3. AFFECTED ENVIRONMENT

The existing environment affected by the three alternatives—the current 1983 Plan (Alternative A) and the alternative proposed Plans for Guntersville Reservoir (Alternatives B1, B2 and B3)—are described in this chapter.

3.1 Environmental Setting and Visual Resources

Guntersville Reservoir lies in a region of the Tennessee River Valley noted for a wide variety of scenic resources. The reservoir and floodplain areas include attractive islands, rock bluffs, secluded coves, wetlands and agricultural land which are framed by high wooded ridges. Since the scenic features of the ridge and valley landscape are not limited by property boundaries, the attractive landscape character extends across TVA public and private land alike. The natural elements together with the communities and other cultural development provide a scenic, relatively harmonious, rural countryside.

With 67,900 surface water acres, Guntersville Reservoir is one of the largest reservoirs on the Tennessee River, second only to Kentucky Reservoir (160,300 surface acres). It is slightly larger than Wheeler Reservoir, immediately downstream, and over five times larger than Nickajack Reservoir, immediately upstream. Guntersville Reservoir has 949 miles of shoreline which is the third-longest after Kentucky (2,386 miles) and Wheeler (1,063 miles) Reservoirs.

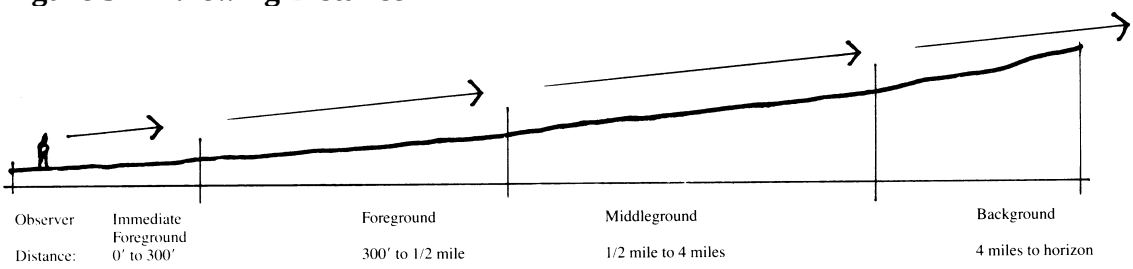
Land uses adjacent to the Guntersville Reservoir shoreline are similar to other mainstream reservoirs. They include industrial areas and a couple of TVA facilities (Bellefonte site and Widows Creek Fossil Plant) as well as state and local parks, WMAs, commercial recreation facilities, and an ever-growing assortment of residential development. The reservoir offers abundant water-recreation opportunities along with a variety of scenery. Most creek embayments are broadly open at the mouth and some wind several miles to their headwaters.

The physical, biological, and cultural features seen in the landscape give reservoir land its distinct visual character and sense of place. Varied combinations of these elements make the scenic resources of any portion identifiable and unique. Areas with the greatest scenic value such as islands, bluffs, wetlands, or steep forested ridges generally have the least capacity to absorb visual change without substantial devaluation. In the planning process, comparative scenic values of reservoir land were assessed to help identify areas for scenic conservation and scenic protection. Four broad visual characteristics were evaluated. Two of these distinct but interrelated characteristics—viewing distance and human sensitivity—are commonly considered together as scenic visibility:

- **Scenic attractiveness** is the measure of outstanding or unique natural features, scenic variety, seasonal change, and strategic location.

- **Scenic integrity** is the measure of human modification and disturbance of the natural landscape.
- **Viewing distance** indicates scenic importance based on how far an area can be seen by observers and the degree of visible detail.
    - The **foreground distance** is within one-half mile of the observer where details of objects are easily distinguished. Details are most significant in the immediate foreground from 0 to 300 feet.
    - **Middle ground** is normally between a half mile and four miles from the observer where objects may be distinguishable, but their details are weak and tend to merge into larger patterns.
    - **Background** is the landscape seen beyond four miles, where object details and colors are not normally discernible unless they are especially large, standing alone, or provide strong contrast. Figure 3-1 illustrates the viewing distance parameters.
- **Human sensitivity** is the expressed concern of people for the scenic value of the land under study. Concerns are derived or confirmed by public meetings and surveys. Sensitivity also includes considerations such as the number of viewers, frequency, and duration of views.

Figure 3-1 Viewing Distance



Where and how the reservoir landscape is viewed affects human perceptions of it's aesthetic quality and sense of place. These impressions of the visual character can significantly influence how the scenic resources of TVA public land are appreciated, protected, and used.

As with other reservoirs in the TVA system, there is a growing public desire for lake-oriented homes on Guntersville. The majority of development occurs around the lower half of the reservoir which has the visual character of a lake. This portion averages over a mile wide, as compared to the first 4 miles upstream of Guntersville Dam which is only half that width. The landscape begins to change near Tennessee River Mile (TRM) 383, a few miles below the reservoir's midpoint. Within the next several miles upstream, the upper half narrows to a riverine-like character with channel islands, relatively little development, and with an average width of 1,400 feet or less. Although human alteration around the

reservoir has added visual congestion and discordant contrasts, a significant amount of undisturbed shoreline and natural landscape remains.

Among the scenic resources of Guntersville Reservoir, the water body itself is the most distinct and outstanding aesthetic feature. The horizontal surface provides visual balance and contrast to the islands, bluffs, and wooded hillsides. The reservoir provides harmony and creates mystery as it weaves around the ridges and bends, constantly changing views seen from the water. It also provides unity, serving as a visual ribbon that links the other landscape features together. Views across the water provide a tranquil sense of place that is satisfying and peaceful to most observers.

Islands are another significant visual feature. There are over 76 notable islands identified and a number of minor ones. They vary in size from 87 acres to less than 2 acres. The islands provide scenic accents and visual reference points throughout the reservoir and serve as visual buffers for less desirable views. They also provide a pleasing foreground frame for the distant shoreline or background.

Limestone bluffs are distinct scenic elements which only occur along a few sections of the main river channel. The sheer rock faces rise over 100 feet from the water with steep, wooded, bluff-like ridges rising several hundred feet more above them. The bluffs provide attractive vertical accents and a natural contrast of colors that can be seen from the distant middle ground.

Masses of summer water lilies provide outstanding visual displays that are seen in the extensive shallow water areas of the reservoir. They occur along some of the channel islands, in many of the embayments, and in backwater areas along highways. The floating blooms and surrounding wetlands provide a variety of pleasing colors and textures which are visible in the foreground views of boat traffic and motorists. Waterfowl and other wildlife seen in these areas add to the scenic attractiveness.

Other important scenic features include the tranquil, secluded coves and steep, wooded ridges that occur around the reservoir. The isolated coves with wooded shoreline provide peaceful and relatively private locations for overnight boat anchorage although shallow waters limit the use of some. Steep slopes along the shoreline rise mostly undisturbed to wooded skylines. Some ridge tops reach more than 900 feet above the water. The significant elevation changes provide a dramatic contrast to the surrounding reservoir and gently sloping countryside, particularly when they are viewed from background distances.

Appendix C contains a narrative description of the reservoir. The narrative notes important viewscapes and unique physical features. It also provides scenic value and scenic integrity ratings for each section described.

3.2 Sensitive Resources

3.2.1 Cultural Resources

Cultural resources/Historic properties include, but are not limited to, prehistoric and historic archaeological sites, historic structures, and historic sites that were the location of important events where no material remains of the event are present. These resources are both finite and nonrenewable and, in many situations, are our only window into the past; therefore, protection, preservation, and management of these fragile resources are important.

Under the regulations of the Advisory Council on Historic Preservation, the area of potential effects (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist." For the action proposed in this EIS, the APE is the approximately 40,236 acres of TVA public land proposed for planning in Alternatives B1, B2 and B3.

Archaeological Resources

An archaeological resource is defined as an area with any grouping of five or more nonmodern historic or prehistoric artifacts that could provide scientific or humanistic understanding of past human behavior and cultural adaptation. Archaeological resources could include, but are not limited to, remains of surface or subsurface structures such as domestic cooking or ceremonial structures, earthworks, fortifications, cooking or fragmentary tools, weapons and weapon projectiles, containers, ceramics, human remains, rock carvings or rock paintings, and all portions of shipwrecks.

Archaeological research has occurred periodically in the Guntersville Reservoir area before and since the development of the reservoir in the 1930s. Research within the Guntersville Reservoir area began in the late 19th century when C. B. Moore and others made archaeological expeditions up the Tennessee River. Immediately prior to the impoundment of the reservoir, a survey and excavation program were undertaken between 1936-1939 (Webb and Wilder, 1951). The survey of the reservoir in 1936 identified 146 archaeological sites in Marshall and Jackson Counties, Alabama. Excavation of 31 sites was undertaken by crews under the direction of William Webb in 1938 and 1939. Little research was undertaken in the Guntersville Reservoir area between this time and the 1970s. In the 1970s and 1980s, excavations were undertaken primarily as a result of federal legislation requiring the assessment of cultural resources prior to an undertaking as it applied to the Widows Creek (Morey, 1996; Warren, 1975), Snodgrass Mound (Krause, 1988), Bellefonte (Futato, 1977) and Murphy Hill sites (Cole, 1981).

TVA routinely conducts inventories of TVA public land to identify historic properties in response to federal legislation. In the mid-1980s TVA contracted with the University of Alabama to conduct a survey of archaeological resources

for approximately 34,000 acres located above summer pool level and on the exposed shoreline of TVA public land being planned in the 1983 Plan (Solis and Futato, 1987). The survey used both systematic and opportunistic methods that employed pedestrian survey and systematic shovel testing from existing humus to culturally sterile subsoil. A recent shoreline management zone survey by the University of Alabama involved the inspection of exposed shoreline by means of systematic pedestrian survey to inventory and evaluate archaeological resources in areas where residential and commercial development is probable (Spry and Hollis, 1997).

Approximately 715 archaeological resources have been identified on TVA public land surrounding Guntersville Reservoir as a result of review of existing data along with the recent survey results. As mentioned previously, a survey prior to inundation identified 146 archaeological sites. The eligibility of these previously recorded sites is currently unknown. The 715 resources identified characterize the archaeology of this area. The eligibility of these or other resources for the National Register of Historic Places (NRHP) would be determined when specific actions are proposed that could potentially affect historical or archaeological resources. This review would be undertaken in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 at 36 CFR. § 800.

Historic Structures

The process of acquisition of land for the Guntersville Reservoir by TVA resulted in the removal of most structures and other man-made features. Very few structures remained, though many historic structures do remain on adjacent non-TVA land.

Initially, white settlement in the early 19th century developed into an agricultural economy with farmsteads and small towns. Transportation networks revolved along the Tennessee River. Towns grew and prospered, and a plantation economy developed. Towns became river ports, and many ferry crossings were established. The development of the railroad resulted in rail lines following the river valley as well as a river crossing at Bridgeport, Alabama. Then the Civil War brought destruction to the area and the building of fortifications. Following this war, development was slow. Agriculture, commerce, industry, and the river and rail systems gradually expanded. The coming of TVA and the development of Guntersville Reservoir (1935-1939) resulted in further, significant changes of the region.

Historic structures (and other man-made features) remain from all of these historical periods. Partial cultural surveys were conducted for both the 1983 Plan and the proposed Plan. These historic structures on TVA public land are identified in Table 3-1. As the table shows, very few features are found on TVA public land, with the exception of Guntersville Reservation. Due to their age and architectural character, Guntersville Dam, Powerhouse, and Locks are considered historically significant. The former Public Safety Building on the north side of the

Reservation is all that remains of the former construction village. Landscaping features of what was once probably a plantation site remain on the former construction village site.

Creek Path Mission site is located in the area of the island fronting Parcel 254. Creek Path Mission was an outreach mission of the Brainerd Mission, the main mission established by the American Board of Commissioners for Foreign Missions (ABCFM) which was located where EastGate Mall is in Chattanooga. Rev. Daniel Butrick helped to build Creek Path Mission in 1820. Butrick later accompanied Cherokees on the Trail of Tears in 1838. The mission closed in 1837 and white families took up residency. The Wyeth Family lived there, with Dr. John A. Wyeth (listed in Who Was Who in Alabama), a prominent 19th century doctor, was born there. The Russell family purchased the property, and Jim Russell and family were the last inhabitants of the structure. The mission building was torn down in 1921.

Table 3-1 Historic Structures on Guntersville Reservoir TVA Public Land

Name	Parcel Number	National Register Status	Description
Ancient Cedar Allee	1	Potentially eligible*	Entry drive to former plantation house
TVA Construction Village Public Safety Building and Garage	1	Probably eligible**	Plans in study for city of Guntersville to move and restore
Pine Tar Rock	1	Potentially eligible	Grooves in large rock used in processing pine pitch, former farm site
Cooley Cemetery	2	Potentially eligible	-
Honeycomb Cemetery	7	Potentially eligible	-
Honeycomb Cave/ Quarry	8	Probably eligible	Saltpeter mine in Civil War; later a limestone quarry and Civil Defense shelter
Fort Deposit	23, 25	Probably eligible	Civil War fort site
Blowing Cave	104	Probably eligible	Civil War saltpeter mine; pre-Civil War log dog-trot house and barn nearby
Adjacent farmhouses	128	Potentially eligible	Former farm houses adjacent to TVA public land
Old Bellefonte	132, 282l	Potentially eligible	Early capitol of Alabama; limestone chimney stack remains adjacent to TVA public land
Coffeys Ferry	137	Probably eligible	Pre-Civil War plantation house and cemetery adjacent to TVA public land
Fort Harker	143	National Register	Civil War earthen fortification
Bridgeport Ferry	154a	Probably eligible	Historic river crossing ferry
Railroad Bridge	159, 175	Probably eligible	Civil War railroad crossing and depot
Battery Hill	160	Probably eligible	Civil War fortifications, late 19th century residential district adjacent to TVA public land
South Pittsburg Ferry	165, 173	Probably eligible	Historic river crossing ferry and house
Abandoned rail line	165, 168	Potentially eligible	Historic pre-1936 railroad bed and trestle piers
Civil War Fort Site	166	Probably eligible	Battle Creek fort site
Murphy Hill	206	Probably eligible	Numerous former farms, cemeteries, and churches adjacent to TVA public land
Creek Path Mission Site	282v	Potentially eligible*	Historic site of the Creek Path Mission

* *Potentially Eligible*: These sites need further historic research to determine if they are eligible for listing on the NRHP.

** *Probably Eligible*: These sites are likely to be eligible for listing on the NRHP, pending further consultation with the State Historic Preservation Officers.

Farms, houses, and towns representing these periods are found adjacent to many of the TVA parcels. Some are listed on the NRHP, and many more are eligible. There are a number of Civil War fortifications—the best preserved and maintained are on TVA public land at Stevenson, Alabama. Fort Harker is listed on the NRHP as is the nearby railroad depot (which it protected), and portions of downtown Stevenson. There are several former ferry crossings which have retained their visual and land features, in particular, Coffey Ferry, Bridgeport Ferry, and South Pittsburg Ferry. Portions of the existing railroad bridge at Bridgeport, Alabama, predate the Civil War which was fortified from Battery Hill. The B. B. Comer Bridge (Alabama Highway 35) which crosses the Tennessee River near Scottsboro, Alabama predates the reservoir.

3.2.2 Wetlands and Floodplains

Wetlands

Wetlands are typically transitional ecosystems between terrestrial and aquatic communities. In the Ridge and Valley Physiographic Province, lower slope/terraced land and floodplains represent a small percentage of the landscape relative to the uplands due primarily to the geology of the region. Wetlands were substantially more widespread prior to impoundments on the Tennessee River and its tributaries. Soon after impoundment, many areas along Guntersville Reservoir's newly established shoreline were dredged in an effort to eliminate shallow water mosquito habitat. This cut-and-fill activity eliminated an unknown acreage of palustrine emergent and scrub-shrub habitat.

