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 Coosa 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 best uses 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 Coosa River basin.

The physical characteristics of the Coosa River basin include its location, physiography, soils, climate, surface water and ground water 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 Coosa River and its tributary streams occupy most of the northwest corner of Georgia (Figure 2-1). Downstream of Georgia, the Coosa extends through northeast Alabama. The Coosa River basin or watershed, comprising all land areas draining into the river above the confluence with the Tallapoosa River near Wetumpka, Alabama, occupies a total area of about 10,059 square miles, of which 4,579 square miles (46 percent) lie in Georgia, 5,353 square miles (53 percent) lie in Alabama, and 127 square

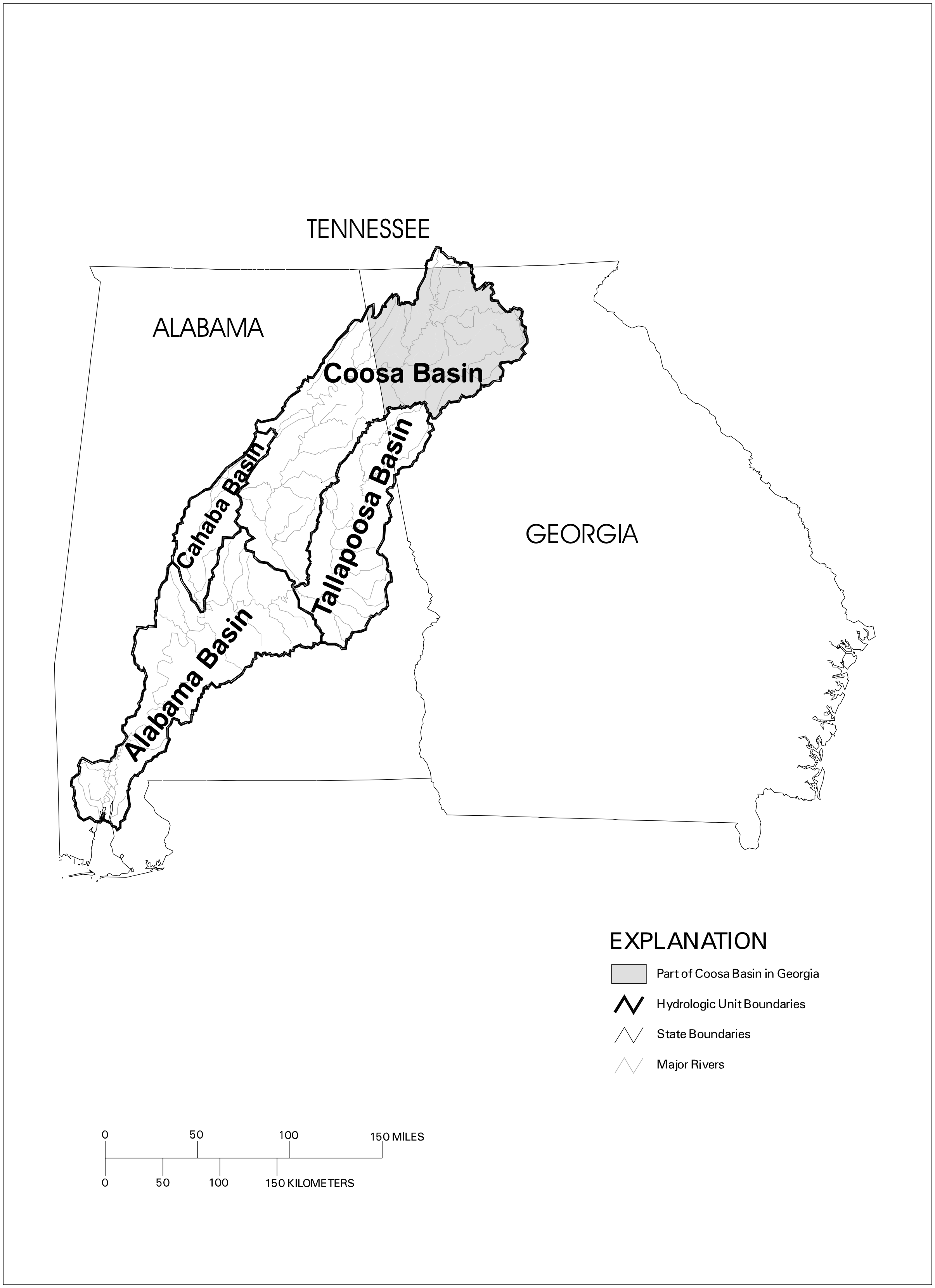

Figure 2-1. Location of the Coosa River Basin

miles (1 percent) lie in Tennessee (referred to by Tennessee as the Conasauga and Coahulla River basin). Water resources within the Coosa River basin are affected by runoff from all parts of the basin. This plan focuses on management of water resources within the Georgia portion of the basin only. The plan benefits significantly from the basin coordination being accomplished through the ACT-ACF Comprehensive Study.

The U.S. Geological Survey (USGS) has divided the Georgia portion of the Coosa basin into five 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 Coosa 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 Coosa River Basin in Georgia

03150101	Conasauga River Basin
03150102	Coosawattee River Basin
03150103	Oostanaula River Basin
03150104	Etowah River Basin
03150105	Mainstem Coosa below Rome and Chattooga River Basin

2.1.2 Climate

The Coosa River basin is characterized by a moist and temperate climate. Mean annual precipitation ranges from 52 to 64 inches. Precipitation chiefly occurs as rainfall, and to a lesser extent, as snowfall. Rainfall is fairly evenly distributed throughout the year, but a distinct dry season usually occurs from mid-summer to late fall. Winter is the wettest season and March the wettest month, on average. The mean annual temperature is about 60 degrees Fahrenheit (Robinson et al., 1996).

2.1.3 Physiography, Geology, and Soils

The Coosa River basin within Georgia contains parts of the Cumberland Plateau, Valley and Ridge, Blue Ridge, and Piedmont physiographic provinces, which extend throughout the southeastern United States. The bulk of the basin lies within the Cumberland Plateau and Piedmont provinces. Similar to much of the upland Southeast, the basin's physiography reflects a geologic history of mountain building in the Appalachian Mountains (Robinson et al., 1996).

The Cumberland Plateau province is dominated by relatively flat plateaus ranging in altitude from 1,500 to 1,800 feet that bound narrow, northeast-southwest-trending linear valleys.

The Valley and Ridge province consists of relatively narrow, northeast-trending linear ridges at altitudes ranging from about 600 to 1,600 feet. Intervening streams drain relatively wide valleys.

The Blue Ridge province is dominated by mountains as high as about 4,100 feet above sea level. Land-surface altitude of intermountain plateaus within the province ranges from about 1,600 to 1,700 feet. The Blue Ridge is distinguished from the Piedmont Province chiefly by its greater topographic relief (Clark and Zisa, 1976).

The Piedmont province is a well-dissected upland characterized by rounded interstream areas to the north and rolling topography further south. Prominent

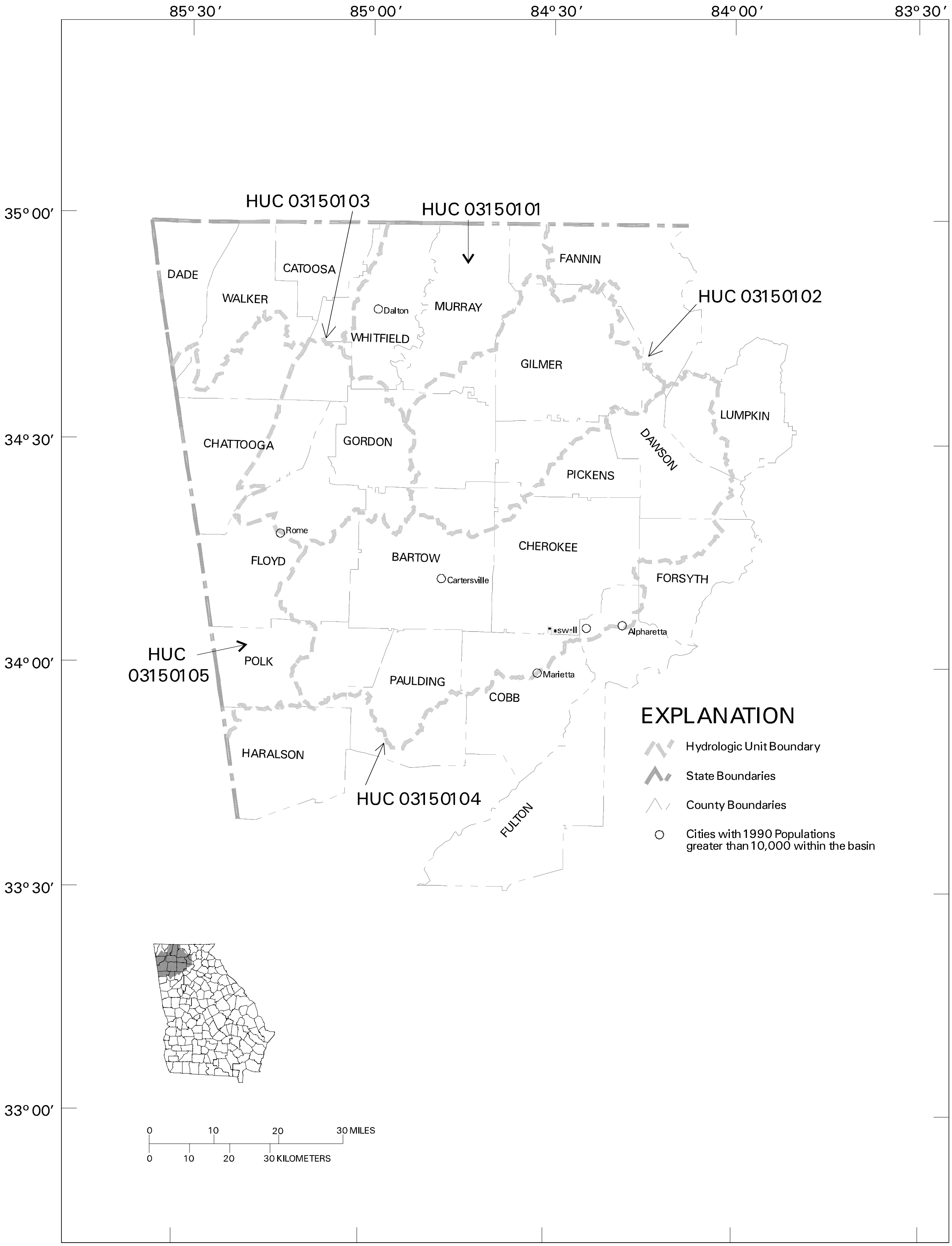

Figure 2-2. Hydrologic Units and Counties of the Coosa River Basin

topographic features generally reflect the erosional and weathering resistance of various rock formations. Altitude ranges from about 550 to 1,500 feet above sea level.

Geology

The geology of the Coosa River basin strongly influences its physiography, geochemistry, soils, and surface and ground water resources. The Coosa River basin in Georgia is underlain by a diverse and complex geology which is generally aligned with the physiographic provinces. The discussion presented here is adapted from Robinson et al. (1996).

Geology of the Blue Ridge and Piedmont Provinces

The Blue Ridge and Piedmont provinces are characterized by complex sequences of igneous rocks of Precambrian to Paleozoic age, and metamorphic rocks of late Precambrian to Permian age (Miller, 1990); in the Piedmont, isolated igneous rocks of Mesozoic age are also present. Collectively, these rocks are called crystalline rocks. The metamorphic rocks originally were sedimentary, volcanic, and volcaniclastic rocks that have been altered by several stages of regional metamorphism to slate, phyllite, schist, gneiss, quartzite and marble. The metamorphic rocks are extensively folded and faulted. The intrusive igneous rocks, dominantly granites and lesser amounts of diorite and gabbro, occur as widespread plutons. The rocks are characterized by a complex outcrop and subsurface distribution pattern. The Piedmont contains major fault zones that generally trend northeast-southwest and form the boundaries between major rock groups (Georgia Geologic Survey, 1976).

The crystalline igneous and metamorphic rocks largely are covered by a layer of weathered rock and soil known as regolith. The regolith ranges in thickness from a few to more than 150 ft, depending upon the type of parent rock, topography, and hydrogeologic history. From the land surface, the regolith consists of a porous and permeable soil zone that grades downward into a clay-rich, relatively impermeable zone that overlies and grades into porous and permeable saprolite, generally referred to as a transition zone (Heath, 1989). The transition zone grades downward into unweathered bedrock. Regolith thickness generally is less in the Blue Ridge province than in the Piedmont because of the steeper slopes. In general, the massive granite and gabbro rocks are poorly fractured and are characterized by a thin soil cover; in contrast, the schists and gneisses are moderately to highly fractured.

Geology of the Valley, Ridge, and Cumberland Plateau Provinces

Rocks of Paleozoic age characterize the Valley and Ridge and Cumberland Plateau provinces. These rocks are folded, faulted, and thrusted clastic and carbonate rocks of fluvial and marine origin that have been only locally metamorphosed. The deformation of rocks in the Cumberland Plateau is less intense than those in the Valley and Ridge. Fold axes trend northeast to southwest. Typical rock types include shale, siltstone, sandstone, limestone, and dolostone. Discontinuous quartz sand and gravel beds of Cenozoic age have been deposited in the valley floor of the Coosa River.

Soils

Soils of the Coosa River basin are divided into four major land-resource areas (MLRAs, formerly called soil provinces), which generally reflect the physiographic provinces and are shown in Figure 2-3. About 50 percent of the area is in the Southern Appalachian Ridges and Valleys MLRA, about 25 percent in the Blue Ridge MLRA, 20 percent in the Southern Piedmont MLRA, and 5 percent in the Sand Mountain MLRA.

The Southern Appalachian Ridges and Valleys portion of the Coosa basin is characterized by a series of limestone, sandstone, and shale ridges separated by gentler sloping valleys. Soils are highly variable, ranging from shallow to very deep, and from

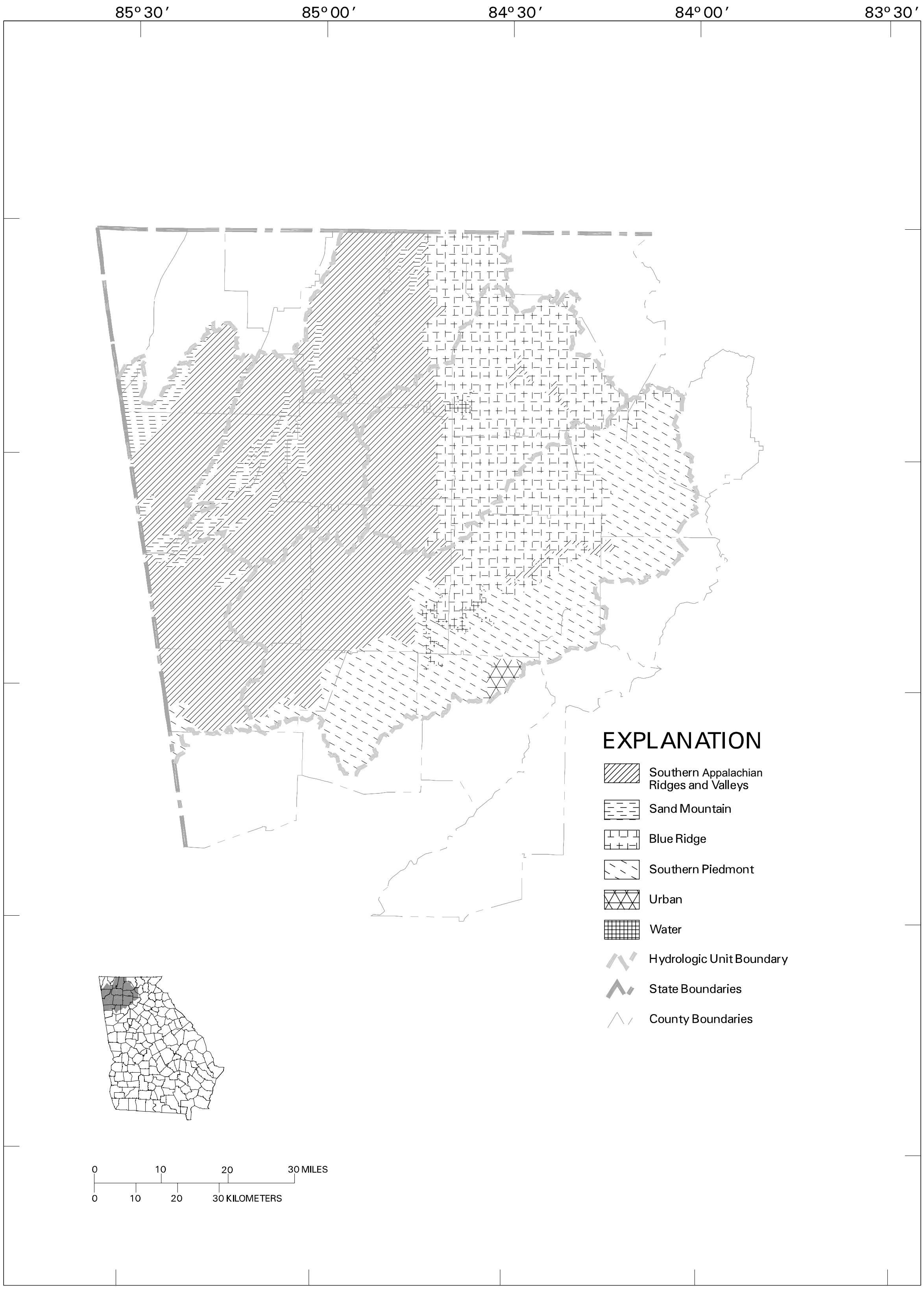

Figure 2-3. Major Land Resource Areas in the Coosa River Basin

clayey to loamy, with varying amounts of rock fragments. Most of the soils have silt loam or gravelly silt loam surface textures. Soils developed on the cherty limestone ridges are primarily very deep and have loamy subsoils with various amount of chert. Soil on the shale ridges normally have clayey subsoils, and vary in content of shale fragments in the soil and in depth to soft shale bedrock. Limestone valleys generally have soils with heavy clay subsoils and are moderately deep over limestone. Flood plains and stream terraces are significant landforms in the regions. Soils on these landforms are very deep, and are dominantly well drained or moderately well drained.

The Blue Ridge portion of the basin is underlain primarily by mica schist, gneiss, quartzite, slate, and conglomerate. Most soils are steep or very steep. Dominant soils have a fine sandy loam or cobbly sandy loam surface layer and a yellowish red loamy subsoil over soft mica schist and phyllite at shallow depths.

The Southern Piedmont portion of the basin is underlain primly by mica schist, biotite, gneiss, and quartzite. Dominant soils have fine sandy loam surface layers and deep red clayey subsoils.

A small portion of the Coosa basin falls within the Sand Mountain MLRA. Soils in this area have fine sandy loam surface textures and loamy subsoils. Soils on the less sloping ridgetops are generally moderately deep. Steeper soils on the side slopes are shallow over sandstone bedrock, and have various amounts of stones and boulders on the surface.

2.1.4 Surface Water Resources

The Coosa River basin contains several major rivers, as well as man-made reservoirs. The Coosa River itself is formed by the confluence of the Oostanuaula and Etowah Rivers near Rome, Georgia. The Oostanuala River in turn is formed by the confluence of the Conasauga and Coosawatee Rivers. The basin also contains the Chattooga River, which joins the Coosa River in Alabama. Each of these rivers is described below. As discussed in Section 2.1.1, the Coosa River basin is subdivided into five Hydrologic Units (HUCs). Stream networks within the Georgia portions of each of these HUCs are shown in Figures 2-4 through 2-8.

Conasauga River

The Conasauga River flows in a northerly direction for about 13 miles from its beginning near Blue Ridge, Georgia. It then flows in a westerly direction 13 miles where it bends, after emerging from the mountains, and flows in a southerly direction for 62 miles. There it joins the Coosawattee River near Resaca, Georgia, and forms the Oostanaula River.

