated that air deposition causes 99 percent of mercury contamination in the Ochoopee River and Sand Hill Lake. Air deposition is caused by widespread air point sources both within and outside the United States. Examples of air point sources include incinerators and electrical power plants. USEPA identified seven potential water point sources of mercury in the Ochoopee River and Sand Hill Lake, and estimated that these sources contribute less than 1 percent of mercury contamination.

TMDL Modeling Methods and Results

When simulating mercury loading, USEPA accounted for nonpoint loading from runoff, erosion, and air deposition as well as the instream processes of mercury cycling and bioaccumulation. Nonpoint source runoff was modeled with the Watershed Characterization System (WCS), and instream processes were modeled with SWAT5. Wet and dry deposition rates were acquired from the Mercury Report to Congress (USEPA, 1997) and the Mercury Deposition Network sample collection site in the Okefenokee Swamp. These air deposition rates were entered into the WCS as yearly averages. The WCS calculated the total mercury load entering the Ochoopee mainstem from the subbasins, and the subbasin load was entered into SWAT5 to simulate mercury concentrations throughout the mainstem. Simulated total mercury concentrations ranged from 3.4 to 4.5 ng/L.

USEPA included critical conditions and implicit margins of safety in the TMDL calculation. Average annual flow and average annual loading were used as the critical conditions because mercury in fish tissue accumulates over time and does not depend on season. To ensure protection from mercury toxicity, USEPA based the load reduction on the highest simulated water column concentration (4.5 ng/L). USEPA was also conservative in estimating the future reduction in air deposition; for example, voluntary control measures and new regulations were not considered.

The relationship between loading and water column concentration was linear, so a proportion was developed relating the highest simulated concentration (4.5 ng/L), the current annual average load (4.99 kg/yr), and the water quality target (3.5 ng/L). In this way, USEPA calculated an allowable mercury load of 3.77 kg/yr.

TMDL Implementation

In this TMDL, USEPA is using a phased-approach, which outlines steps that need to be taken to better characterize the pollutant allocation. USEPA is using the phased-approach because very little data exists on sources of mercury contamination. During Phase 1, mercury loading will be monitored to provide additional data for analysis.

USEPA will use the information collected in Phase 1 to better understand air deposition and point source loading. In Phase 2, USEPA may reevaluate the load allocations based on this information.

Identified Gaps and Needs

The source of mercury in the basin is not well quantified. Mercury within these watersheds is likely derived from natural sources or from atmospheric deposition.

General Strategies for Action

Because mercury is not originating from any known point or other identifiable anthropogenic sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. EPD will evaluate the need for additional sampling of different media (fish tissue, water and/or sediment), if localized anthropogenic sources are indicated.
- EPA will implement reductions in air mercury sources over time that will achieve load reductions required in the TMDL.

Method of Tracking Performance

Trends in fish tissue concentration of mercury.

7.3.4 Erosion and Sedimentation

Problem Statement

Water use classifications are potentially threatened in many water body segments by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, stream erosion (including head cutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. A common strategy is proposed for addressing erosion and sedimentation throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Altamaha River Subbasin (HUC 03070106)

There are two stream segments listed in this subbasin as not fully supporting the designated water use of fishing due to poor fish communities likely due to sedimentation.

Ochoopee River Subbasin (HUC 03070107)

There is one stream segment listed in this subbasin as not fully supporting the designated water use of fishing due to poor fish communities likely due to sedimentation.

General Goals

Control erosion and sedimentation from land disturbing activities in order to meet narrative turbidity water quality standards and support designated uses. Increase public awareness of erosion and sedimentation through coordinated education and outreach efforts.

Ongoing Efforts

Forestry and Agriculture both have voluntary E&SC programs built around implementation of BMPs and water complaint resolution procedures in place. GSWCC recently updated and is distributing the *Manual for Erosion and Sediment Control* in Georgia and the *Field Manual for Erosion and Sediment Control* in Georgia. The GSWCC, with its agricultural partners, has produced and distributed three E&SC pamphlets: "Guidelines for Streambank Restoration," "A Guide to Controlling Erosion with Vegetation," and "Agricultural Management Practices." These, along with a number of E&SC related pamphlets and other informational materials are available in agricultural offices throughout the state. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs) which are comprised of resource professionals from a variety of disciplines and interested stakeholders at the local level to identify resource concerns in their areas. These LWGs develop proposals for USDA or other funding to address identified resource concerns.

Forestry has made significant E&SC progress. GFC has been and is specifically targeting those landowner groups and regions with low compliance that were identified in their statewide surveys for increased BMP education throughout local talks, workshops, etc. The Georgia Forestry Association, UGA, the American Forest and Paper Association (AF&PA), and Southeastern Wood Producers Association sponsor Master Timber Harvesters Workshops with the goal of training every logger in the state on BMPs. In addition, the Georgia State Board of Registration for Foresters requires every licensed forester to implement BMPs as a minimum standard of practice. The Forestry BMPs, printed in January 1999, will result in additional sedimentation reductions with more riparian tree cover left over perennial and intermittent streams.

EPD currently serves as the "Issuing Authority" providing permitting, inspection, and compliance enforcement services in those localities across the state where local Erosion and Sedimentation Control Ordinances or Programs are not yet established. A general NPDES permit that would regulate stormwater discharges from construction activities

was issued by GAEPD and subsequently appealed in 1992, 1994, 1995, 1996 and 1999. Settlement negotiations involving the regulated community who filed the three petitions, several environmental organizations, GAEPD, and a professional facilitator began in October, 1999. After months of negotiation, GAEPD issued a revised general NPDES permit GAR 100000 for construction activities on June 12, 2000. The permit became effective on August 1, 2000. This permit currently regulates construction activity which results in land disturbances of five acres or greater. The construction permit requires permittees to implement best management practices, conduct inspections and sample stormwater leaving their site after certain rainfall events. There is a three-tiered permitting structure to differentiate between permittees' responsibilities, which allows for easier enforcement. Georgia EPD has received approximately 20,000 "Notice of Intent" applications since the permit issuance in 2000.

In an effort to determine compliance with the construction general permit, Georgia EPD and the USEPA partnered to form the Stormwater Taskforce which conducted over 200 inspections between May and September 2001. The Taskforce adopted a "zero tolerance" enforcement position with regard to violations of the permit. Substantial fines were levied on permittees found to be in violation.

Looking ahead to the construction permit re-issuance in July 2003, a group of stakeholders, the Stormwater General Permit Advisory Committee (GPAC), has been holding regular meetings to discuss permit issues. GPAC is comprised of those parties who were involved in the settlement negotiations of 1999, with the addition of Georgia DOT. GPAC is a forum for these groups and the general public to discuss issues related to the construction permit. GPAC is currently tasked with recommending appropriate changes to the current permit and examining how Phase II NPDES permitting, which will require permit coverage for sites disturbing between one acre and five acres, can be incorporated into the permit. Input has also been received from the Erosion and Sediment Control Overview Council.

An Erosion and Sedimentation Control (E&SC) Advisory Committee developed an Erosion and Sediment Control Complaint Resolution Procedure by which concerned citizens or other parties may register E&SC complaints. The procedure is a three-step process with Local Issuing Authorities serving as the primary contact, followed by the local Soil and Water Conservation District, and finally EPD in some cases. The purpose of the procedure is to provide timely and workable solutions to E&SC control complaints through local Soil and Water Conservation Districts.

There are several erosion educational initiatives underway which have an urban focus. Each year GSWCC and EPD conduct five formal E&SC courses to provide training to the regulated community, regulators, consultants, and interested citizens. GSWCC also provides detailed E&SC training for 8 to 11 units of government each year. A task force established by the Sediment Control Technical Study Committee, known as DIRT II, has completed its assessment of the economic and environmental impacts of erosion prevention and sediment control BMPs for urban construction sites. Another urban initiative is the U.S. Forest Service's Planting Along Stream Sides (PASS) which deals with vegetative plantings to reduce erosion from streambanks.

In 1997, EPD, in cooperation with the University of Georgia, prepared and distributed the Land Development Provisions to Protect Georgia Water Quality report. The report describes provisions which may be modified or added to local development programs to better protect water quality. Portions of the report address water quality impacts from stormwater runoff and its relationship to urban development.

Local Soil and Water Conservation Districts and Resource Conservation and Development (RC&D) Councils are working with crop producers to reduce erosion and sedimentation through their No-Till Drill Program in the Altamaha River basin.

Forestry BMP Education and Implementation

From 1995 through 2003, the GFC provided BMP training at the 3-day Master Timber Harvester Workshops. During this period, the workshops were attended by the following number of personnel affiliated with timber buyers and loggers in the two subbasins:

- Altamaha River Subbasin (Hydrologic Unit 03070106) – 182 personnel
- Ochoopee River Subbasin (Hydrologic Unit 03070107) – 134 personnel

Altamaha River Subbasin (HUC 03070106)

The GFC conducted BMP Implementation and Compliance Surveys in 1991, 1992, 1998, and in 2002. No data was extracted specifically for the Altamaha River basin during the 1991 survey. However the data for the Altamaha River Subbasin should be similar to the statewide data for the Lower Coastal Plain region. There, the GFC evaluated approximately 23,987 acres on 202 sites. The sites were distributed such that 132 occurred on the non-industrial private forest (NIPF) owner, 68 occurred on forest industry land, and 2 were on public lands. The results indicate that the overall percentage of acres in compliance with BMPs was 93.3 percent. The percentage of streambanks or channels in compliance with BMPs was 95.1 percent. By ownership, 89.8 percent of the acres evaluated on NIPF lands were in compliance with BMPs. On forest industry lands, 95.8 percent of the acres were in compliance. On public lands, 98.4 percent of the acres were in compliance.