Extensive sections of wetland habitat are found on or adjacent to many parcels on Guntersville Reservoir. These wetland habitats include aquatic bed, herbaceous-emergent, scrub-shrub, and forested wetlands. The major portion (approximately 65-70 percent) of wetlands on Guntersville Reservoir are located within the five WMAs and refuges under long-term easement to the ADCNR in the upper portion of the middle reservoir between Tennessee River Mile (TRM) 397 and 411. Table 3-2 lists the significant wetlands found on Guntersville Reservoir.

Aquatic bed wetlands which are the most common type across the reservoir are comprised primarily of Eurasian milfoil, hydrilla, naiads, and lotus. In 1999, 76 percent of the aquatic beds were milfoil or hydrilla with the remainder either naiads, lotus, or various mixtures of the above-mentioned species. Aerial investigations of aquatic macrophytes showed a continued trend for increased growth from 10,500 acres in 1996 to 15,700 acres in 1999.

Herbaceous-emergent wetlands and scrub-shrub wetlands are the second most prevalent types. These wetlands occur in shallow water areas of coves and embayments, such as upper Honeycomb Creek (Parcel 19), Jagger Branch (Parcels 11, 12), Siebold Creek (Parcel 45), Mill Creek (Parcel 69), and Polecat Creek (Parcel 219); in shallows adjacent to islands, such as below the Highway 35 bridge in Scottsboro, upstream to Bellefonte Island (Parcel 180) including

Table 3-2 Significant Wetlands on Guntersville Reservoir

Parcel Number	Area Name	Major Wetland Type	TRM
12	Jagger Branch	emergent-scrub-shrub	352R
19	Honeycomb Creek	emergent-scrub-shrub	352R
26a	Conners Island	emergent-scrub-shrub	357R
45	Siebold Creek	emergent-scrub-shrub	363R
69	Mill Creek	emergent-scrub-shrub	367R
116	Roseberry Creek	forested	383R
121, 22, 124	Dry Creek	forested	383R
132	Polecat Creek	emergent-scrub-shrub	359L
162	Jones Creek	forested	415R
163	Poplar Branch	forested	417R
166	Battle Creek	forested	419R
182	Bellefonte Island	forested	393
242	Spring Creek	forested	359L
260	Browns Creek	forested	356L
198, 282g	South Sauty	emergent-scrub-shrub	347L
various	Buck Island/Columbus City	emergent-scrub-shrub	360R-366R

Conners Island (Parcel 26a); and in relatively narrow riparian shallows adjacent to the reservoir, such as Conners Island, Buck Island upstream to Columbus City, and the lower South Sauty. Common vegetation associated with these wetlands includes common cattail, giant cut-grass lizard's tail, soft rush, soft-stem bulrush, various sedges, smartweed, buttonbush, lead bush, black willow, silky dogwood, alder, red maple, green ash and sycamore. Most of this type of wetland is bordered on the upland side by forested wetlands.

Forested wetlands on Guntersville Reservoir occur primarily along tributary creeks and large embayments. The bottomland hardwood wetlands not under easement to ADCNR are on relatively small tracts. Most significant among these are upper Browns's Creek (Parcel 260), Spring Creek Natural Area (Parcel 242), Dry Creek (Parcel 121), Upper Roseberry Creek (Parcel 116), upper Widows Creek (152), Jones Creek (162), lower Battle Creek (Parcel 166), and Poplar Branch Creek (Parcels 163). Predominate woody plant species in these forested wetlands include water, willow and white oaks, sweetgum, sycamore, red maple, American elm, box elder, black willow, and Chinese privet. These wetlands provide essential summer, winter, and maternity roosting and foraging habitat for numerous protected and common wildlife, including waterfowl, songbirds, raptors, small and large mammals, and amphibians.

The tupelo forested community is uncommon TVA public land on Guntersville Reservoir. Stands of tupelo have become established in low-lying shoreline areas of Parcels 121, 122, and 124 on Dry Creek, upstream of its confluence with Roseberry Creek. Another more mature stand of tupelo is found inland on Bellefonte Island (Parcel 182).

In addition to supporting plant community diversity, Guntersville Reservoir wetlands provide habitat for a variety of waterfowl, wading bird, songbird, amphibian, reptile and mammal species. Common waterfowl using these habitats

for feeding areas, resting cover, and/or breeding areas include the wood duck, gadwall, ring-neck duck, Canada goose, mallard, American coot, and hooded merganser. Other birds such as killdeer, common snipe, American woodcock, great blue heron, green-backed heron, red-winged blackbird, swamp sparrow, common yellowthroat, and yellow warbler are abundant in these areas. Amphibians include bullfrog, green frog, upland chorus frog, American toad and dusky salamander. Common reptiles include the northern water snake, snapping turtle, mud turtle, and painted turtle. Mammals commonly found in these wetland habitats include muskrat, mink, beaver, and a variety of shrews and small mammals.

Floodplains

The 100-year floodplain on Guntersville Reservoir is the area that would be inundated by a 100-year flood event. The 100-year flood elevation for the Tennessee River varies from elevation 595.8 feet above msl at Guntersville Dam (TRM 349.0) to elevation 616.2-feet msl at the upper end of Guntersville Reservoir at TRM 424.7 (downstream of Nickajack Dam). A tabulation of the 100-year flood elevations is included in Table 3-3.

The Flood Risk Profile (FRP) elevation varies from elevation 597.0-feet msl at Guntersville Dam (TRM 349.0) to elevation 619.9-feet msl at the upper end of Guntersville Reservoir at TRM 424.7. The FRP is used to control residential and commercial development on TVA public land and is based on the 500-year flood elevation. A tabulation of FRP elevations is also included in Table 3-3.

Table 3-3 Flood Profiles for the Tennessee River at Guntersville Reservoir

River Mile	100-Year Flood	Flood Risk Profile	Landmarks	River Mile	100-Year Flood	Flood Risk Profile*	Landmark
349.00	595.8	597.0	Guntersville Dam	388.00	599.4	600.6	Jones Cr.
350.00	595.8	597.0	-	388.95	599.8	601.1	-
351.00	595.9	597.0	-	389.00	599.9	601.1	-
351.10	595.9	597.0	-	390.00	600.3	601.6	-
351.65	596.0	597.0	Honeycomb Creek	391.00	600.7	602.1	-
352.00	596.0	597.0	-	391.06	600.7	602.1	-
353.00	596.1	597.0	-	392.00	601.0	602.5	-
353.21	596.1	597.0	-	393.16	601.3	603.0	-
354.00	596.2	597.0	-	393.57	601.4	603.1	Town Creek
355.00	596.2	597.0	-	394.00	601.6	603.3	-
355.31	596.2	597.0	-	394.40	601.7	603.4	Mud Creek
356.00	596.3	597.0	-	395.00	601.9	603.6	-
356.30	596.3	597.0	Browns Creek	395.26	602.0	603.7	-
357.00	596.3	597.0	-	396.00	602.4	604.2	Coon Creek
357.41	596.3	597.0	-	397.00	602.9	604.8	-
358.00	596.3	597.0	U.S. Highway 431	397.36	603.1	605.1	-
358.59	596.4	597.0	Big Spring Creek	398.00	603.4	605.3	-
359.00	596.4	597.0	-	399.00	603.8	605.7	-

Table 3-3 Flood Profiles for the Tennessee River at Guntersville Reservoir

River Mile	100-Year Flood	Flood Risk Profile	Landmarks	River Mile	100-Year Flood	Flood Risk Profile*	Landmark
359.51	596.4	597.0	-	399.47	603.9	605.9	-
360.00	596.5	597.0	-	400.00	604.2	606.3	-
360.60	596.5	597.0	Short Creek	401.00	604.8	606.9	-
361.00	596.6	597.0	-	401.19	604.9	607.0	Crow Creek
361.62	596.6	597.0	-	401.57	605.1	607.3	-
362.00	596.7	597.1	-	401.80	605.2	607.4	Marshall Branch
362.60	596.7	597.2	Town Creek	402.00	605.3	607.4	-
363.00	596.8	597.2	-	403.00	605.6	607.8	-
363.38	596.8	597.3	Stearnes Creek	403.13	605.7	607.9	Alabama Hwy. 117
363.72	596.9	597.3	-	403.67	605.9	608.1	-
364.00	596.9	597.4	Siebold Branch	404.00	606.1	608.3	-
365.00	597.0	597.5	-	405.00	606.6	609.0	-
365.82	597.1	597.6	-	405.77	607.0	609.4	-
366.00	597.1	597.7	-	406.00	607.1	609.6	-
367.00	597.2	597.8	-	407.00	607.5	610.0	-
367.30	597.2	597.8	Mill Creek	407.88	607.9	610.4	-
367.92	597.3	597.9	-	408.00	607.9	610.5	-
368.00	597.3	597.9	-	408.24	608.0	610.6	Widows Creek
369.00	597.4	598.0	-	409.00	608.3	610.9	-
370.00	597.5	598.1	-	409.98	608.7	611.3	-
370.03	597.5	598.1	-	410.00	608.7	611.4	Long Island Creek
371.00	597.5	598.2	-	411.00	609.0	611.8	-
372.00	597.6	598.3	Boshart Creek	412.00	609.4	612.2	-
372.13	597.6	598.3	-	412.08	609.4	612.2	-
373.00	597.7	598.4	-	413.00	609.9	612.8	-
373.50	597.7	598.4	South Sauty Cr.	414.00	610.5	613.4	-
374.00	597.7	598.5	-	414.19	610.6	613.5	-
374.23	597.7	598.5	-	414.42	610.8	613.7	L&N Railway
375.00	597.8	598.6	-	415.00	611.2	614.1	-
375.36	597.9	598.6	Mink Cr.	415.52	611.6	614.5	Jones Creek
376.00	597.9	598.7	-	416.00	612.0	614.8	-
376.34	597.9	598.7	-	416.28	612.2	615.0	-
377.00	598.0	598.8	North Sauty Cr.	416.80	612.5	615.4	Poplar Spring Branch
378.00	598.1	598.9	-	417.00	612.6	615.5	-
378.44	598.1	598.9	-	418.00	613.2	616.2	-
379.00	598.2	599.0	-	418.39	613.5	616.5	-
380.00	598.3	599.1	-	418.45	613.5	616.5	TN Hwy. 156
380.54	598.3	599.2	-	418.62	613.6	616.7	Battle Creek
381.00	598.4	599.3	-	419.00	613.8	616.9	-
382.00	598.4	599.4	-	420.00	614.3	617.5	-
382.45	598.5	599.4	Roseberry Cr.	420.49	614.5	617.8	-
382.64	598.5	599.4	-	421.00	614.8	618.0	-

Table 3-3 Flood Profiles for the Tennessee River at Guntersville Reservoir

River Mile	100-Year Flood	Flood Risk Profile	Landmarks	River Mile	100-Year Flood	Flood Risk Profile*	Landmark
383.00	598.5	599.5	-	422.00	615.2	618.4	-
384.00	598.6	599.5	-	422.60	615.5	618.6	-
384.74	598.6	599.6	-	422.66	615.5	618.6	Sequatchie River
385.00	598.7	599.6	-	423.00	615.6	618.8	-
385.80	598.8	599.8	Alabama 35	424.00	616.0	619.5	-
386.00	598.8	599.8	-	424.70	616.2	619.9	Nickajack Dam
386.85	599.0	600.0	-				
387.00	599.0	600.1	-				

*The Flood Risk Profile is equal to the 500-year flood from TRM 361.62 upstream to Nickajack Dam.

3.2.3 Prime Farmland

The Guntersville Reservoir spans three counties. Marshall County, Alabama has 151,031 acres (37.6 % of total acreage) of soils classified as prime farmland. Prime farmland in Jackson County, Alabama covers 168,241 acres (24.2 %). Only 44,699 acres (13.7 %) in Marion County, Tennessee are classified as prime farmland. Table 3-4 lists prime farmland acreages found on TVA planning parcels.

Table 3-4 Guntersville Land Management Plan Parcels with 10 Acres or More of Prime Farmland Soils

TVA Parcel Number	Acres in Parcel	Acres of Prime Farmland	Percent Prime Farmland
1	1818.2	745.1	41.0
6	47.0	14.9	31.7
26, 26a	537.4	95.5	17.6
32	58.3	19.3	33.2
39	314.9	279.9	88.9
55	16.7	15.0	89.9
59	80.9	30.4	37.5
84	18.3	13.8	75.4
95	20.5	12.6	61.3
97	19.7	12.0	60.7
100	21.0	10.5	49.9
105	118.2	64.5	54.5
114	26.3	11.5	43.8
120	18.7	14.8	79.3
134	14.1	10.4	74.0
142	121.1	92.4	76.3
150	16.4	13.4	81.6
152	1390.9	155.4	11.2
161	34.6	20.7	59.8
163	71.2	58.6	82.3
165	11.6	10.3	88.6

Table 3-4 Guntersville Land Management Plan Parcels with 10 Acres or More of Prime Farmland Soils

TVA Parcel Number	Acres in Parcel	Acres of Prime Farmland	Percent Prime Farmland
166	257.2	257.2	100.0
167	26.3	14.2	54.1
168	14.7	13.9	94.8
170	12.1	12.1	100.0
171	68.3	15.9	23.2
172	16.7	16.7	100.0
173	73.5	22.2	30.3
200a	34.5	18.8	38.0
207	91.9	47.5	51.7
210	53.0	25.8	48.8
212	314.0	86.5	27.5
241	40.2	14.1	35.1
242	103.4	80.0	77.4
243	34.1	30.2	88.4
245	18.5	10.5	56.5
247	36.7	35.8	97.5
256	32.7	10.4	31.8
260	358.9	12.3	3.4
263	47.3	16.1	34.0
274	40.6	13.8	34.0
276	73.9	24.3	32.9
279	22.1	19.2	86.8

Source: STATSGO soils database.
USDA-SCS, 1956, Soil Survey of Marshall County, Alabama.
USDA-SCS, 1941, Soil Survey of Jackson County, Alabama.
USDA-SCS, 1950, Soil Survey of Marion County, Tennessee.

3.2.4 Sensitive Plant and Animal (Threatened and Endangered) Species

Plants

Field surveys were conducted in 1999 and 2000 as part of TVA's effort to update the 1983 Plan. Prior to these surveys, a search of the TVA Natural Heritage Project and the Alabama Natural Heritage Program databases was conducted for protected plant species known from DeKalb, Madison, Marshall, and Jackson Counties in Alabama and Marion County in Tennessee. The results of the search indicated that eight federal-listed, 43 Tennessee state-listed and 66 Alabama state-listed plant species are known from those counties (Table 3-5). This list, combined with regional information on additional species likely to occur on Guntersville Reservoir land, provided a focus for the field surveys.