The Conasauga River drains an area of 727 square miles. About 127 square miles are in Tennessee and the remaining area is in Georgia. It has a channel 50 to 150 feet wide with banks 10 feet high along the flood plain. From its source, the river falls at a rate of about 35.5 feet per mile for 41 miles through the mountains. Then it descends at a more gradual slope of about 3 feet per mile for 47 miles to its mouth. Bankfull capacity (the amount of flow the river can carry without overflowing its banks) at Tennga, Georgia is approximately 700 cfs in the upper reaches of the stream. At Tilton, Georgia, bankfull capacity is approximately 4,700 cfs. The largest tributaries are Coahulla Creek with a drainage area of 178 square miles and Jacks River which drains 88 square miles.

Coosawattee River

The Cartecay and Ellijay Rivers form the Coosawattee River at Ellijay, Georgia. It drains an area of 865 square miles. It flows 48 miles from its source, in a generally

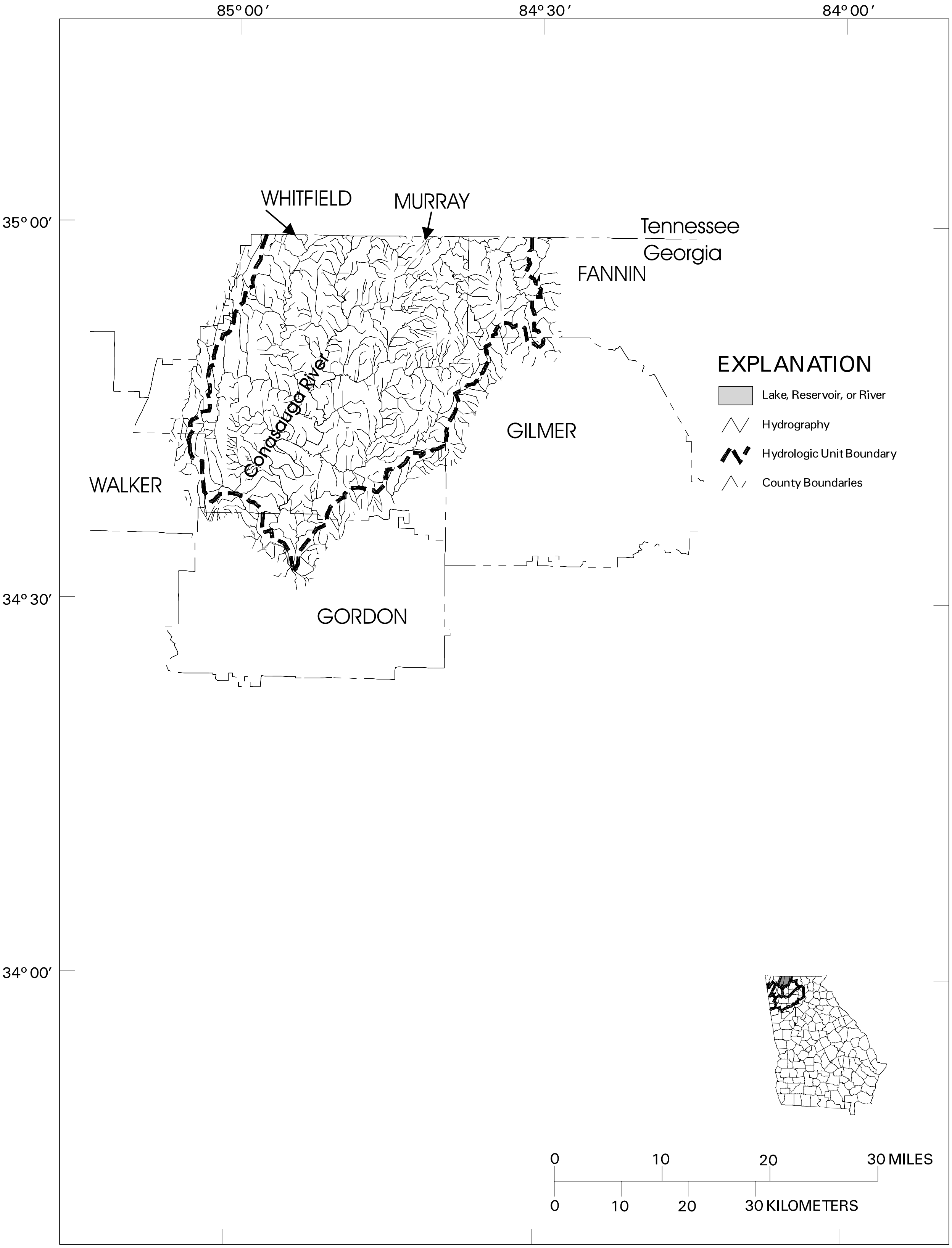

Figure 2-4. Hydrography, Coosa River Basin, HUC 03150101 (Conasauga River Basin)

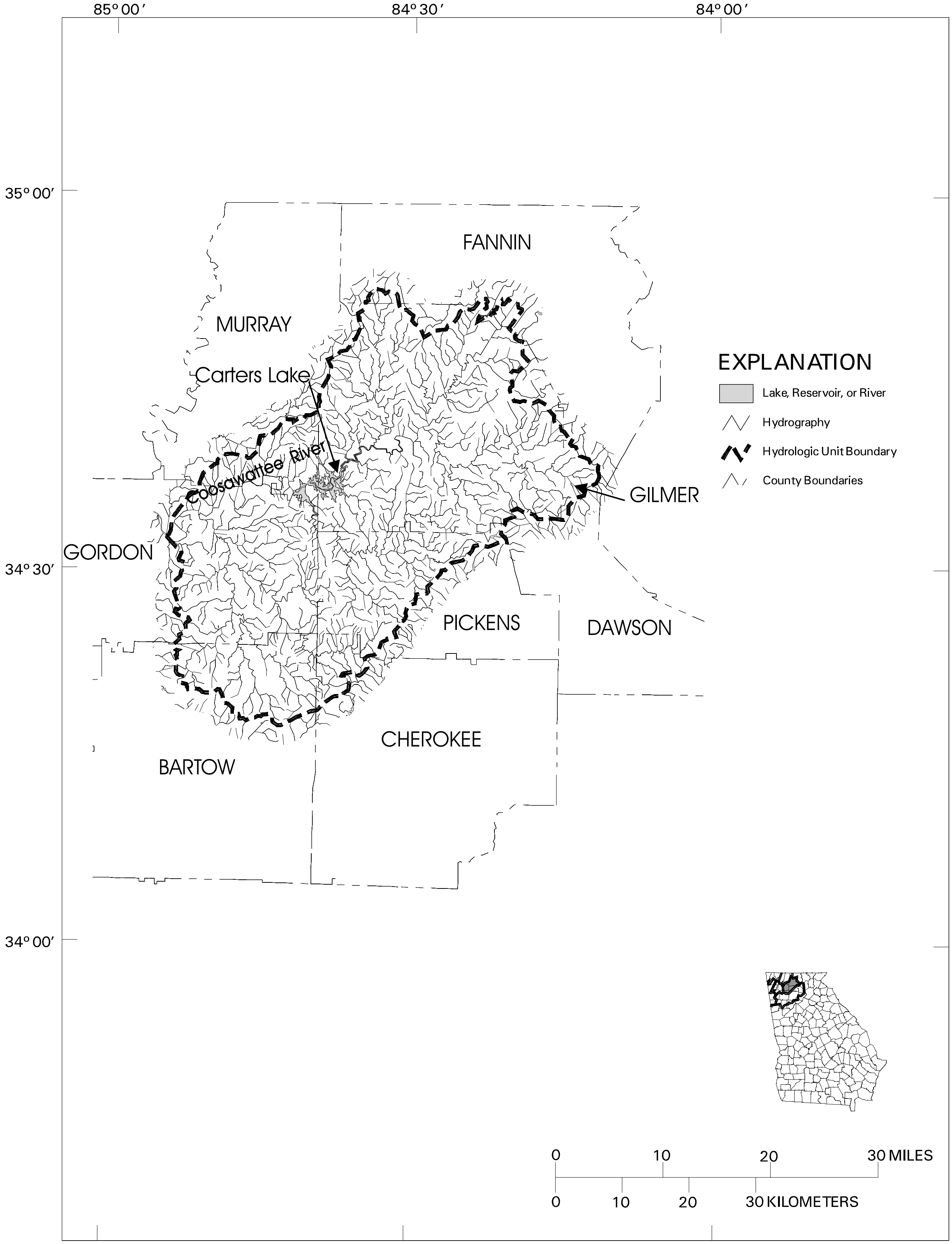

Figure 2-5. Hydrography, Coosa River Basin, HUC 03150102 (Coosawattee River Basin)

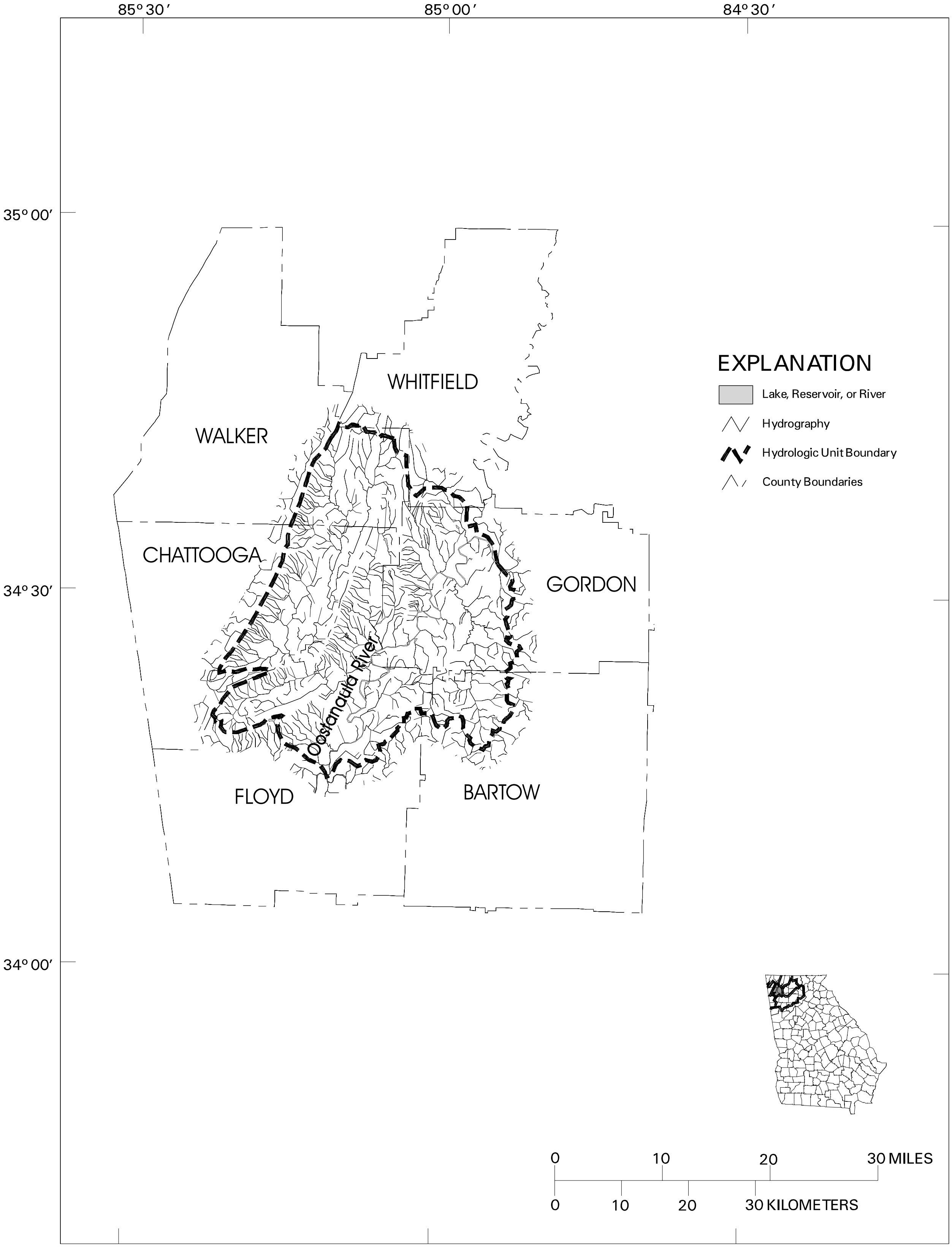

Figure 2-6. Hydrography, Coosa River Basin, HUC 03150103 (Oostanaula River Basin)

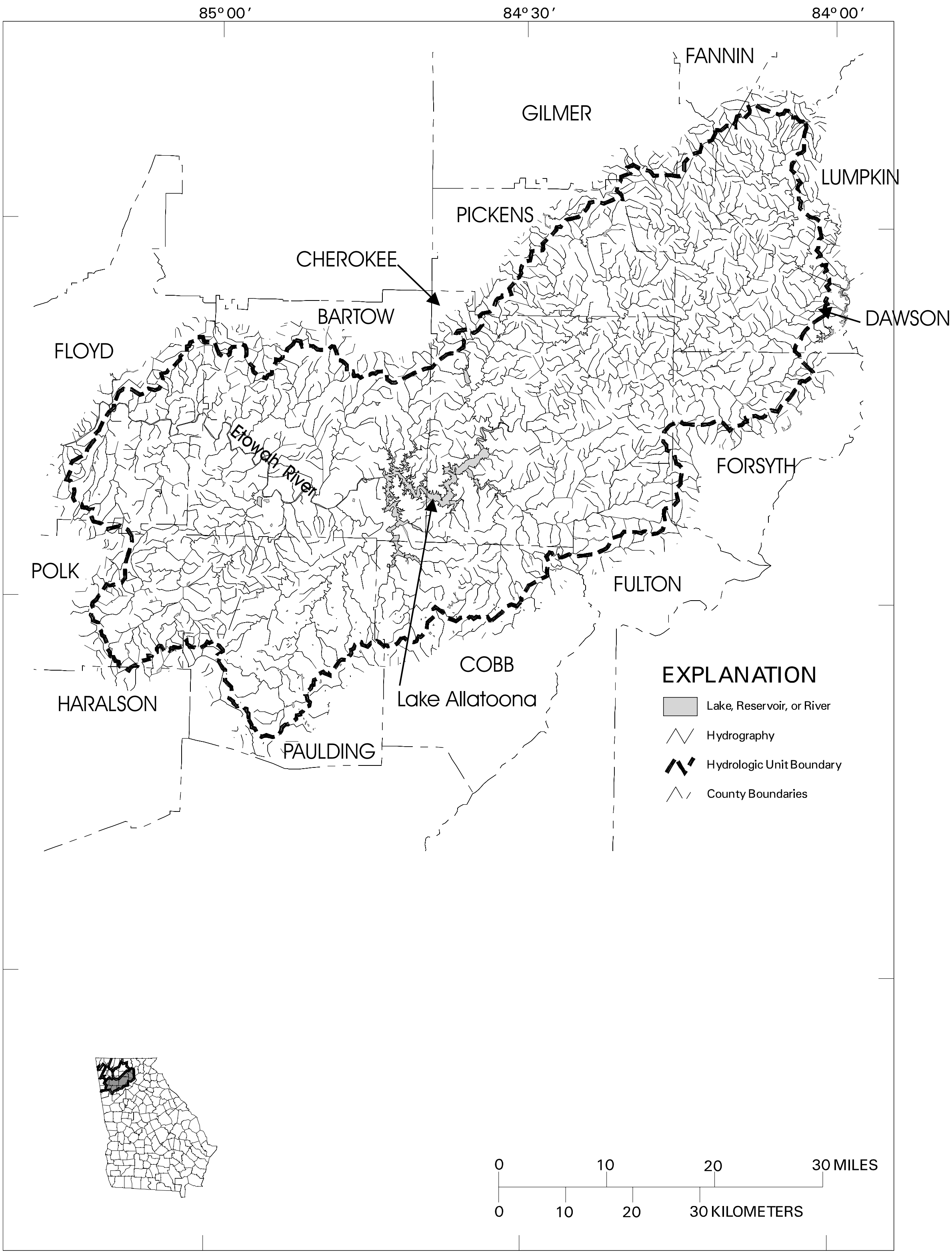

Figure 2-7. Hydrography, Coosa River Basin, HUC 03150104 (Etowah River Basin)

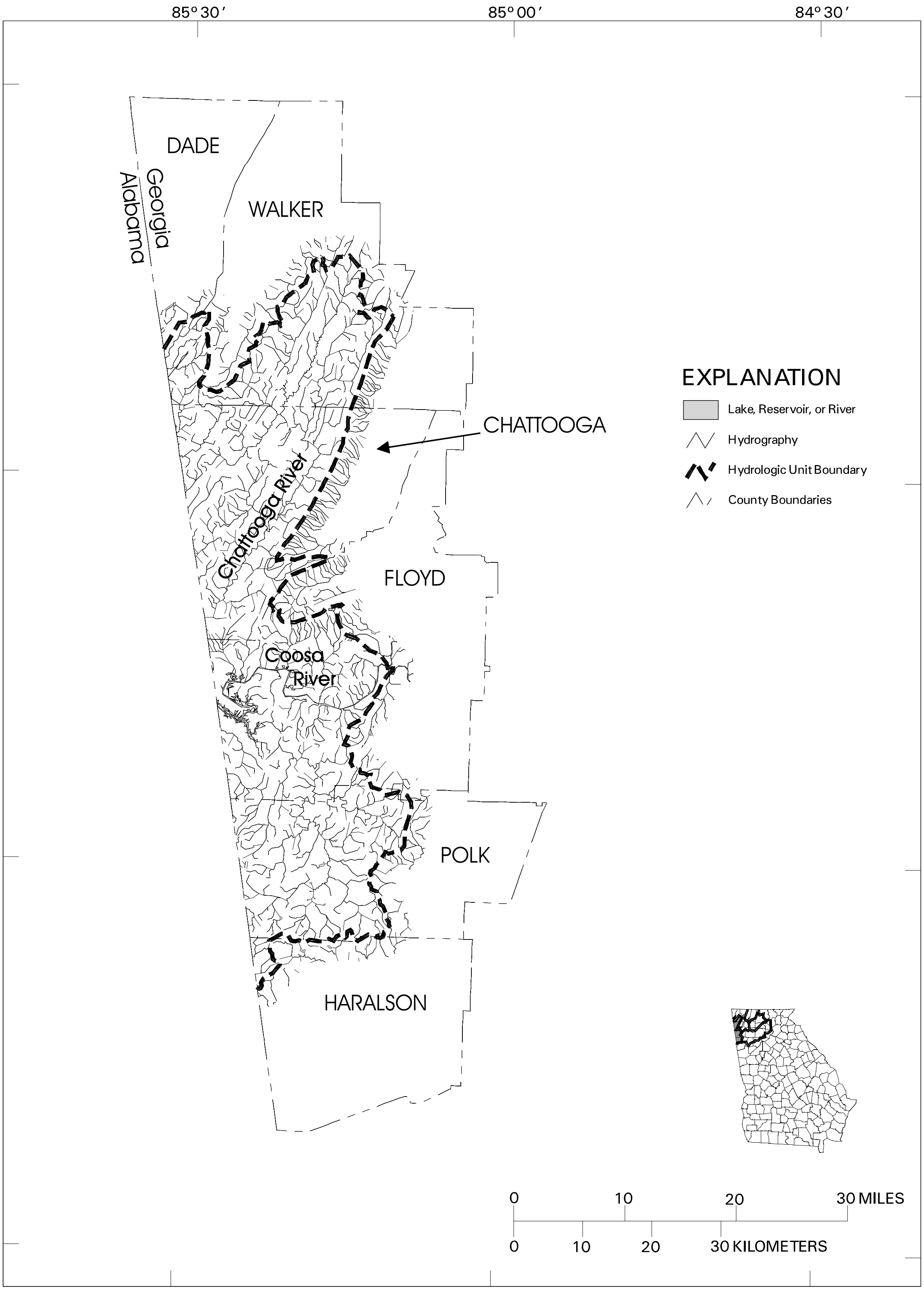

Figure 2-8. Hydrography, Coosa River Basin, HUC 03150105 (Coosa below Rome and Chattooga River Basin)

westward direction, to its juncture with the Conasauga River. The Coosawattee begins its descent at a relatively moderate rate of about 10 feet per mile for two miles. Then it drops 552 feet in the next 19 miles to the escarpment of the mountains, for an average fall of 29 feet per mile. In the lower 27 miles below the mountains to its mouth, the river has a total fall of 50 feet or an average of nearly two feet per mile. The channel, which varies in width from 120 to 150 feet, has banks that are 10 feet high in areas subject to flooding. Near the source of the river at Ellijay, bankfull capacity is approximately 3,500 cfs. Bankfull capacity is approximately 5,000 cfs at Pine Chapel, Georgia, about seven miles above the mouth. Carters Dam is on this stream, 26.8 miles above its mouth. The Carters project has an operating head of about 392 feet. The Carters Reregulation Dam is a short distance downstream, and is designed to moderate the impact of power-generation releases. Sallacoa Creek, with a drainage of 241 square miles, is the largest stream contributing to the Coosawattee River. The headwater streams, Cartecay and Ellijay Rivers, drain areas of 136 and 92 square miles, respectively.