The 1992 Georgia Forestry Commission (GFC) compliance survey examined approximately 882 acres on 12 sites in the Altamaha River subbasin. Six sites were evaluated on NIPF lands and 6 were on forest industry lands. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 98.3 percent of the harvested acres were in compliance with BMPs. By ownership, compliance was 99.2 percent on NIPF owners and 97.9 percent on forest industry land.
- Overall, 97.1 percent of main haul road miles were in compliance with BMPs. By ownership, compliance was 94.4 percent on NIPF owners and 97.6 percent on forest industry lands.
- Three mechanical site-preparation tracts totaling 312 acres were evaluated. Overall, 98.7 percent of the acres were in compliance with BMPs. By ownership, compliance was 100 percent on NIPF owners and 98 percent on forest industry.
- No sites were evaluated for regeneration or burning.
- Overall 97.9 percent of the acres were in compliance with BMPs. By ownership, compliance was 98.8 percent on NIPF and 97.7 percent on forest industry lands.
- There were 4.0 miles of stream evaluated with 97.5 percent being in compliance with BMPs.

During the 1998 survey, the GFC examined approximately 2,188 acres on 12 sites in the Altamaha Subbasin. Six sites were on NIPF landowners and six sites were on forest industry lands. According to the Southern Group of State Foresters recommended protocol, adopted in 1997, two scores will now be reported. Compliance is the measure of units (acres, miles of road, number of stream crossings, etc.) in compliance with BMPs. Implementation rate is the percentage of applicable BMPs that are implemented in their entirety over the tract. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 96.5 percent of the streamside management zone (SMZ) acres evaluated on 10 sites were in compliance with BMPs with only one water quality risk

identified. The percentage of applicable BMPs implemented was 91.4 percent. The main problem was logging debris left in stream channels on 20 percent of the sites. Aerial application of herbicides occurred on one site. Burning and firebreaks occurred within the SMZ on one site. By ownership, overall compliance was 88.4 percent and implementation was 85.7 percent on NIPF lands resulting in one water quality risk that was associated with firebreaks. On forest industry lands, compliance and implementation were both 100 percent.

- Overall, 28 stream crossings were evaluated, 6 sites with 23 crossings occurring on 3 NIPF sites and 5 crossings on 3 forest industry sites. Overall only 17.9 percent were in full compliance with BMPs. The percentage of applicable BMP implementation was 72.7 percent resulting in seven water quality risks identified. By ownership, overall compliance was 4.4 percent and implementation was 52.2 percent on NIPF lands resulting in the seven water quality risks. Problems were found regarding random crossings, stabilization of exposed fill over culverts, the use of skidder fords and debris and dirt type crossings and their removal. On forest industry lands, compliance was 80 percent with implementation at 95.2 percent and no water quality risks.
- Overall, 95.8 percent of the forest road miles evaluated on nine sites were in compliance with BMPs. The percentage of applicable BMPs implemented was 87.5 percent with no water quality risks identified. The main problem was inadequate or lack of installation of water diversion measures in roads on 25 percent of the sites. By ownership, on NIPF lands, overall compliance was 91.5 percent with 77.8 percent of the BMPs implemented with no water quality risks identified. On forest industry lands, compliance was 97.9 percent with 95.4 percent of the applicable BMPs being implemented and no water quality risks.
- Overall, 99.8 percent of the harvested acres on eight sites were in compliance with BMPs. The percentage of BMP Implementation was 97.1 percent with no water quality risks. By ownership, on four sites that were located on NIPF lands and overall compliance was 100 percent with 100 percent of the applicable BMPs implemented. On four forest industry sites, compliance was 99.8 percent with 94.1 percent of the applicable BMPs implemented. Trash and garbage were not removed from one site.
- Overall, 100 percent of the mechanical site preparation acres on five sites were in compliance with BMPs. The percentage of BMP implementation was 100 percent with no water quality risks identified. Three sites were on NIPF lands and two were on forest industry lands.
- Overall, 100 percent of the chemical site preparation acres on three sites were in compliance with BMPs. The percentage of BMP implementation was 100 percent and no water quality risks were identified. One site was on NIPF lands and two were on forest industry lands.
- Controlled burning was evaluated on two NIPF sites. Overall 100 percent of the acres were in compliance with BMPs. The percentage of BMP implementation was 66.7 percent but no water quality risks were found. The only problem was inadequate water diversion measures installed in firebreaks.
- Overall, 99.8 percent of the artificial regeneration acres on five sites were in compliance with BMPs. The percentage of BMP implementation was 90.9 percent with no water quality risks identified. No bottomland hardwood wetlands identified in the 1995 EPA/COE memo were planted to pine on these sites. By ownership, three sites were located on NIPF lands and two were on forest industry lands. Compliance on NIPF lands was 99.4 percent, with BMP implementation at

83.3 percent. Trash was not removed from one site. On forest industry land, compliance and implementation were both 100 percent.

- There were no perennial and eight intermittent streams evaluated accounting for approximately 3.75 miles of stream of which 94.4 percent of those miles were in compliance with BMPs. By ownership, compliance was 86.9 percent on NIPF lands and 100 percent on forest industry lands.
- Overall, 99.9 percent of the acres evaluated in the Altamaha River subbasin during the 1998 survey were in compliance with BMPs. The percentage of applicable BMPs implemented was 88.7 percent resulting in eight water quality risks. By ownership, compliance on NIPF lands was 99.7 percent with 81.2 percent of the applicable BMPs implemented resulting in all eight water quality risks. On forest industry lands, BMP compliance was 99.9 percent with 97.1 percent of the applicable BMPs implemented resulting in no water quality risks identified.

During the 2002 survey, the GFC evaluated approximately 2,036 acres on 12 sites in the Altamaha Subbasin. Seven sites were on NIPF landowners and five sites were on forest industry lands. This is the first survey to evaluate the revised BMPs adopted in 1999. As with the 1998 survey, two scores will now be reported according to the Southern Group of State Foresters' recommended protocol. Compliance is the measure of units (acres, miles of road, number of stream crossings, etc.) in compliance with BMPs. Implementation rate is the percentage of applicable BMPs that are implemented in their entirety over the tract. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 97.0 percent of the streamside management zone (SMZ) acres on seven sites were in compliance with BMPs. The percentage of applicable BMPs implemented was 88.9 percent resulting in no water quality risks identified. By ownership, overall compliance was 95.3 percent and implementation was 84.2 percent on NIPF lands resulting in no water quality risks. The main problem was that inadequate widths were maintained on one site resulting in insufficient tree canopy left along the stream, logging debris was left in stream channel, mechanical site preparation and mechanical tree planting within the SMZ. On forest industry lands, compliance and implementation were both 100 percent.
- Overall, eight stream crossings were evaluated on four sites. Three of these crossings occurred on the NIPF owner and the remaining five occurred on forest industry lands. On NIPF lands, all three of the crossings were new and associated with the forest operation. None were in full compliance. Overall, on NIPF lands, the percentage of applicable BMP implementation was 33.3 percent resulting in no water quality risks identified. Problems were found regarding the use of debris and dirt type crossings and their removal. On forest industry lands, there were five pre-existing culverted crossings with only three or 60 percent in compliance. The percentage of BMP implementation was 90.6 percent. Problems involved undersized permanent culverts and stabilization of exposed soil over the fill resulting in one water quality risk identified.
- Overall, 93.6 percent of the 8.54 forest road miles evaluated on six sites were in compliance with BMPs. There were 7.5 miles of pre-existing road of which 97.3 percent were in compliance with BMPs. Of the 1.01 miles of newly constructed roads, 66.4 percent were in compliance with BMPs. The overall percentage of applicable BMPs implemented was 93.6 percent resulting in no water quality risks identified. The main problem was inadequate or lack of installation of surface drainage measures in roads as this was done on only 60 percent of the sites. By ownership, on NIPF lands, overall compliance was 87.5 percent with 57.1 percent of the BMPs implemented. On forest industry lands, overall compliance was 98.0 percent with 90.5 percent of the applicable BMPs being implemented.

- Overall, 100 percent of the harvested acres on eight sites were in compliance with BMPs. The percentage of BMP Implementation was 97.9 percent with no water quality risks. By ownership, on five NIPF sites, overall compliance was 100 percent with 96.6 percent of the applicable BMPs implemented. On three forest industry sites, compliance was 100 percent with 100 percent of the applicable BMPs implemented.
- Overall, 99.9 percent of the mechanical site preparation acres on four sites were in compliance with BMPs. The percentage of BMP implementation was 92.9 percent with no water quality risks identified. Two sites each were on NIPF lands and forest industry lands. By ownership, 100 percent of the acres were in compliance on NIPF sites with the percentage of BMP implementation at 100 percent. On forest industry lands, compliance was 99.9 percent and implementation was 88.9 percent. Bedding directed surface drainage into roadside ditches on one site.
- There were no chemical site preparation, controlled burning, or forest fertilization sites evaluated.
- Overall, 100 percent of the artificial regeneration acres on two sites were in compliance with BMPs. The percentage of BMP implementation was 100 percent with no water quality risks identified. By ownership, one site each was located on NIPF and forest industry lands. No bottomland hardwood wetlands identified in the 1995 EPA/COE memo were planted to pine on these two sites.
- Twelve sites were evaluated for equipment servicing. Seven sites were on NIPF lands and five sites were on forest industry lands. Overall implementation was 100 percent and no water quality risks.
- There were three perennial and five intermittent streams evaluated accounting for approximately 6.62 miles of stream of which 96.2 percent of those miles were in compliance with BMPs. By ownership, compliance was 94.6 percent on NIPF lands and 100 percent on forest industry lands.
- Overall, 99.9 percent of the acres evaluated in the Altamaha River Subbasin during the 2002 survey were in compliance with BMPs. The percentage of applicable BMPs implemented was 89.8 percent resulting in one water quality risk. By ownership, compliance on NIPF lands was 99.9 percent with 84.6 percent of the applicable BMPs implemented resulting in no water quality risks. On forest industry lands, BMP compliance was 99.9 percent with 94.9 percent of the applicable BMPs implemented resulting in the one water quality risk identified.