Table 3-5 Records of Protected Plant Species Known to Occur in the Vicinity of Guntersville Reservoir (in DeKalb, Madison, Marshall, and Jackson Counties in Alabama and Marion County in Tennessee), 2000

Common Name	Scientific Name	Alabama Status	Tennessee Status	Federal Status
Alder-leaf buckthorn	*Rhamnus alnifolia*	-	Endangered	-
Allegheny-spurge	*Pachysandra procumbens*	NOST	-	-
American Hart's tongue fern	*Asplenium scolopendrium var. americanum*	NOST	Endangered	Threatened
Arrowhead*	*Sagittaria secundifolia*	NOST	-	Threatened
Aster*	*Aster spectabilis*	NOST	-	-
Bastard toadflax	*Comandra umbellata*	NOST	-	-
Black-eyed Susan	*Rudbeckia heliopsidis*	NOST	-	--
Bladder-fern	*Cystopteris tennesseensis*	NOST	-	-
Bradley spleenwort	*Asplenium bradleyi*	NOST	-	-
Buffalo-nut	*Pyrularia pubera*	NOST	-	-
Bugbane*	*Cimicifuga rubifolia*	NOST	Threatened	-
Bush honeysuckle*	*Diervilla lonicera*	-	Threatened	-
Canada lily	*Lilium canadense*	NOST	Threatened	-
Canada violet	*Viola canadensis*	NOST	-	-
Carolina silverbell	*Halesia carolina*	NOST	-	-
Catchfly*	*Silene caroliniana* ssp. *wherryi*	NOST	-	-
Chalk maple	*Acer saccharum* ssp. *leucoderme*	-	SPCO	-
Climbing bittersweet	*Celastrus scandens*	NOST	-	-
Creeping St. John-wort	*Hypericum adpressum*	-	Threatened	-
Croomia	*Croomia pauciflora*	NOST	-	-
Cylindric blazing star	*Liatris cylindracea*	NOST	Threatened	-
Dodder*	*Cuscuta harperi*	NOST	-	-
Dutchmans breeches	*Dicentra cucullaria*	NOST	-	-
Dwarf filmy-fern	*Trichomanes petersii*	NOST	Threatened	-
Eggert sunflower	*Helianthus eggertii*	NOST	Threatened	Threatened
Fame-flower	*Talinum mengesii*	NOST	Threatened	-
Featherfoil	*Hottonia inflata*	NOST	SPCO	-
Ginseng	*Panax quinquefolius*	-	S-CE	-
Goldenrod*	*Solidago tarda*	-	SPCO	-
Goldenrod*	*Solidago uliginosa*	NOST	SPCO	-
Goldenseal	*Hydrastis canadensis*	NOST	S-CE	-
Gooseberry*	*Ribes curvatum*	NOST	-	-
Gooseberry*	*Ribes cynosbati*	NOST	-	-
Green pitcher plant	*Sarracenia oreophila*	NOST	E-P	Endangered
Guyandotte beauty	*Synandra hispidula*	NOST	-	-
Hairy flase gromwell	*Onosmodium molle* ssp. *hispidissimum*	-	SPCO	-
Harper umbrella plant	*Eriogonum longifolium var. harperi*	NOST	Endangered	-
Harperella	*Ptilimium nodosum*	NOST	-	Endangered
Horse-gentian	*Triosteum angustifolium*	NOST	-	-
Horsemint*	*Monarda clinopodia*	NOST	-	-
Jointweed*	*Polygonella americana*	NOST	Endangered	-
Lance-leaf trillium	*Trilium lancifolium*	NOST	Endangered	-
Large whorled pogonia	*Isotria verticillata*	NOST	-	-
Meadow rue*	*Thalictrum debile*	NOST	-	-
Morefield's leather flower	*Clematis morefieldii*	NOST	-	Endangered
Mountain skullcap	*Scutellaria montana*	-	Endangered	Endangered
Mountain-camellia	*Stewartia ovata*	NOST	-	-
Necklace glade cress	*Leavenworthia torulosa*	Extirpated	-	-

Table 3-5 Records of Protected Plant Species Known to Occur in the Vicinity of Guntersville Reservoir (in DeKalb, Madison, Marshall, and Jackson Counties in Alabama and Marion County in Tennessee), 2000

Common Name	Scientific Name	Alabama Status	Tennessee Status	Federal Status
Nestronia	*Nestronia umbellula*	NOST	Endangered	-
One-flower cancer root	*Orobanche uniflora*	NOST	-	-
Ovate catchfly	*Silene ovata*	NOST	T-PE	-
Price potato-bean	*Apios priceana*	NOST	Endangered	Threatened
Riverbank bush honeysuckle	*Diervilla rivularis*	-	Threatened	-
Rose-gentian	*Sabatia capitata*	NOST	Endangered	-
Rosinweed*	*Silphium brachiatum*	NOST	Endangered	-
Roundleaf fame-flower	*Talinum teretifolium*	-	Threatened	-
Royal catch-fly	*Royal catchfly*	-	E-P	-
Running serviceberry	*Amelanchier stolonifera*	-	SPCO	-
Scarlet Indian paintbrush	*Castilleja coccinea*	NOST	-	-
Sedge*	*Carex purpurifera*	NOST	-	-
Small's stonecrop	*Diamorpha smallii*	-	Endangered	-
Smoketree	*Cotinus obovatus*	NOST	SPCO	-
Snow-wreath	*Neviusia alabamensis*	NOST	Threatened	-
Southern red trillium	*Trillium sulcatum*	NOST	-	-
Southern rein orchid	*Platanthera flava* var. *flava*	NOST	Endangered	-
Spiknard	*Aralia racemosa*	NOST	-	-
Spotted mandrin	*Disporum maculatum*	NOST	-	-
Spreading rockcress	*Arabis patens*	NOST	Endangered	-
Sweetflag	*Acorus calamus*	NOST	-	-
Tawny cotton-grass	*Eriophorum virginicum*	-	Threatened	-
Three-parted violet	*Viola tripartita* var. *tripartita*	-	SPCO	-
Tickseed*	*Coreopsis pulchra*	NOST	-	-
Turtlehead*	*Chelone lyonii*	NOST	-	-
Twinleaf	*Jeffersonia diphylla*	NOST	-	-
Valerian*	*Valeriana pauciflora*	NOST	-	-
Virginia chain-fern	*Woodwardia virginica*	-	SPCO	-
Wall-rue spleenwort	*Asplenium ruta-muraria*	NOST	-	-
Waterweed*	*Elodea canadensis*	NOST	-	-
Wister coral-root	*Corallorhiza wisteriana*	NOST	-	-
Witch-alder*	*Fothergilla major*	NOST	Threatened	-
Woodfern*	*Dryopteris x australis*	NOST	SPCO	-
Wood-sorrel	*Oxalis grandis*	NOST	-	-
Yellow honeysuckle	*Lonicera flava*	-	SPCO	-
Yellow jassamine	*Gelsemium sempervirens*	-	SPCO	-

*No standard common name for the species.
Common name given is that of the genus.
NOST = State listed, no state status assigned

Rare plant surveys were conducted from December 1999 through July 2000. These surveys were restricted to selected parcels of TVA public land on Guntersville Reservoir. On each of the parcels studied, emphasis was placed on locating populations of federal- or state-listed plants, uncommon habitats, and sensitive ecological areas. No federal-listed plant species or suitable habitat for such species were located during this survey. Ten Alabama and five Tennessee state-listed plant species were observed during these surveys on a total of nine Guntersville Reservoir parcels (Table 3-6).

Table 3-6 Listed Plants Observed During Surveys of Land Planning Parcels on Guntersville Reservoir, 1999-2000

Common Name	Scientific Name	Alabama Status	Tennessee Status	Federal Status
American Smoke-tree	*Cotinus obovatus*	NOST	SPCO	-
Carolina Silverbell	*Halesia carolina*	NOST	-	-
Carolina Spring Beauty	*Claytonia caroliniana*	NOST	-	-
Goldenseal	*Hydrastis canadensis*	NOST	S-CE	-
Gooseberry	*Ribes cynosbati*	NOST	-	-
Limestone Adder-tongue	*Ophioglossum engelmannii*	NOST	-	-
Nevius' Stonecrop	*Sedum nevii*	-	Endangered	-
Rosinweed	*Silphium brachiatum*	NOST	Endangered	-
Smooth Leaf-cup	*Polymnia laevigata*	NOST	-	-
Southern Rein Orchid	*Platanthera flava* var. flava	NOST	SPCO	-
Wood-sorrel	*Oxalis grandis*	NOST	-	-

SPCO – Special Concern
S-CE – Special Concern because of Commercial Exploitation
NOST – State listed, but no state status assigned

The Alabama Natural Heritage Program uses the Heritage ranking system developed by The Nature Conservancy, in which each species is assigned a rank representing its status in the state (S rank). Species with a rank of 1 are considered critically imperiled; those with a rank of 5 are the most secure. All of the Alabama state-listed plant species observed during field surveys have been assigned ranks of S1 (critically imperiled), S2 (imperiled) or S1S2 (an intermediate ranking) under this system. These state ranks are included in the following descriptions of all rare plant species found during surveys of TVA parcels on Guntersville Reservoir.

American Smoke-tree

This species (state rank S2), a member of the cashew family, typically favors drier hardwood forests, rocky limestone uplands, and ravines, especially on south- and southwest-facing slopes. Primarily an understory species, the American smoke-tree often reproduces by root sprouts. Ten individuals were found in flower in the limestone woods around Chisenhall Spring on Parcel 193 (north).

Carolina Silverbell

This species (state rank S2), a member of the storax family, is typically found as a shrub or small tree in rich moist woods. Over 100 individuals of this species were found southeast of Polecat Hollow along a north-facing slope, on Parcel 43. Approximately 20 of these were in fruit, and the remainder were immature. In addition, two individuals of this species were also observed on parcels along Sand Mountain on Parcel 193 (south).

Carolina Spring Beauty

This species (state rank S1) of the purslane family is typically found in moist, cool woodlands in the southern mountains. Over 100 individuals of this plant were found on a north-facing slope near Poplar Spring Branch on Parcel 39.

Goldenseal

This member (state rank S2) of the crowfoot family typically favors rich soils in both dry and moist forest types. Populations of this plant have been greatly reduced as a result of both habitat destruction and over harvesting for the herb trade. A large population of 150-200 individuals was found in a rich, mesophytic forest dominated by American beech. Because the species is threatened by over harvesting, the location of this occurrence will not be addressed in this environmental review.

Gooseberry

This member (state rank S2) of the gooseberry family is typically found as an understory species in rich woods. Approximately ten individuals of this species were found in shady, moist habitat on sandstone boulders.

Limestone Adder's-tongue

This member (state rank S2S3) of the adder's-tongue family, favors ledges and open pastures and woodlands typically on calcareous soils. Approximately 40 individuals of limestone adder's-tongue were found in a highly disturbed, limestone glade area on Parcel 7. A primitive road bisects this glade, allowing the area to be used as an illegal dump site.

Nevius' Stonecrop

This species (state rank S3), a member of the stonecrop family, is typically associated with the rocky slopes of river gorges and the cracks and crevices of large shale boulders. Nevius' stonecrop can occur in shade or full sun. Several hundred specimens were observed on approximately 15 large, flat, limestone boulders on Parcel 180, in TVA Coon Gulf SWA. No other herbaceous species were found associated with these occurrences. The forest was dominated by cedar, hickory, and white oak.

Rosinweed

This species (state rank S2), member of the aster family, favors rocky clearings and open mixed hardwood woodlands. Over 100 individuals of this species were found primarily in and around limestone outcrops on the slopes of Sand Mountain on Parcel 193 (north). Over one-half of these individuals were flowering or beginning to flower. Approximately 12 individuals were also found on Parcel 3, along the steeper slopes of the shoreline near Guntersville Dam.

Smooth Leaf-cup

The smooth leaf-cup (state rank S2S3), a member of the aster family, is usually found in moist woods but may rarely occur in wet meadows. Over 1,000

individuals were found on both sandstone and limestone soils on Parcel 184. These individuals were found in varying forest types but all in excellent habitat for this species.

Southern Rein Orchid

The southern rein orchid (state rank S2S3), a member of the orchid family, grows in soil or on rotting logs in wooded wetlands, seep areas, stream sides, moist meadows, and alluvial flood plains. This orchid is very sensitive to the removal of overstory trees. Numerous individuals of the orchid family were observed during TVA parcel surveys. However, positive identification of some of these individuals was not possible because no flowers or fruits were present. However, five individuals found in low alluvial woods on Parcel 124, southeast of Tipton Cemetery were positively identified as the southern rein orchid. Approximately 100 sterile individuals of a Platanthera species were also discovered. These plants were found in a low area that is frequently covered in standing water.

Wood-sorrel

This wood-sorrel (state rank S1), a member of the wood sorrel family is typically found in rich woodlands. Approximately ten plants were found growing in soil at the base of a sandstone cliff on Parcel 184. The habitat in and around this occurrence is of good quality and should continue to support this species if left undisturbed.

Terrestrial Animals

The plant communities on Guntersville Reservoir provide suitable habitat for a variety of rare and uncommon terrestrial animals. These diverse communities include mature, deciduous woodlands, pine woodlands, upland and riparian hardwood forests and open-field habitats. In addition to distinctive vegetated communities, many features, such as wetlands, streams, seepage areas, caves, sandstone bluffs, rock communities and sinkholes on reservoir parcels provide unique habitats for rare species of wildlife.

Prior to initiating field surveys on reservoir parcels, the TVA Regional Natural Heritage Project and Alabama Natural Heritage Program databases were queried to identify federal- and state-protected terrestrial animals as well as sensitive ecological areas (e.g., caves and heron colonies) from counties adjacent to Guntersville Reservoir. These counties include DeKalb, Madison, Marshall, and Jackson Counties in Alabama and Marion County in Tennessee. Twenty-six rare terrestrial animal species (Table 3-7), 1,231 caves, and 19 heron colonies were identified from the database. Four of these terrestrial animals—the bald eagle, red-cockaded woodpecker, gray bat and Indiana bat—are protected by the U. S. Fish and Wildlife Service (USFWS). The remaining species are protected by the states of Alabama and Tennessee or are tracked as rare species by the Alabama Natural Heritage Program.

Table 3-7 Records of Rare or Uncommon Terrestrial Animals Known to Occur in DeKalb, Madison, Marshall, and Jackson Counties, Alabama, and Marion County, Tennessee

Common Name	Scientific Name	Alabama Status	Tennessee Status	Federal Status
Amphibians				
Barking Tree Frog	*Hyla gratiosa*	—	INM[1]	—
Eastern Hellbender	*Cryptobranchus a. alleganiensis*	Protected	INM	—
Four-toed Salamander	*Hemidactylium scutatum*	SPCO[2]	INM	—
Green Salamander	*Aneides aeneus*	Protected	—	—
Mountain Dusky Salamander	*Desmognathus ocoee*	SPCO	—	—
Tennessee Cave Salamander	*Gyrinophilus palleucus*	Protected	Threatened	—
Reptiles				
Coachwhip	*Masticophis flagellum*	Protected	—	—
Eastern Milk Snake	*Lampropeltis t. triangulum*	SPCO	—	—
Northern Pine Snake	*Pituophis m. melanoleucus*	SPCO	Threatened	—
Red Milk Snake	*Lampropeltis triangulum syspila*	SPCO	—	—
Birds				
Appalachian Bewick's Wren	*Thryomanes bewickii altus*	Protected	Endangered	—
Bald Eagle	*Haliaeetus leucocephalus*	Protected	INM	Threatened
Bewick's Wren	*Thryomanes b. bewickii*	Protected	Endangered	—
Common Raven	*Corvus corax*	—	Threatened	—
Cooper's Hawk	*Accipiter cooperii*	Protected	—	—
Grasshopper Sparrow	*Ammodramus savannarum*	SPCO	—	—
Osprey	*Pandion haliaetus*	Protected	—	—
Peregrine Falcon	*Falco peregrinus*	Protected	Endangered	—
Red-cockaded Woodpecker	*Picoides borealis*	Protected	—	Endangered
Mammals				
Allegheny Woodrat	*Neotoma magister*	SPCO	INM	—
Common Shrew	*Sorex cinereus*	—	INM	—
Eastern Big-eared Bat	*Corynorhinus rafinesquii*	Protected	INM	—
Eastern Small-footed Bat	*Myotis leibii*	—	INM	—
Gray Bat	*Myotis grisescens*	Protected	Endangered	Endangered
Indiana Bat	*Myotis sodalis*	Protected	Endangered	Endangered
Southern Appalachian Woodrat	*Neotoma floridana haematoreia*	—	INM	—

[1] Species Deemed as In Need of Management by the Tennessee Wildlife Resources Agency
[2] Tracked as Species of Special Concern by the Alabama Natural Heritage Program

Terrestrial animal surveys were conducted from December 1999 through July 2000 and were restricted to selected planning parcels on Guntersville Reservoir. On each of these parcels, special emphasis was placed on locating populations of federal- and state-listed animals, uncommon habitats, and sensitive ecological areas. Various sampling techniques were used during surveys including qualitative, time-constrained searches, pitfall trapping, mist netting, and surveys of woodland ponds, caves, and heron colonies. Populations of five listed species of animals were observed during field surveys (Table 3-8).