Oostanaula River

The Oostanaula River flows in a southerly direction from its source at the juncture of the Conasauga and Coosawattee Rivers for 47 miles to join the Etowah River at Rome. The Oostanaula basin has an area of 2,150 square miles all of which, except for 140 square miles of the Conasauga River area, are in Georgia. The Oostanaula River has an average width of about 200 feet and banks 15 to 20 feet high. The slope of the river is relatively flat with a fall averaging about one foot per mile. Bankfull capacity at Resaca is approximately 10,000 cfs and is approximately 12,000 cfs at Rome. The largest tributary entering below the Conasauga and Coosawattee Rivers is Armuchee Creek that drains an area of 225 square miles.

Etowah River

The Etowah River begins in the Blue Ridge Mountains near Dahlonega, Georgia, and flows about 150 miles in a southwesterly direction to its confluence with the Oostanaula River at Rome. The basin drains an area of 1,860 square miles in Georgia. The Allatoona Dam is on this river, located about 48 miles above its mouth near Cartersville, Georgia. The Allatoona project has an operating head of about 150 feet. Portions of a small privately owned dam (Thompson and Weinman Dam) remain about four miles downstream from Allatoona Dam. This structure is maintained in accordance to agreements made with the Corps of Engineers and has no effect on streamflow. The river, with banks 25 feet high along the flood plain, varies in width from 100 to 300 feet. From its source, the Etowah River falls at a rate of about 45 feet per mile to the vicinity of Dawsonville. Then it falls 4.5 feet per mile for the next 43 miles to the reservoir of Allatoona Dam. It has an average fall of 3.2 feet per mile in the 48-mile-long reach from the dam to the mouth. Bankfull capacity is approximately 800 cfs at Dawsonville, approximately 3,500 cfs at Canton, approximately 9,200 cfs near Cartersville and approximately 10,000 cfs at Rome. The principal streams contributing to the Etowah River are the Little River of Georgia which drains a 210-square-mile area, and Euharlee, Pumpkinvine and Allatoona Creeks.

Coosa River

The Coosa River, from its beginning at the juncture of the Oostanaula and Etowah Rivers at Rome, flows in a westward direction for 30 miles into Alabama before flowing in a southerly direction past Gadsden and Childersburg, joining the Tallapoosa River just south of Wetumpka to form the Alabama River. For the upper reaches of the Coosa River from Rome to Gadsden bankfull flow capacity ranges from about 15,000 cfs to about 50,000 cfs. The total drainage area for the Coosa basin is 10,161 square miles.

Approximately 4,400 square miles are in Georgia and Tennessee with the remaining area in Alabama. The river from its source falls 420 feet in 267 miles in a series of six successive pools to Jordan Dam. The Coosa River channel, about 286 miles long, varies in width from 300 to 500 feet with banks 25 feet in height along the flood plain. The principal tributaries entering the Coosa River below Rome are: Chatooga River, Little River, and Cedar Creek, which flow into Weiss Lake; Big Wills, Terrapin, and Big Canoe Creeks, which flow into H. Neely Henry Lake; Choccolocco Creek, which flows into Logan Martin Lake; Yellowleaf and Waxahatchee Creeks, which flow into Lay Lake; and Weogufka and Hatchet Creeks, which flow into Mitchell Lake.

Flow rates for the Coosa River

The estimated mean annual discharge of the Coosa River at the Georgia-Alabama border is between 6,700 and 8,200 cfs, using values based on mean-annual stream discharge data collected at Coosa River near Rome, Georgia (USGS gage 02397000) and Coosa River at Leesburg, Alabama (USGS gage 02399500), respectively (Robinson et al. 1989). The majority of the flow from the Georgia portion of the Coosa River basin passes the Rome gage. Figure 2-9 displays trends in discharge at this station for 1975–1996 as boxplots. Each entry on the plot summarizes daily average flow measurements for a water year. (The water year is defined as running from October of the previous calendar year through September of the current year). The center horizontal line marks the median flow for the year, which is the 50th percentile or flow that is exceeded on half of the days in the year. The upper and lower edges of the box represent the 75th and 25th percentiles, respectively. The lines or "whiskers" extending from each box show the range of data, except that high values far above the median are shown as asterisks or circles. Median yearly flows show significant variability, ranging from 1,890 cfs in 1988 to 7,240 cfs in 1990 over the last 20 years. The maximum daily average flow observed between 1975 and 1996 was 64,200 cfs on March 18, 1990, while the minimum was 907 cfs on October 14, 1988. Measures of instantaneous peak flows at this station are available since 1897, with maximum peak flow reported of 70,200 cfs on 30 December, 1932 (prior to regulation of the basin). A flood peak of April 1, 1886 is estimated by USGS to have been in excess of 100,000 cfs.

Chattooga River

The Chattooga River, with a total drainage area of the 675 square miles, drains portions of Walker and Chattooga counties in Georgia before entering Lake Weiss in Alabama.

Reservoirs and Dams

Three dams are located within the Georgia portion of the Coosa River basin, while a fourth, the Weiss Dam in Alabama, has an impoundment which extends into Georgia (Figure 2-10, Table 2-2). Modern dam construction in the Coosa basin began in 1914 with the construction of Lay Dam by Alabama Power Company. By 1930 two additional dams had been constructed in Alabama to harness the natural power present at the Fall Line (where the Peidmont meets the Coastal Plain). Within Georgia, multi-purpose projects have been constructed to harness the power potential of headwater streams, beginning with Allatoona Dam, constructed by the Corps of Engineers in 1949 and followed by Carters Dam on the Coosawattee River in 1974. There is also a re-regulation dam below Carters Dam which captures water for pump back and moderates the impacts of hydropower generation flow. Total annual flow in the basin has not been appreciably altered by the system of dams., although storage is used to augment flows during periods of low flow; and daily fluctuations below some reservoirs can be dramatic.

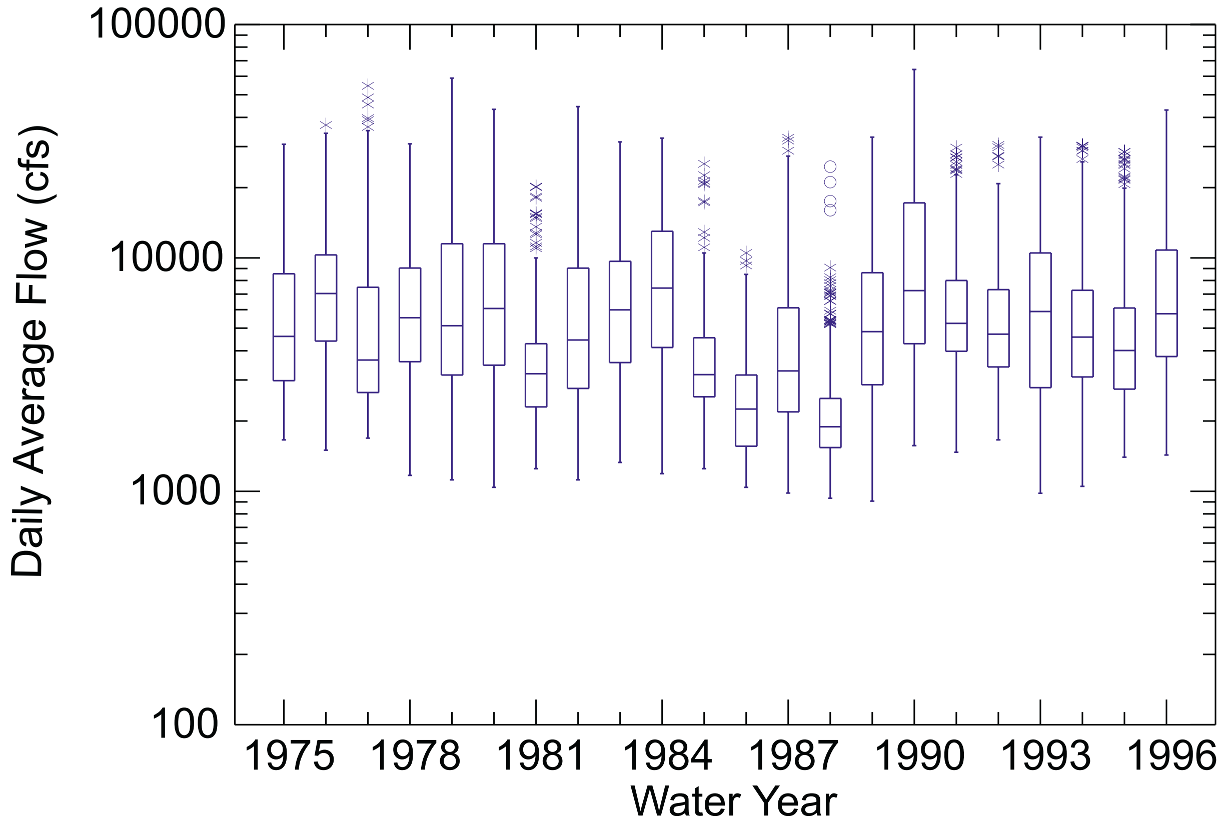

Figure 2-9. Mean Daily Discharge for the Coosa River at Rome (USGS Station 02397000)

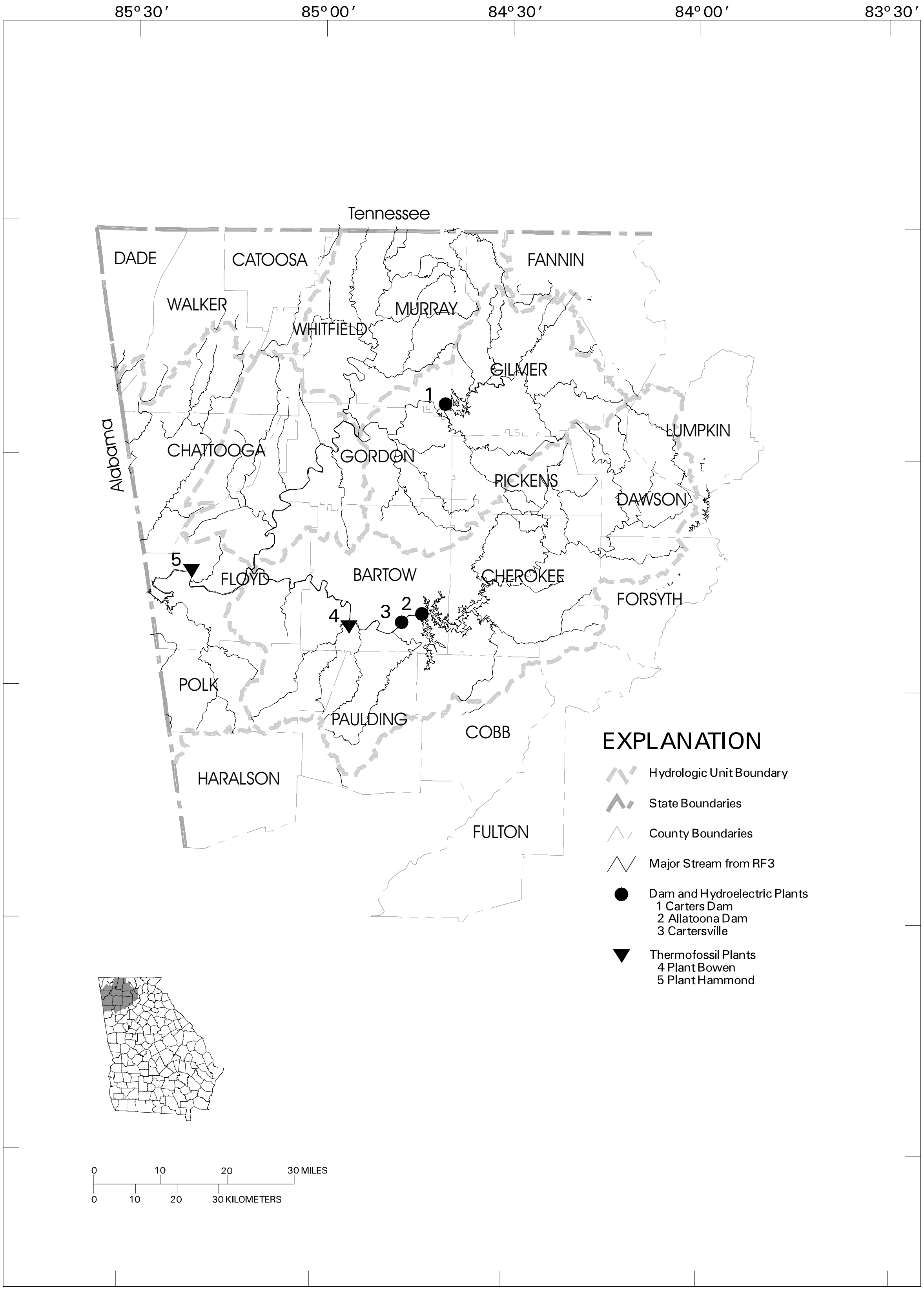

Figure 2-10. Location of Mainstem Dams and Power-Generating Plants in the Coosa River Basin

Table 2-2. Major Dams and Impoundments in the Georgia Portion of the Coosa River Basin

Project Name	Owner Year Initially Completed	Drainage Area (Sq. mi.)	Reservoir Size (Ac)	Reservoir Storage Volume (Ac-Ft)	Total Power Capacity (kW)	Normal Lake Elevation (ft)
Carters Lake and Dam	Corps of Engineers, 1974	376	3,220	383,565	125,000	1,074
Carters Reregulation Dam	Corps of Engineers, 1974	521		19,300	0	700
Allatoona Lake and Dam	Corps of Engineers, 1949	1,110	11,860	670,050	74,400	840
Weiss Lake and Dam	Alabama Power Company, 1961	5,270	30,200	360,400	135,000	564

The major dams and associated impoundments are shown in Table 2-2 and Figure 2-10. The following impoundments have a surface area greater than 500 acres and are considered major lakes:

Carter's Lake

Carters Dam near Redbud, Georgia is located at river mile 63.7 on the Coosawattee River, a tributary of the Oostanaula River in Murry County Georgia and impounds Carter's Lake. Construction was completed in November 1974. It is a storage project with normal operating head of 390 feet and a drainage area of 376 square miles.

Carters Re-regulation Dam near Redbud, Georgia is located at river mile 62.2 on the Coosawattee River, a tributary of the Oostanaula River in Murray County, Georgia. Construction was completed in November 1974. This project provides temporary storage for the generation water from the main dam before some of the discharge is pumped back to the main reservoir. Talking Rock Creek enters the lake adding a drainage area of 145 square miles between the main dam and the re-regulation dam.

Lake Allatoona

Allatoona Dam is located between Cartersville and Canton at river mile 47.8 on the Etowah River. Construction was completed in December 1949 and impounds Lake Allatoona. It is a storage project with normal operating head of 190 feet and a drainage area of 1,110 square miles.

Lake Weiss

Weiss Dam is located on the Coosa River at river mile 225.7 near Leesburg, Cherokee County, Alabama and impounds Lake Weiss. Construction was completed in July 1962. Lake Weiss is a storage project with normal operating head of 53 to 56 feet and a drainage area of 5,270 square miles.

2.1.5 Ground Water Resources

The geology of the Coosa River basin determines the ground water characteristics of the area. Three aquifer systems underlie the Coosa River basin: the Piedmont and Blue Ridge crystalline rock aquifers, the Valley and Ridge and Cumberland Plateau sandstone aquifers, and the Valley and Ridge and Cumberland Plateau carbonate aquifers. The crystalline rock and sandstone aquifers are fracture-conduit aquifers, while the carbonate aquifers are solution-conduit aquifers. Generalized outcrop areas of major aquifers for the Coosa River basin are shown in Figure 2-11. Ground-water yields from the crystalline rock aquifers tend to be low, but are significant in areas in the Coosa basin which are underlain by carbonate and fractured sandstone aquifers. Brief descriptions of the aquifer systems, adapted from Robinson et al. (1996), are presented below.

Crystalline rock aquifers

Crystalline rock aquifers of the Blue Ridge and Piedmont provinces occur as fracture-conduit aquifers in igneous and metamorphic rocks. Two general water-bearing zones comprise the groundwater flow system in fracture-conduit aquifers: (1) the shallow regolith, consisting of saprolite, soil, colluvium, and alluvium; and (2) the deeper, fractured bedrock. The soil and alluvium of the regolith has the characteristics of a porous-media aquifer, but generally grades downward into a highly weathered, clay-rich, relatively impermeable zone that overlies a less-weathered and more permeable transition zone (Heath,1989). Porosity of the regolith can range from 20 to 30 percent.

In fracture-conduit aquifers, nearly all ground-water movement is through fractured or broken rock and through openings between cleavage planes. Secondary porosity is created by faulting and fracturing and is enhanced by weathering along these openings. The bedrock below the weathered zone and beyond fractures typically has little or no porosity. Ground-water storage primarily is in the overlying weathered rock. The volume of water in storage is controlled by the porosity and thickness of the regolith, which is thicker in marble, schist, and gneiss, and in valleys (Kidd, 1989); to a lesser degree, the volume of water in storage is controlled by the amount of fracturing of the rock. Because of the limited storage in fractures, water levels in fracture-conduit aquifers respond rapidly to pumping and to seasonal changes in rainfall.

Within the crystalline rock aquifers well yields are variable, due to local and discontinuous properties, but water quality is generally good. Yields of 1 to 25 gallons per minute are typical of wells, but some wells in this aquifer system may exceed 500 gallons per minute yield.

Sandstone aquifers

Sandstone aquifers of the Valley and Ridge and Cumberland Plateau provinces also occur as fracture-conduit aquifers. These aquifers share many of the properties of the crystalline rock aquifers, with the volume of water in storage generally controlled by the porosity and thickness of the overlying weathered surfaces. Well yields range from 10 to 200 gallons per minute (Bossong, 1989). Fracture-conduit aquifers formed in shale, siltstone, and sandstone of the Valley and Ride and Cumberland Plateau provinces may yield quantities of water suitable for public or industrial supply. Most public water-supply wells in the sandstone aquifers of the Coosa basin yield less than 100 gallons per minute.