Ohoopsee River Subbasin (HUC 03070107)

The GFC conducted BMP Implementation and Compliance Surveys in 1991, 1992, 1998, and 2002. No data was extracted specifically for the Altamaha River basin during the 1991 survey. However the data for the Altamaha River Subbasin should be similar to the statewide data for the Lower Coastal Plain region. There, the GFC evaluated approximately 23,987 acres on 202 sites. The sites were distributed such that 132 occurred on non-industrial private forest (NIPF) lands, 68 occurred on forest industry land, and 2 were on public lands. The results indicate that the overall percentage of acres in compliance with BMPs was 93.3 percent. The percentage of streambanks or channels in compliance with BMPs was 95.1 percent. By ownership, 89.8 percent of the acres evaluated on NIPF lands were in compliance with BMPs. On forest industry lands, 95.8 percent of the acres were in compliance. On public lands, 98.4 percent of the acres were in compliance.

The 1992 Georgia Forestry Commission (GFC) compliance survey examined approximately 1,260 acres on nine sites in the Ohoopsee River subbasin. Five sites were

evaluated on NIPF lands and four were on forest industry lands. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 97 percent of the harvested acres were in compliance with BMPs. By ownership, compliance was 99.7 percent on NIPF owners and 94.4 percent on forest industry land.
- Overall, 95.1 percent of main haul road miles were in compliance with BMPs. By ownership, compliance was 95.6 percent on NIPF owners and 94.4 percent on forest industry lands.
- One mechanical site-preparation and one chemical site preparation tract totaling 75 acres were evaluated. Overall, 98.7 percent of the acres were in compliance with BMPs. By ownership, compliance was 98 percent on NIPF owners and 100 percent on forest industry.
- No sites were evaluated for regeneration or burning.
- Overall 96.9 percent of the acres were in compliance with BMPs. By ownership, compliance was 99.7 percent on NIPF and 94.4 percent on forest industry lands.
- There were 5.1 miles of stream evaluated with 100 percent being in compliance with BMPs.

During the 1998 survey, the GFC examined approximately 1,211 acres on 10 sites in the Ohoopsee River Subbasin. Eight sites were on NIPF landowners and two sites were on forest industry lands. According to the Southern Group of State Foresters recommended protocol, adopted in 1997, two scores will now be reported. Compliance is the measure of units (acres, miles of road, number of stream crossings, etc.) in compliance with BMPs. Implementation rate is the percentage of applicable BMPs that are implemented in their entirety over the tract. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 89.4 percent of the streamside management zone (SMZ) acres were in compliance with BMPs with only one water quality risk was identified. The percentage of applicable BMPs implemented was 87.0 percent. By ownership, overall compliance was 87.0 percent and implementation was 84.2 percent on NIPF lands resulting in one water quality risk that was associated with herbicide application. The main problem was logging debris left in stream channels on 38 percent of the sites. Rutting occurred on one site. Aerial application of herbicides occurred on one site. On forest industry lands, compliance was 98.4 percent and implementation was 100 percent with no water quality risks identified.
- Overall, only one stream crossing was evaluated and that occurred on forest industry land. That crossing was in full compliance. The percentage of applicable BMP implementation was 87.5 percent resulting in no water quality risks identified. The only problem found was lack of stabilization of exposed fill over a culvert.
- Overall, 87.8 percent of the forest road miles evaluated on nine sites were in compliance with BMPs. The percentage of applicable BMPs implemented was 87.0 percent with no water quality risks identified. The main problem was inadequate or lack of installation of water diversion measures in roads on 43 percent of the sites. By ownership, on NIPF lands, overall compliance was 86.6 percent, with 88.2 percent of the BMPs implemented with no water quality risks identified. On forest industry lands, compliance was 90.9 percent with 83.3 percent of the applicable BMPs being implemented and no water quality risks.
- Overall, 100 percent of the harvested acres on 10 sites were in compliance with BMPs. The percentage of BMP implementation was 97.7 percent with one water quality risk. By ownership, on eight NIPF sites, overall compliance was 100

percent with 97.1 percent of the applicable BMPs implemented resulting in the one water quality risk. The main problem found was associated with inadequate water bars and stabilization of main skid trails on one site. On two forest industry sites, compliance was 100 percent with 100 percent of the applicable BMPs implemented with no water quality risks identified.

- Overall, 100 percent of the mechanical site preparation acres on four sites were in compliance with BMPs. The percentage of BMP implementation was also 100 percent with no water quality risks identified. Two sites were on NIPF lands and two were on forest industry lands.
- Outside the SMZ, 100 percent of the chemical site preparation acres on one NIPF site were in compliance with BMPs. The percentage of BMP implementation was 75 percent with one water quality risk.
- Overall, 100 percent of the control burning acres on three sites were in compliance with BMPs. The percentage of BMP implementation was 100 percent resulting in no water quality risks. One site was on NIPF owners and two were on forest industry lands.
- Overall, 100 percent of the artificial regeneration acres on three sites were in compliance with BMPs. The percentage of BMP implementation was 100 percent with no water quality risks identified. By ownership, one site was on NIPF land and two were on forest industry land.
- There was one perennial and seven intermittent streams evaluated accounting for approximately 4.02 miles of stream of which 99.8 percent of those miles were in compliance with BMPs. By ownership, compliance was 100 percent on NIPF lands and 98.5 percent on forest industry lands.
- Overall, 99.9 percent of the acres evaluated in the Oohoopee River Subbasin during the 1998 survey were in compliance with BMPs. The percentage of applicable BMPs implemented was 91.6 percent resulting in three water quality risks. By ownership, compliance on NIPF lands was 99.8 percent with 90.2 percent of the applicable BMPs implemented resulting in all three water quality risks. On forest industry lands, BMP compliance was 99.9 percent with 94.6 percent of the applicable BMPs implemented but no water quality risks identified.

During the 2002 survey, the GFC evaluated approximately 3,935 acres on nine sites in the Oohoopee Subbasin. Six sites were on NIPF landowners and three sites were on forest industry lands. As with the 1998 survey, two scores will now be reported according to the Southern Group of State Foresters' recommended protocol: Compliance is the measure of units (acres, miles of road, number of stream crossings, etc.) in compliance with BMPs. Implementation rate is the percentage of applicable BMPs that are implemented in their entirety over the tract. Key highlights and areas for improvement for each category of practice are discussed below.

- Overall, 96.7 percent of the streamside management zone (SMZ) acres on eight sites were in compliance with BMPs. The percentage of applicable BMPs implemented was 88.2 percent resulting in six water quality risks identified. By ownership, overall compliance was 93 percent and implementation was 80 percent on NIPF lands resulting in the six water quality risks. The main problem was that inadequate widths were maintained on two sites resulting in insufficient tree canopy left along the stream. Logging debris was left in the stream channel on one site and a log deck was within the SMZ on one site. On forest industry lands, compliance and implementation were both 100 percent.
- Overall, 34 stream crossings were evaluated on seven sites. Twenty-four of these crossings occurred on the NIPF owner and the remaining 10 occurred on forest

industry lands. On NIPF lands, 10 of the crossings were pre-existing with five or 50 percent at full compliance. There were 14 new crossings associated with the forest operation. Thirteen or 93 percent were in full compliance. Overall, on NIPF lands, the percentage of applicable BMP implementation was 81.4 percent resulting in four water quality risks identified. Problems were found regarding the use of undersized and un-stabilized culverts, debris and dirt type crossings and their removal. On forest industry lands, there were five pre-existing culverted crossings and five new crossings with all ten or 100 percent in compliance. The percentage of BMP implementation was 97 percent.

- Overall, 96.8 percent of the 18.53 forest road miles evaluated on nine sites were in compliance with BMPs. There were 18.38 miles of pre-existing road, of which 97.1 percent were in compliance with BMPs. Of the 0.15 miles of newly constructed road, 66.7 percent were in compliance with BMPs. The overall percentage of applicable BMPs implemented was 78.5 percent resulting in one water quality risk identified. The main problem was inadequate or lack of installation of water diversion measures in roads, as this was done on only 40 percent of the sites. By ownership, on NIPF lands, overall compliance was 95.6 percent with 75 percent of the BMPs implemented. On forest industry lands, overall road compliance was 98.6 percent with 87 percent of the applicable BMPs being implemented resulting in the one water quality risk.
- Overall, 99.9 percent of the harvested acres on nine sites were in compliance with BMPs. The percentage of BMP Implementation was 97 percent with no water quality risks. By ownership, on six NIPF sites, overall compliance was 99.9 percent with 95.9 percent of the applicable BMPs implemented. On three forest industry sites, compliance was 100 percent with 100 percent of the applicable BMPs implemented.
- Overall, 100 percent of the mechanical site preparation acres on one site were in compliance with BMPs. The percentage of BMP implementation was 100 percent with no water quality risks identified. The site was on forest industry land.
- There were two chemical site preparation sites evaluated with both occurring on forest industry lands. Overall, the percentage of acres in compliance was 100 percent with the percentage of BMP implementation at 100 percent with no water quality risks identified.
- One site was evaluated for firebreak compliance and that occurred on NIPF land. No controlled burning had occurred. The percentage of firebreak miles in compliance was 100 percent and BMP implementation was 100 percent.
- No forest fertilization sites were evaluated.
- Overall, 100 percent of the artificial regeneration acres on one site were in compliance with BMPs. The percentage of BMP implementation was 100 percent with no water quality risks identified. The site each was located on forest industry land. No bottomland hardwood wetlands identified in the 1995 EPA/COE memo were planted to pine on this site.
- Nine sites were evaluated for equipment servicing. Six sites were on NIPF lands and three sites were on forest industry lands. Overall implementation was 96.2 percent and no water quality risks. By ownership, implementation was 100 percent on NIPF and 88.9 percent on forest industry.
- There were three perennial and eight intermittent streams evaluated accounting for approximately 18.49 miles of stream of which 94.5 percent of those miles were in compliance with BMPs. By ownership, compliance was 90.1 percent on NIPF lands and 100 percent on forest industry lands.