Table 3-8 Protected Terrestrial Animals Observed During Surveys of Selected Planning Parcels on Guntersville Reservoir, 1999-2000

Common Name	Scientific Name	Alabama Status	Tennessee Status	Federal Status
Bald eagle	*Haliaeetus leucocephalus*	Protected	Protected	Threatened
Gray bat	*Myotis grisescens*	Protected	Endangered	Endangered
Green Salamander	*Aneides aeneus*	Protected	—	—
Osprey	*Pandion haliaetus*	Protected	—	—
Southeastern Shrew	*Sorex longirostris*	—	INM*	—

* Species Deemed as "In Need of Management" by the Tennessee Wildlife Resources Agency

Bald Eagle

Bald eagles are federal-listed as "Threatened" and are protected in Tennessee and Alabama. Recently, the number of bald eagles has increased in northern Alabama especially along Guntersville Reservoir. The reservoir provides habitat for breeding and winter populations of bald eagles. Several breeding pairs are reported from land surrounding the reservoir. Active bald eagle nests are located in close proximity to Guntersville Dam, Short Creek, Crow Creek, and in several smaller embayments between the cities of Scottsboro and Guntersville. Many of these nests have been active for more than 5 years. During field surveys, two new bald eagle nests were discovered on TVA public land on Guntersville Reservoir. The bald eagle pairs successfully fledged young at both nests in 2000. The presence of nesting bald eagles on the reservoir is significant given the bird's extended absence from the region. Large winter aggregations of migratory bald eagles are noted from Town Creek near Lake Guntersville State Park and to a lesser extent around Guntersville Dam.

Large, middle-aged and mature tracts of deciduous forests adjacent to reservoirs provide both nesting habitat for resident eagles and winter habitat for migratory bald eagles. These birds regularly perch on snags adjacent to water when foraging. Protecting large forested parcels and snags would benefit bald eagles. Suitable bald eagle nesting, foraging, and wintering habitat is found along Guntersville Reservoir on parcels which support large parcels of middle-aged and mature woodlands.

Gray Bat

Gray bats are listed as federal and state "Endangered." They are listed as "Protected" in Alabama. These bats occupy a limited geographic range that includes limestone karst areas of the southeastern United States (USFWS, 1982). Gray bats utilize caves year-round, usually occupying different caves during the summer and winter. In the summer, female gray bats form maternity colonies in caves that contain unique habitat requirements (i.e., temperature, size, and structure). Summer maternity caves are usually located near rivers or reservoirs over which the bats feed.

Two of the most significant populations of gray bats on the reservoir are found in caves near Guntersville Reservoir. Numbers of gray bats at Sauta (Blowing Wind) Cave and Hambrick Cave can exceed 100,000 individuals during summer months. Both caves are also used as gathering sites as gray bats prepare to migrate to nearby caves to hibernate. During fall migrations, numbers of gray bats can exceed 150,000 individuals at each of these caves. Several smaller populations are known from caves throughout the reservoir. Numerous caves along the river are also used as night roosts and migratory roosts.

During the 1990s, TVA and Auburn University studied the distribution and movement patterns of gray bats at Guntersville Reservoir. Gray bats were found to feed heavily on aerial forms of aquatic insects emerging from aquatic weed beds near their maternity colonies (Best, et al., 1997; Henry, 1998). The bats were also found to travel great distances while foraging (Goebel, 1996). The gray bats were found to feed up to 32 kilometers from their primary roosting sites.

During the recent field surveys, a new population of gray bats was discovered at the Quarry Cave near the Honeycomb Creek embayment. This population consisted of a significant number of bachelor males. Lastly, a foraging gray bat was captured during mist-net surveys on Parcel 128 near B. B. Comer Bridge. Gray bats from Sauta Cave were recorded in this area regularly during earlier field investigations.

Forested areas surrounding caves and over-water foraging habitats are important for gray bat survival (USFWS, 1982). Timber harvesting near these sites should be limited. In the winter, gray bats migrate and hibernate in a limited number of caves across the southeast. Numerous caves along the Tennessee River are used as night roosts and migratory roosts. Protection of caves, quarries, and surrounding forests would benefit this species. Protection of aquatic weed beds in close proximity of known summer roosts, such as Sauta Cave, is essential. A mixture of aquatic beds and open water habitats were shown to provide a greater diversity of prey items for gray bats than habitats that did not have aquatic plants (Henry, 1998).

Green Salamander

Green salamanders are listed as “Protected” in Alabama. Regionally this amphibian is found in narrow crevices on shaded sandstone and limestone bluffs and outcrops. This habitat is somewhat common throughout portions of north Alabama. However sandstone bluffs and outcrops are primarily restricted to narrow escarpments of the Cumberland Plateau, Sand Mountain, Lookout Mountain, and Little River Canyon. Because most of TVA public land is restricted to lower elevations along the Tennessee River, this habitat is uncommon on Plan land.

Several populations of green salamanders were found on Plan land. An extensive population was found among bluffs along Sand Mountain on Parcels 184 and 193.

Additional populations were found at Cave Mountain SWA, just southwest of Guntersville Dam. Typically, suitable bluff habitats are located within mature hardwoods or hardwood/Virginia pine forests. These shaded, geological habitats support a moist and delicate micro-climate that not only provides suitable habitat for this sensitive species but also provides habitat for a variety of additional woodland amphibians and rare plants.

The green salamander could be viewed as an excellent indicator of the ecological integrity and health of similar forested, geological habitats. Establishing protective buffer zones and allowing minimal timber harvest around sandstone bluffs and outcrops would benefit this species (Wilson, 1995).

Osprey

Osprey are listed as "Protected" in Alabama. In recent years, osprey populations have increased in Tennessee and Alabama. On Guntersville Reservoir, this species readily utilizes transmission line towers within the reservoir as nesting sites. During late winter field activities, nests were observed on several structures, although nesting activity had not yet commenced. In the spring of 2000, two active osprey nests were observed near Browns Creek and Crow Creek.

Protecting snags and mature woodlands along the reservoir would benefit this species. Suitable nesting and foraging habitats for this species are found on and adjacent to multiple reservoir shoreline parcels.

Southeastern Shrew

Southeastern shrews are listed as "In Need of Management" in Tennessee. This shrew is found in a variety of habitats across Tennessee and Alabama, including moist forests and wetlands, old fields, and early successional habitats. A population of southeastern shrews was found on Parcel 163. Suitable habitat for this species is found on numerous parcels surrounding Guntersville Reservoir.

Indiana Bat

Although Indiana bats were not found during field surveys on Guntersville Reservoir land, forested habitats and numerous caves surrounding Guntersville Reservoir provide suitable habitat for this federal endangered species. These colonial bats hibernate in caves during winter months and form small bachelor and maternity colonies during summer months in hollow trees and beneath peeling bark on various species of hardwood trees. Small populations of Indiana bats are known to hibernate at Sauta (Blowing Wind) Cave Wildlife Refuge near Scottsboro, Alabama, and in smaller caves located on the northern portions of Guntersville Reservoir. This indicates that summer colonies of Indiana bats may exist in suitable habitat on TVA public land at Guntersville Reservoir. TVA biologists surveyed several parcels surrounding Guntersville Reservoir for suitable habitats for Indiana bats. Although a variety of bat species were captured, Indiana bats were not observed at these sites.

Although surveys for Indiana bats were unsuccessful, small summer colonies of Indiana bats likely occur on forested portions of TVA public land surrounding Guntersville Reservoir. Timber management practices that favor the development of mature hardwood stands and the retention of snags would favor this species.

No populations of the remaining rare animal species listed in Table 3-8 were found during field surveys. However, suitable habitat exists on Guntersville Reservoir for most of these species. The presence of sensitive terrestrial animal species was projected based on the geographical range of the species and the presence of habitat deemed suitable for the respective species found in Barbour and Davis (1969), Choate, et al., (1994), Conant and Collins (1998), Harvey (1992), Imhof (1976), Mount, (1975; 1986), Nicholson (1997), Petranka (1998), Redmond and Scott (1996), Whitaker and Hamilton (1998), and Wilson (1995). Guntersville Reservoir parcels contain special habitat types which contribute to regional natural resources or landscape diversity. These include mature deciduous woodlands, wetlands and tupelo communities, woodland rock outcrops and sandstone bluffs, karst features, and woodland ponds. The reservoir also contains common habitat types found in the region, such as old fields and pine woodlands, which provide potential habitat for protected terrestrial animals.

Heron colonies

Heron colonies are colonial nesting sites used by migratory wading birds, most often great blue herons (*Ardea herodias*). Several species of birds in large numbers may nest in these colonies. Birds that occupy these colonies are sensitive to disturbance especially during the nesting season. Many parcels on Guntersville Reservoir provide suitable foraging and nesting habitat for these birds.

Two new heron colonies were identified on the reservoir during field surveys. The first colony is located on a small island and is composed of approximately 20 nesting great blue herons. The second colony is composed of approximately 30 nests and is located on an island near Scottsboro. In addition, expansion of several established heron colonies throughout Guntersville Reservoir was documented during field activities.

The establishment and expansion of heron colonies on Guntersville Reservoir is notable. Great blue heron populations underwent declines in the late 1960s and early 1970s. This species is currently expanding its range into unoccupied reservoirs, and additional areas of suitable habitat exist on Guntersville Reservoir. The degree of nesting activity of great blue herons, as well as bald eagles and osprey, on Guntersville Reservoir suggests that water quality is improving in Guntersville Reservoir. These colonies may eventually provide suitable nesting habitat for other species of wading birds that are considered uncommon in the region.

Suitable Habitat for Other Threatened and Endangered Animal Species

Mature Deciduous Woodlands

Middle-aged and mature deciduous woodlands on Guntersville Reservoir are found on riparian and upland parcels. These forests remain on steep parcels with a slope not easily logged or developed in bottomland hardwood forests (Parcels 138 and 147) or in mature forested wetlands. Large, middle-aged and mature parcels of deciduous forests adjacent to reservoirs provide habitat for resident and migratory bald eagles.

Middle-aged and mature woodlands also contain numerous hollow trees and trees with crevices or sloughing bark that may be used by Indiana bats and eastern big-eared bats (*Corynorhinus rafinesquii*). Additional species such as the eastern small-footed bat (*Myotis leibii*), common shrew (*Sorex cinereus*), southeastern shrew and mountain dusky salamander (*Desmognathus ocoee*) may also be found in this habitat type.

Wetlands and Tupelo Communities

Extensive parcels of wetland habitats are found on or adjacent to many TVA parcels on Guntersville Reservoir. These wetland habitats include herbaceous-emergent, scrub-shrub, and forested wetlands. Herbaceous-emergent wetlands and scrub-shrub wetlands are the most prevalent types. These wetlands occur in shallow water areas of coves and embayments, in shallows adjacent to islands, in riparian shallows of off-reservoir lakes and ponds, and in some stream corridors. Osprey and a variety of wading birds, shorebirds, and waterfowl were observed in these habitats.

Forested wetlands on Guntersville Reservoir include those in bottomlands with middle-aged and mature hardwood forests and the tupelo wetlands along the shoreline on Dry Creek near Scottsboro, Alabama, and inland on Bellefonte Island. The remaining bottomland hardwood wetlands are on relatively small parcels. These wetlands represent suitable habitat for numerous rare and common species of wildlife. Wetlands and other aquatic habitats on reservoir parcels provide habitat for barking tree frogs (*Hyla gratiosa*) and four-toed salamanders (*Hemidactylium scutatum*). Forested wetlands provide habitat for eastern milk snakes (*Lampropeltis t. triangulum*) and the red milk snakes (*Lampropeltis triangulum syspila*).

The tupelo community is uncommon on Guntersville Reservoir and appears to be declining throughout the Tennessee River Valley. Stands of tupelo have become established in low-lying shoreline areas of three parcels on Dry Creek upstream of its confluence with Roseberry Creek. A mature stand of tupelo was found on Bellefonte Island (Parcel 182). Because of the high quality of the tupelo stand, this site was designated as a TVA SWA for protection.

Woodland Rock Outcrops and Sandstone Bluffs

A variety of woodland rock habitats are present on TVA public land, ranging from exposed surface rock and small rock outcrops to extensive sandstone bluffs, rock shelters, and rock overhang formations up to 80 feet in height. These formations are generally located on midslopes and along ridge tops; however, they frequently extend down slope to the shoreline. These rock outcrops and bluffs contain fractures, crevices, and natural den sites that may be favored by a variety of wildlife species. The rugged terrain associated with these habitats has made timber harvesting difficult in these areas. As a result, these habitats have developed to more mature stages than surrounding habitats.

The woodland, sandstone rock bluffs and outcrops are optimal habitat for the green salamander. The variety of rock habitats provide roosting habitat for the eastern small-footed bats, and the mature deciduous forests surrounding these rock habitats provide suitable habitat for Indiana bats and eastern big-eared bats. Rocky hillsides provide habitat for the eastern milk snake and the red milk snake. The abundant natural den sites associated with rock formations provide habitat for the Allegheny woodrat (*Neotoma magister*) and southern Appalachian woodrat (*Neotoma floridana haematoreia*). The presence of rotting logs, woody debris, and quality leaf litter associated with the woodland outcrops also provide suitable habitat for a variety of small mammals, reptiles, and amphibians.

Karst Features

Caves are common in the rocky terrain surrounding Guntersville Reservoir. Caves provide habitat for a variety of invertebrates, amphibians, mammals and birds—many of which are protected species. Caves having large populations of bats usually have very complex assemblages of cave-dwelling species due to the large amounts of nutrients typically found in these cave systems. Many of these species are only found in single-cave systems. Therefore caves can be very biologically significant. Sinkholes are also associated with karst terrain and when present in middle-aged or mature woodlands are favored by several listed and common plants and animals. Several biologically significant caves are mentioned in Section 3.2.5, Significant Natural Areas.

Woodland Ponds and Associated Habitats

Woodland ponds, especially temporary ponds not supporting populations of fish, provide breeding sites for large numbers of amphibians. Woodland salamanders travel in large numbers to these sites during fall and winter to breed at these sites. These sites also provide water sources and foraging sites for many woodland species of wildlife. Permanent ponds were found within a middle-aged forest on Parcel 3.

On Parcels 147, 149, and 151, streams have been altered by beaver activity to create two off-reservoir lakes on each parcel. A mixture of middle-aged woodlands, agricultural land, regenerating thickets, and young, forested wetlands surround these lakes. Areas of standing dead trees are also present. The forested

wetlands associated with Parcels 147 and 149 are located along streams flowing into these lakes and in low-lying coves. On Parcel 151, wetland habitats associated with the lake are more complex with well-developed, herbaceous-emergent, scrub-shrub, and forested wetlands. Waterfowl, wading birds, and shorebirds are abundant on these parcels, as are numerous species of nesting, neotropical birds, such as prothonotary warbler, in addition to a variety of small mammals, reptiles, and amphibians. The open water and wetland habitats represent optimal forage areas for osprey and bald eagles as well as federal-listed "Endangered" gray bats.

On Parcel 153, a large wetland approximately 400 feet in width has developed along a stream tributary that extends northward for one-half mile beneath five transmission line rights-of-ways. This wetland is influenced by beaver activity and consists of a mixture of herbaceous-emergent, scrub-shrub, and forested wetlands. Habitat for waterfowl, wading birds, and shorebirds is abundant at this site. Numerous species of neotropical birds, small mammals, reptiles, and amphibians would be expected to occur here.