Carbonate aquifers

Carbonate aquifers of the Valley and Ridge and Cumberland Plateau provinces occur as solution conduits in well-cemented carbonate rocks. These carbonate rocks have little primary porosity or permeability. Secondary porosity features, such as solution-enlarged fractures and bedding planes, form a system of interconnected conduits through which water moves (Bossong, 1989). The weathered zone above many of the carbonate-rock

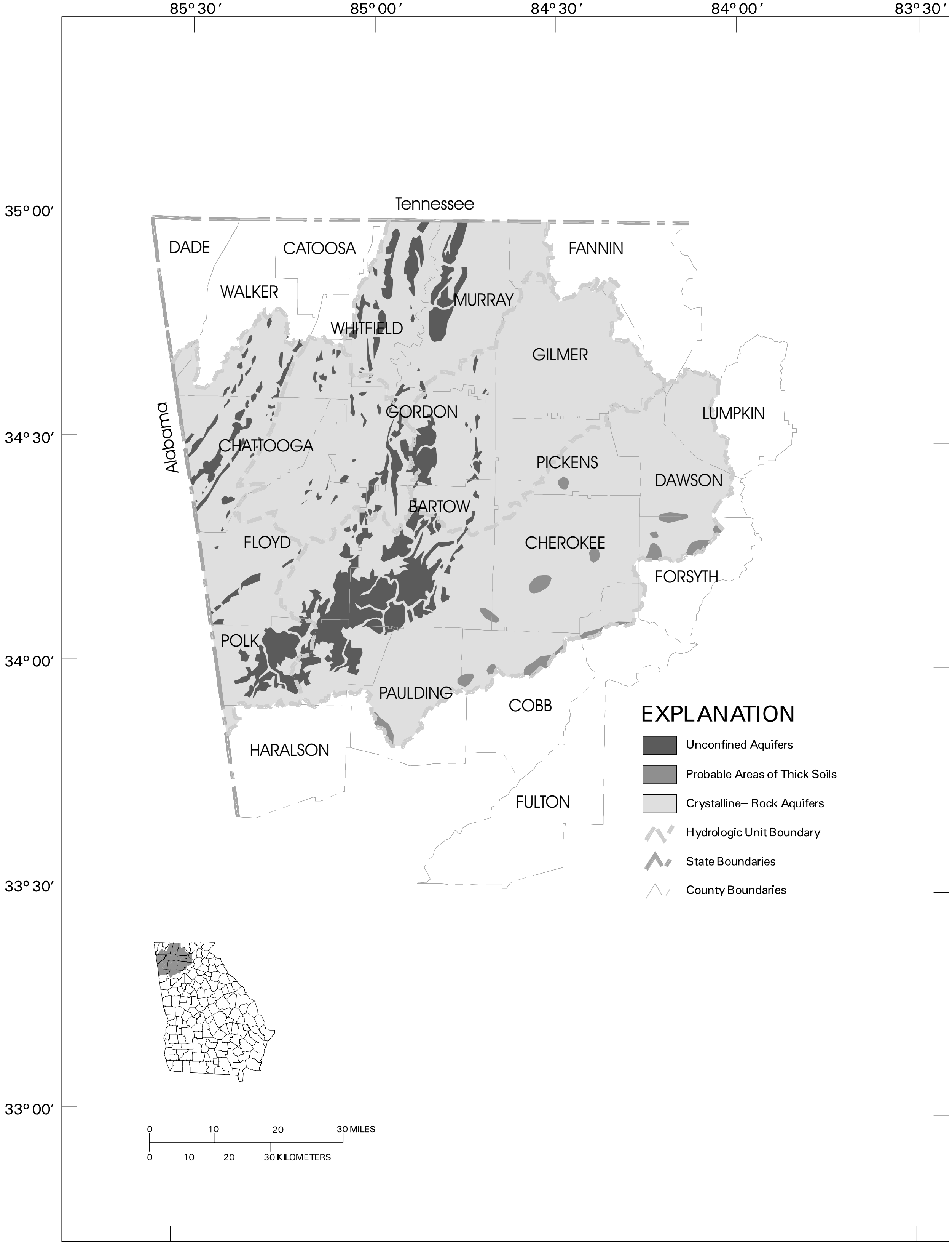

Figure 2-II. Hydrogeologic Units Underlying the Coosa River Basin

aquifers contains a layer of chert rubble that stores and transmits water slowly to the underlying aquifer. The carbonate-rock aquifers exhibit preferential flow directions (anisotropy) because of the local and discontinuous nature of water-bearing units in the bedrock.

The solution-conduit aquifers are widely used for public water supply, although the water may have high concentrations of calcium and bicarbonate. Wells completed in solution-conduit aquifers may supply several thousand gallons of water per minute. Wells that do not intercept secondary porosity zones will, however, seldom supply more that 10 gallons per minute or may be dry. Most public water-supply wells completed in solution-conduit aquifers in the Coosa Basin yield 350 to 700 gallons per minute (Bossong, 1989). As in any solution-conduit aquifer system, ground-water withdrawal and consequent water-level declines potentially induce sinkhole development. Because water can flow rapidly through large conduits, solution-conduit aquifers are also susceptible to contamination from land surface and surface water sources.

Ground Water/Surface Water Interactions

Ground water and surface water have important interactions in the Coosa River basin. Streamflow is composed of two major components: overland or surface runoff, and baseflow, representing ground-water discharge to the stream during dry periods. Robinson et al. (1996) estimate that mean annual baseflow river in the Coosa River and tributaries at the Georgia-Alabama state line is about 4,600 cfs, or about 58 to 64 percent of the mean annual stream discharge. During drought periods this contribution may be greatly reduced; the estimated baseflow discharge at the state line during the drought of 1941 was only 990 cfs. Analysis of Georgia stream gage records (Robinson et al., 1996) indicates that unit-area mean annual baseflow varies considerably, ranging from 1.46 cubic feet per second per square mile for the Etowah River at Canton, Georgia (USGS gage 02392000, with aquifers predominantly fracture-conduit type in igneous and metamorphic rock) to 0.775 cubic foot per second per square mile for Cedar Creek near Cedartown, Georgia (USGS gage 02397500, with aquifers predominantly solution-conduit type in carbonate rocks).

2.1.6 Biological Resources

The Coosa River basin supports a diverse and rich mix of terrestrial and aquatic habitats and is home to a number of federally and state-protected species. The basin encompasses parts of four major land resource areas, with a wide range of elevations and slopes, providing many different habitat types. Large portions of the basin are managed as part of the Chattahoochee National Forest, which includes a number of wilderness and wildlife management areas. Some of the most important biological resources of the basin are summarized below.

Terrestrial Habitats

The health of aquatic ecosystems is linked to the health of terrestrial ecosystems. All parts of the Coosa River basin have been subjected to varying degrees of forest-cover alteration. Small-scale disturbance of native forests began with American Indians who used fire to create fields for cultivation. Forest disturbance was greatly accelerated by European settlers who logged throughout the basin and extensively cleared land for agriculture in the Piedmont regions.

Prior to European settlement, the Coosa River basin was mostly forested. Historically, the Blue Ridge province was covered by oak-chestnut-hickory forests, with hemlock in moist coves and white pine in drier ridges. Chestnut was extirpated from these forests as a result of the Chestnut Blight. Native forests in the Piedmont province were dominantly deciduous hardwoods and mixed stands of pine and hardwoods.

Cumberland Plateau Region

The northwest part of the Coosa River basin includes the Cumberland Plateau region. Streamside forests in this region are often associated with deep gorges and steep slopes. Typical species of the slopes and ravines bordering streams in this region include *Quercus rubra, Q. prinus, Ostrya virginiana, Fagus grandifolia, Carya ovata, C. glabra, C. tomentosa, Celtis occidentalis, Platanus occidentalis, Carpinus caroliniana, Acer negundo, A. rubrum, Rhododendron arborescens, Kalmia latifolia, Ilex opaca, I. verticillata*, and *Asimina triloba*. Upland sag ponds and sinks occur on top of Lookout and Pigeon mountains, and provide habitat for interesting combinations of mesic and xeric species, such as *Quercus prinus, Nyssa sylvatica, Acer rubrum*, and *Salix nigra.* Bottomland forests of the Cumberland Plateau region are similar to those of the Blue Ridge region, but contain some hardwood species such as *Quercus phellos, Q. michauxii, Q. nigra*, and *Q. shumardii* which are absent from the Blue Ridge-Cohutta mountains. Species found in bottomland areas such as The Pocket at Pigeon Mountain include *Quercus alba, Q. velutina, Acer rubrum, A. saccharum, Aesculus octandra, Tilia heterophylla, Sassafras albidum, Carya ovata, C. glabra, Robinia pseudoacacia, Prunus serotina, Carpinus caroliniana, Fraxinus americana, Halesia carolina*, and *Cercis canadensis*.

Valley and Ridge Region

The Valley and Ridge (Great Appalachian Valley) region includes the Chickamauga Valley, Armuchee Ridges, and Great Valley districts. It is bounded on the east by the Cartersville Fault, and on the west by the Lookout-Pigeon Mountain escarpment. Bottomland forests in this area are associated with streams of the Alabama drainage, except for the upper part of the Chickamauga Valley, which drains into the Tennessee system. Typical species of these forests include *Quercus phellos, Aesculus octandra, Acer negundo, Ostrya virginiana, Fagus grandifolia, Carpinus caroliniana, Nyssa sylvatica, Ulmus rubra,* and *Prunus serotina.*

The Great Valley District represents a major portion of Georgia's section of the Coosa River floodplain, whose drainage system extends into the Coastal Plain of Alabama. This area represents a rather unique river/floodplain forest system with many Coastal Plain elements, including *Cornus stricta, Acer floridanum,* and *Carya aquatica* (Wharton, 1978). The Great Valley District also contains the highest concentration of sagponds in northwest Georgia. These fluctuating-water habitats are connected by dendritic drainage patterns during the wetter parts of the year. Sagponds contain many plants common to the Coastal Plain, including *Ilex glabra* and *Quercus laurifolia.* Trees and shrubs bordering sagponds may include *Acer rubrum, Quercus phellos, Q. falcata, Nyssa biflora, Lyonia lucida, Cephalanthus occidentalis, Cornus florida,* and *Itea virginica*.

Blue Ridge Region

The Blue Ridge habitat region includes the Cohutta and Blue Ridge mountain districts, and the McCaysville Basin District. The Talladega Upland and Sharp Top-Pine Log mountain regions (see Pehl and Brim, 1985), while physiographically and geologically related, are considered part of the Upper Piedmont region below.

Streams in this region comprise the headwaters of major alluvial rivers of the Piedmont. Blue Ridge streams are generally fast-moving and clear, with rocky substrates. These highly oxygenated waters are often fed by springs or seeps. Floodplains are generally narrow, and are bordered by *Kalmia latifolia, Rhododendron maximum, Tsuga canadensis, Acer rubrum, A. saccharum, Ostrya virginiana, Carpinus caroliniana, Pinus strobus,* and *Alnus serrulata.* Many of the wider floodplains have been cleared and planted.

Forests of the Blue Ridge mountain coves are similarly rich in species to those of the Cumberland Plateau, but harbor several more montane trees such as *Magnolia fraseri, Betula lenta, B. lutea,* and *Tsuga canadensis.* Common species shared with the Cumberland Plateau lower slope forests include *Aesculus octandra, Tilia heterophylla, Liriodendron tulipifera, Magnolia acuminata, Magnolia tripetala, Carya cordiformis, C. tomentosa, C. glabra, Quercus rubra, O. alba, Acer rubrum, A. negundo, A. saccharum, A. saccharinum, Platanus occidentalis, Salix nigra, Carpinus caroliniana, Ostrya virginiana,* and *Liquidambar styraciflua.*

Upper Piedmont Region

The Upper Piedmont region comprises the hilly upland portion of the Piedmont. Streams in this region drain primarily into the Etowah, Tallapoosa, Tugaloo, and upper Chattahoochee rivers. Valleys of this region are intermediate in breadth between the Blue Ridge and the lower Piedmont. Flooding occurs less frequently here than in the lower Piedmont, in part because the headwaters of these streams lie in the mountains, with deep humus soils and abundant vegetation. Floodplains are generally narrower and steeper than in the lower Piedmont, and valley forests contain a greater number of northern biotic elements, such as *Quercus rubra, Q. alba, Juglans nigra, Asimina triloba. Magnolia tripetala,* and *Lindera benzoin.*

Wetland Habitats

Wetlands are lands transitional between terrestrial and deep-water habitats where the water table is at or near land surface or the land is covered by shallow water (Cowardin *et al.*, 1979). Most wetlands in the Coosa River basin are forested wetlands located in floodplains of streams and rivers. Forested-floodplain wetlands are maintained by the natural flooding regime of rivers and streams, and in turn, influence the water and habitat quality of riverain ecosystems.

Assessments of wetland resources in Georgia have been carried out with varying degrees of success by the Natural Resources Conservation Service (NRCS), the U.S. Fish and Wildlife Service National Wetland Inventory, and Georgia's Department of Natural Resources. Georgia DNR compiled a wetlands mapping database in 1991 which is based on classification of Landsat Thematic Mapper (TM) satellite imagery taken during 1988-1990. Total wetland acreage based on landsat TM imagery is 8572 acres or 0.3 percent of land area in the Coosa River basin. These data may underestimate the acreage of forested wetlands, where considerable acreage may have been classified as hardwood or mixed forest.

Aquatic Fauna

This section focuses on aquatic or wetland species including fishes, amphibians, aquatic reptiles, and aquatic invertebrates. However, the Coosa River basin is rich in many other fauna that rely on the water resources of the basin, including many species of breeding birds and mammals. Although a description of these bird and mammal species is beyond the scope of this report, the water needs of these species, such as bald eagles, fish-eating mammals, and migratory water fowl, should be considered in water-resource planning and management.

According to Burkhead et al. (1997) the Coosa River and its major tributaries may have had more recent extirpations and extinctions of aquatic organisms than any other equally-sized river system in the United States. They estimate that the Etowah River has more imperiled fishes and invertebrates than any other river system of similar length in the southeastern United States, and that the Conasauga River has the second highest number of such imperiled species. According to Neves et al. (1997), 26 of 82 species of aquatic gastropods (snails) historically known from the Coosa River Basin are now considered extinct (a 63 percent decline in species diversity).

Fish Fauna

The diverse fish fauna of the Coosa River basin includes 87 species representing 17 families. The largest group of fish species found in the Coosa Basin are in the minnow family Cyprinidae. Minnows are small fish that can be seen darting around in streams that are only a few feet wide. Other families with large numbers of species are the sunfish and bass family, the catfish family, and the sucker family. Species that have the largest numbers of individuals living in streams typically are minnows and suckers. These species are often not well known because unlike sunfish, bass, and catfish, people do not fish for them, although certain minnows may be used as bait. Minnows have an important role in the aquatic food chain as prey for larger fish, snakes, turtles and wading birds such as herons. Suckers can grow to more than one foot long and are named for their down-turned mouth that they use to "vacuum" food from stream bottoms. Although suckers are not popular game fish, they are ecologically important because they often account for the largest fish biomass in streams.

Fisheries. There are several lakes within the Coosa River basin that provide excellent habitat for various freshwater fisheries. The Wildlife Resources Division manages Rocky Mountain Public Fishing Area, with 202 and 357 acre lakes in Floyd County. The lakes offer excellent fishing for largemouth bass, bluegill, redear sunfish, channel catfish, black crappie, and hybrid bass.

Carters Lake is a U.S. Army Corps of Engineers reservoir on the Coosawattee River in Murray and Gilmer counties. Impounded in 1975, this oligotrophic mountain reservoir is the deepest in Georgia. The lake has good fisheries for walleye, striped bass, spotted bass, largemouth bass, crappie, and channel catfish.

Lake Allatoona is another U.S. Army Corps of Engineers reservoir on the Etowah River in Bartow, Cherokee and Cobb counties. Impounded in 1949, this 11,860 acre reservoir just north of Atlanta receives heavy recreational use. The lake has good fisheries for crappie, largemouth bass, striped bass, white bass, hybrid bass, channel catfish and flathead catfish.

Below Carters Reservoir, the Coosawattee flows unimpeded for approximately 50 miles to its confluence with the Etowah River. The Etowah, downstream of Lake Allatoona, flows approximately 30 miles to its confluence with the Coosawattee. Together the two rivers form the Coosa River. A significant recreational river fishery exists in the Coosa River. The river has good fisheries for white bass, striped bass, largemouth bass, black crappie, blue, channel, and flathead catfishes, and various sunfish species. The landlocked striped bass population in this section of the Coosa River is unique as it is one of the few in the United States that are naturally reproducing.

Thirteen fish species occurring within the Coosa River basin (as well as a myotis bat) have been listed for protection by Federal or State agencies as endangered, threatened, or rare (Table 2-3). The majority of these species occur in HUC 03150101 (Conasauga drainage) or 03150104 (Etowah).

Amphibians and Reptiles

Twenty-eight documented species of amphibians (14 salamanders and 14 frogs) inhabit the Coosa River basin that require freshwater for all or part of their life cycle (Williamson and Moulis, 1994). Four additional salamanders, the slimy salamander

Table 2-3. Federal and State Protected Aquatic and Wetland Species in the Coosa River Basin

Common Name	Species	Federal Status	State Status	Ranking	Occurrence by HUC				
						03150102	03150103	03150104	03150105
Vertebrate Animals									
Gray Myotis Bat	*Myotis grisescens*	LE	E	Globally imperiled or rare; critically imperiled in state because of extreme rarity.			✔	✔	
Alabama Map Turtle	*Graptemys pulchra*		R	Apparently secure in state.	✔				
Blue Shiner	*Cyprinella caerulea*	LT	E	Globally imperiled because of rarity; imperiled or critically imperiled in state.	✔	✔			
Bluestripe Shiner	*Cyprinella callitaenia*		T	Globally imperiled; critically imperiled in state because of extreme rarity.				✔	
Holiday (Ellijay) Darter	*Etheostoma brevirostrum*		T	Globally imperiled because of rarity; imperiled or critically imperiled in state.	✔	✔		✔	
Coldwater Darter	*Etheostoma ditrema*		T	Imperiled in state because of rarity.	✔				✔
Etowah Darter	*Etheostoma etowahae*	LE	T	Critically imperiled in state because of extreme rarity.				✔	
Cherokee Darter	*Etheostoma scotti*	LT	T	Globally imperiled; imperiled or critically imperiled in state.		✔		✔	
Trispot Darter	*Etheostoma trisella*		T	Imperiled in state because of rarity.	✔	✔	✔		
Bigeye Chub	*Hybopsis amblops*		R	Demonstrably secure in state.	✔			✔	
River Redhorse	*Moxostoma carinatum*		R	Apparently secure in state.	✔				
Frecklebelly Madtom	*Noturus munitus*		E	Rare or uncommon in state.	✔			✔	

Common Name	Species	Federal Status	State Status	Ranking	Occurrence by HUC				
						03150102	03150103	03150104	03150105
Freckled Madtom	*Noturus nocturnus*		E	Globally secure; of historical occurrence in state, not verified in last 20 years.				✔	
Amber Darter	*Percina antesella*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity	✔			✔	
Goldline Darter	*Percina aurolineata*	LT	T	Globally imperiled; critically imperiled in state because of extreme rarity.		✔			
Conasauga Logperch	*Percina jenkinsi*	LE	E	Critically imperiled globally and in state because of extreme rarity	✔				
Freckled Dater	*Percina lenticula*		E	Globally imperiled; critically imperiled in state because of extreme rarity.	✔			✔	
Invertebrate Animals									
Upland Combshell	*Epioblasma metastriata*	LE	E	Globally of historical occurrence; critically endangered in state because of extreme rarity; taxonomy uncertain.	✔				✔
Southern Acornshell	*Epioblasma othcaloogensis*	LE	E	Globally of historical occurrence; critically endangered in state because of extreme rarity, taxonomy uncertain.	✔		✔		✔
Southern Combshell	*Epioblasma penita*	LE		Critically imperiled globally and within state because of extreme rarity.					✔
Fine-lined Pocketbook	*Lampsilis altilis*	LT	T	Thought to be imperiled in state because of rarity.	✔				✔
Alabama Moccasinshell	*Medionidus acutissimus*	LT	T	Critically imperiled globally and in state because of extreme rarity.	✔		✔		✔
Coosa Moccasinshell	*Medionidus parvulus*	LE	E	Imperiled or critically imperiled globally; critically imperiled in state because of extreme rarity.	✔				✔

Common Name	Species	Federal Status	State Status	Ranking	Occurrence by HUC	03150102	03150103	03150104	03150105
Gulf Moccasinshell	*Medionidus penicillatus*	PE		Imperiled globally and in state because of rarity.	✔				
Southern Clubshell	*Pleurobema decisum*	LE	E	Globally imperiled or critically imperiled; of historical occurrence in the state.	✔	✔	✔		
Southern Pigtoe	*Pleurobema georgianum*	LE	E	Critically imperiled globally and in state because of extreme rarity.	✔		✔		✔
Ovate Clubshell	*Pleurobema perovatum*	LE	E	Globally critically imperiled because of extreme rarity; of historical occurrence in state.	✔				
Triangular Kidneyshell	*Ptychobranchus greenii*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity.	✔				✔
Plants									
Fraser Loosestrife	*Lysimachia fraseri*		R	Globally imperiled or rare; critically imperiled in state because of extreme rarity.					✔
Coosa Barbara Buttons	*Marshallia mohrii*	LT	T	Globally rare or uncommon; critically imperiled in state because of extreme rarity.					✔
Monkeyface Orchid	*Platanthera integrilabia*		T	Globally imperiled; imperiled or critically imperiled within state.				✔	
Little River Water-Plantain	*Sagittaria secundifolia*	LT	T	Critically imperiled globally and within state because of extreme rarity.					✔
Green Pitcherplant	*Sarracenia oreophila*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity.		✔			
Tennessee Yellow-eyed Grass	*Xyris tennesseensis*	LE	E	Critically imperiled globally and in state because of extreme rarity.	✔	✔		✔	✔

E: Endangered   T: Threatened   R: Rare   L: Listed   P: Proposed

(*Plethodon glutinosus)*, southern red-back salamander (*P. serratus*), Webster's salamander (*P. websteri*), and seepage salamander (*Desmognathus aeneus*), that omit an aquatic life-stage are nevertheless strongly associated with riparian zones of the Coosa River basin and others. Further, five undocumented amphibians, the wood frog (*Rana sylvatica*), green salamander (*Aneides aeneus*), flatwoods salamander (*Ambystoma talpoideum*, mud salamander (*Pseudotriton montanus*), and Alabama waterdog (*Necturus alabamensis*), are quite likely to inhabit this region either due to their occurrence in the adjacent Alabama portions of the Coosa drainage (Mount, 1975) or because they are not considered evolutionarily specific to the Coosa and occur in other nearby drainage basins of Georgia (Jensen, 1996). Of these 37 amphibian species, nine (*Aneides aeneus, Desmognathus aeneus, Eurycea longicauda, E. lucifuga, Hemidactylium scutatum, Necturus alabamensis, Plethodon websteri, Pseudotriton montanus,* and *Rana sylvatica*) are considered of "Special Concern" by the Georgia Natural Heritage Program. *Aneides aeneus* is state listed/protected as "Rare" in Georgia. Additionally, *Eurycea aquatica*, although of questionable validity as a separate species from the southern two-lined salamander (*E. cirrigera*), is nearly endemic to the Coosa River basin and is considered globally imperiled by The Nature Conservancy.