- Overall, 99.9 percent of the acres evaluated in the Ohoopsee River Subbasin during the 2002 survey were in compliance with BMPs. The percentage of applicable BMPs implemented was 88.0 percent resulting in 12 water quality risks. By ownership, compliance on NIPF lands was 99.7 percent with 83.8 percent of the applicable BMPs implemented resulting in 10 water quality risks. On forest industry lands, BMP Compliance was 100 percent with 95.9 percent of the applicable BMPs implemented resulting in two water quality risks identified.

Identified Gaps and Needs

Adverse impacts of excess sediment loading include degradation of habitat and reduction of species diversity. These types of impacts are best evaluated through biological monitoring, for which improved capabilities are needed. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. EPD protocols also include habitat assessment. The WRD is working with the IBI (Index of Biologic Integrity) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

A key for addressing erosion, sedimentation, and habitat issues on highly impacted streams is the definition of appropriate management goals. Many highly impacted streams cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD partners and other stakeholders.

Many privately owned sawmills are not members of the AF&PA. These mills and their producers are not required to attend the Master Timber Harvesters Workshops at this time. However if they do sell their chip residues to AF&PA member companies, they are required to attend. A need still exists for education of private landowners who are selling timber. Many such landowners attempt to maximize return on timber, sometimes at the expense of BMPs. The GFC, UGA, GFA, and the Southeastern Wood Producers Association are working on a solution by hosting dozens of landowner workshops each year.

Much of the sediment being produced and adversely impacting streams and lakes is associated with development and maintenance of unpaved rural roads. In many instances E&SC plans, implementation, inspection, and enforcement are not adequate on unpaved rural road projects. Without aggressive inspection and enforcement, contractors sometimes tend to allow erosion to occur and attempt mitigation after the fact. Georgia DOT and other agencies charged with E&SC need to work with county road departments in identifying road segments that are high sediment producers and recommend abatement measures. Additional monitoring may be needed to quantify the impact of unpaved rural roads as a source of sedimentation into streams.

Additional efforts should be directed toward increasing public awareness of erosion and sedimentation, with an emphasis on potential sources and controls. State and basinwide coordination between agencies and organizations providing public education and technical assistance may help extend outreach efforts.

General Strategies for Action

Many agricultural sediment reduction practices are relatively expensive and landowners are reluctant to spend today's dollars for long term BMP amortization in uncertain future markets. Agricultural cost share dollars (Farm Bill) and perhaps low interest loans (Clean Water State Revolving Fund) should be concentrated in priority watersheds with sufficient technical workforce to implement BMPs through long-term agreements or contracts to reduce sediment loading. An understanding of the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these

streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles

GFC: encourage implementation of the newly revised 1999 forestry BMPs through workshops and demonstrations.

American Forest and Paper Association (AF&PA): The forest products industry has a strong record of stewardship on the land it owns and manages. Member companies have agreed to a Sustainable Forestry Initiative (SFI) program. The goal of the program is to improve the performance of member companies and licensees, and set new standards for the entire forest industry as well as for other forest landowners through implementation of the following 12 objectives:

1. Broaden the practice of sustainable forestry by employing an array of scientifically, environmentally, and economically sound forest practices in the growth, harvest, and use of forests.
2. Promptly reforest harvested acres to ensure long-term forest productivity and conservation of forest resources.
3. Protect the water quality in streams, lakes, and other water bodies by establishing riparian protection measures based on soil type, terrain, vegetation, and other applicable factors, and by using EPA approved Best Management Practices in all forest management operations.
4. Enhance the quality of wildlife habitat by developing and implementing measures that promote habitat diversity and the conservation of plant and animal populations found in forest communities.
5. Minimize the visual impact by designing harvests to blend into the terrain by restricting clear-cut size (120 acres average) and/or by using harvest methods, age classes, and judicious placement of harvest units to promote diversity in forest cover.
6. Manage company lands of ecologic, geologic, or historic significance in a manner that accounts for their special qualities.
7. Contribute to bio-diversity by enhancing landscape diversity and providing an array of habitats.
8. Continue to improve forest utilization to help ensure the most efficient use of forest resources.
9. Continue the prudent use of forest chemicals to improve forest health and growth while protecting employees, neighbors, the public, and sensitive lands.
10. Broaden the practice of sustainable forestry by further involving non-industrial landowners, loggers, consulting foresters, and company employees who are active in wood procurement and landowner assistance programs.
11. Publicly report Program Participants' progress in fulfilling their commitment to sustainable forestry.
12. Provide opportunities for the public and the forestry community to participate in the commitment to sustainable forestry.

From a water quality perspective, Objectives 3 and 10 are extremely important. Performance measures for Objective 3 state:

- Participants will meet or exceed all established BMPs, all applicable state water quality laws and regulations, and the requirements of the Clean Water Act for forestland.

- Participants will establish and implement riparian protection measures for all perennial streams and lakes and involve a panel of experts at the state level to help identify goals and objectives for riparian protection.
- Participants will individually, through cooperative efforts, or through AF&PA, provide funding for water quality research.

Performance measures for Objective 10 state:

- Participants will encourage landowners who sell timber to reforest, following harvest, and to use BMPs by providing these landowners with information on the environmental and economic advantages of these practices.
- Participants will work closely with the Southeastern Wood Producers Association, the Georgia Forestry Association, the University of Georgia School of Forest Resources, the GFC, the Georgia Wildlife Resources Division, and others in the forestry community to further improve the professionalism of loggers through the Master Timber Harvesters program by establishing and/or cooperating with existing state groups to promote the training and education of loggers in:
 - 1) BMPs, including road construction and retirement, site preparation, streamside management, etc.
 - 2) Awareness of responsibilities under the Endangered Species Act and other wildlife consideration.
 - 3) Regeneration and forest resource conservation.
 - 4) Logging safety.
 - 5) OSHA and wage and hour rules.
 - 6) Transportation.
 - 7) Business management including employee training, public relations, etc.

Specific Management Objectives

Control erosion and sedimentation from land disturbing activities in order to meet narrative water quality standards.

Management Option Evaluation

During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan

EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic life. EPD will work with the issuing authority of local governments for erosion and sedimentation controls, first through education and second through enforcement, to control erosion at construction sites, and will encourage local governments to implement land use planning.

GSWCC and local SWCDs and RC&D Councils with assistance from NRCS will provide technical and educational assistance to producers to encourage the implementation of BMPs to control erosion of agricultural lands. Local SWCDs will convene local workgroups to identify resource concerns and develop proposals for funding to address these concerns. The University of Georgia will provide on-farm assessments to local producers through their Farm-A-Syst Program.

The GFC will encourage implementation of forestry BMPs through workshops and demonstrations. GFC will continue to monitor BMP implementation rates through biennial surveys and determine effectiveness of BMPs. GFC will target landowner and

user groups with low implementation rates for BMP education to encourage compliance with forestry BMP guidelines. GFC will work with AF&PA and the forestry community to provide BMP training.

The GFC implemented a monthly BMP Assurance Examination program in January 2003. The objective is to identify active forestry operations, determine landowner and forestry operators, educate them on BMPs and provide recommendations to prevent problems before they happen by conducting an initial and final examination. Sites in 303(d) sediment listed watershed will be targeted for examinations.

Member companies of the American Forest and Paper Association (AF&PA) will document performance measures for each objective through annual reports to AF&PA as required for Objective 11. AF&PA will issue an annual report to the public.

EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of streams. Citizen groups will implement Adopt-A-Stream programs and work with local governments in implementing watershed initiatives. EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic communities.

Method for Tracking Performance

GSWCC, GFC, EPD, and issuing authorities will track BMP implementation: GSWCC by the number of E&SC plans reviewed and DAT evaluations and recommendations; GFC through its biennial and monthly surveys; and EPD through routine inspections of permitted projects, surveillance for any incidences of noncompliance, and enforcement activities. NRCS will track BMP implementation through its NIMS reporting system.

7.3.5 Drought Conditions

Problem Statement

Drought conditions in Georgia during the 1998-2000 period significantly impacted river basins throughout the state including the Altamaha, Ocmulgee, and Oconee basins. According to the National Oceanic and Atmospheric Administration and the state climate office, rainfall shortages in the state during the May 1998-August 2000 period range from just over 20 inches in North Central Georgia to just over 30 inches in West Central Georgia. Recorded rainfall shortages in the Altamaha, Ocmulgee, and Oconee regions were about 25 inches.

In 2000, EPD developed the "1998-2000 Georgia Drought Report" that documents and evaluates the management actions implemented by state and local authorities during the drought of 1998-2000; provides a summary of drought impacts and an objective assessment of the state's vulnerability and mitigation efforts; and presents a clear set of recommendations for improving drought preparedness and response.

General Goals

Georgia's goals are to control its level of drought preparedness, reduce its drought vulnerability and effectively manage its resources to meet the complex water demands of its natural environment, citizens and economic prosperity.

Ongoing Efforts

Comprehensive drought planning measures will be ongoing with the assistance of experts and stakeholders from within Georgia and the state has contracted with a team of experts from across the nation to guide and facilitate the process. The result of this effort will be a drought plan that provides a statewide framework, regional approach, and linkages with local drought plans.