Common Habitats for Protected Species

Early successional habitats such as old fields and grasslands along the reservoir provide suitable habitat for the coachwhip (*Masticophis flagellum*), grasshopper sparrow (*Ammodramus savannarum*) and Bewick's wren (*Thryomanes bewickii*). Cooper's hawk (*Accipiter cooperii)* nest in woodlands and often forage in early successional habitats. Northern pine snake (*Pituophis m. melanoleucus*) may occur in low-lying pine woodlands along the reservoir. Eastern hellbender (*Cryptobranchus a. alleganiensis*) inhabit cool, unpolluted waters and may be found along several parcels.

No suitable habitat for red-cockaded woodpeckers (*Picoides borealis*) was observed on Guntersville Reservoir parcels. Although stands of pine were observed, none were of suitable age or were extensive enough to provide suitable nesting habitat for the red-cockaded woodpecker. Limited habitat exists on reservoir parcels for the peregrine falcon (*Falco peregrinus*). Suitable habitat for the peregrine falcon was observed on more rugged portions of Parcels 193 and 184.

Aquatic Animals

Analyses of the TVA Regional Natural Heritage database indicated several species of federal- or state-protected aquatic animals are known from areas within or adjacent to Guntersville Reservoir TVA public land. In addition to several state-protected species, these include one snail, six mussels, and a fish that are currently federal protected, and an additional mussel that is officially a candidate for potential federal protection (Table 3-9). With the exception of the Tennessee heelsplitter and the southern cavefish, these aquatic species are all known from large river habitats, and many of these records date from pre-impoundment mainstem Tennessee River surveys (Bogan and Parmalee, 1983; Parmalee and

Bogan, 1998; Etnier and Starnes, 1993). Because of the habitat changes resulting from impoundment, some of these are believed to have been extirpated from this part of their historic range. These include the spiny riversnail and the ring pink and Cumberland monkeyface mussels (Bogan and Parmalee, 1983; Parmalee and Bogan, 1998). Likewise, many of the state-protected mussels have also likely been extirpated by these changes.

Anthony's riversnail, pink mucket mussels, and snail darters have been recently recorded from and are likely to occur in the riverine reach of Guntersville Reservoir near Long Island. The likelihood of occurrence of several of the other federal-protected mussels (orange-foot pimpleback, dromedary pearlymussel, rough pigtoe) in this area is much less certain. Although these mussels are occasionally found in other Tennessee River mainstem areas that are affected by impoundment, their occurrence in this area has not been documented in recent years.

The Tennessee heelsplitter is known mostly from small, headwater streams. The southern cavefish is strictly an inhabitant of pools in caves. No appropriate habitats for either of these species are known from parcels considered in the proposed Plan.

Table 3-9 Sensitive Aquatic Species Known from Guntersville Reservoir

Common Name	Scientific Name	AL Status	TN Status	Federal Status
FISH				
Snail darter	*Percina tanasi*	Threatened	Threatened	Threatened
Southern cavefish	*Typhlichthys subterraneus*	Special Concern	In Need of Management	-
MUSSELS				
Cumberland Monkeyface	*Quadrula intermedia*	Endangered	Endangered	Endangered
Dromedary pearlymussel	*Dromus dromas*	Endangered	Endangered	Endangered
Hickorynut	*Obovaria olivaria*	Endangered	-	-
Kidneyshell	*Ptychobranchus fasciolaris*	Threatened	-	-
Orange-foot pimpleback	*Plethobasus cooperianus*	Endangered	Endangered	Endangered
Pink mucket	*Lampsilis abrupta*	Endangered	Endangered	Endangered
Pocketbook	*Lampsilis ovata*	Endangered	-	-
Ring pink	*Obovaria retusa*	Endangered	Endangered	Endangered
Rough pigtoe	*Pleurobema plenum*	Endangered	Endangered	Endangered
Rough rabbitsfoot	*Quadrula c. cylindrica*	Endangered	-	-
Sheepnose	*Plethobasus cyphyus*	Endangered	-	-
Slabside pearlymussel	*Lexingtonia dollabelloides*	Endangered	-	Candidate
Snuffbox	*Epioblasma triquetra*	Endangered	-	-
Tennessee heelsplitter	*Lasmigonia holstonia*	Endangered	-	-
SNAILS				
Anthony's riversnail	*Athearnia anthonyi*	-	Endangered	Endangered
Corpulent hornsnail	*Pleurocera corpulenta*	Threatened	-	-
Spiny riversnail	*Io fluvialis*	Endangered	-	-
Varicose rocksnail	*Lithasia verrucosa*	Threatened	-	-

3.2.5 Significant Natural Areas

Prior to the 1999-2000 field surveys for the Guntersville Plan, 15 Ecologically Significant Sites and Managed Areas were known to occur on or within 5 miles of the Guntersville Reservoir. Two of the areas, Lake Guntersville State Park (Parcel 212) and Buck's Pocket State Park (Parcel 202) are managed for public recreation, and one area is managed as a designated Alabama State Natural Area. Six areas are designated as state or federal WMAs or refuges, and five areas are managed by TVA as Small Wild Areas (SWA) and Habitat Protection Areas (HPA). There are presently no TVA Ecological Study Areas on or adjacent to the Guntersville Reservoir. Lake Guntersville and Buck's Pocket State Parks are managed by the Alabama Department of Conservation and Natural Resources for low intensity recreation. Mud Creek (Parcel 136), North Sauty Creek (Parcels 103 and 104), Raccoon Creek (Parcel 176) and Skyline State WMA comprise over 13,000 acres of land and water. Skyline WMA is located in the Cumberland Plateau area northwest of Stevenson in the reservoir watershed. These areas are managed by the ADCNR, Division of Game and Fish for waterfowl and small game.

TVA Big Spring Creek Small Wild Area (Parcel 242) is located on the upstream half of Big Spring embayment of Guntersville Reservoir. This area includes a stand of old-growth, bottomland forest (approximately 13 acres) and a large expanse of shallow water habitat mingled with numerous islands and sloughs.

The majority of the 34-acre **TVA Cave Mountain Small Wild Area,** on Guntersville Dam Reservation, is covered with upland hardwoods. Beaver dams occur periodically along the northern edge of the parcel, near the location of a small, narrow saltpeter cave. Another small cave provides habitat for an Alabama protected species. Spring wildflower displays are spectacular. The parcel is managed to preserve its unique natural features and to provide passive recreation opportunities for the public.

The forested cove designated as **TVA Coon Gulf Small Wild Area** (Parcel 180) on Guntersville Reservoir serves as a flyway for a federal-listed endangered mammal. Nitre Cave is also used by a federal-listed mammal for hibernation. Blowing Hole Cave may also be utilized by these species. At least 55 Alabama state-listed plants are also known from this HPA.

Comprised of 274 acres, the **TVA Honeycomb Creek Small Wild Area** (Parcel 3) is located on Honeycomb Creek embayment of Guntersville Reservoir. The topography of this area is steep to moderately rolling, with many limestone rock outcrops. Upland hardwoods and plantations of old-growth, short-leaf Virginia and loblolly pines are abundant here. Sinkholes, caves, and other karst features are also present.

The **TVA South Sauty Creek Small Wild Area** (Parcel 202) is located on both sides of South Sauty Creek. It was designated as a Natural Area because of its unique natural and scenic qualities. Often described as one of the most scenic areas on Guntersville Reservoir, this Natural Area adjoins Buck's Pocket State Park.

Blowing Wind Cave Gray Bat Sanctuary (Parcel 104) provides an important roosting habitat for a federal-listed mammal. The adjacent Blowing Wind Cave National Wildlife Refuge also provides extensive foraging habitat for this species.

TVA Mink Creek Habitat Protection Area (Parcel 98) includes the Gross Skeleton Cave and adjacent underwater area within Mink Creek. This Natural Area provides roosting and foraging habitat for a federal-listed mammal.

TVA Honey Bluff Habitat Protection Area is located east of Guntersville Dam on Parcel 3. This area encompasses 5.6 acres of bluff along the Guntersville Reservoir shoreline and includes Hambrick Cave. The cave provides habitat for a federal-listed endangered species. TVA maintains a fence and signs at the entrance to the cave and monitors the site annually.

3.3 Water

Watershed Description

A watershed is defined as an area bordered by a divide which drains to a particular stream, river, lake or reservoir. Large watersheds, like the Tennessee River, are made up of many smaller watersheds. The Guntersville Reservoir watershed encompasses the land surrounding the mainstem Tennessee River between TRM 349.0 and TRM 424.7. It covers portions of three distinct physiographic provinces:

- Guntersville Dam is located in the Cumberland Plateau Physiographic Province.
- A majority of the watershed can be found in the Sequatchie Valley Province.
- The remainder is located in the Southwestern Appalachian Valley Province (TVA, 1941).

The watershed contains 2,669 square miles of drainage area and includes the Sequatchie River watershed which accounts for approximately 600 square miles (TVA 1999b). The region's topography channels the reservoir's flow in a southwesterly direction. The landscape is typically narrow valleys surrounded by ridges, rolling hills and/or escarpments. Many of the smaller tributaries, particularly those in the higher elevations, exhibit seasonally intermittent flow patterns (Saylor, 2000). Consequently, the reservoir itself is the dominant characteristic of the area. (TVA, 1999b).

Hydrologic Units

Hydrologic Unit Codes (HUCs) are cataloging units assigned to each watershed by the U.S. Geological Survey. The HUCs are based on size ranging from two-digit regional watershed codes to eight-digit cataloging units that represent the large subwatersheds. The Guntersville Reservoir watershed is comprised of two regional cataloging units; 06030001 for the Guntersville Reservoir and 06020004 for the Sequatchie River. It crosses three state boundaries–Alabama, Tennessee, and Georgia–and contains a total of 40 smaller, 11-digit subwatersheds (Figure 3-9). Twenty-three of these are located in Alabama and cover parts of Jackson, Marshall, DeKalb, Etowah, and Blount Counties. The Tennessee portion is comprised of 16 subwatersheds within Marion, Sequatchie, Bledsoe, Franklin, Van Buren, Grundy, and Cumberland Counties. One additional subwatershed is located on the western edge of Dade County, Georgia. Twenty-three of the subwatersheds surrounding Guntersville Reservoir contain TVA public land (see Table 3-10).

Table 3-10 TVA Parcels Located Within the Watershed Basins Surrounding Guntersville Reservoir

Hydrologic Unit	Watershed Name	Square miles	TVA Parcels Within the Hydrological Unit
TN-06020004-010	Sequatchie River	58.9	-
TN-06020004-020	Sequatchie River	63.6	-
TN-06020004-040	Brush Creek	67.6	-
TN-06020004-030	Sequatchie River	86.9	-
TN-06020004-050	Sequatchie River	83.8	-
TN-06020004-070	Little Sequatchie River	81.3	-
TN-06020004-060	Sequatchie River	95.7	170, 171
TN-06030001-030	Big Fiery Gizzard Creek	52.4	-
TN-06030001-020	Battle Creek	60.6	-
TN-06020004-080	Little Sequatchie River	50.8	-
TN-06030001-090	Crow Creek	87.6	-
TN-06030001-040	Battle Creek	55.2	165-168
TN-06030001-110	Tributary To Crow Creek	29.3	-
TN-06030001-010	Tennessee River	13.1	168-170, 173-176
TN-06030001-060	Tennessee River	29	163-165, 161A
TN-06030001-130	Little Coon Creek	5	-
AL-06030001-140	Big Coon Creek	43.3	-
AL-06030001-120	Little Coon Creek	25.4	-
AL-06030001-100	Crow Creek	41.3	137
AL-06030001-060	Tennessee River	75.8	137, 140-162, 154A, 161A, 282N
AL-06030001-080	Tennessee River	97.4	175, 176
GA-06030001-070	Tennessee River	12.5	-
AL-06030001-170	Tennessee River	105.3	129-137, 180, 182, {282 L, M, U}*
AL-06030001-150	Tennessee River	22.2	137, 138, 139
AL-06030001-160	Flat Rock Creek	96.4	176-180
AL-06030001-190	Tennessee River	102.7	105, 108, 109, 111-129, 180, 116A, 127A, 282K
AL-06030001-210	Tennessee River	84.1	90 -111, {282 H, I}
AL-06030001-180	Tennessee River	86	180, 181, 181a, 181b, 181c, 183

Table 3-10 TVA Parcels Located Within the Watershed Basins Surrounding Guntersville Reservoir

Hydrologic Unit	Watershed Name	Square miles	TVA Parcels Within the Hydrological Unit
AL-06030001-250	Town Creek	202.1	212, 202A and 282P
AL-06030001-200	Tennessee River	17.8	180, 183-198 and {282I, J}
AL-06030001-220	South Sauty Creek	125.9	202A
AL-06030001-230	Tennessee River	26.5	198-202, 202A and {282G, O}
AL-06030001-240	Tennessee River	37.6	30, 38-90 and {282B, C, D, F, S, T}
AL-06030001-260	Tennessee River	47.2	201-212, 202A, 207A and {282E, P}
AL-06030001-320	Tennessee River	40	1, 3-37
AL-06030001-310	Tennessee River	74.4	1, 2, 250-281 and 282 R
AL-06030001-290	Scarham Creek	20.5	212
AL-06030001-270	Scarham Creek	91.1	-
AL-06030001-300	Tennessee River	71.4	212-250 and 282Q
AL-06030001-280	Short Creek	114.2	-

Reservoir Description

Nickajack Dam releases account for approximately 37,200 cubic feet per second (cfs) of the water entering Guntersville Reservoir (TVA, 1999b). The average annual discharge to Wheeler Reservoir from Guntersville Dam is 41,800 cfs; thus, only 4,600 cfs of the water volume released originates from within the Guntersville Reservoir watershed's hydrologic units (TVA, 1999b). The mean annual precipitation in the Guntersville Reservoir watershed ranges from 55.6 to 57.2 inches. Guntersville Reservoir has an average depth of only 15 feet with the maximum depth of 60 feet. The overall shallow depth is attributable to the midreservoir reaches where the reservoir margins become dominated by wide over-bank and numerous broad, shallow embayments (Webb, et al., n.d.). Physical habitat within the reservoir varies from well defined channel boundaries with isolated, shallow, over-bank areas in the upstream reaches, previously described as midreservoir reaches, to a predominately deep forebay area (TVA, 1987). Guntersville Reservoir is categorized as a "run of the river" reservoir because it has an average hydraulic retention time of only 12-13 days, a winter drawdown of only 2 to 3 feet, and much of the water flowing through its main channel originates from other reservoir/watershed areas located upstream (TVA, 1987; 1999b). Summertime thermal stratification does occur but is generally weak and short of duration due to its overall shallow depth and "run of the river" characteristics (TVA, 1987).

Water Quality Characteristics

Guntersville Reservoir is classified as a nutrient rich, highly productive (eutrophic) body of water (Poppe, et al., 1982). Most of the nutrients found in the reservoir (87.3 percent of the total phosphorous and 80.8 percent of the total nitrogen) are attributable to the water releases from Nickajack Dam. Recent data from the TVA Reservoir Vital Signs Monitoring Program (for the period 1990 through 1999) indicated that the average summer concentration (monthly

collections April through September) was equal to 0.55 mg/L for total nitrogen and 0.03 mg/L for total phosphorus.

The overall potential for nonpoint source pollutants to impair the water quality from within the Guntersville Reservoir watershed is high. Local Soil and Water Conservation Districts found that estimates of sedimentation rates, animal unit densities, pastureland use, and the number of current construction storm water authorizations (due to development) were the primary contributors and causes for concern. Mined land and crop land were typically the highest contributors of sediment loading components (ADEM, 2000).