Ten turtle and five snake species comprise the documented reptiles strongly associated with freshwater habitats (Williamson and Moulis, 1994) of the Coosa River basin and others. Two map turtles, the common map turtle (*Graptemys geographica*) and Alabama map turtle (*G. pulchra*), are currently known from nowhere else in Georgia and are therefore state listed/protected as "Rare". Among other things, these two turtles are threatened by the reduction of their molluscan prey resulting from sedimentation and other stream perturbations.

This region of Georgia is unusually rich in both flora and fauna typically associated with the Coastal Plain (Wharton, 1978; Jensen, pers. obs.). Amphibians and reptiles that fit this description include the barking tree frog (*Hyla gratiosa*), flatwoods salamander (*Ambystoma talpoideum*), and cottonmouth (*Agkistrodon piscivorus*).

Aquatic Macroinvertebrate Fauna

Freshwater mussels provide natural filtration systems that help keep water clean and clear. The southeastern United States is the global epicenter of freshwater molluscan diversity (Burch 1973) and the status of riverain freshwater mussels may be one of the most critical conservation problems in the region (Williams *et al.* 1992; Neves *et al.* 1997). Nearly three-fourths of the southeastern freshwater mussel fauna is federally listed or has candidate species status (Williams *et al.* 1992). At least 21 southeastern mussel species have gone extinct in relatively recent times (Neves *et al.* 1997). Tennessee and Alabama historically contain the most diverse mussel fauna but Georgia, with 98 species in the family Unionidae, has the fourth most diverse mussel fauna of the 50 states (Neves *et al.* 1997). Eleven species of freshwater molluscs native to the Coosa basin are currently listed or proposed for listing as endangered or threatened (Table 2-3).

Several factors have contributed to the decline of freshwater mussels, including their own complicated life-history strategy and the many impacts on riverain habitat. Mussels have a parasitic larval stage that generally require specific fish hosts (Watters 1994).

Thus, mussel populations can be impacted either directly through habitat degradation or indirectly through impacts on species of fish that serve as hosts. Modification of river channels for shipping, sedimentation from improper land use or inadequate erosion control, and non-point source pollution are the factors most responsible for mussel population declines (Williams *et al.* 1992; Neves *et al.* 1997).

The Nature Conservancy and the U.S. Fish and Wildlife Service are working with other stakeholders to identify ways to protect habitat and improve water quality in the

Conasauga River. Plans are being developed for propagation and reintroduction of endangered and threatened mussels in selected reaches.

Hobbs (1981) lists 15 crayfish species, representing three genera, that occur in the Coosa basin. All four of the ecological groups discussed by Hobbs (stream dwellers, lake pond and ditch inhabitants, the burrowers, and the cave dwellers) are found in the basin.

Aquatic and Wetland Vegetation

Although the Coosa River basin supports a diverse population of upland plants, wetland areas are limited, while lakes and ponds occur only as a result of human activities. The Georgia Natural Heritage Program has identified six "Special Concern" wetland or aquatic plant species occurring in the Coosa River basin that are rare, threatened, or endangered (Table 2-3).

2.2 Population and Land Use

2.2.1 Population

As of 1995 more than 606,000 people lived in the Georgia portion of the Coosa River basin, with more than 26 percent of that population in the two counties of Cherokee and Paulding, bordering the Atlanta metropolitan area (DRI/McGraw-Hill, 1996). Population centers in the Coosa watershed outside the Metropolitan Atlanta area include Rome and Dalton. Population distribution in the basin at the time of the 1990 Census by Census blocks is shown in Figure 2-12. A summary of 1990 population estimates for the Coosa Basin by HUC units based on census tract/block centroids (EPA Geographic Information Query System) for Georgia, Alabama, and Tennessee is shown in Table 2-4.

Between 1975 and 1995, the population in the Coosa River basin increased at a rate of 2.7 percent per year. Although past growth has been strong, a heavy dependence on declining industrial sectors is expected to temper growth in the long term (DRI/McGraw-Hill, 1996). Basin population is projected to increase at a rate of 0.8 percent per year between 1995 and 2050. The largest increases in population are projected for Cherokee, Dawson, Paulding and Pickens Counties, along the southeast edge of the basin in HUC 03150104 (Etowah River basin). The predominantly rural counties in the northern part of Figure 2-12 the basin are projected to have stable or slightly declining populations by this study (DRI/McGraw-Hill, 1996), although the predictions have been questioned by local governments in the area.

2.2.2 Employment

The Georgia portion of the Coosa River basin supported 209,000 jobs in 1990, of which nearly 40 percent were in manufacturing. This market share is expected to shrink dramatically in coming years, and by 2050 manufacturing is expected to account for 12 percent of all jobs in the basin (DRI/McGraw-Hill, 1996). Every manufacturing sector is expected to suffer heavy losses. Between 1990 and 2050, jobs in the dominant textiles sector are predicted to fall at an annual rate of 3.0 percent, eliminating 40,000 of today's 48,000 jobs. Following textiles, the greatest losses are expected to be in durables, which will shrink to half of today's 15,000 jobs. Despite job loss, industrial output is expected to see strong growth due to increasing productivity. Strong job growth is expected in the areas of financial institutions and real estate, services, and government (DRI/McGraw-Hill, 1996).

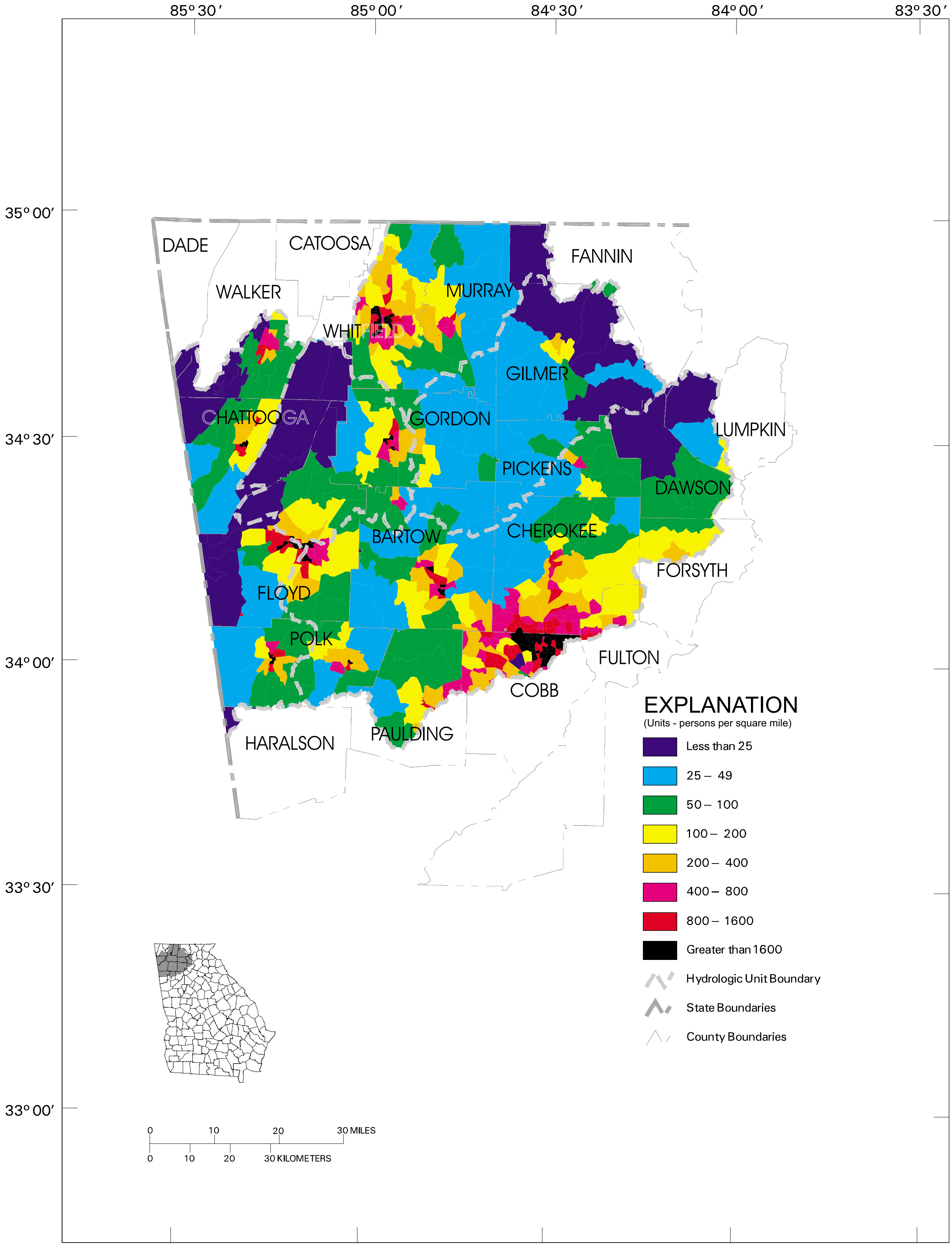

Figure 2-12. Population Density in the Coosa River Basin, 1990

Table 2-4. Population Estimates for the Coosa River Basin by HUC (1990)

HUC	Population	Housing Units
03150101 (Georgia, Tennessee)	104247	41310
03150102 (Georgia)	31542	13996
03150103 (Georgia)	52330	20680
03150104 (Georgia)	344437	132063
03150105 (Georgia, Alabama)	114544	48405
Total	*647100*	*256454*

2.2.3 Land Cover and Use

Land use/land cover classification was determined for the Coosa River basin based on high-altitude aerial photography for 1972-1976 and interpreted by the U.S. Geological Survey. In 1991 land cover data were developed based on interpretation of Landsat TM satellite image data obtained during 1988-1990, 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 1972-1976 land use classification (Figures 2-13 through 2-17) indicated that 77.5 percent of the basin land areas was forest, 17.4 percent was agriculture, and 2.9 percent was urban land use, with 2.1 percent in other land uses, including less than 0.1 percent wetlands. The large percentage in forest includes the extensive landholdings of the Chattahoochee National Forest within this basin.

The 1988-1990 land cover interpretation showed 76 percent of the basin in forest cover, 0.3 percent in wetlands, 2.9 percent in urban land cover, and 15.4 percent in agriculture (Figures 2-18 through 2-22). Statistics for 15 landcover classes in the Georgia portion of the Coosa basin for the 1988-1990 coverage are presented in Table 2-5 (GA DNR, 1996).

Forestry

Forestry is a major part of the economy within the basin. Markets for forest Figure 2-13 products afford landowners excellent investment opportunities to manage and sell their timber, pine straw, naval stores, and other products. Statewide, the forest industry output for 1997 was approximately $19.5 billion. The value added by this production, which includes wages, profits, interest, rent, depreciation, and taxes paid into the economy reached a record high $9.3 billion. Georgians benefit directly from 177,000 job opportunities created by the manufacture of paper, lumber, furniture, and various other wood products; consumers of these products also benefit. Other benefits of the forest include hunting, fishing, aesthetics, wildlife watching, hiking, camping, and other recreational opportunities as well as important environmental benefits such as clean air and water and wildlife habitat.

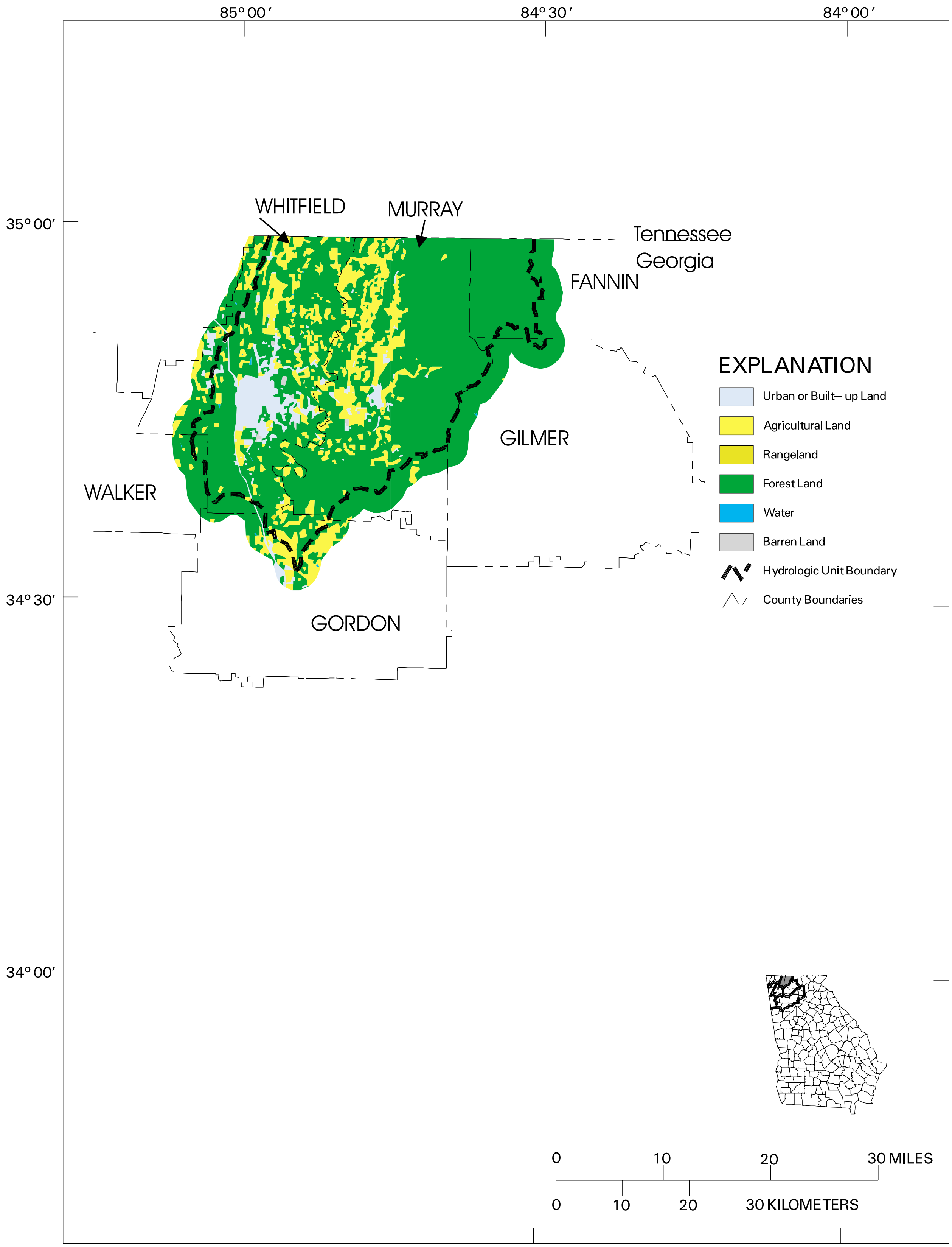

Figure 2-13. Land Use, Coosa River Basin, HUC 03150101, USGS 1972-76 Classification Updated with 1990 Urban Areas

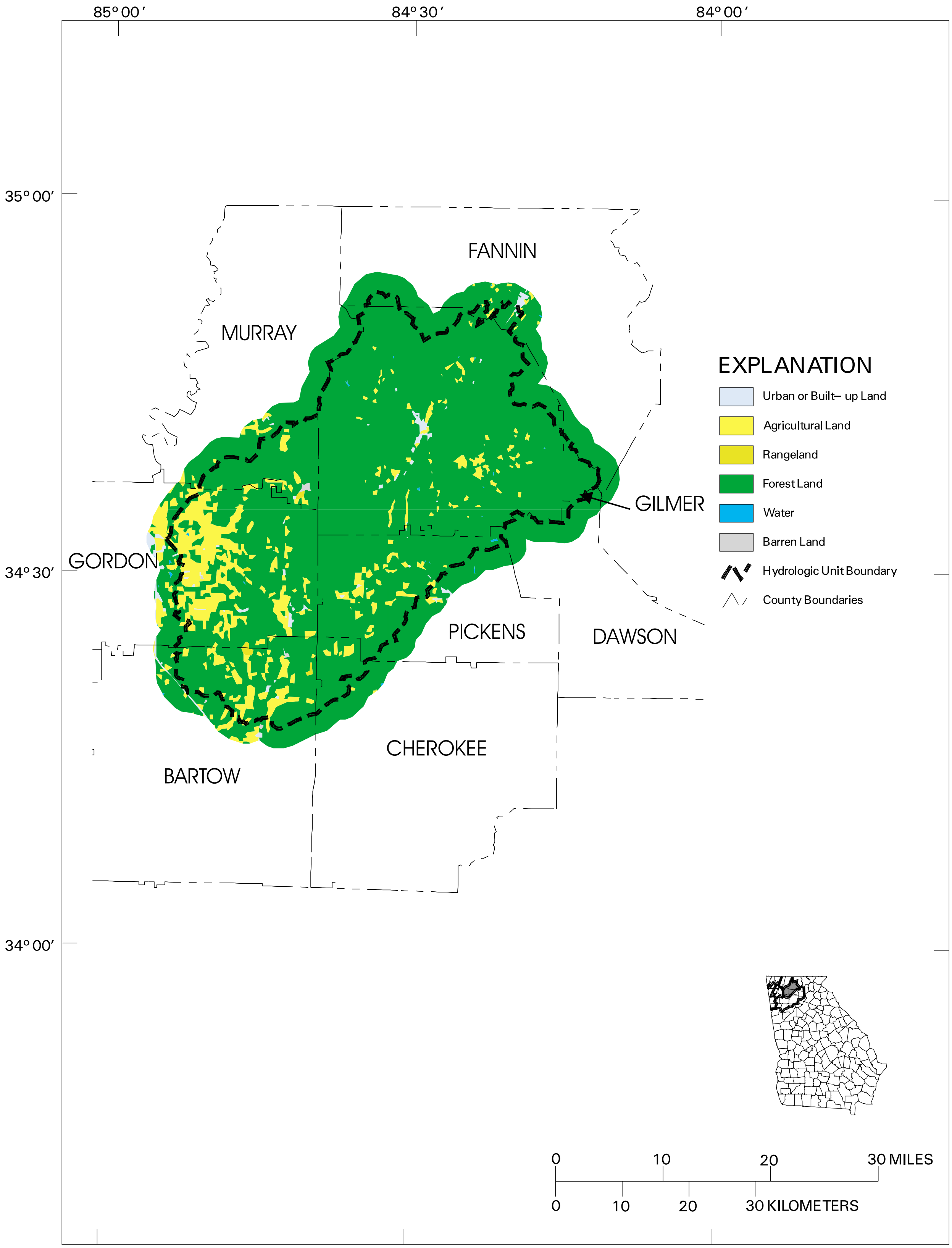

Figure 2-14. Land Use, Coosa River Basin, HUC 03150102, USGS 1972-76 Classification Updated with 1990 Urban Areas