Strategies for Action

The 1998-2000 Georgia Drought Report (GAEPD, 2000) provides recommendations that are designed to supplement actions taken by all Georgians to better manage their water resources, and can be facilitated by a number of state agencies, including EPD. The six recommendations in the report are as follows:

1. **Emergency Relief:** The State of Georgia should provide emergency grants and loans to assist local governments with critical or threatened water supplies.
2. **Water Conservation:** The State of Georgia must develop a comprehensive water conservation plan to address a wide range of water conserving measures that can be implemented to reduce water demand in Georgia.
3. **Agricultural Water Use:** The State of Georgia must develop an effective method to evaluate consumptive use of water for agricultural irrigation, and implement programs for reducing water use while protecting the prosperity of farmers and agricultural communities.
4. **State Water Plan:** The State of Georgia must perform a detailed review of existing water policy and laws and develop a comprehensive state water plan that will provide the framework and support for effective management of Georgia's water resources.
5. **State Drought Plan:** The State of Georgia must continue developing a comprehensive drought plan and drought management process in order to implement appropriate drought response, preparedness and mitigation measures in future droughts. The Plan was approved in March 2003.

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In This Section

- Where Do We Go From Here?
- Working to Strengthen Planning and Implementation Capabilities
- Addressing the Impacts from Continued Population Growth and Land Development
- The Next Iteration of the Basin Cycle
- Priorities for Additional Data Collection

Section 8

Future Issues and Challenges

8.1 Where Do We Go From Here?

The Dynamic Process of Basin Management

This plan represents another step in managing the water resources in the Altamaha River basin, but not the final step. It is important to recognize that effective basin management is ongoing and dynamic because changes in resource use and conditions occur continually, as do changes in management resources and perspectives. Therefore, management planning and implementation must remain flexible and adapt to changing needs and capabilities.

Building on Past Improvements

As discussed above in Section 7.3, there is more work to do to adequately restore and protect all of Georgia's water resources. After focusing on the implementation of this plan, the Altamaha River basin will enter into its second iteration of the basin management cycle (scheduled for 2003). The next cycle will provide an opportunity to review issues that were not fully addressed during the first cycle and to reassess or identify any new priority issues. In other words, future management efforts can and should build on the foundation created by previous, ongoing, and already planned management actions.

Participation by Many Different Stakeholders

Partners will not have to start from scratch during the next iteration of the basin planning cycle. The information in this document provides an historical account of what is known and planned to date. Stakeholders in the Altamaha basin will know what was accomplished in the first iteration, and can therefore focus on enhancing ongoing efforts or filling gaps. Data collection and public discussion activities scheduled early in the next cycle can draw on information in the plan to identify areas in need of additional monitoring, assessment, and strategy development.

Blending Regulatory and Voluntary Approaches

Although the regulatory authorities of agencies such as EPD are important for protection and restoration of Georgia's waters, RBMP partners will continue to emphasize voluntary and cooperative approaches to watershed management. This will take time and be very challenging. Long-term protection means that the people, local governments, and businesses must learn collectively what is needed for protection and adapt their lifestyle and operations accordingly. Experience indicates that we are much more likely to buy into proposed management solutions in which we have a say and control over how we spend our time and money. The challenge in the future, therefore, is to continue to "build bridges" between regulatory and voluntary efforts, using each where they best serve the people and natural resources of Georgia.

8.2 Working to Strengthen Planning and Implementation Capabilities

Understanding One Another's Roles

Increasing awareness and understanding of the roles and capabilities of local, state, and federal partners is one of the keys to future success in basin management for the Altamaha River. Lack of understanding can lead to finger pointing and frustration on the part of all involved. Increasing opportunities for stakeholders to develop this awareness and understanding should result in more effective management actions.

This basin plan provides one opportunity for stakeholders to increase their awareness of conditions in the basin and to learn about ongoing and proposed new management strategies. Within this context, stakeholders can develop a better understanding of certain roles and responsibilities. For example, this basin plan points out several areas where EPD has regulatory authority and corresponding duties, including:

- Establishing water quality use classifications and standards.
- Assessing and reporting on water quality conditions.
- Facilitating development of River Basin Management Plans.
- Developing TMDLs.
- Issuing permits for point source discharges of treated wastewater, municipal stormwater discharges as required, and land application systems.
- Issuing water supply permits.
- Enforcing compliance with permit conditions.

In many areas, however, organizations or entities other than EPD are responsible; for example:

- Septic tank permitting and inspection (County Health Departments) and maintenance (individual landowners).
- Land development (land use) and zoning ordinances (local governments).
- Sanitary sewer and stormwater ordinances (local governments).
- Water supply source water protection ordinances (local governments).
- Urban stormwater and drainage (local governments).
- Erosion and sediment control (local governments).
- Siting of industrial parks, landfills, and wastewater treatment facilities (local governments).

- Floodplain management (FEMA, local governments).
- Implementation of forestry best management practices (Georgia Forestry Commission with support from the American Forest and Paper Association, the Georgia Forestry Association, the University of Georgia School of Forest Resources, Southeastern Wood Producers Association, and the American Pulpwood Association).
- Implementation of agricultural best management practices (landowners with support from state and federal agricultural agencies).
- Proper use, handling, storage, and disposal of chemicals (businesses, landowners, municipalities, counties, etc.).

These are but a few of the areas involved, but they illustrate how responsibilities are spread across many stakeholders in each basin. Additionally, other agencies and organizations – regional development centers; federal, state, and local technical assistance programs; citizens groups; and business associations – assist in planning and implementation in many of these areas. As stakeholders become more familiar with one another's responsibilities and capabilities, they will become increasingly aware of appropriate partners to work with in addressing their issues of concern.

Using the RBMP Framework to Improve Communication

Raising awareness frequently involves two-way communication. The RBMP framework's interactive planning and outreach sessions provide additional opportunities for two-way communication. For example, Basin Technical Planning Team meetings provide opportunities for partners to share information on their responsibilities and capabilities with each other. Similarly, stakeholder meetings provide opportunities for citizens, businesses, government agencies, associations, and others to share information and learn from each other. Although these interactions often require considerable time, they are critical to the future of management in the basin because they build the working relationships and trust that are essential to carrying out effective, integrated actions.

Continuing to Streamline Our Efforts

Increased coordination will also result if partners in this approach continue to streamline their efforts. There are many laws and requirements with related and complementary goals, e.g., Georgia's Growth Strategies Act, Planning Act, River Corridor Protection Act, Comprehensive Ground Water Management Plan, and River Basin Management Planning requirements, in addition to federal Clean Water Act water quality regulations and Safe Drinking Water Act source water protection requirements. Partners should continue to find ways to make actions under these laws consistent and complementary by eliminating redundancy and leveraging efforts. Again, partners can use the forums in the RBMP framework (e.g., river basin team and advisory committees) to discuss and implement ideas to streamline roles and make the best use of their funds and staff resources.

8.3 Addressing the Impacts from Continued Population Growth and Land Development

Supporting Consistent Implementation of Protection Measures

In addressing the impacts from anticipated population growth and increased land development in the basin, future managers will need to increase their understanding of roles and use forums to coordinate and develop more specific action plans. Historically, mitigating impacts from newly developed areas has been approached mostly on a case-by-case basis. Unfortunately, this approach has resulted in inconsistent planning and implementation of water resource protection measures. River basin planning offers an

opportunity for a more consistent approach by making it easier for landowners, local governments and businesses to work together at the watershed and basin levels.

One way that Georgia EPD will address this issue is by approving only new and expanding permits for water withdrawals and wastewater discharges that are consistent with the basin plan and that meet the intent of the Georgia Planning Act. Rather than waiting for the permit application process, however, local governments can work together and with EPD to work out some of these issues in advance. There are incentives for organizations such as the Georgia Water Pollution Control Association (GWPCA), the Georgia Municipal Association (GMA), the Association of County Commissioners of Georgia (ACCG), and the Regional Development Centers (RDCs) to work out consistent methods to conduct watershed assessments in developing areas and to improve the implementation of protection measures as development occurs. EPD, DCA, and other partners can coordinate by facilitating discussion at RBMP meetings and supporting local initiatives aimed at this issue.

8.4 The Next Iteration of the Basin Cycle

Building on Previous, Ongoing, Planned Efforts

As discussed above and in Section 7.3, there is more work to do to adequately restore and protect all of Georgia's water resources. After focusing on the implementation of this plan, the Altamaha River basin will enter into its second iteration of the basin management cycle (scheduled for 2003). The next cycle will provide an opportunity to review issues that were not fully addressed during the first cycle and to reassess or identify any new priority issues. In other words, future management efforts can and should build on the foundation created by previous, ongoing, and already planned management actions.

8.5 Priorities for Additional Data Collection

In 1999, monitoring efforts were focused on the Altamaha, Ocmulgee, and Oconee River basins in accordance with the EPD basin planning schedule. Intensive monitoring will return to the Altamaha basin in support of the next iteration of the basin planning cycle in 2004. Prior to this time, EPD and partners will develop a monitoring plan for the Altamaha. The monitoring plan will have two major components: general assessment of water quality status within the basin, and targeted assessment to address priority issues and concerns.

River Basin Planning Act

(O.C.G.A. 12-5-520 to 525)

92 SB637/AP

Senate Bill 637

By: Senators Johnson of the 47th, Pollard of the 24th, Edge of the 28th and Egan of the 40th.

An Act

To amend Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, so as to define certain terms; to provide for the development of river basin management plans for certain rivers; to provide for the contents of such plans; to provide for the appointment and duties of local advisory committees; to provide for notice and public hearings; to provide for submission to and approval of plans to the Board of Natural Resources; to make certain provisions relative to issuing certain permits; to provide for the application for and use of certain funds; to provide that this Act shall not enlarge the powers of the Department of Natural Resources; to repeal conflicting laws; and for other purposes.