TVA Water Quality Monitoring and Results

As part of the Reservoir Vital Signs Monitoring Program (RVSMP) initiated by TVA in 1990, Guntersville Reservoir has been monitored for physical/chemical characteristics of waters, physical/chemical characteristics of sediment, benthic macroinvertebrate community sampling, and fish community assemblage. RVSMP was designed to systematically monitor the ecological condition of individual reservoirs. Five key indicators (dissolved oxygen [DO], chlorophyll, fish, bottom life, and sediment) are monitored and contribute to a final rating/score that describes the "health" and integrity of an aquatic ecosystem. Other components of the RVSMP include: (1) monitoring of toxic contaminants in fish flesh to determine their suitability for consumption and (2) sampling of bacteriological concentrations at recreational areas to evaluate their suitability for water contact recreation (TVA, 2000).

Ratings for Guntersville Reservoir have been among the highest (or best) observed since the program began. Table 3-11 shows the water quality ratings from data collected in 1996 and 1998. Improved scores for chlorophyll and lower scores for sediment and fish were observed in 1998. Polychlorinated biphenols (PCBs) found in the sediment at the forebay site resulted in a decreased sediment rating for the entire reservoir. PCBs were commonly used in a variety of commercial products, including adhesives, transformers, electric motors, hydraulic systems, fluorescent lights, and other electrical equipment. If precautions are not taken when this equipment is discarded, PCBs can find their way into aquatic systems.

As chlorinated hydrocarbons, PCBs are persistent when released into the environment. Environmental Protection Agency (EPA) suspects they are probable human carcinogens. PCBs tend to accumulate in the forebay areas where the sediment settles out of the water column due to the depth and stillness of the water. Catfish and other bottom-feeding species come in contact with the sediment on a daily basis; hence, they tend to accumulate the compound within their fatty tissues. Species that eat these fish, such as humans, in turn also accumulate the PCBs in fatty tissues.

Fish community ratings at all three sample locations declined between 1996 and 1998 but may have been affected by migration of fish species to cooler, deeper waters (due to drought-like conditions). Also, sampling efforts might have been hindered by the growth of abundant aquatic plant life (TVA, 1999b). Fish fillets were last analyzed for pesticides, PCBs and metals in 1996. Based upon the results of that study, there are no fish consumption advisories currently issued for Guntersville Reservoir (Dycus, 2000).

All fecal coliform bacteria levels for each of the 13 stations sampled in 1998 were within water contact guidelines for the state of Alabama. The thirteen sampling sites were: the swimming beaches at Honeycomb Creek Campground, Carlisle Park, Jayceete Park, Lake Guntersville State Park, and Goose Pond Park; Marshall County Park #1, Siebold Creek public use area; Short Creek boat ramp; Riverview Campground and two locations each on Town Creek and South Sauty Creek (TVA, 1999b).

Table 3-11 Guntersville Reservoir Water Quality Ratings, Reservoir Vital Signs Monitoring Program Data

Location and Elements Monitored	Monitoring Years	
	1996	1998
Forebay		
Chlorophyll	Fair	Good
Dissolved Oxygen	Good	Good
Sediment	Good	Fair
Transition		
Chlorophyll	Good	Good
Dissolved Oxygen	Good	Good
Sediment	Good	Good

Recent Evaluations by the State of Tennessee – According to the 1996 Tennessee Department of Environment and Conservation (TDEC) water quality assessment report, known as the 305(b) Report, tributaries leading from Tracy City, Tennessee, to their confluence with Big Fiery Gizzard Creek are "Not Supporting" their designated stream use (TDEC, 1996). Failing septic tanks combined with the lack of a sewage treatment plant in Tracy City are listed as the causes for high pathogen concentrations (TDEC, 1998). Section 303 of the federal Clean Water Act directs all states to compile a list of the streams and lakes requiring additional pollution controls in order to meet water quality standards. Tennessee's listings for the Guntersville Reservoir watershed include Woodcock and Hicks Creeks in Sequatchie County, which are listed for metals, pH, and siltation due to inactive mining, resource extraction, and channelization; Griffith Creek of Marion County is listed for pollutants related to silviculture activities and resource extraction; and the Grundy County Lakes (Nos. 1 and 2) where subsurface mining was listed as the cause for the "Partially Supporting" stream use designation (TDEC, 1998).

Recent Evaluations by the State of Alabama—The 1998 303(d) Report published by the ADEM listed the following tributaries of Guntersville Reservoir as either not supporting or only partially supporting designated stream use: Town Creek and South Sauty Creek of DeKalb County; Warren Smith Creek, Hogue Creek, Guess Creek, Dry Creek, Mud Creek, Coon/Flat Rock Creek, Rocky Branch, and Cole Spring Branch of Jackson County; and Mill Pond Creek, Scarham Creek, Short Creek, and Little Paint Rock Creek of Marshall County (ADEM, 1999). The causes for the stream listings can be found in Table 3-12.

Table 3-12 Alabama's 1998 303(d) Stream Listings for Guntersville Reservoir

County	Hydrologic Unit Code	Tributary	Size (mi.)	Use	Cause	Source
Blount	N/A	None	N/A	N/A	N/A	N/A
DeKalb	06030001-220	South Sauty Creek	N/A	Swimming, F&W	pH	Unknown
	06030001-250	Town Creek	N/A	F&W	pH	Unknown
Etowah	N/A	None	N/A	N/A	N/A	N/A
Jackson	06030001-160	Coon/Flat Rock Creek	20	F&W	metals, pH, siltation	surface mining - abandoned, mine tailings - abandoned
	06030001-160	Dry Creek	8	F&W	pesticides, pH, siltation	None listed
	06030001-160	Hogue Creek	2.4	F&W	nutrients, siltation, organic enrichment/ DO	None listed
	06030001-170	Mud Creek	21	F&W	organic enrichment/ DO	nonirrigated crop production, pasture grazing
	06030001-160	Rocky Branch	4	F&W	pH, siltation	surface mining - abandoned, mine tailings - abandoned
	06030001-160	Warren Smith Creek	3	F&W	pH, siltation	None listed
Marshall	06030001-290	Scarham Creek	12	F&W	pesticides, ammonia, siltation, organic enrichment/ DO, pathogens	nonirrigated crop production, intensive animal feeding operation, pasture grazing
	06030001-280	Short Creek	N/A	PW, F&W	Pathogens	Unknown

N/A - Not available
F&W - Fish & Wildlife
PW - Public Water Supply

3.3.1 Navigation

The commercial navigation channel on Guntersville Reservoir extends from the Guntersville Lock and Dam (TRM 349.0) on the Tennessee River upstream to below the Nickajack Lock and Dam (TRM 424.7). The commercial channel was designed prior to impoundment of the reservoir to provide a year-round channel with a minimum 11-foot depth suitable for towboats and barges with a 9-foot draft. The U. S. Coast Guard maintains the navigation channel buoys and onshore day beacons marking the commercial navigation channel. Navigation safety landings and harbors (see Table 3-13) have been established at various locations along the reservoir to provide safe locations for commercial tows and recreational vessels to tie off and wait during periods of severe weather, fog, or equipment malfunction. One private mooring facility is proposed by U.S. Gypsum on Parcel 141 at river mile 417.2R. There are public and private use barge terminals (see Table 3-14) on Guntersville Reservoir which handle barge shipments of various commodities.

TVA maintains secondary navigation channel markers and aids for 17 tributary channels (approximately 38 miles) for recreational boaters and boat hazard buoys for two harbor areas. Secondary navigation channel markers consist of buoys and onshore day boards which mark the navigable limits of the channel.

Table 3-13 Navigation Safety Landings and Harbors on Guntersville Reservoir

Parcel Number	River Mile	Type of Landing or Harbor
3	349.8R	1st class harbor (mooring cells at entrance)
7	351.6R	1st class harbor
24	358.3R	1st class landing (mooring buoys)
56	365.3L	1st class landing
60	369.4R	1st class landing
82	373.0R	1st class landing
125	397.2R	1st class landing
132	402.8L	1st class landing
134	411.1R	1st class landing
148	418.3L	1st class landing
148	419.8L	1st class harbor
215	379.0R	2nd class harbor (with four mooring dolphins)

Table 3-14 Barge Terminals on Guntersville Reservoir

Mile	Name	Type of Use	Handling Capabilities	Comments
358.2L	Global Materials Services Port of Guntersville-Steel	Private Owned/Public Use	Dry Bulk-Un loading	Guntersville Harbor
358.2L	Global Materials Services Port of Guntersville-Truck Dump	Private Owned/Public Use	Dry Bulk-Loading	Guntersville Harbor

Table 3-14 Barge Terminals on Guntersville Reservoir

Mile	Name	Type of Use	Handling Capabilities	Comments
358.2L	Global Materials Services Port of Guntersville-Bulk Handling	Private Owned/Public Use	Dry Bulk-Loading/Unloading	Guntersville Harbor
358.2L	Global Materials Services Port of Guntersville-Liquid	Private Owned/Public Use	Liquid-Unloading	Guntersville Harbor
358.2L	BP Amoco (Inactive)	Private Owned/Private Use	Liquid-Unloading	Guntersville Harbor
358.2L	Guntersville Wood Terminal	Private Owned/Private Use	Dry Bulk-Loading	Guntersville Harbor
358.2L	Cargill Marketing Company	Private Owned/Private Use	Dry Bulk-Loading/Unloading	Guntersville Harbor
358.2L	Consolidated Blenders, Inc.	Private Owned/Public Use	Dry Bulk-Unloading	Guntersville Harbor
358.2L	Cargill, Inc.	Private Owned/Private Use	Dry Bulk-Loading/Unloading, Liquid-Loading	Guntersville Harbor
358.2L	Cargill, Inc.-Tank Farm Wharf	Private Owned/Private Use	Liquid-Loading	Guntersville Harbor
358.2L	Gold Kist, Inc.-Poultry Feed Mill	Private Owned/Private Use	Dry Bulk-Unloading	Guntersville Harbor
358.2L	Guntersville Marine, Inc.	Private Owned/Public Use	Dry Bulk-Loading/Unloading	Guntersville Harbor
358.2L	Guntersville Marine, Inc.-Fleeting	Private Owned/Public Use	Fleeting	Guntersville Harbor
358.2L	Southern States Feed Mill	Private Owned/Private Use	Dry Bulk-Unloading	Guntersville Harbor
358.2L	Tyson Foods	Private Owned/Private Use	Dry Bulk-Loading/Unloading	-
363.8L	Monsanto Company-Sand Mountain Plant	Private Owned/Private Use	Liquid-Unloading	Inactive
380.5R	Scottsboro Development Corporation	Private Owned/Public Use	Dry Bulk-Unloading	Inactive
390.4R	Baker Sand and Gravel Company, Inc.	Private Owned/Private Use	Dry Bulk-Loading/Unloading	Inactive
391.2R	TVA Bellefonte site	Public Owned/Private Use	None	Inactive
403.0R	Mead Containerboard	Private Owned/Private Use	Dry Bulk-Loading/Unloading	Inactive
403.4R	Mead Containerboard	Private Owned/Private Use	Dry Bulk-Loading/Unloading	Inactive
405.2R	Mead Containerboard	Private Owned/Private Use	Liquid-Unloading	-
407.3R	TVA Widows Creek Fossil Plant	Public Owned/Private Use	Dry Bulk-Unloading	-
407.7R	TVA Widows Creek Fossil Plant	Public Owned/Private Use	None	-
413.4R	Bridgeport Terminal, Alabama State Docks	Public Owned/Public Use	Dry Bulk-Loading/Unloading	-
415.1R	United States Gypsum Company	Private Owned/Private Use	Dry Bulk-Unloading	-
423.7L	Port of Nickajack, Inc.	Public Owned/Public Use	Dry Bulk-Loading/Unloading	-

3.4 Ecology

3.4.1 Terrestrial Ecology

The 40,236 acres of TVA public land surrounding Guntersville Reservoir can be roughly divided into the following categories: deciduous/mixed forests (46.8 percent), coniferous forests (16.7 percent), pasture/hay (14.1 percent), forested wetlands (12.3 percent), row crops (4.1 percent), urban (2.6 percent), and emergent wetlands (2.5 percent).

Upland hardwood forests are dominated by oaks (white, southern red, black, chestnut, and scarlet) and hickories with smaller numbers of yellow-poplar, red maple, beech and blackgum. Bottomland hardwood is restricted to low-lying areas along creeks and rivers and is occupied by water and willow oaks, sweetgum, red maple, ash, and sycamore. Most of the pine stands on Guntersville Reservoir are located on areas that were previously agricultural fields. The majority of these fields were planted with loblolly pine, but some smaller areas reverted naturally to mixed pine/hardwood. Idle/reverting areas are dominated by shrubs, vines, herbaceous plants, and small trees including blackberry, honeysuckle, ragweed, ironweed, sumac, green ash, persimmon, and dogwood.

Privately owned land surrounding the reservoir is a mosaic of residential and industrial/commercial development, upland and bottomland forests and farm land comprised of hay, pasture, row crops, and small woodlots. Open TVA public land on Guntersville Reservoir is comprised of approximately 914 acres of land licensed for agricultural use. Hay/pastureland totals 567 acres, row crop land totals 160 acres, and sod production land totals 187 acres. Outside of the prescribed forest stands and managed open land are small parcels of unmanaged forest stands and open land lying in narrow strips along the reservoir shoreline. Included are old fields in various stages of succession and a forested riparian (shoreline) edge. The wetland communities found on TVA public land make up a substantial percentage of the community types considered and are addressed in Section 3.2.2.

The remaining TVA public land surrounding Guntersville Reservoir includes a variety of land uses. This land includes TVA-managed natural areas, habitat protection areas (HPAs), marginal strip land fronting residential development, state parks, unmanaged forest areas, licensed recreation areas, power transmission line corridors, riparian/wetland areas along streams and the reservoir shoreline, and the Guntersville Dam Reservation. Most parcels range in size from less than 2 acres to over 1,100 acres. Ecological conditions and forest communities occupying this land are similar to inventoried reservoir land, except some marginal strip land fronting residential development may have been cleared for mowed lawns or forested areas cleared of underbrush.

Reverting old fields and edge areas include a variety of shrubs, forbs, vines, tree seedlings, and grasses. These old field communities might include green ash,

maple, sweetgum, persimmon, sumac, honeysuckle, ironweed, ragweed, thistle, beggarweed, blackberries, and broom-sedge. Meadows may include planted native warm season grasses, clovers, sericea lespedeza, orchard grass, and wheat.

Riparian areas along streams and reservoir shores include forested buffer strips, reverting old fields, shoreline fringe wetlands, and mowed lawns adjacent to residential areas. The land-based wetland communities found on Guntersville Reservoir make up the smallest percentage of the community types considered and are addressed in Section 3.2.2.

The forested uplands, open land, and riparian/wetland community types surrounding Guntersville Reservoir provide a broad range of habitats capable of supporting a wide array of terrestrial wildlife species. Mammals which may be commonly found in these habitats include gray and fox squirrels, white-tailed deer, woodchucks and white-footed mice. Bird species using these habitats throughout the year include eastern wild turkeys, various woodpeckers, eastern bluebirds, song sparrows, and northern cardinals. Migrant neotropical songbirds such as yellow-billed cuckoos, red-eyed vireos, yellow-throated warblers, and indigo buntings may be observed during spring and summer. Eastern box turtles, black rat snakes, and five-lined skinks are common reptile species also utilizing these widely varied habitats.