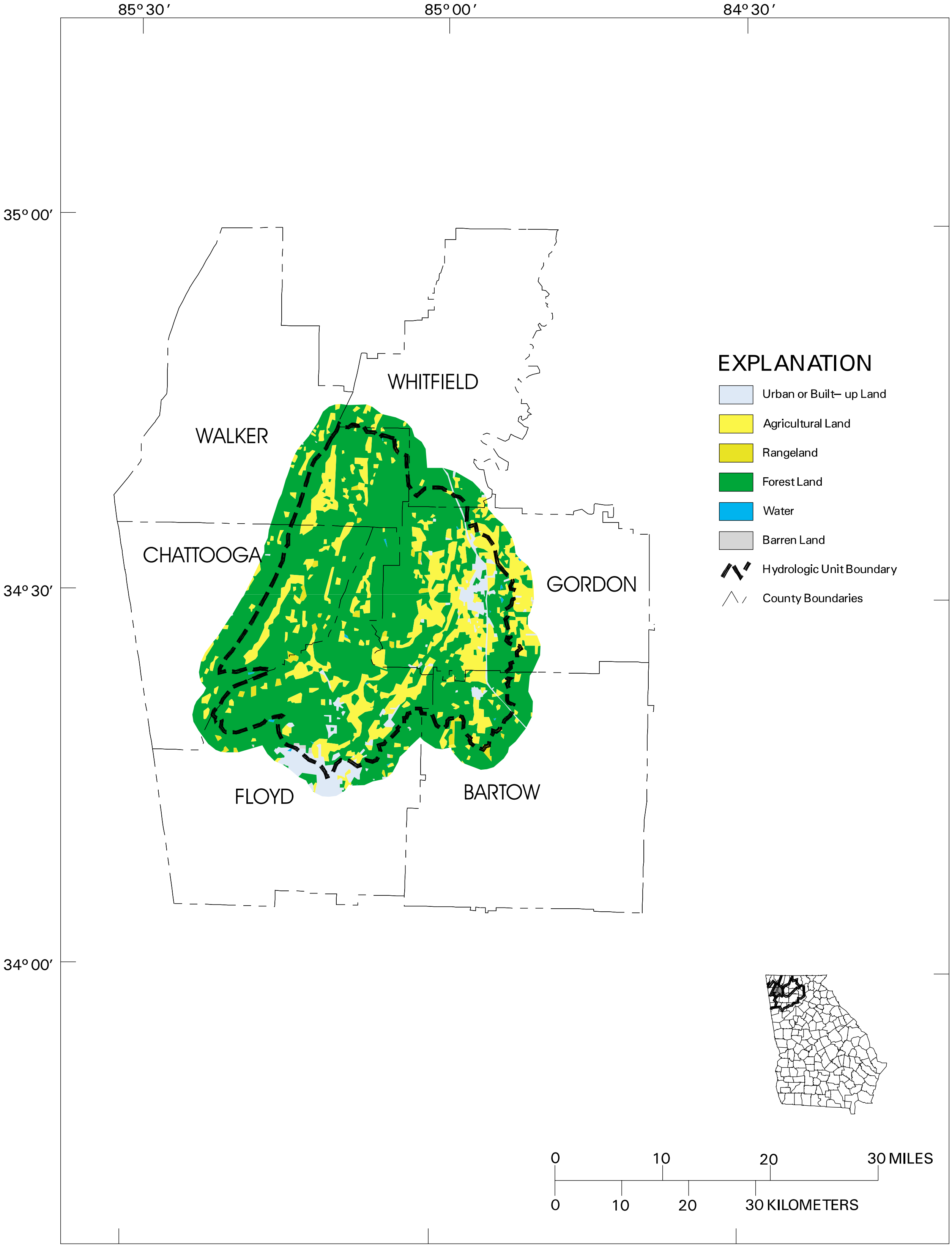

Figure 2-15. Land Use, Coosa River Basin, HUC 03150103, USGS 1972-76 Classification Updated with 1990 Urban Areas

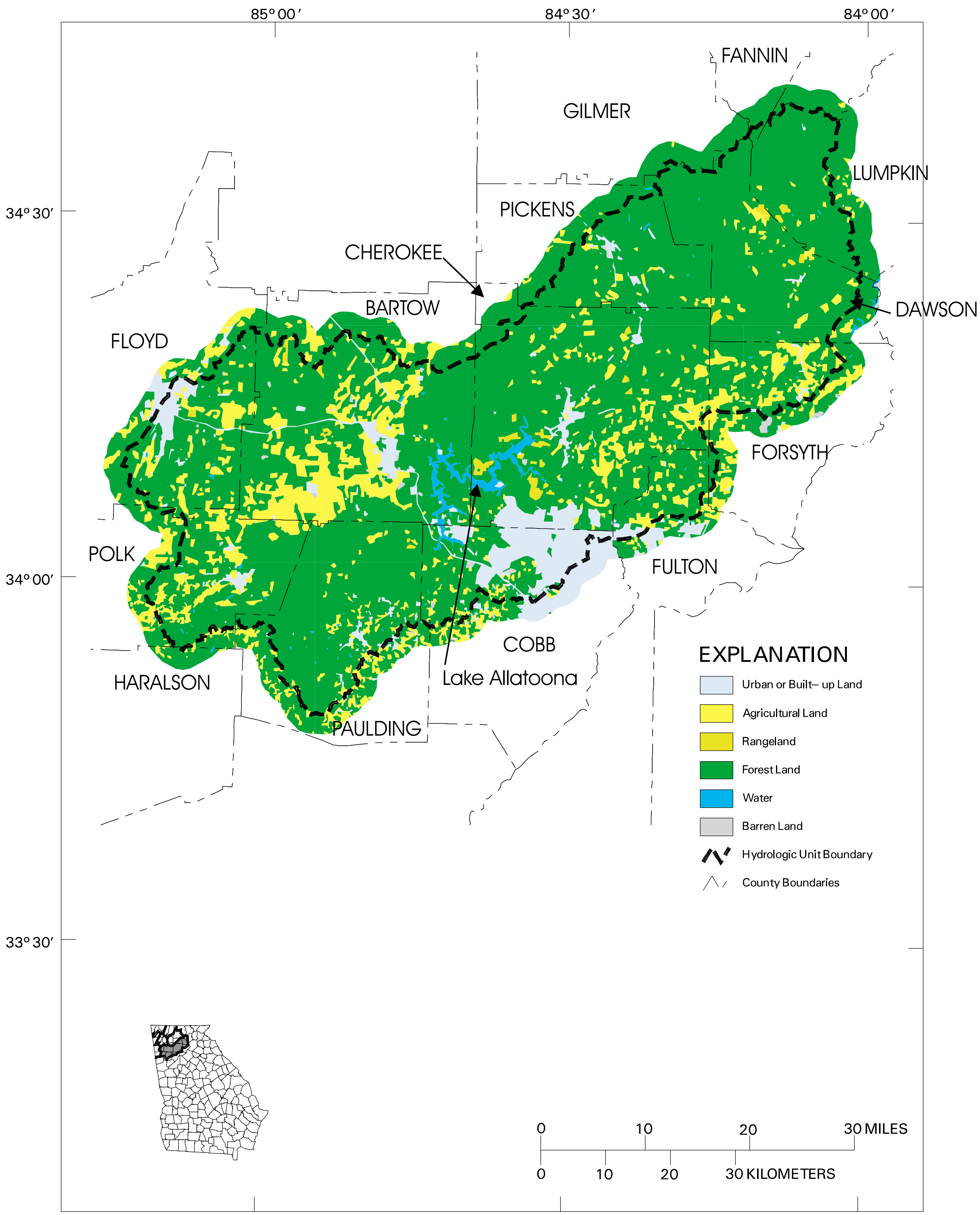

Figure 2-16. Land Use, Coosa River Basin, HUC 03150104, USGS 1972-76 Classification Updated with 1990 Urban Areas

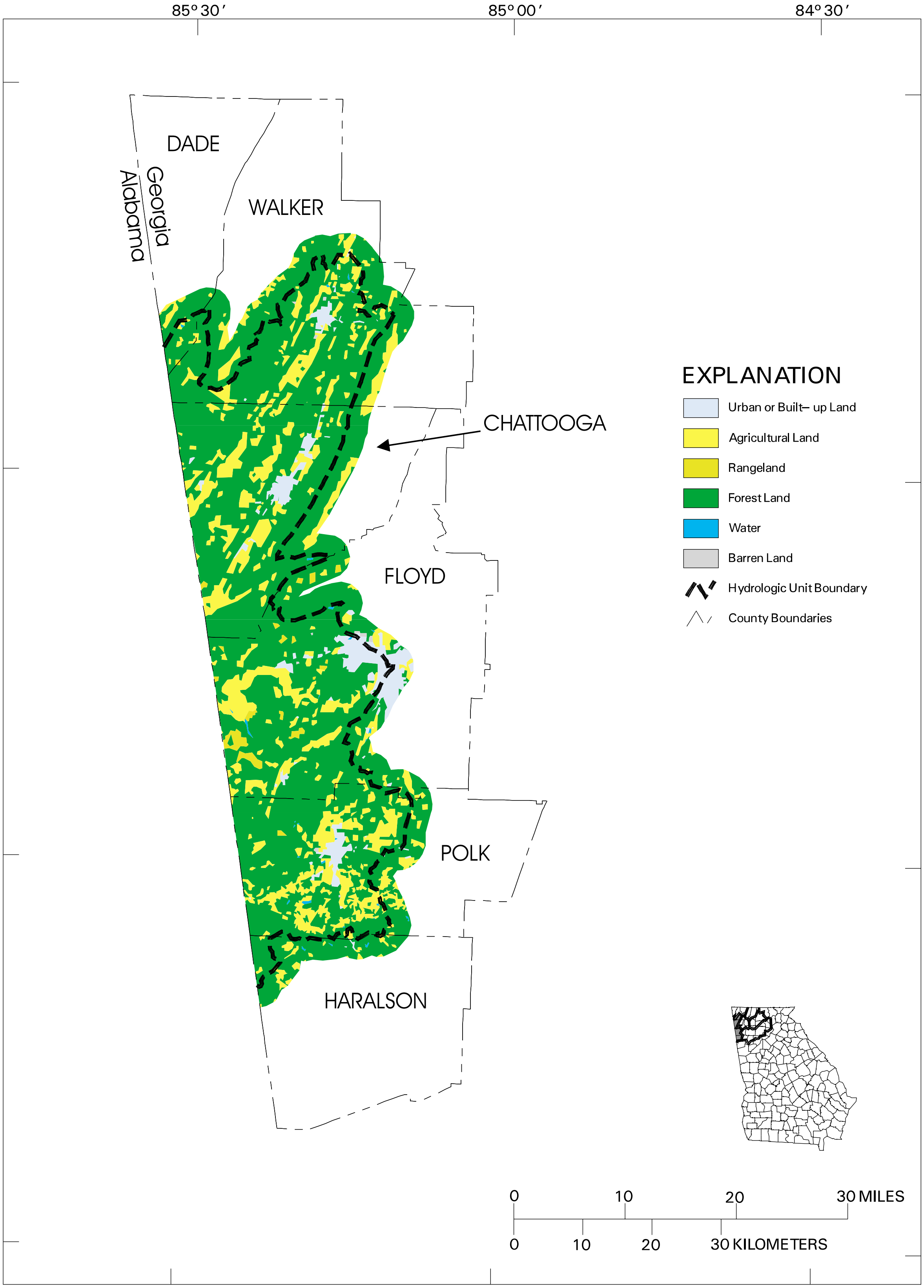

Figure 2-17. Land Use, Coosa River Basin, HUC 03150105, USGS 1972-76 Classification Updated with 1990 Urban Areas