Be It Enacted by the General Assembly of Georgia:

Section 1. Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, is amended by inserting at the end thereof the following:

Article 8

12-5-520. As used in this article, the term:

- (1) "Board" means the Board of Natural Resources.
- (2) "Director" means the director of the Environmental Protection Division of the Department of Natural Resources.

12-5-521. The director shall develop river basin management plans for the following rivers: Alapaha, Altamaha, Canoochee, Chattahoochee, Coosa, Flint, Ochlocknee, Ocmulgee, Oconee, Ogeechee, St. Marys, Satilla, Savannah, Suwanee, Tallapoosa, and Tennessee. The director shall consult the chairmen of the local advisory committees on all aspects of developing the management plans. The director shall begin development of the management plan for the Chattahoochee and Flint river basins by December 31, 1992, and for the Coosa and Oconee river basins by December 31, 1993. Beginning in 1994, the director shall begin development of one management plan per calendar year until all required management plans have been begun. All management plans shall be completed not later than five years after they

were begun and shall be made available to the public within 180 days after completion.

12-5-522. The management plans provided by Code Section 12-5-521 shall include, but not be limited to, the following:

- (1) A description of the watershed, including the geographic boundaries, historical, current, and projected uses, hydrology, and a description of water quality, including the current water quality conditions;
- (2) An identification of all governmental units that have jurisdiction over the watershed and its drainage basin;
- (3) An inventory of land uses within the drainage basin and important tributaries including point and nonpoint sources of pollution;
- (4) A description of the goals of the management plan, which may include educating the general public on matters involving the environmental and ecological concerns specific to the river basin, improving water quality and reducing pollution at the source, improving aquatic habitat and reestablishing native species of fish, restoring and protecting wildlife habitat, and providing recreational benefits; and
- (5) A description of the strategies and measures necessary to accomplish the goals of the management plan.

12-5-523. As an initial action in the development of a management plan, the director shall appoint local advisory committees for each river basin to consist of at least seven citizens and a chairman appointed by the director. The local advisory committees shall provide advice and counsel to the director during the development of the management plan. Each committee shall meet at the call of the chairman but not less than once every four months. The chairman and members of the local advisory committees shall serve without compensation or reimbursement of expenses.

12-5-524.

- (a) Upon completion of the penultimate draft of a management plan, the director shall conduct public hearings within the river basin. At least one public hearing shall be held in each river basin named in Code Section 12-5-521. The director shall publish notice of each such public hearing in a newspaper of general circulation in the area announcing the date, time, place, and purpose of the public hearing. A draft of the management plan shall be made available to the public at least 30 days prior to the public hearing. The director shall receive public comment at the public hearing and for a period of at least ten days after the public hearing.
- (b) The division shall evaluate the comments received as a result of the public hearings and shall develop the final draft of the management plan for submission to the board for consideration within 60 days of the public hearing.
- (c) The board shall consider the management plan within 60 days after submission by the director. The department shall publish the management plan adopted by the board and shall make copies available to all interested local governmental officials and citizens within the river basin covered by such management plan.

- (d) Upon the board's adoption of a final river basin management plan, all permitting and other activities conducted by or under the control of the Department of Natural Resources shall be consistent with such plan.
- (e) No provision of this article shall constitute an enlargement of the existing statutory powers of the department.

12-5-525. The director is directed to apply for the maximum amount of available funds pursuant to Sections 106, 314, 319, and 104(b)(2) of Public Law 95-217, the federal Clean Water Act, and any other available source for the development of river basin management plans.

Section 2. All laws and parts of laws in conflict with this Act are repealed.

Georgia Instream Water Quality Standards For All Waters: Toxic Substances

(Excerpt from Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.03 Water Use Classifications and Water Quality Standards)

- (i) Instream concentrations of the following chemical constituents which are considered to be other toxic pollutants of concern in the State of Georgia shall not exceed the criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones:
1. 2,4-Dichlorophenoxyacetic acid (2,4-D) 70 µg/l
 2. Methoxychlor 0.03 µg/l*
 3. 2,4,5-Trichlorophenoxy propionic acid (TP Silvex) 50 µg/l
- (ii) Instream concentrations of the following chemical constituents listed by the U.S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed the acute criteria indicated below under 1-day, 10-year minimum flow (1Q10) or higher stream flow conditions and shall not exceed the chronic criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06. Unless otherwise specified, the criteria below are listed in their total recoverable form. Because most of the numeric criteria for the metals below are listed as the dissolved form, total recoverable concentrations of metals that are measured instream will need to be translated to the dissolved form in order to compare the instream data with the numeric criteria. This translation will be performed using guidance found in "Guidance Document of Dynamic Modeling and Translators August 1993" found in Appendix J of EPA's Water Quality Standards Handbook: Second Edition, EPA-823-B-94-005a or by using other appropriate guidance from EPA.

	Acute	Chronic
1. Arsenic		
(a) Freshwater	340 µg/l ¹	150 µg/l ¹
(b) Coastal and Marine Estuarine Waters	69 µg/l ¹	36 µg/l ¹
2. Cadmium		
(a) Freshwater	2.0 µg/l ^{1,3}	1.3 µg/l ^{1,3}
(b) Coastal and Marine Estuarine Waters	42 µg/l ¹	9.3 µg/l ¹
3. Chromium III		
(a) Freshwater	320 µg/l ^{1,3}	42 µg/l ^{1,3}
(b) Coastal and Marine Estuarine Waters	--	--
4. Chromium VI		
(a) Freshwater	16 µg/l ¹	11 µg/l ¹
(b) Coastal and Marine Estuarine Waters	1,100 µg/l ¹	50 µg/l ¹
5. Copper		
(a) Freshwater	7.0 µg/l ^{1,2,3}	5.0 µg/l ^{1,2,3}
(b) Coastal and Marine Estuarine Waters	4.8 µg/l ^{1,2}	3.1 µg/l ^{1,2}
	Acute	Chronic

6.	Lead		
	(a) Freshwater	30 µg/l ^{1,3}	1.2 µg/l ^{1,2,3}
	(b) Coastal and Marine Estuarine Waters	210 µg/l ¹	8.1 µg/l ¹
7.	Mercury		
	(a) Freshwater	1.4 µg/l	0.012 µg/l ²
	(b) Coastal and Marine Estuarine Waters	1.8 µg/l	0.025 µg/l ²
8.	Nickel		
	(a) Freshwater	260 µg/l ^{1,3}	29 µg/l ^{1,3}
	(b) Coastal and Marine Estuarine Waters	74 µg/l ¹	8.2 µg/l ¹
9.	Selenium		
	(a) Freshwater	--	5.0 µg/l
	(b) Coastal and Marine Estuarine Waters	290 µg/l ¹	71 µg/l ¹
10.	Silver	-- ⁴	-- ⁴
11.	Zinc		
	(a) Freshwater	65 µg/l ^{1,3}	65 µg/l ^{1,3}
	(b) Coastal and Marine Estuarine Waters	90 µg/l ¹	81 µg/l ¹
12.	Lindane [Hexachlorocyclohexane (g-BHC-Gamma)]		
	(a) Freshwater	0.95 µg/l	
	(b) Coastal and Marine Estuarine Waters	0.16 µg/l	

¹ The in-stream criterion is expressed in terms of the dissolved fraction in the water column. Conversion factors used to calculate dissolved criteria are found in the EPA document – National Recommended Water Quality Criteria – Correction, EPA 822-Z-99-001, April 1999.

² The in-stream criterion is lower than the EPD laboratory detection limits. (A "--" indicates that the criterion may be higher than or lower than EPD laboratory detection limits depending upon the hardness of the water.)

³ The aquatic life criteria for these metals are expressed as a function of total hardness (mg/l) in a water body. Values in the table above assume a hardness of 50 mg/l CaCO₃. For other hardness values, the following equations from the EPA document – National Recommended Water Quality Criteria – Correction, EPA 822-Z-99-001, April 1999 should be used. The minimum hardness allowed for use in these equations shall not be less than 25 mg/l, as calcium carbonate and the maximum shall not be greater than 400 mg/l as calcium carbonate.

Cadmium

acute criteria = $(e^{(1.128[\ln(\text{hardness})] - 3.6867)}) (1.136672 - [(\ln \text{hardness})(0.041838)]) \mu\text{g/l}$

chronic criteria = $(e^{(0.7852[\ln(\text{hardness})] - 2.715)}) (1.101672 - [(\ln \text{hardness})(0.041838)]) \mu\text{g/l}$

Chromium III

acute criteria = $(e^{(0.8190[\ln(\text{hardness})] + 3.7256)}) (0.316) \mu\text{g/l}$

chronic criteria = $(e^{(0.8190[\ln(\text{hardness})] + 0.6848)}) (0.860) \mu\text{g/l}$

Copper

acute criteria = $(e^{(0.8422[\ln(\text{hardness})] - 1.700)}) (0.96) \mu\text{g/l}$

chronic criteria = $(e^{(0.8545[\ln(\text{hardness})] - 1.702)}) (0.96) \mu\text{g/l}$

Lead

acute criteria = $(e^{(1.273[\ln(\text{hardness})] - 1.460)}) (1.46203 - [(\ln \text{hardness})(0.145712)]) \mu\text{g/l}$

chronic criteria = $(e^{(1.273[\ln(\text{hardness})] - 4.705)}) (1.46203 - [(\ln \text{hardness})(0.145712)]) \mu\text{g/l}$

Nickel

acute criteria = $(e^{(0.8460[\ln(\text{hardness})] + 2.255)}) (.998) \mu\text{g/l}$

chronic criteria = $(e^{(0.8460[\ln(\text{hardness})] + 0.0584)}) (.997) \mu\text{g/l}$

Zinc

acute criteria = $(e^{(0.8473[\ln(\text{hardness})] + 0.884)}) (0.978) \mu\text{g/l}$

chronic criteria = $(e^{(0.8473[\ln(\text{hardness})] + 0.884)}) (0.986) \mu\text{g/l}$

⁴ This pollutant is addressed in 391-3-6-.06.