3.4.2 Aquatic Ecology

Aquatic habitat in the littoral (near shore) zone is greatly influenced by underwater topography and back-lying land use. Underwater topography at Guntersville Reservoir varies from moderately steep land with scattered small bluffs near the river channel to shallow embayments and coves further from the main river channel. Large areas of shallow over-bank are present on both sides of the channel between TRM 351 and TRM 386. Natural shoreline is mostly wooded, and fallen trees and brush provide woody cover. In residential areas, habitat typically includes man-made features such as shoreline stabilization structures (e.g., seawalls or riprap) and docks. Fallen trees, though not completely absent, tend to be less numerous in residential areas. In fact, woody habitat is typically less abundant on both TVA public land and non-TVA public land where the back-lying land use is largely residential or agricultural.

A shoreline survey was conducted on Guntersville Reservoir in February 2000 to arrive at a Shoreline Aquatic Habitat Index (SAHI) score. The SAHI score is an indication of the quality of aquatic habitat adjacent to the shoreline. Scoring is based on seven physical habitat parameters (i.e., riparian zone condition, amount of canopy cover, bank stability, substrate composition, amount of cover, habitat diversity, and degree of slope) important to Tennessee River Valley reservoir's resident sport fish populations. Aquatic populations rely heavily on shoreline areas for reproductive success, juvenile development, and/or adult feeding. Field methods and an explanation of the SAHI process are described in Appendix F of the SMI EIS (TVA, 1996). The overall average SAHI score for Guntersville

Reservoir was 23.83 out of a possible 35 points, with 7 being the minimum possible score, which indicates a "fair" aquatic habitat condition exists along its shoreline. Fifty three percent of the shoreline habitat scored fair, 39 percent scored good, while only 8 percent fell into the poor category.

Rock is an important constituent of the near shore aquatic habitat over much of the reservoir, either in the form of bedrock outcrops, or a mixture of rubble and cobble on steeper shorelines, or gravel along shallower shorelines. Substrate and available aquatic habitat in coves and embayments tend to correspond with shoreline topography and vegetation.

In recent years (between 1996 and 1998), aquatic vegetation has covered between 10,500 and 15,200 acres (respectively)—up to a quarter of the reservoir surface. While these plants do provide many benefits to wildlife, sport fish, and similar aquatic organisms, they can also cause problems when they reach excessive and extensive population levels. They can interfere with recreational activities such as swimming, skiing, bank fishing, and boating. They may even negatively impact the aesthetic qualities of the reservoir, particularly if viewed by visitors or future economic prospects. The most abundant aquatic plant species in the lake are exotic or nonnative species such as Eurasian milfoil, hydrilla and spinyleaf naiad—all introduced to the United States from other regions of the world. Native species such as coontail, small pondweed, American pondweed, southern naiad, and muskgrass also grow in the reservoir but seldom colonize large areas like the nonnative species do (Webb, 1999).

In 1998, an aquatic plant management plan was designed/developed primarily by a diverse stakeholder group comprised of land owners and lake users (i.e., those that benefit from the economic development and various recreational opportunities the reservoir provides). The plan strategy calls for a combination of both mechanical harvesters to provide access lanes to open water areas and herbicide treatments to manage the aquatic plant populations in critical near shore areas (Webb, 1999). These methods were used in combination in FY 2000, proving effective in providing an overall satisfactory level of control, while allowing wildlife and aquatic organisms to continue benefiting from the habitat the plants provide. The same aquatic plant management plan will be utilized again in 2001.

Benthic Community - Benthic macroinvertebrate (e.g., lake bottom-dwelling, readily visible, aquatic insects, aquatic worms, snails, crayfish, and mussels) samples were taken in three sampling areas of Guntersville Reservoir in 1994, 1996, and 1998. Areas sampled included the forebay (area of the reservoir nearest the dam) at TRM 350.0, the midreservoir transition station at TRM 375.2, and the upper-reservoir inflow station at TRM 420.0. Benthic species are included in aquatic monitoring programs because they are an integral part of the aquatic food chain and because they have relatively limited capability of movement, thereby, preventing them from avoiding undesirable conditions.

Sampling and data analyses were based on seven parameters that indicate species diversity, abundance of selected species that are indicative of good (and poor) water quality, total abundance of all species except those indicative of poor water quality, and proportion of samples with no organisms present. As shown in Table 3-15 the benthic communities of Guntersville Reservoir are in good to excellent condition.

Table 3-15 Benthic Community Ratings for Guntersville Reservoir, Reservoir Vital Signs Monitoring Program Data

	Monitoring years		
Station	**1994**	**1996**	**1998**
Forebay (TRM 350)	35 Excellent	35 Excellent	33 Excellent
Inflow (TRM 420)	27 Good	35 Excellent	35 Excellent
Transition (TRM 375.2)	25 Good	29 Good	25 Good

In 1980, the Tennessee Wildlife Resources Agency (TWRA) designated the river reach from Nickajack Dam downstream to the Tennessee-Alabama state line as a mussel sanctuary. No commercial musseling is known to persist in the Alabama portion of the Nickajack Dam tailwater (upstream of river mile 410).

Fish Community—TVA has conducted biannual fish sampling on Guntersville Reservoir (since 1994). Electrofishing and gill netting stations correspond to those described for the benthic sampling. Fish are included in aquatic monitoring programs because they are important to the aquatic food chain and because they have a long life cycle which allows them to reflect conditions over time. Fish are also important to the public for aesthetic, recreational, and commercial reasons. Monitoring results for each sampling station were analyzed to arrive at a Reservoir Fish Assemblage Index (RFAI) ratings, which are based primarily on fish community structure and function. Also considered in the rating is the percentage of the samples represented by omnivores and insectivores, overall number of fish collected, and the occurrence of fish with anomalies such as diseases, lesions, parasites, deformities, etc. (TVA, 1997).

The fish community monitoring results are shown in Table 3-16. These data compare Guntersville Reservoir to other Tennessee River mainstem reservoirs. The ratings for the fish assemblage declined between the years 1996 and 1998 for all three sampling stations. Relatively fewer fish were collected in 1998, and of those collected, few were considered intolerant species, sucker species, or lithophilic spawning species. Collection of fewer fish may have been due to one or a combination of two factors which occurred in 1998: (1) aquatic macrophytes (plant species) were more abundant in 1998 than in 1996, and their presence may have interfered with the crew's ability to see and collect the fish; and (2) low river flows and higher than normal water temperatures which existed during autumn 1998 may have resulted in fish moving to other parts of the lake, making them unavailable for collection. Further monitoring will be required to determine if these observations represent a long-term condition (TVA, 1999b). More likely,

these fish population differences are attributable to sampling error and normal population cycles. Tributary scores for the Sequatchie River watershed improved between 1998 and 2000. Given that tributary water quality influences the reservoir, and that the reservoir fish assemblage influences the mouths of tributaries, TVA expects that fish scores for the reservoir sampling should recover when future monitoring results are tabulated.

Table 3-16 Fish Community Ratings, Reservoir Vital Signs Monitoring Program Data

	Monitoring years			
Station	**1993**	**1994**	**1996**	**1998**
Forebay (TRM 350.0)	46 good	30 poor	44 good	39 fair
Inflow (TRM 420.0)	38 fair	42 good	46 good	32 fair
Transition (TRM 375.2)	38 fair	35 fair	36 fair	30 poor

Twenty-eight fish species were collected during the fall of 1998 sampling efforts. More abundant species in the overall sample were gizzard and threadfin shad, emerald shiner, inland silverside, bluegill, and spotted and largemouth bass. Fish species collected in the 1998 fall electrofishing and gill netting samples for Guntersville Reservoir at the forebay and midreservoir stations identified many representative species, including the following: spotted gar, common carp, smallmouth buffalo, channel and flathead catfish, shiners, perch, crappie, freshwater drum, white and striped white bass, longear and redear sunfish, largemouth and spotted bass and others (Brown, 2000).

3.5 Socioeconomics

Population

In 2000, the population of the three counties (Jackson and Marshall County, Alabama, and Marion County, Tennessee) in the Guntersville Reservoir area was 163,933, a 14.4 percent increase over the 1990 population of 143,311 (Tables 3-17 and 3-18). This growth rate is faster than that of the state of Alabama, which is estimated to have grown by 10.1 percent, as well as the nation at 13.1 percent. Marshall County, the largest of the three counties, had the fastest growth rate at 16.1 percent. Projections show that if the growth pattern of the past decade continues, the total population of the three counties will reach about 195,000 by 2015. The major population centers in the area are Scottsboro, Stevenson, and Bridgeport in Jackson County; Guntersville, Albertville, Boaz, and Arab in Marshall County; and South Pittsburg and Jasper in Marion County.

Table 3-17 Population and Population Projections 1980-2015

	1980	1990	2000	2005	2015
Jackson County (AL)	51,407	47,796	53,926	56,991	63,121
Marion County (TN)	24,416	24,683	27,776	29,322	32,415
Marshall County (AL)	65,622	70,832	82,231	87.930	99,329
Area Total	141,445	143,311	163,933	174,244	194,866
Alabama	3,894,025	4,040,389	4,447,100	4,650,455	5,057,166
United States (000)	226,542	248,791	281,422	297,737	330,368

Source: Historical data from the U. S. Census Bureau. projections by TVA, based on growth trends from 1990 to 2000.

Table 3-18 Percent Change in Population

	1980-1990	1990-2000	2000-2005	2005-2015	1980-2015
Jackson County (AL)	- 7.0	12.8	5.7	10.8	22.8
Marion County (TN)	1.1	12.5	5.6	10.5	32.8
Marshall County (AL)	7.9	16.1	6.9	13.0	51.4
Area Total	1.3	14.4	6.3	11.8	37.8
Alabama	3.8	10.1	4.6	8.7	29.9
United States	9.8	13.1	5.8	11.0	45.8

Source: Based on Table 3-17

Labor Force and Unemployment

In 2000, the civilian labor force of the three county area was 78,155 as shown in Table 3-19. The area's unemployment rate was 5.4 percent. Unemployment rates ranged among the counties from 4.6 percent in Marion County, Tennessee, to 6.3 percent in Jackson County, Alabama. The overall rate was higher than the state and national rates; all the county rates were higher than the nation and the same as or higher than the state of Alabama.

Table 3-19 Labor Force Data, Residents of Guntersville Reservoir Area, 2000

	Civilian Labor Force	Unemployment	Unemployment Rate
Jackson County (AL)	26,344	1,662	6.3
Marion County (TN)	12,700	580	4.6
Marshall County (AL)	39,111	2,001	5.1
Area Total	78,155	4,243	5.4
Alabama	2,154,273	99,092	4.6
United States (000)	140,863	5,655	4.0

Source: Alabama Department of Industrial Relations and Tennessee Department of Labor and Workforce Development

Jobs

In 1999, the Guntersville Reservoir area had more than 83,000 jobs, an increase of 23 percent over the level in 1989 (Table 3-20). This represents a faster rate of growth than in both the nation and the state. All three counties grew faster than the nation and the state of Alabama. About 58 percent of the jobs in 1999 were in Marshall County.

Table 3-20 Employment, Guntersville Reservoir Area			
	1989	1999	Percent Change
Total Employment			
Jackson County (AL)	20,890	25,122	20.3
Marion County (TN)	7,659	10,052	31.2
Marshall County (AL)	39,409	48,407	22.8
Area Total	67,958	83,581	23.0
Alabama	2,019,441	2,409,612	19.3
United States (000)	137,240.8	163,757.9	19.3
Manufacturing			
Jackson County (AL)	6,376	7,511	17.8
Marion County (TN)	1,666	1,811	8.7
Marshall County (AL)	13,284	14,206	6.9
Area Total	21,326	23,528	10.3
Alabama	396,582	379,469	- 4.3
United States (000)	19,992.5	19,252.7	- 3.7

Note: Includes full- and part-time employment, both wage and salary employees and proprietors.
Source: U. S. Bureau of Economic Analysis, Regional Economic Information System.

Manufacturing is a larger part of the economy of the Guntersville Reservoir area counties than in the state or the nation. About 28.1 percent of jobs in the area are manufacturing, compared to 15.7 percent in Alabama and 11.8 percent nationally. Manufacturing's share of total employment in Marion County is much lower than in the two Alabama counties.

Nationally, as production has become more efficient and the economy moves more and more to a service economy, manufacturing employment has declined by 3.7 percent between 1989 and 1999. The state of Alabama has followed that trend with a decline of 4.3 percent from 1989 to 1999. In contrast with that trend, the Guntersville Reservoir area counties had an increase of 10.3 percent during this same time period. These increases ranged from 6.9 percent in Marshall County to 17.8 percent in Jackson County.

Income

Per capita personal income in the Guntersville Reservoir area in 1999 was lower than the state and national averages at 88.8 percent of the state and 71.5 percent of the national levels. Within the three-county area, there was little variation in per capita income levels which ranged from $19,955 in Marshall County to $20,891 in Jackson County.

Per capita personal income in the area increased by 48.3 percent from 1989 to 1999. This was slower than both the national growth rate of 53.8 percent and the Alabama rate of 54.2 percent. Both Jackson and Marion Counties per capita personal income grew faster than the Alabama and national rate. Marshall County grew more slowly.

3.5.1 Environmental Justice

The minority population in the area at 8.3 percent of the total in 2000 is well below the Alabama state average of 29.7 percent and the national average of 30.9 percent None of the three counties has a minority population close to the Alabama and national averages, with Jackson the highest at 8.8 percent. The estimated poverty rate in 1997 was 15.0 percent, lower than the state average of 16.2 percent, but higher than the national average of 13.3 percent. Rates were similar in all three area counties.

3.6 Land Use

Use of TVA public land is initiated by submittal of a formal request in the form of a land use application accompanied by information necessary for TVA reviewers to make sound judgment for the best use of the TVA public land. If the proposed land use is consistent with the allocated use, as documented in the Board approved 1983 Plan, then the proposal is reviewed for site-specific environmental considerations and administrative requirements. Major public land use proposals are presented to the public for their input. If the proposal is not consistent with the planned use for the TVA public land, then formal TVA Board of Directors review is necessary before the land use can be approved.

Existing land use agreements are summarized in Table 3-21. A listing of all existing agreements by category are provided in Appendix B-2. Table 3-20 provides the number of currently approved land use agreements as well as the number that were approved in 1983. A comparison between the 1983 land use agreements and committed land uses in 2001 shows an increase of 109 agreements (totaling 390 acres).

Highway/roads and railroad easements provide the necessary transportation infrastructure to permit access to and around the reservoir. There are presently 85 land use agreements for transportation-related land use (748 acres).

At present, a total of 12 industrial land use agreements (123 acres) are located in the Guntersville Reservoir region on parcels that are developed and available for industrial use. There are three industrial parks on the reservoir, including Signal Point and Conners Island Park in Guntersville, and Goose Pond in Scottsboro. Signal Point is home for several industries that ship products by barge, including seed companies, tire manufacturers, and suppliers of construction products. In the Goose Pond Industrial Park, no major industry uses the reservoir for shipping. Conners Island Park, over 400 acres in size, is under development by the city of Guntersville. It is largely surrounded by TVA public land that is currently used for wildlife and timber management.

Table 3-21 Number of Land Use Agreements by Category Existing in 1983 and 2001

Land Use Agreement Categories	1983		2001	
	Number of Agreements	Acres	Number of Agreements	Acres
Highway/Roads	65	577	79	629
Railroad Easements	5	19	6	19
Industrial				
Barge Terminals	4	15	5	15
Industrial Sites	3	61	7	108
Project Operations				
Maintenance Facility	3	15	3	15
Miscellaneous	22	42	43	55
Pump Station/Dewatering	10	2	10	7
Recreation	25	871	44	1,109
Sufferance Agreements	0	N/A	10	N/A
Wastewater Treatment	7	44	10	46
Wildlife Management Areas	2	14,189	3	14,189
Utilities				
Electric	66	48	75	51
Gas	14	11	18	12
Sewer	24	28	34	40
Telephone	17	17	20	17
Water	18	9	28	19
Total	**285**	**15,948**	**395**	**16,331**

Two major industries located on the reservoir in Jackson County—Beaulieu of America and U.S. Gypsum—use the reservoir for shipping synthetic fiber and wallboard, respectively. Yamaha Marine Division has a test facility for watercraft located on the reservoir in Bridgeport in Jackson County. An available industrial site of 1,200 acres (the Hill site in Bridgeport) has potential access to the reservoir for shipping. Marion County has an unoccupied 1,200-acre industrial park near Guntersville Reservoir in New Hope. No industries are located in the Marion County portion of Guntersville Reservoir.