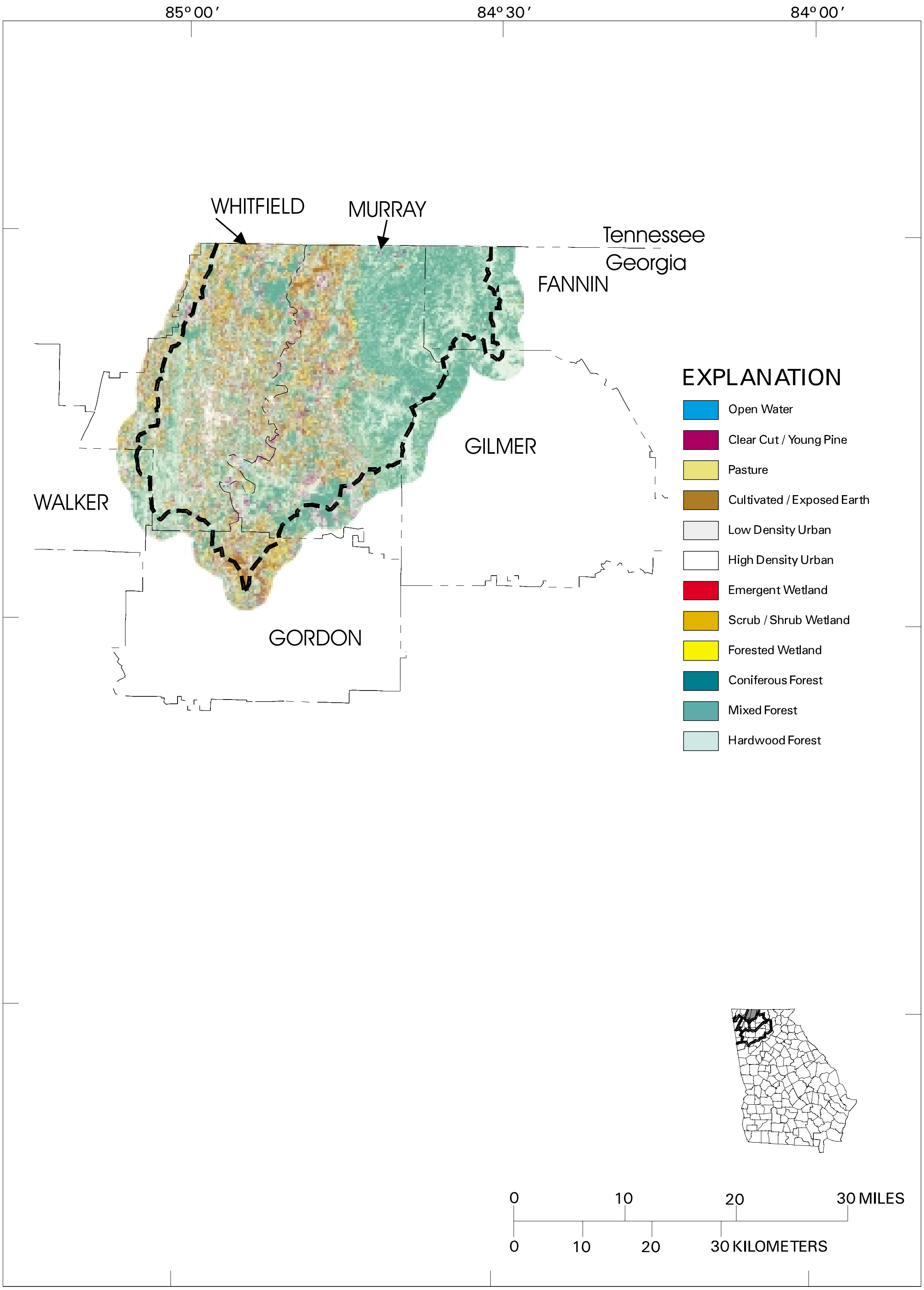

Figure 2-18. Land Cover 1990, Coosa River Basin, HUC 03150101

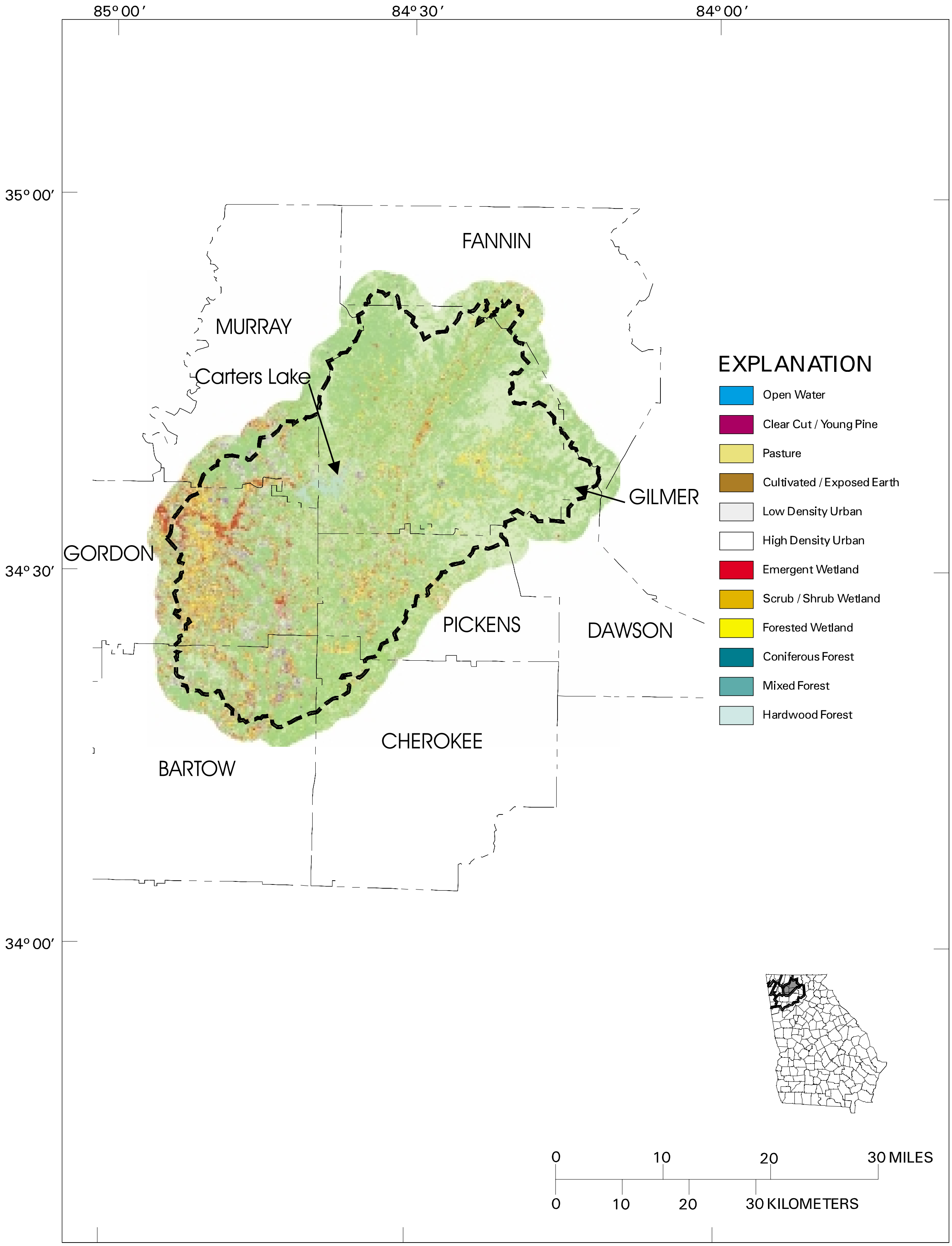

Figure 2-19. Land Cover 1990, Coosa River Basin, HUC 03150102

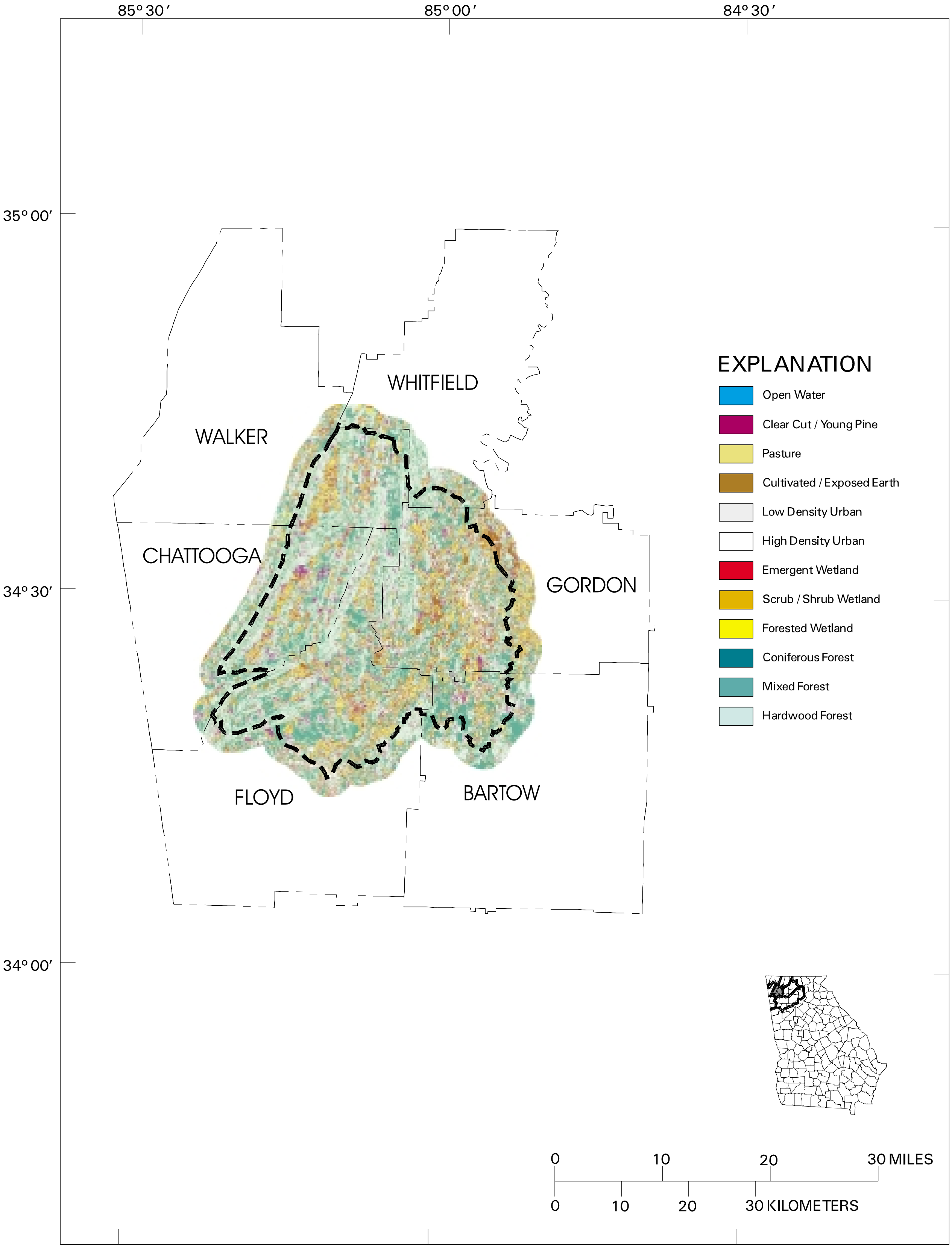

Figure 2-20. Land Cover 1990, Coosa River Basin, HUC 03150103

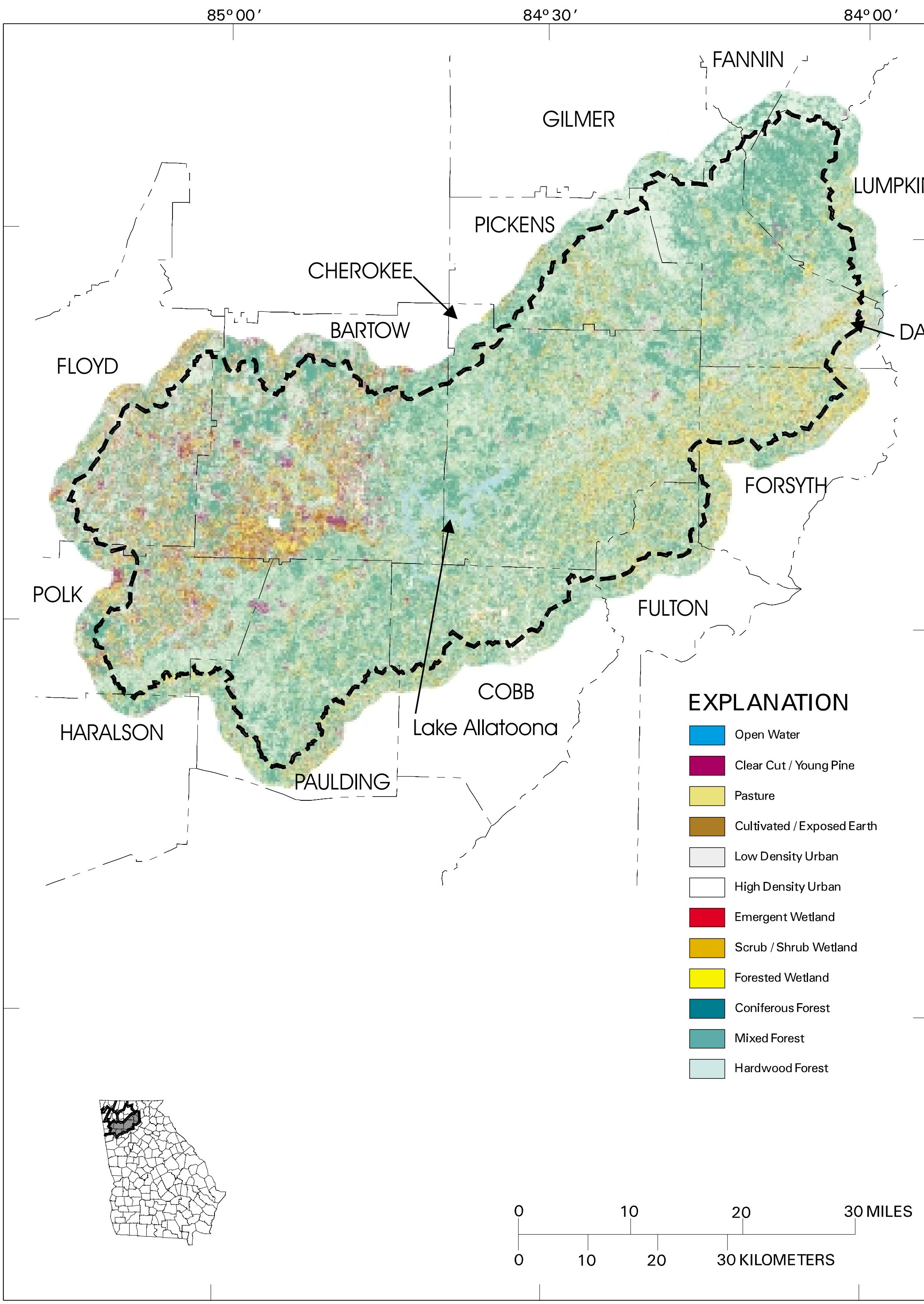

Figure 2-21. Land Cover 1990, Coosa River Basin, HUC 03150104

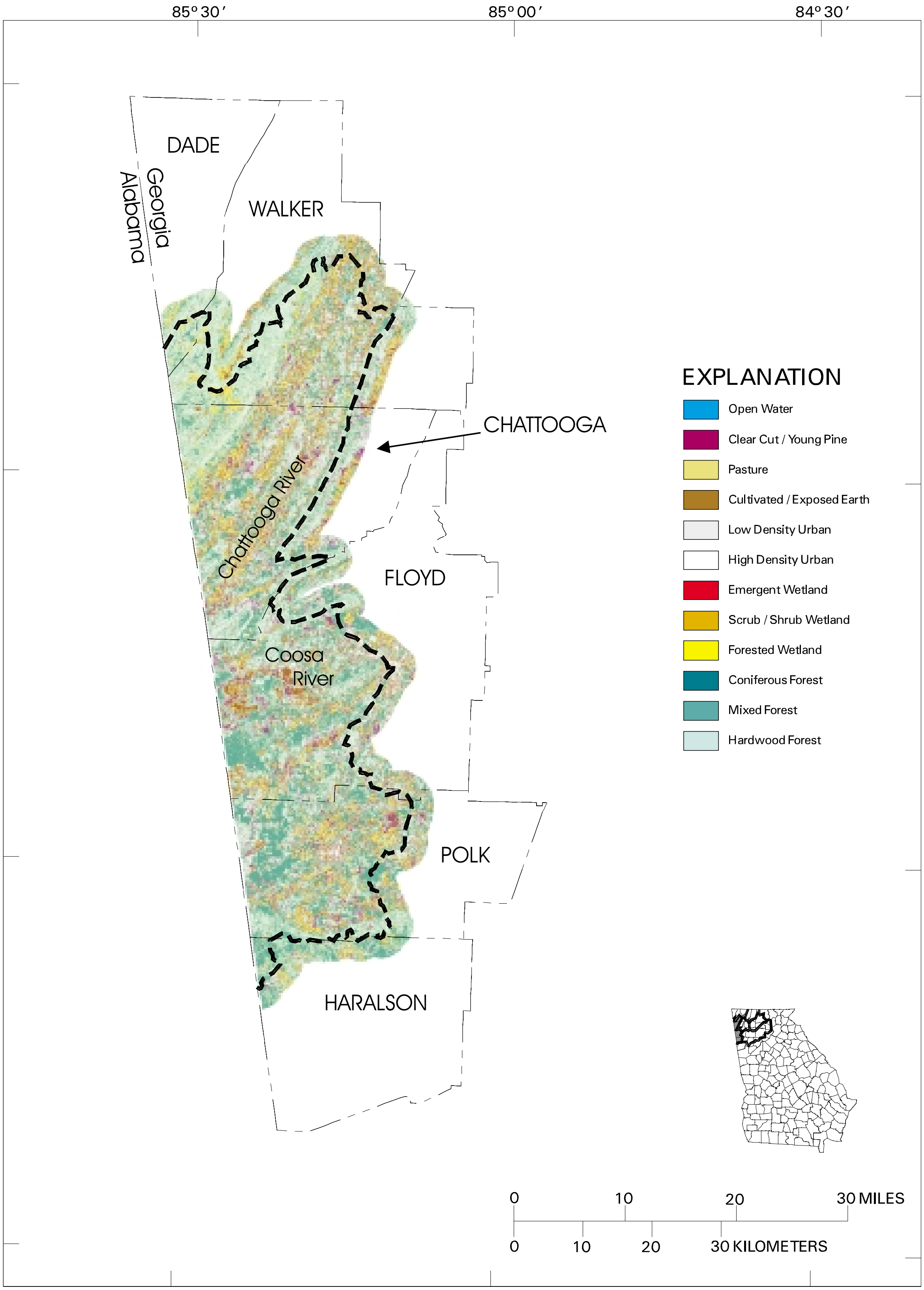

Figure 2-22. Land Cover 1990, Coosa River Basin, HUC 03150105

Table 2-5. Land Cover Statistics for the Coosa Basin, 1988–90

Class Name	%	Acres
Open Water	1.0	31,490.5
Clear Cut/Young Pine	4.6	136,692.0
Pasture	8.8	259,169.1
Cultivated/Exposed Earth	6.6	195,392.9
Low Density Urban	2.1	60,482.3
High Density Urban	0.8	24,881.7
Emergent Wetland	0.0	809.9
Scrub/Shrub Wetland	0.1	1,418.7
Forested Wetland	0.2	6,343.5
Coniferous Forest	22.5	664,882.5
Mixed Forest	23.2	685,230.5
Hardwood Forest	30.1	889,175.4
Salt Marsh	0.0	0.0
Brackish Marsh	0.0	0.0
Tidal Flats/Beaches	0.0	0.0
Total	*100.0*	*2,956,127.0*

According to the 1989 U.S. Forest Service's Forest Statistics for Georgia (Thompson, 1989), there are approximately 2,010,200 acres of commercial forest land in the basin, representing about 69 percent of the total land area. An additional 38,100 acres are classified as forest land but are withdrawn from timber utilization through statute or administrative designation. Private landowners account for 72 percent of the commercial forest ownership, while the forest industry companies account for 16 percent. Governmental entities account for about 12 percent of the forest land. Commercial silvicultural land use is concentrated in the Piedmont and mountains north of Atlanta (Figure 2-23). Forestry acreage in the Coosa River basin is summarized in Table 2-6.

The pine type is composed of 24,700 acres of white pine, 190,100 acres of plantation, and 538,700 acres of natural stands.

For the period from 1982 through 1989, there was a statewide trend of loss of forest acreage resulting from both conversion to urban and related uses and clearing for agricultural uses. For the counties entirely within basin, the area classified as commercial forest land decreased 106,986 acres from 2,650,268 acres to 2,543,282 acres. The area classified as pine type (199, 312 acres plantation and 704,569 acres natural) decreased 102,419 acres (10 percent) from 1,006,300 acres to 903,881 acres. The area classified as oak-pine type increased 36,380 acres (8 percent) from 418,116 acres to 454,496 acres. Upland hardwood acreage decreased 33,722 acres (3 percent) from 1,182,849 acres to 1,149,127 acres. Lowland hardwood acres decreased 7,225 acres (17 percent) from 43,003 acres to 35,778 acres.

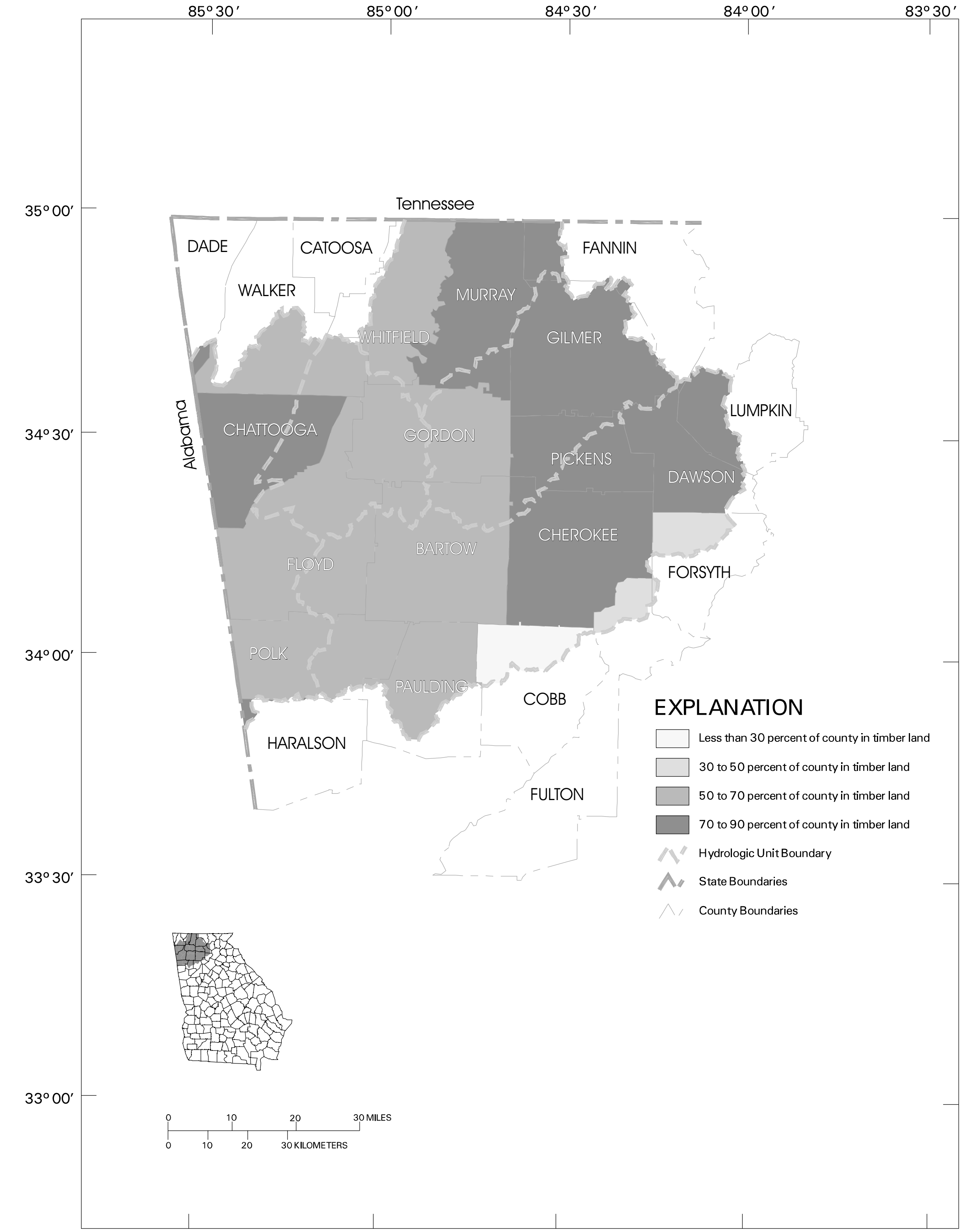

Figure 2-23. Silvicultural Land in the Coosa River Basin

Table 2-6. Forestry Acreage in the Coosa River Basin

County	All Land (acres)	Non-Forest	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Bartow	291,900	98,600	193,400	86,500	53,900	52,900	0
Chattooga	200,600	56,900	143,700	39,700	25,600	78,400	0
Cherokee	266,700	79,900	186,700	76,700	34,900	70,200	4,700
Cobb	64,800	36,700	28,100	20,800	7,300	0	0
Dade *							
Dawson	116,300	15,400	100,900	21,400	32,300	47,300	0
Fannin	41,400	2,900	9,700	4,900	0	4,900	0
Floyd	331,900	127,600	204,300	85,500	9,400	99,900	9,400
Forsyth	33,700	17,700	16,000	4,000	4,000	8,000	0
Fulton	31,900	9,400	22,500	14,000	2,800	5,600	0
Gilmer	251,700	31,200	217,000	35,000	63,700	113,600	4,700
Gordon	227,200	100,300	126,900	43,800	32,200	40,800	9,900
Haralson	4,900	0	4,900	0	0	0	0
Lumpkin	69,100	4,800	64,300	26,400	10,800	27,000	0
Murray	220,600	57,500	156,900	63,600	21,800	68,100	0
Paulding	123,400	11,700	111,700	55,800	15,200	40,700	0
Pickens	148,600	30,400	118,200	36,100	25,400	56,600	0
Polk	195,600	65,300	130,300	59,800	11,200	59,400	0
Walker	137,900	52,900	85,100	31,200	9,200	44,700	0
Whitfield	158,900	69,300	89,600	43,200	5,900	40,400	0
Total	*2,916,800*	*868,500*	*2,010,200*	*728,700*	*365,600*	*858,600*	*28,800*

* *Even though Dade County is within the basin, there were no forest plots located there and as a result no information available.*

Agriculture

Agriculture in the Coosa River basin is a varied mixture of animal operations and commodity production. Total farmland in the basin (Figure 2-24) is on the decline according to the agricultural census (U.S. Bureau of the Census, 1981a,b,c). By 1992, the total amount of land in farms in the basin had fallen to 569,330 acres. Much of the land in farms is pasture; however there are more than 116,000 acres of cropland harvested each year in the Basin. The principle crops include cotton and small grain [wheat, sorghum, soybeans]. Harvested acres among these crops varies from year to year in response to market conditions, government subsidy programs, and weather.