- (iii) Instream concentrations of the following chemical constituents listed by the U.S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06.

1.	Chlordane	
	(a) Freshwater	0.0043 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.004 µg/l*
2.	Cyanide	
	(a) Freshwater	5.2 µg/l*
	(b) Coastal and Marine Estuarine Waters	1.0 µg/l*
3.	Dieldrin	
	(a) Freshwater	0.056 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0019 µg/l*
4.	4,4'-DDT	0.001 µg/l*
5.	a-Endosulfan	
	(a) Freshwater	0.056 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0087 µg/l*
6.	b-Endosulfan	
	(a) Freshwater	0.056 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0087 µg/l*
7.	Endrin	
	(a) Freshwater	0.036 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0023 µg/l*
8.	Heptachlor	
	(a) Freshwater	0.0038 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0036 µg/l*
9.	Heptachlor Epoxide	
	(a) Freshwater	0.0038 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.0036 µg/l*
10.	Pentachlorophenol	
	(a) Freshwater	2.1 µg/l*
	(b) Coastal and Marine Estuarine Waters	7.9 µg/l*
11.	PCBs	
	(a) Freshwater	0.014 µg/l*
	(b) Coastal and Marine Estuarine Waters	0.03 µg/l*
12.	Phenol	300 µg/l
13.	Toxaphene	0.0002 µg/l*

*The in-stream criterion is lower than the EPD laboratory detection limits.

- (iv) Instream concentrations of the following chemical constituents listed by the U. S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under annual average or higher stream flow conditions:

1.	Acenaphthene	2700 µg/l
2.	Acenaphthylene	**
3.	Acrolein	780 µg/l
4.	Acrylonitrile	0.66 µg/l
5.	Aldrin	0.00014 µg/l
6.	Anthracene	110000 µg/l
7.	Antimony	4300 µg/l
8.	Arsenic	50 µg/l
9.	Benzidine	0.00054 µg/l
10.	Benzo(a)Anthracene	0.049 µg/l
11.	Benzo(a)Pyrene	0.049 µg/l
12.	3,4-Benzofluoranthene	0.049 µg/l
13.	Benzene	71 µg/l
14.	Benzo(ghi)Perylene	**

15.	Benzo(k)Fluoranthene	0.049 µg/l
16.	Beryllium	**
17.	a-BHC-Alpha	0.013 µg/l
18.	b-BHC-Beta	0.046 µg/l
19.	Bis(2-Chloroethyl)Ether	1.4 µg/l
20.	Bis(2-Chloroisopropyl)Ether	170000 µg/l
21.	Bis(2-Ethylhexyl)Phthalate	5.9 µg/l
22.	Bromoform (Tribromomethane)	360 µg/l
23.	Butylbenzyl Phthalate	5200
24.	Carbon Tetrachloride	4.4 µg/l
25.	Chlorobenzene	21000 µg/l
26.	Chlorodibromomethane	34 µg/l
27.	2-Chloroethylvinyl Ether	**
28.	Chlordane	0.0022 µg/l
29.	Chloroform (Trichloromethane)	470 µg/l
30.	2-Chloronaphthalene	4300 µg/l
31.	2-Chlorophenol	400 µg/l
32.	Chrysene	0.049 µg/l
33.	Dibenzo(a,h)Anthracene	0.049 µg/l
34.	Dichlorobromomethane	46 µg/l
35.	1,2-Dichloroethane	99 µg/l
36.	1,1-Dichloroethylene	3.2 µg/l
37.	1,2 - Dichloropropane	39 µg/l
38.	1,3-Dichloropropylene	1700 µg/l
39.	2,4-Dichlorophenol	790 µg/l
40.	1,2-Dichlorobenzene	17000 µg/l
41.	1,3-Dichlorobenzene	2600 µg/l
42.	1,4-Dichlorobenzene	2600 µg/l
43.	3,3'-Dichlorobenzidine	0.077 µg/l
44.	4,4'-DDT	0.00059 µg/l
45.	4,4'-DDD	0.00084 µg/l
46.	4,4'-DDE	0.00059 µg/l
47.	Dieldrin	0.00014 µg/l
48.	Diethyl Phthalate	120000 µg/l
49.	Dimethyl Phthalate	2900000 µg/l
50.	2,4-Dimethylphenol	2300 µg/l
51.	2,4-Dinitrophenol	14000 µg/l
52.	Di-n-Butyl Phthalate	12000 µg/l
53.	2,4-Dinitrotoluene	9.1 µg/l
54.	1,2-Diphenylhydrazine	0.54 µg/l
55.	Endrin	0.81 µg/l
56.	Endrin Aldehyde	0.81 µg/l
57.	alpha - Endosulfan	240 µg/l
58.	beta - Endosulfan	240 µg/l
59.	Endosulfan Sulfate	240 µg/l
60.	Ethylbenzene	29000 µg/l
61.	Fluoranthene	370 µg/l
62.	Fluorene	14000 µg/l
63.	Heptachlor	0.00021 µg/l
64.	Heptachlor Epoxide	0.00011 µg/l
65.	Hexachlorobenzene	0.00077 µg/l
66.	Hexachlorobutadiene	50 µg/l
67.	Hexachlorocyclopentadiene	17000 µg/l
68.	Hexachloroethane	8.9 µg/l
69.	Indeno(1,2,3-cd)Pyrene	0.049 µg/l
70.	Isophorone	2600 µg/l
71.	Lindane [Hexachlorocyclohexane (g-BHC-Gamma)]	0.063 µg/l
72.	Methyl Bromide (Bromomethane)	4000 µg/l
73.	Methyl Chloride (Chloromethane)	**

74.	Methylene Chloride	1600 µg/l
75.	2-Methyl-4,6-Dinitrophenol	765 µg/l
76.	3-Methyl-4-Chlorophenol	**
77.	Nitrobenzene	1900 µg/l
78.	N-Nitrosodimethylamine	8.1 µg/l
79.	N-Nitrosodi-n-Propylamine	1.4 µg/l
80.	N-Nitrosodiphenylamine	16 µg/l
81.	PCBs	0.00017 µg/l
82.	Pentachlorophenol	8.2 µg/l
83.	Phenanthrene	**
84.	Phenol	4,600,000 µg/l
85.	Pyrene	11,000 µg/l
86.	1,1,2,2-Tetrachloroethane	11 µg/l
87.	Tetrachloroethylene	8.85 µg/l
88.	Thallium	6.3 µg/l
89.	Toluene	200000 µg/l
90.	Toxaphene	0.00075 µg/l
91.	1,2-Trans-Dichloroethylene	140000
92.	1,1,2-Trichloroethane	42 µg/l
93.	Trichloroethylene	81 µg/l
94.	2,4,6-Trichlorophenol	6.5 µg/l
95.	1,2,4-Trichlorobenzene	940 µg/l
96.	Vinyl Chloride	525 µg/l

**These pollutants are addressed in 391-3-6-.06.

(v) Site specific criteria for the following chemical constituents will be developed on an as-needed basis through toxic pollutant monitoring efforts at new or existing discharges that are suspected to be a source of the pollutant at levels sufficient to interfere with designated uses:

1. Asbestos

(vi) Instream concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) must not exceed 0.0000012 µg/l under long-term average stream flow conditions.

(f) Applicable state and federal requirements and regulations for the discharge of radioactive substances shall be met at all times.

NPDES Permits for Discharges in the Altamaha River Basin

FACILITY NAME	NPDES #	PERMITTED FLOW (MGD)	MAJOR	COUNTY	RECEIVING STREAM
ALTAMAHA MHP BAXLEY	GA0023442	0.013		APPLING	BAY CR
CATOS MHP LYONS	GAPID1000	0.013		TOOMBS	WILLIAMS CR
DOC ROGERS CORRECT INST	GA0022900	0.85		TATTNALL	OHOOPEE RV
GEORGIA POWER HATCH	GA0004120	43.4		APPLING	ALTAMAHA RV
GLENNVILLE	GA0037982	2	Y	TATTNALL	BRICKYARD BR
GLENNVILLE	GA0031836	0.88		TATTNALL	BRICKYARD BR
JESUP WPCP	GA0026000	2.5	Y	WAYNE	ALTAMAHA RV
JOHNSON COUNTY NURSING HOME	GAPID1000	0.007		JOHNSON	PENDLETON CR
LUDOWICI WPCP	GA0049166	0.24		LONG	JONES CR SWAMP TRIB
LYONS NORTH WPCP #2	GA0033391	0.67		TOOMBS	SWIFT CR
LYONS POND #1	GA0033405	0.67		TOOMBS	PENDLETON CR
RAYONIER INC JESUP	GA0003620	67	Y	WAYNE	ALTAMAHA RV
ROGERS STATE PRISON	GA0038237			TATTNALL	
SANTA CLAUS POND	GA0050059	0.01		TOOMBS	ROCKY CR- OHOOPEE RV
SWAINSBORO WPCP	GA0020346	3	Y	EMANUEL	CROOKED CR
TENNILLE POND	GA0049956	0.45		WASHINGTON	DYERS CR- OHOOPEE RV

FACILITY NAME	NPDES #	PERMITTED FLOW (MGD)	MAJOR	COUNTY	RECEIVING STREAM
THOMAS AND BETTS CORPORATION	GA0002186			TOOMBS	LITTLE ROCKY CR
VIDALIA WPCP	GA0025488	1.88	Y	TOOMBS	SWIFT CR
WRIGHTSVILLE POND	GA0032395	0.745		JOHNSON	BIG CEDAR CREEK TRIB