TVA project operations on Guntersville Reservoir include the Guntersville Dam Reservation, Widows Creek Fossil Plant, the Bellefonte Nuclear Plant site, TVA maintenance facilities, and navigation safety harbors. Also categorized as project operations are public works projects, dewatering/pump stations, and community maintenance facilities. There are currently ten land use agreements (46 acres) for wastewater treatment and sewage lift stations serving the communities of Scottsboro, Arab, Stevenson, and Guntersville. An additional ten land use agreements (7 acres) provide dewatering/pump stations for Scottsboro, Guntersville, and ADCNR.

Use of TVA public land for recreation has increased since the 1983 Plan was developed. There are currently 44 recreation agreements (1,109 acres), an increase of 19 additional recreation land use agreements (238 acres) since 1983. Recreation development is more fully discussed in Section 3.7.

The ADCNR currently has long-term land use agreements in Jackson County for approximately 14,189 acres of TVA public land for five WMAs. The land area of the WMAs is primarily the land surrounding and included within the large embayments of North Sauty, Mud, Crow, and Raccoon Creeks (Parcels 103, 137, 176, and 169). Significant Natural Areas are discussed in Section 3.2.5.

Use of TVA public land for utility rights-of-way and facilities is necessary to provide the infrastructure for development of residential and industrial/commercial development around the reservoir. Utilities present on TVA public land include electric, gas, sewer, telephone, and water service. There are currently 175 land use agreements for utility use of TVA public land on Guntersville Reservoir (139 acres).

TVA considers use of TVA public land for agriculture to be a short-term use of the properties. There are currently 28 licenses for agricultural use on portions of 27 parcels of TVA public land on Guntersville Reservoir (Table 3-22).

Table 3-22 Current Agriculture Licenses on Guntersville Reservoir TVA Public Land

TVA Parcel Number	Agriculture License #	License Use	Acres Licensed	Expiration Date
1	99488	hay	199.0	12/31/2004
26a	70115	hay	24.3	12/31/2002
	70367	sod	17.5	12/31/2002
45	70366	hay	28.0	12/31/2002
98	108176	sod	29.2	01/01/2005
99	108191	sod	12.5	01/01/2005
121	108094	sod	31.5	12/21/2005
124	108130	sod	3.0	01/01/2005
129	18886	hay	4.5	12/31/2001
132	108091	sod	2.5	12/31/2005
149	108712	row crop	49.5	12/31/2005
151	108174	row crop	39.5	01/01/2005
167	70121	hay	19.0	12/31/2002
194	108193	hay	20.5	01/01/2005
194,195,196	108175	sod	55.0	01/01/2005
199	79470	sod	5.0	01/31/2002
203	70118	hay	3.0	12/31/2002
206	70116	hay	25.5	12/31/2002
	70117	hay	14.5	12/31/2002
	70119	hay	31.5	12/31/2002
243	70210	hay	5.2	12/31/2002
	70373	sod	4.7	12/31/2002
257a,258	70113	hay	39.7	12/31/2002
260	90785	row crop	23.6	12/31/2002
268	70112	hay	65.7	12/31/2002
269	70208	hay	85.3	12/31/2002
270,271	70209	hay	19.2	12/31/2002
275	70114	hay	2.6	12/31/2002

3.7 Recreation

Recreational use of Guntersville Reservoir is largely influenced by the existing and/or planned residential development around the reservoir; the population from the surrounding adjoining cities, communities, and counties; and special events, such as boat races and fishing tournaments. The reservoir is easily accessible to the region from the counties of Blount, Cullman, DeKalb, Etowah, Jackson, Madison, Marshall, and Morgan in Alabama and the counties of Marion and Sequatchie in Tennessee. Demands for water-based recreation activities are expected to increase as a result of continuing residential development of privately owned land in close proximity to the reservoir and the anticipated population increases in the surrounding areas.

There are 16 marinas, 43 well-dispersed public boat ramps, 9 city parks, 4 county parks, 2 state parks, 3 TVA leased campgrounds, 5 camping resorts, 6 church and group camps, 2 private boating clubs, 82 waterfront subdivisions, and numerous individual waterfront home sites on Guntersville Reservoir. The names, acreage, and types of facilities present on TVA public land are shown in Table 3-23. The marinas contain a total of approximately 1,453 wet slips and 1,206 dry slips. As of June 2000, there were approximately 182 wet slips and 246 dry slips available for use. Boat registrations issued in the Alabama counties listed in close proximity to Guntersville Reservoir totaled 46,977 in June 2000. The Alabama Marine Police expect the number of boat registrations to increase at the rate of approximately 1 percent each year.

The two state parks on Guntersville Reservoir are comprised of a total of approximately 7,909 acres and provide for a variety of recreational activities such as boating, fishing, water sports, hiking, camping, and wildlife viewing. In addition, 13,550 acres of TVA public land are under long-term easement to the ADCNR for use as a WMA/refuge. Approximately 16,422 acres of uncommitted TVA public land are also available to the general public to use for a variety of activities, such as camping, fishing, hunting, hiking, picnicking, and wildlife viewing. The type of activities occurring on this land vary according to the location of the individual parcel on Guntersville Reservoir.

Table 3-23 Recreation Facilities on TVA Public Land

2001 Parcel No.	Approx. Acres	Name of Facility	Type of Facility	Location
6	47	Honeycomb Campground and Sunrise Marine	Campground, Wet and Dry Boat Slips, Docks, Boat Ramps, and Bathrooms	Hwy. 431 on Honeycomb Creek
9	5	State of Alabama Day Use Area	Informal Picnicking and Bank Fishing	Along Hwy. 431 on Honeycomb Creek
21	13.5	Old Snug Harbor Marina Site and State Public Ramp	Old Dry Boat Storage Bldg., Boat Ramp and Parking Lot	Hwy. 431 and Honeycomb Creek
29	5.2	Alred Marina	Full Service Marina	Off Hwy. 431N and Bakers Chapel Road
32	58.3	Marshall County Park # 1	Boat Ramp, Docks, Parking, Bathrooms, and Pavilions	On Hwy. 431 North

Table 3-23 Recreation Facilities on TVA Public Land

2001 Parcel No.	Approx. Acres	Name of Facility	Type of Facility	Location
43	1.9	Lakeside Sailing Center	Full Service Sailboat Marina	Hwy. 431 and Stearnes Creek
49	4.3	Marshall Baptist Camp	Assorted Youth Camp Facilities	Off Hwy. 431 on Baptist Camp Road
51	15.8	Shriners Recreation Area	Fixed Dock, Picnic Facilities	Off Hwy. 431 Below Siebold Creek
56	80.8	Siebold Campground and Marina	Full Service Camping, Docks, Boat Ramp With Parking, and Marina	Off Highway 79 North on Siebold Creek
61	3.4	Camp Ney-A-Ti Church Camp	Assorted Youth Camp Facilities	Off Highway 79 North
63	23	Camp Trico	Assorted Facilities For Girl Scouts	Off Highway 79 North Below Mill Creek
65	3.3	Clay's Marina	Boat Ramp, Marina Slips, and Some Camping	On Highway 79 North
75	1.5	Waterfront Grocery State Ramp	Two Boat Ramps, Docks, and Gravel Parking	On Highway 79 North
79	13.8	Preston Island Public Use Area	Boat Ramp, Dock, Parking Lot, and Picnic Tables	Off Hwy. 79 on Boshart Creek
97	20.8	Mink Creek State Ramp	Boat Ramp, Dock, Parking Lot, and Picnic Area	Off Hwy. 79 on Mink Creek
102	7.6	Camp Maranatha	Assorted Facilities For Church Youth Camp	Off Hwy. 79 N. on North Sauty Creek
105	118.2	Goose Pond Colony	Campground, Boat Ramp, Golf Course, Cabins, Docks, Convention Center, Lodge, and Walking Trail	Off Highway 79 North on North Sauty Creek
106	22.4	Goose Pond Colony	Boat Ramps, Bait and Tackle Store, Docks, Paved Parking Lots, Marina With Wet and Dry Boat Storage, Gas, Restaurant, Beach, and Amphitheater	Off Highway 79 North on North Sauty Creek
114	26.3	Scottsboro City Park	Day Use Park With Boat Ramp, Docks, and Picnic Facilities	Off Wynn Road on Roseberry Creek
116	2.3	Scottsboro Soccer Field	No Improvements	Along Bob Jones Ave. on Roseberry Creek
117	16.6	Scottsboro High School Football Stadium	Field, Stadium, and Concession Facilities	Off Broad Street on Upper Roseberry Creek
118	2.1	Scottsboro Recreation Department	Athletic Field	Off Jefferson Drive on Upper Roseberry Creek
120	18.7	Jackson County Park	Campground, Pool, Marina, Boat Ramp, Docks, Picnic Tables, Restaurant, and Gas	County Park Road on Dry Creek
125	18	Jackson County Sportsman Club Public Use Area	Boat Ramp, Picnic Tables, Dock, and Pavilion	Above the Mouth of Roseberry Creek at the End of Clemons Road
127	13.7	Wood Yard Marina	Not Developed Yet	Off Hwy. 35 at B. B. Comer Bridge
135	10.1	Mud Creek Fish Camp	Boat Ramp, Docks, Boat Repairs, and Restaurant	On Old Hwy. 72 at Mud Creek
139	0.4	Crow Creek State Ramp	Boat Ramp, Dock, Paved Parking Lot, and Restaurant	On Hwy. 72 at Crow Creek Bridge
142	121.1	Stevenson City Park	Ramp, Dock. and Assorted Other Public Rec. Facilities	Off Hwy. 117 on Crow Creek
143	10.2	Fort Harker	Historic Civil War Fort Site	Off Hwy. 117 in Stevenson on Crow Creek
145	0.2	Snodgrass Bridge Public Boat Launching Facility	Gravel Ramp and Gravel Parking	Above Hwy. 117 and Snodgrass Bridge
154	3.8	Old Bridgeport Ferry Landing	Ramp and Gravel Parking	End of Ferry Road at the Lower End of Long

Table 3-23 Recreation Facilities on TVA Public Land

2001 Parcel No.	Approx. Acres	Name of Facility	Type of Facility	Location
				Island
159	9.2	Bridgeport Boy Scout Hiking Trail	Under Construction	Along the River Bank Behind the City of Bridgeport
165	11.6	South Pittsburg Public Use Area and Fort McCook Greenway Trail	Ramp, Dock, Parking Lot, Pavilion and Other Proposed Recreation Facilities	Off Hwy. 72 and Hwy. 156 along the River Bank and on Battle Creek
183	17.8	Camp Jackson	Assorted Boy Scout Camping Facilities and Docks	On Jones Creek at End of Co. Rd. 24
186	2.6	Comer Bridge Ramp	Ramp, Dock, and Paved Parking	On Hwy. 35 at B. B. Comer Bridge
189	4.5	Langston Road State Ramp	Ramp, Dock, and Parking Lot	On County Road 67
200	0.6	Old South Sauty Public Use Area and State Ramp	Ramp, Dock, Parking Lot, and Picnic Tables	On South Sauty Creek and County Road 67
202	266.7	Bucks Pocket State Park	Ramp, Docks, Paved Parking Lot, Trails, and Campground	Off Hwy. 227 at Head of South Sauty Creek
204	8.8	South Sauty Creek Resort	Camping, Marina, Gas, Pool, Ramps, Docks, Store, and Restaurant	On South Sauty Road at South Sauty Creek
207	63.4	Little Mountain Marina and Resort and Mountain Lakes Resort	Pools, Assorted Camping Facilities, Ramps, Docks, Marinas, and Camping Memberships	On Murphy Hill Road
212	314	Lake Guntersville State Park	Camping, Picnic Tables, Ramps, Docks, Beach, Cabins, Hiking Trails, Lodge, and Restaurant	Along Highway 227
214	2.5	Signal Point Marina	Wet and Dry Boat Slips, Docks, Gas, Sewage Pump-Out, and Proposed Restaurant	Signal Point Road
217	1.4	Polecat Creek Public Ramp	Ramp, Dock, and Gravel Parking Area	On Hwy. 227 and Polecat Creek
221	0.2	Guntersville Transfer Tract XTGR-92	Undeveloped	On Hideaway Drive and Polecat Creek
225	3.8	Hideaway Drive City Park	Assorted Play Facilities and Bathroom	Corner of Hideaway Drive and Gordon Street
228	0.9	Powell Harbor	Marine Repairs and Party Boat Rental	Hwy. 227 and Polecat Creek
229	5.2	Eastlake City Park	Play and Picnic Facilities	On Wyeth Drive and Big Spring Creek
231	4.1	Willie J's and Covenant Cove	Marina With Wet and Dry Slips, Ramp, Docks, Gas, Restaurant, and Motel	Off Wyeth Drive on Big Spring Creek
236	19.1	Wyeth Drive Public Use Area, Vaughn's Recreation Center, and Guntersville High School Recreation Easement	Ramps, Docks, Parking Lots, Marina, and Gas	Hwy. 431, Wyeth Drive, and Oakwood Drive
238	62.1	RSVP Recreation Site	Undeveloped With Environmental Education Center and Walking Trails Proposed	Off Doris Lane on Big Spring Creek
244	0.5	City of Guntersville Transfer Tract XTGR-95	Undeveloped	Highway 79 South
246	12.9	Holiday Inn and Steel Ford Recreation Areas	Ramps, Docks, and Parking Lots	Hwy. 431, Cowen Circle, and Steel Ford Road on Big Spring Creek
248	1.3	Cisco Steel Marina Site	Undeveloped With Proposed Marina Facilities	Hwy. 227 and Big Spring Creek
250	83.6	Primary Guntersville Recreation Areas	Marina, Ramps, Docks, Ball Fields, Tennis Courts, Recreation Center, Senior	Hwy. 431, Hwy. 69, Sunset Drive, and Lurleen B. Wallace

Table 3-23 Recreation Facilities on TVA Public Land

2001 Parcel No.	Approx. Acres	Name of Facility	Type of Facility	Location
			Center, Amphitheater, and Walking Trails	Drive on Big Spring Creek and Browns Creek
253	3.1	Willow Beach Public Use Area	Ramp, Informal Parking, and Sewage Lift Station	End of Lakeshore Street on Browns Creek
256	32.8	Armory Recreation Area	Undeveloped Now	Off Creek Path Road on Browns Creek
264	13.6	Beech Creek State Public Use Area	Ramp, Dock, Paved Parking Lot	On Warrenton Road and Beech Creek
274	40.6	Jaycees State Ramp, Guntersville Boat Mart, and Browns Creek Sailing Association	Ramps, Docks, Sail and Power Boat Marinas, Gas, Boat Sales and Repairs, Parking Lots, and Restaurant	On Hwy. 69 and Browns Creek
276	73.9	Riverview Campground and Marshall County Park # 2	Camping, Ramps, Docks, and Bathrooms	On Cha-La-Kee Road
279	22.1	Camp Cha-La-Kee	Youth Camp Facilities, Dock, Cabins, Athletic Field, and Horse Stables	On Cha-La-Kee Road
282	12.8	Bellefonte Public Boat Ramp	Concrete Ramp With Gravel Parking	Off Hwy. 72 and the Closed Access Road to Bellefonte Nuclear Plant on Town Creek