Livestock and poultry production in the Coosa River basin is relatively intense. Approximately 136,000 head of cattle, 70,000 head of swine, and 221,000,000 broilers are currently being raised on farms in the basin (Table 2-7). Gordon County ranks ninth among Georgia counties in cattle production with 24,000 head. Hog production in the basin is led by Bartow County with 21,000 head. Finally, Gordon

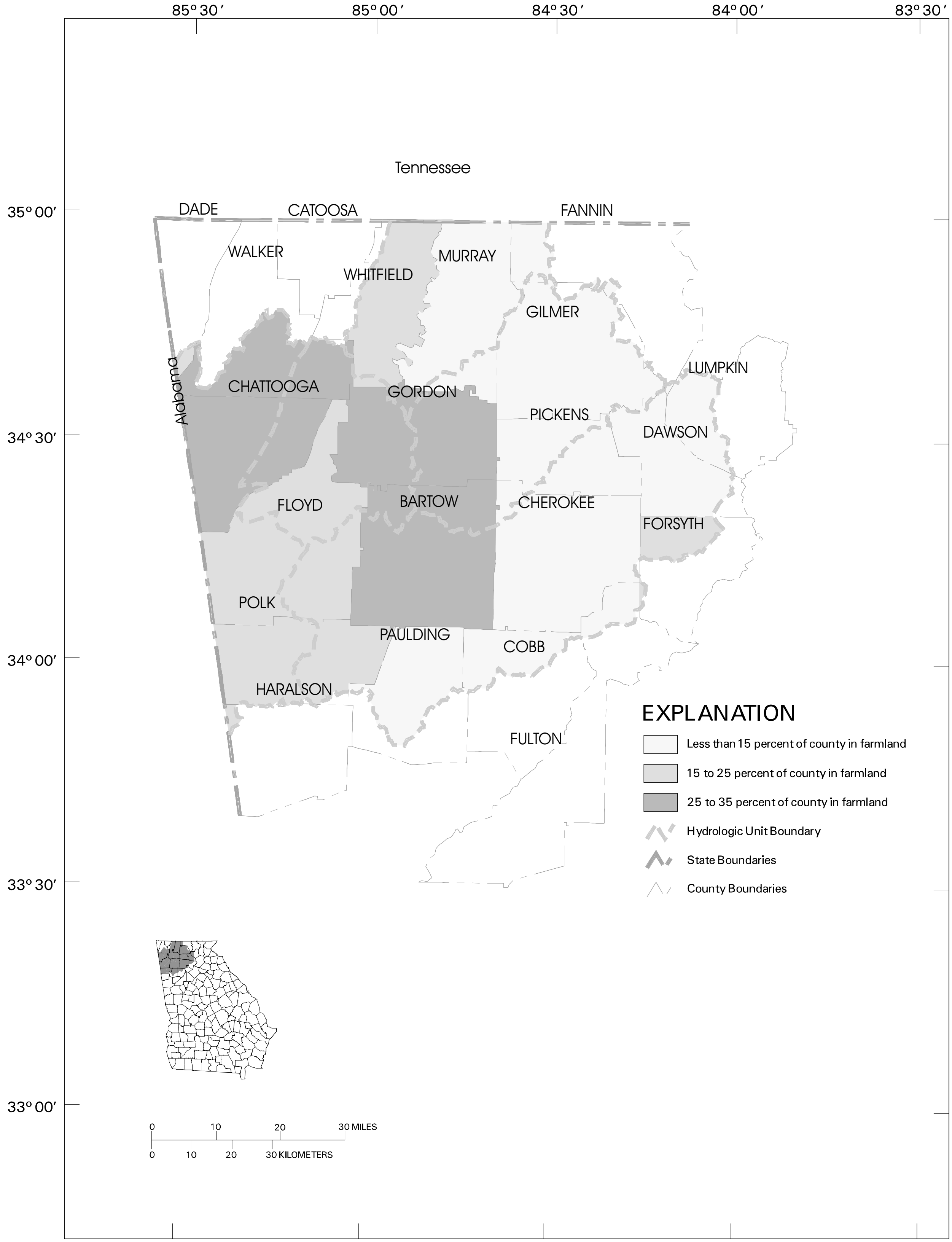

Figure 2-24. Agricultural Land in the Coosa River Basin

Table 2-7. Agricultural Operations in the Coosa River Basin, 1987-1991 (data supplied by NRCS)

Element	Conasausa River Basin HUC 03150101	Coosawattee River Basin HUC 03150102	Oostanaula River Basin HUC 03150103	Etowah River Basin HUC 03150104	Coosa River below Rome and Chattooga River Basin HUC 03150105	Total for Basin
Dairy Cows	800	1,130	470	1,520.00	910	4,830
Beef Cattle	19,380	19,880	16,610	48,670	31,500	136,040
Hogs	5,100	19,000	4,000	35,330	6,480	69,910
Layer Hens (thousands)	60	48	57	342	24	531
Broilers (thousands)	17,254	68,827	28,528	93,285	13,647	221,540
Harvested Cropland (acres)	14,470	14,750	16,820	42,750	27,640	116,430
Total Agriculture (acres)	*64,210*	*69,920*	*61,490*	*228,430*	*145,280*	*569,330*

and Forsyth counties collectively produce over 54,000,000 broilers and layers each year, ranking them among the top 10 counties in Georgia's poultry industry.

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 storm water 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.

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, storm water and development ordinances; undertaking water supply and wastewater treatment planning; and participating in programs to protect wellheads and significant ground water recharge areas. Many local governments are also responsible for the operation of water supply and wastewater treatment facilities.

The Coosa basin includes part or all of 20 Georgia counties (Table 2-8 and Figure 2-2); however, only six counties are entirely within the basin. Two counties (Dade and Haralson) have only a tiny amount of area in the basin. Thus, there are a total of 18 counties with significant planning jurisdiction in the basin. Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-9 lists the municipalities in the basin.

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. Funding sources include members' dues and funds available through DCA. Table 2-10 summarizes the RDCs and the associated counties within the Coosa basin.

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 that established a framework to be used by the Water Quality Control Board and later the EPD in making water use regulatory decisions.

In 1972 the EPD applied the water use classification system to interstate waters in 1972. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-11 provides a summary of water use classifications and criteria for each use.

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. To comply with these requirements, the Board of Natural Resources adopted 31

Table 2-8. Georgia Counties in the Coosa River Basin

Counties Entirely Within the Coosa Basin	Counties Partially Within the Coosa Basin	Counties with Insignificant Area Within the Coosa Basin
Bartow, Chattoga, Floyd, Gordon, Murray, Pickens	Cherokee, Cobb, Dawson, Fannin, Forsyth, Fulton, Gilmer, Lumpkin, Paulding, Polk, Walker, Whitfield	Dade, Haralson

Table 2-9. Georgia Municipalities in the Coosa River basin

HUC 03150101				
Beaverdale	Crandall	Nicholsville	Rocky Face	Tilton
Chatsworth	Dayton	Phelps	Spring Place	Waring
Cisco	Eton	Ramhurst	Sumac	Varnell
Cohutta	Mill Creek	Red Clay	Tennga	
HUC 03150102				
Blaine	Ellijay	Funkhouser	Pine Chapel	Rydal
Carters	Fairmount	Hinton	Pine Log	Sonoraville
Cash	Farmville	Ludville	Ranger	Talking Rock
Cherrylog	Folsom	Oakman	Redbud	Whitestone
HUC 03150103				
Adairsville	Damascus	Lillypond	Reeves	Villanow
Armuchee	Echota Village	McDaniels	Resaca	
Calhoun	Everrett Springs	Mt. Berry	Shannon	
Crystal Springs	Floyd City	Oostanaula	Subligna	
Curryville	Hill City	Plainsville	Sugar Valley	
HUC 03150104				
Acworth	Cassville	Keithsburg	Nelson	Six Mile
Aragon	Dallas	Kennesaw	New Hope	Stilesboro
Ball Ground	Dawsonville	Kingston	North Canton	Sutalee
Birmingham	Ducktown	Landrum	Oakland Heights	Tate
Blackwells	Emerson	Lathemtown	Portland	Taylorsville
Braswell	Euharlee	Lebanon	Rockmart	Van Wert
Cagle	Free Home	Lindale	Rome	Victoria
Canton	Halls	Marblehill	Seney	Waleska
Cartersville	Holly Springs	Matt	Silver City	White
Cass	Jasper	Mountain Park	Silver Creek	Woodstock
HUC 03150105				
Berryton	Chattoogaville	Holland	Lyerly	Summerville
Cave Spring	Cloudland	LaFayette	Menlo	Trion
Cedartown	Coosa	Lake	Mount Carmel	
Center Post	Esom Hill	Lavender	Prior	

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.

In the late 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 reclassified to the uses of fishing or coastal fishing, which include more stringent water quality standards. The final two segments in Georgia were

Table 2-10. Regional Development Centers in the Coosa River Basin

Regional Development Center	Member Counties with Land Area in the Coosa Basin
Coosa Valley RDC	Bartow, Chattooga, Dade, Floyd, Gordon, Haralson, Paulding, Polk, Walker
North Georgia RDC	Fannin, Gilmer, Murray, Pickens, Whitfield
Georgia Mountains RDC	Dawson, Forsyth, Lumpkin
Atlanta Regional Commission	Cherokee, Cobb, Fulton

Table 2-11. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[2]		pH	Temperature (other than trout streams)[2]	
Use Classification[1]	30-Day Geometric Mean[3] (no/100 ml)	Maximum (no./100ml)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise above Ambient (°F)	Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	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-April) 200 (May-October)	4,000 (Nov-April)	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°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 same as fishing with the exception of dissolved oxygen which is site specific.*

upgraded as a part of the triennial review of standards completed in 1989. All of Georgia's waters are currently classified as fishing, recreation, drinking water, wild river, scenic river, or coastal fishing.

2.4.2 Water Use Classifications for the Coosa River Basin

Waters in the Coosa 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 2-12; all other waters in the basin are classified as fishing. A number of waters in the northern portion of the Coosa River basin are also designated as primary or secondary trout streams, as shown in Table 2-13. Primary trout streams are defined as streams containing naturally-reproducing populations of brook trout, brown trout, and/or rainbow trout, while secondary trout streams contain no naturally-reproducing trout populations but are capable of sustaining stocked trout throughout the year.

Table 2-12. Coosa River Basin Waters Classified in Georgia Regulations[1]

Water body	Description of Segment	Use Classification
Conasauga River	Georgia Hwy. 2 to Dalton Water Intake	Drinking Water
Ellijay River	Headwaters to Ellijay Water Intake	Drinking Water
Cartecay River	Headwaters to Ellijay Water Intake	Drinking Water
Coosawattee River	Confluence to Mountaintown Creek to Carters Dam	Recreation
Coosawattee River	U.S. Hwy. 411 to confluence of Conasauga River	Drinking Water
Oostanaula River	Confluence to Conasauga and Coosawattee Rivers to Calhoun Water Intake	Drinking Water
Oostanaula River	Confluence with Armuchee Creek to Rome Water Intake	Drinking Water
Oostanaula River	Confluence of Little Dry Creek (below Rome Water Intake) to Coosa River	Fishing
Etowah River	Cherokee County Road 782 to Canton Water Intake	Drinking Water
Etowah River	Georgia Hwy. 20 to Allatoona Dam	Recreation and Drinking Water
Etowah River	Allatoona Dam to Cartersville Water Intake	Drinking Water
Coosa River	Confluence of Etowah and Coosawattee to Mayo's Lock and Dam	Fishing
Coosa River	At the Alabama State Line	Recreation
Mill Creek	Headwaters to Dalton Water Supply	Drinking Water
Conasauga River	Waters Within the Cohutta Wilderness Area	Wild and Scenic
Jacks Creek	Waters Within the Cohutta Wilderness Area	Wild and Scenic

[1] *Rules and Regulations for Water Quality Control, Chapter 391-3-6 (13). Waters within the Coosa River basin not explicitly classified and listed above are classified as Fishing.*

Table 2-13. Coosa River Basin Waters Classified as Trout Streams

County	Classification	Description of Segment
Bartow	Secondary	Boston Creek watershed upstream from Georgia Hwy. 20
	Secondary	Connesena Creek watershed
	Secondary	Dykes Creek watershed
	Secondary	Pine Log Creek watershed
	Secondary	Pyle Creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Spring Creek watershed
	Secondary	Stamp Creek watershed upstream from Bartow County Road 269
	Secondary	Toms Creek watershed upstream from Bartow County Road 82
	Secondary	Two Run Creek watershed
	Secondary	Ward Creek watershed
Chattooga	Secondary	Allgood Branch watershed upstream from Southern Railroad
	Secondary	Chappel Creek watershed
	Secondary	Chelsea Creek watershed
	Secondary	East Fork Little River watershed

County	Classification	Description of Segment
	Secondary	Hinton Creek watershed
	Secondary	Kings Creek watershed
	Secondary	Little Armuchee Creek watershed upstream from Chattooga County Road 326
	Secondary	Middle Fork Little River watershed
	Secondary	Mt. Hope Creek watershed
	Secondary	Perennial Spring watershed
	Secondary	Racoon Creek watershed upstream from Georgia Hwy. 48
	Secondary	Ruff Creek watershed
	Secondary	Storey Mill Creek watershed
	Secondary	Taliaferro Creek watershed
Cherokee	Secondary	Boston Creek watershed
	Secondary	Pine Log creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Stamp Creek watershed
	Secondary	Bluff Creek watershed upstream from Cherokee County Road 114
	Secondary	Murphy Creek watershed
	Secondary	Soap Creek watershed upstream from Cherokee County Road 116
	Secondary	Wiley Creek watershed
Dawson	Primary	Amicalola Creek watershed upstream from Dawson County Road 192 (Devil's Elbow Road)
	Primary	Sweetwater Creek watershed
	Primary	Anderson Creek watershed
	Primary	Long Swamp Creek watershed
	Primary	Nimblewill Creek watershed
	Secondary	Amicalola Creek watershed form Georgia Hwy. 53 upstream to Dawson County Road 192 (Devil's Elbow Road)
	Secondary	Shoal Creek watershed upstream from the mouth of Burt Creek
Fannin	Primary	Conasauga River - Jacks River watershed
	Primary	Ellijay River watershed
	Primary	Etowah River watershed
	Secondary	All streams or sections of stream in county not Primary
Floyd	Secondary	Dykes Creek watershed
	Secondary	Johns Creek watershed upstream from Floyd County Road 212
	Secondary	Kings Creek watershed
	Secondary	Lavender Creek watershed upstream from Floyd County Road 234
	Secondary	Little Cedar Creek watershed
	Secondary	Mt. Hope Creek watershed
	Secondary	Spring Creek watershed (flows into Etowah River)
	Secondary	Spring Creek watershed (flows into State of Alabama)
	Secondary	Toms Creek watershed

County	Classification	Description of Segment
	Secondary	Silver Creek watershed upstream from Georgia Highway 1E
Gilmer	Primary	Cartecay River watershed upstream from the mouth of Clear Creek
	Primary	Clear Creek watershed upstream from Gilmer County Road 92
	Primary	Conasauga River - Jacks River watershed
	Primary	Ellijay River watershed upstream from the mouth of Kells Creek
	Primary	Harris Creek watershed
	Primary	Johnson Creek watershed
	Primary	Mountaintown Creek watershed upstream from U.S. Highway 76
	Primary	Tails Creek watershed upstream from Georgia Hwy. 282
	Secondary	All other streams not classified as primary (except Talking Rock Creek & Coosawatee below Highway 5)
	Secondary	Ball Creek watershed
	Secondary	Sevenmile Creek watershed
	Secondary	Town Creek watershed
	Secondary	Wildcat Creek watershed
Gordon	Secondary	Johns Creek watershed
	Secondary	Long Branch watershed
	Secondary	Pine Log Creek watershed upstream from Georgia Hwy. 53
	Secondary	Pin Hook Creek watershed upstream from Ryo Road
	Secondary	Rocky Creek watershed upstream from West Union Road
	Secondary	Salacoa Creek watershed upstream from U.S. Hwy. 411
	Secondary	Snake Creek watershed
	Primary	Etowah River watershed upstream from the Ga Highway 52 Bridge
	Secondary	Etowah River watershed upstream from Castleberry Bridge to Hwy 52 except those Primary above
Murray	Primary	Conasauga - Jacks River watershed upstream from Georgia - Tennessee state line
	Primary	Holly Creek watershed upstream from Murray County Rd. SR826 (U.S. Forest Service line)
	Primary	Rock Creek watershed upstream from Murray County Rd. 4 (Dennis)
	Secondary	All tributaries to Carters Reservior
	Secondary	Holly Creek watershed (including Emory Creek watershed) upstream from Emory Creek to Murray County Road SR826 (U.S. Forest Service line)
	Secondary	Mill Creek watershed upstream from Murray County Road 27
	Secondary	North Prong Sumac Creek watershed
	Secondary	Sugar Creek watershed upstream from Murray County Road 4
	Secondary	Sumac Creek watershed upstream from Coffey Lake
	Secondary	Mill Creek watershed
	Secondary	Rock Creek watershed upstream of Murray County Road 301
Paulding	Secondary	Possum Creek watershed upstream from Paulding County Road 64
	Secondary	Powder Creek watershed

County	Classification	Description of Segment
	Secondary	Pumpkinvine Creek watershed upstream from Paulding County Road 231
	Secondary	Pyl Creek watershed
	Secondary	Racoon Creek watershed
	Secondary	Ward Creek watershed
	Secondary	Simpson Creek watershed
	Secondary	Thompson Creek watershed
Pickens	Primary	Cartecay River watershed
	Primary	Talking Rock Creek watershed upstream from Route S1011
	Secondary	Amicalola Creek watershed
	Secondary	East Branch watershed (including Damell Creek watershed)
	Secondary	Fisher Creek watershed (upstream from the confluence of Talona Creek and Fisher Creek)
	Secondary	Fourmile Creek watershed
	Secondary	Hobson Creek watershed
	Secondary	Little Scarecorn Creek watershed
	Secondary	Long Branch watershed
	Secondary	Long Swamp Creek watershed upstream from Pickens County Road 294
	Secondary	Mud Creek watershed
	Secondary	Pin Hook Creek watershed
	Secondary	Polecat Creek watershed
	Secondary	Rock Creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Scarecorn Creek watershed upstream from Georgia Hwy. 53
	Secondary	Ball Creek watershed
	Secondary	Bluff Creek watershed
	Secondary	Sevenmile Creek watershed
	Secondary	Soap Creek watershed
	Secondary	Town Creek watershed
	Secondary	Wildcat Creek watershed
Polk	Secondary	Cedar Creek watershed upstream from Polk County Road 121
	Secondary	Lassetter Creek watershed
	Secondary	Little Cedar Creek watershed
	Secondary	Pumpkinpile Creek watershed upstream from Road SR1032
	Secondary	Spring Creek watershed
	Secondary	Swinney Branch watershed
	Secondary	Thomasson Creek watershed
	Secondary	Fish Creek watershed upstream of Plantation Pipeline
	Secondary	Silver Creek watershed
	Secondary	Simpson Creek watershed upstream of Lake Dorene
	Secondary	Thompson Creek watershed upstream of Polk County Road 441
Walker	Primary	Furnace Creek watershed

County	Classification	Description of Segment
	Primary	Harrisburg Creek watershed
	Secondary	Chappel Creek watershed
	Secondary	Concord Creek watershed
	Secondary	Dry Creek watershed (trib to E.Armuchee Cr)
	Secondary	Duck Creek watershed
	Secondary	E.Armuchee Cr watershed upstream Ga Hwy 136
	Secondary	Johns Creek watershed
	Secondary	Middle Fork Little R. watershed
	Secondary	Ruff Creek watershed
	Secondary	Snake Creek watershed
	Secondary	West Armuchee Creek watershed
	Secondary	West Fork Little River watershed
Whitfield	Secondary	Coahulla Creek watershed upstream Whitfield Co Rd 183
	Secondary	East Armuchee Creek watershed
	Secondary	Snake Creek watershed
	Secondary	Swamp Creek watershed upstream Whitfield Co Rd 9

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