Support of Designated Uses for Rivers, Streams, and Lakes in the Altamaha River Basin, 2000-2002

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Data Source Codes

State Agencies

- 1 DNR-EPD, Watershed Planning & Monitoring Program
- 2 DNR-EPD, Permitting Comp. & Enf. Program (Municipal)
- 3 DNR-EPD, Permitting Comp. & Enf. Program (Industrial)
- 4 DNR, Wildlife Resources Division
- 5 DNR, Coastal Resources Division
- 6 State University of West Georgia
- 7 Gainesville College
- 8 Georgia Institute of Technology

Federal Agencies

- 9 U.S. Environmental Protection Agency
- 10 U.S. Geological Survey
- 11 U.S. Army Corps of Engineers
- 12 U.S. Forest Service
- 13 Tennessee Valley Authority

Local Agencies

- 14 Cobb County
- 15 Dekalb County
- 16 Douglas County Water & Sewer Authority
- 17 Fulton County
- 18 Gwinnett County
- 19 City of Clayton
- 20 City of Gainesville
- 21 City of LaGrange
- 22 Georgia Mountains R.D.C.
- 23 City of Conyers

Contracted Clean Lakes Studies

- 24 Lake Allatoona (Kennesaw State University)
- 25 Lake Blackshear (Lake Blackshear Watershed Assoc.)
- 26 Lake Lanier (University of Georgia)
- 27 West Point (LaGrange College/Auburn University)

Other

- 28 Georgia Power Company
- 29 Oglethorpe Power Company
- 30 South Carolina Electric & Gas Company
- 31 South Carolina DHEC
- 32 Jones Ecological Research Center
- 33 Alabama DEM
- 34 City of College Park
- 35 Kennesaw State University
- 36 University of Georgia
- 37 Columbus Water Works
- 38 Columbus Unified Government
- 39 St. Johns River Water Mgmt. District
- 40 Town of Trion
- 41 Cherokee County
- 42 Clayton County Water Authority
- 43 City of Atlanta
- 44 City of Cartersville
- 45 Georgia Ports Authority

Criterion Violated Codes

- | | |
|------|---------------------------|
| As | Arsenic |
| Bio | Biota Impacted |
| Cd | Cadmium |
| CFB | Commercial Fishing Ban |
| CN | Cyanide |
| Cr | Chromium |
| Cu | Copper |
| DO | Dissolved Oxygen |
| FC | Fecal Coliform Bacteria |
| FCG | Fish Consumption Guidance |
| Hg | Mercury |
| Ni | Nickel |
| Pb | Lead |
| SB | Shellfishing Ban |
| Se | Selenium |
| Temp | Temperature |
| Tox | Toxicity Indicated |
| Zn | Zinc |

Potential Cause Codes

- | | |
|-----|----------------------------------|
| CSO | Combined Sewer Overflow |
| I1 | Industrial Facility |
| I2 | Residual from Industrial Source |
| M | Municipal Facility |
| MA | Marina |
| NAT | Natural |
| NP | Nonpoint Sources/Unknown Sources |
| SB | Shellfish Ban |
| UR | Urban Runoff/Urban Effects |

Rivers/Streams Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Miles
ALTAMAHA RIVER BASIN			
HUC 03070106			
Altamaha River (1,9)	Confluence of Oconee and Ocmulgee Rivers to Rayonier (Jeff Davis/Appling/Wayne Co.)	Fishing	72
Altamaha River (1,9)	Rayonier to Penholoway Creek (Wayne Co.)	Fishing	20
HUC 03070107			
Pendleton Creek (1)	Swift Creek to Ohoopee River (Toombs Co.)	Fishing	9

Rivers/Streams Partially Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
ALTAMAHA RIVER BASIN									
HUC 03070106									
Altamaha River (1)	Penholoway Creek to Butler River (Wayne/Glynn/ McIntosh Co.)	Fishing	FC	NP	EPD will address nonpoint sources through a watershed protection strategy.	23	X	X	3
Bullard Creek (4)	~0.25 mi u/s Altamaha Road to Altamaha River (Jeff Davis Co.)	Fishing	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy.	8	X	X	3
Five Mile Creek (4)	Headwaters to Altamaha River (Appling/Wayne Co.)	Fishing	Bio	NP	EPD will address nonpoint sources through a watershed protection strategy.	9	X	X	3
Goose Creek (1)	U/S Rd. S1922 (Walton Griffis Rd.) to Little Goose Creek (Wayne Co.)	Fishing	FC	UR	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	8	X	3	3
HUC 03070107									
Little Oohopee River (1)	Sardis Creek to Oohopee River (Emanuel Co.)	Fishing	FC, DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	18	X	3	2
Oohopee River (1)	Neels Creek to Little Oohopee River (Johnson/ Emanuel Co.)	Fishing	DO, FC, FCG	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Fish Consumption Guidelines due to mercury in fish tissue.	18	X	3	2
Oohopee River (1)	Little Oohopee River to U.S. Highway 292 (Emanuel/Candler/ Tattnall Co.)	Fishing	DO, FC, FCG	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Fish Consumption Guidelines due to mercury in fish tissue.	23	X	3	2

Rivers/Streams Partially Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
ALTAMAHA RIVER BASIN									
Ochoopee River (1,9)	Hwy 292 to Hwy 147 (Tattnall Co.)	Fishing	FCG	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Fish Consumption Guidelines due to mercury in fish tissue.	12	X	3	3
Ochoopee River (1,9)	Ga. Hwy 147 to Confluence with Altamaha River (Tattnall Co.)	Fishing	FCG	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. Fish Consumption Guidelines due to mercury in fish tissue.	13	X	3	3
Pendleton Creek (1)	Sand Hill Lake to Reedy Creek (Treutlen Co.)	Fishing	DO, FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	7	X	3	2
Pendleton Creek (1)	Wildwood Lake to Tiger Creek (Treutlen/ Toombs Co.)	Fishing	DO, FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	12	X	3	2
Thomas Creek (1)	D/S CR203 to Ochoopee River (Tattnall Co.)	Fishing	DO	UR	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	12	X	3	2

Rivers/Streams Not Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
ALTAMAHA RIVER BASIN									
HUC 03070106									
Alex Creek (1)	Mason Cowpen Branch to Altamaha River (Wayne Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	3	X	3	2
Beards Creek (1)	Spring Branch to Altamaha River (Tattnall Co.)	Fishing	FC	M	Glennville WPCP currently upgrading to a constructed wetlands system due to be complete by 5/02.	11	X	2	1
Cobb Creek (1)	Oconee Creek to Altamaha River (Toombs Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	13	X	3	2
Doctors Creek (1)	U/S Jones Creek (Long Co.)	Fishing	DO, FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	5	X	3	2
Jones Creek (1)	Still Creek to Doctors Creek (Long Co.)	Fishing	DO	UR	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	11	X	3	2
Milligan Creek (1)	Uvalda to Altamaha River (Montgomery/ Toombs Co.)	Fishing	FC, DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	11	X	3	2
Oconee Creek (1)	Headwaters to Cobb Creek (Montgomery/ Toombs Co.)	Fishing	FC, DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	11	X	3	2
Penholoway Creek (1,10)	Little Creek to Altamaha River (Wayne Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	13	X	3	2

Rivers/Streams Not Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
ALTAMAHA RIVER BASIN									
Ten Mile Creek (1)	Little Ten Mile Creek to Altamaha River (Appling Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	13	X	3	2
HUC 03070107									
Big Cedar Creek (1)	Little Cedar Creek to Ochoopee River (Johnson Co.)	Fishing	DO, FC	M, NP	Wrightsville Pond WPCP will be addressed through EPD's Basin Planning Permitting Strategy. Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	3	X	3	2
Jacks Creek (1,4)	U.S. Hwy. 1 to Ochoopee River (Emanuel Co.)	Fishing	DO, FC, Bio	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution. EPD will address nonpoint sources through a watershed protection strategy.	9	X	3, 3, X	2
Little Ochoopee River (1)	Gully Branch to Neeley Creek (Washington Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	14	X	3	2
Little Ochoopee River (1)	Neeley Creek to Sardis Creek (Johnson Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	15	X	3	2
Ochoopee River (1)	Dyers Creek to Big Cedar Creek (Washington/ Johnson Co.)	Fishing	FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	15	X	3	3
Rocky Creek (1)	Ga. Hwy. 130 to Little Rocky Creek (Toombs Co.)	Fishing	FC, DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	10	X	3	2

Rivers/Streams Not Supporting Designated Uses

Basin/Stream (Data Source)	Location	Water Use Classification	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
ALTAMAHA RIVER BASIN									
Rocky Creek (1)	Little Rocky Creek to Ohoopsee River (Toombs/ Tattnall Co.)	Fishing	DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	11	X	3	2
Swift Creek (1)	Old Normantown Rd. to Pendleton Creek (Toombs Co.)	Fishing	FC, DO	M, UR	Lyons North WPCP in compliance with NPDES permit requirements. Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	5	X	3	2
Tiger Creek (1)	Little Creek to Pendleton Creek (Montgomery/ Toombs Co.)	Fishing	FC, DO	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	16	X	3	2
Yam Grandy Creek (1)	D/S Crooked Creek (Emanuel Co.)	Fishing	DO, FC	NP	Impairment will be addressed by implementing a locally developed plan that includes the remedial actions necessary for problem resolution.	3	X	3	2

Lakes/Reservoirs Not Fully Supporting Designated Uses

Lake Name (Data Source)	Location	Basin	Support Category	Water Use Classification	Criterion Violated	Potential Cause(s)	Acres Affected	305(b)	303(d)	Priority
Treutlen County PFA (Sand Hill Lake) (1)	Treutlen County	Altamaha	Partial Support	Fishing	FCG (Hg)	NP	166	X	4	3

All Estuarine Waters Support Designated Uses