

### **3.0 AFFECTED ENVIRONMENT**

Nickajack Reservoir is 46 miles (74 km) long, stretching from the City of Chattanooga, Tennessee, to the mouth to the Sequatchie Valley. The lake contains 10,370 acres (4,198 ha) of water surface and 192 miles (310 km) of shoreline.

The site of the proposed recreational development project is on the northwest shore of Nickajack Reservoir, approximately 37 river miles (60 km) or 20 air miles (32 km) west-southwest from downtown Chattanooga. The site consists of approximately 4 miles (6.5 km) of lake frontage (proposed to be developed) and one mile (2 km) of river frontage in the Nickajack tailwater (proposed to be allocated to wildlife management). Access to the property is provided by a paved, two-lane road that parallels the property. This road provides access to Nickajack Dam and TVA public recreation facilities near the dam, and is accessible via Exit 158 from Interstate 24.

#### **3.1 Vegetation and Wildlife**

Tracts 1, 3, and 4 are located within the Cumberland Plateau Physiographic Province, an elevated plateau surrounded by cliffs and steep slopes. Within this province, these tracts are somewhat unusual in that they are topographically and physiographically similar to the adjacent Ridge and Valley Province. The Ridge and Valley Province is characterized by prominent, northeast-southwest trending ridges and their adjacent valleys.

With regard to vegetation, these tracts are located within the Mixed Mesophytic Forest Region. However, because of their unusual topography and soils, vegetation is more similar to that of the adjacent Oak-Chestnut Forest Region. Area forests are characterized by red oak, white oak, various hickories, red maple, black gum, sour wood, sassafras, tulip tree, loblolly pine, Virginia pine, short-leaf pine, and dogwood. Valleys and lower ridge slopes in the region have been cleared for agricultural use. Row crops are typically restricted to broad valleys. The ridges and knolls are mostly forested, although timber has been repeatedly harvested for more than 200 years.

Tracts 1, 3 and 4 are located on the right descending bank of the reservoir, and extend from just north of I-24 downstream to a point approximately a mile (2 km) past Nickajack Dam. To the east, the tracts are bordered by approximately 4.5 miles (7 km) of Nickajack Reservoir shoreline, and 0.85 miles (1 km) of upland habitat along the base of Little Cedar Mountain. To the northwest, the tract is bordered by private property in residential, forest and open land condition.

Geologically, the tracts are underlain by pre-Pennsylvanian limestone of the Pennington Formation. The dominant rocks are cherty dolomite or limestone. Soils are derived from limestone, sedimentary deposits, and rock debris. The soils are generally clay loam, with depths of 15 to 40 inches (40 to 100 cm) to bedrock. Soils are classified as poorly to

moderately well drained with an erosion hazard of slight to moderate. Soil types are loam, silt loam and silty clay loam, eroded and undulating, gently rolling to hilly phases.

Vegetative cover has been altered by decades of timber harvest and agriculture. Past and current land/resource uses have resulted in a mosaic of plant communities representing a wide range of successional stages. The percentage of weedy plant species (both native and exotic) occurring within this mosaic is high.

Approximately 162 acres (66 ha) of Tracts 3 and 4 are currently licensed for agricultural uses. A small percentage of this area is used for row crops. The majority is being used for pasture, or for producing hay. At present, the licensed area is composed of a mosaic of 16 fields, interrupted by densely vegetated fence rows and scattered wood lots. Some of the fields are fallow and reverting through the initial stages of forest succession. Pasture and hayfields contain fescue, orchard grass, Johnson grass, Bermuda grass, and numerous broad leaf weeds. Fence rows support a mixture of herbaceous and woody species, with the more common being mulberry, hackberry, sassafras, Japanese honeysuckle, privet, blackberry, and pokeweed. Generally speaking, old fields include the same species as found in fence rows, plus species that thrive in full sunlight (such as Joe-pye-weed, coreopsis, various asters, lespedeza, foxtail, and other native grasses). In an effort to improve wildlife habitat, 22 acres (9 ha) have been seeded in partridge pea, lespedeza, and native warm season, grasses. Additionally, bicolor lespedeza has been established in selected field margins and fence rows.

About 366 acres (148 ha) of Tracts 3 and 4 are forested; however, most of this is forest fragments or small woodlots. Forest cover types include planted and natural pine, pine-hardwood, and upland hardwoods, and riparian or bottomland hardwoods. Age classes of these communities vary from 5-100 years old. Upland hardwood forests consist of various oaks, hickories, red maple, black gum, sassafras, and white ash. Narrow, non-continuous, riparian forests exist along the reservoir edge and stream courses. In these communities, the canopy includes such species as white oak, winged elm, river birch, swamp tupelo, sycamore, hackberry, and hornbeam. The understories include pokeweed, honeysuckle, privet, Virginia creeper, muscadine, and swamp dogwood.

The remaining portion of Tract 3 is managed as a developed recreation area, and consists of a campground and day use area, a public boat launch, an informal trail system, and associated roads and parking areas. Three intermittent streams, two man-made ponds, and two natural ponds also exist on the tract. Tract 4 is managed for informal recreation.

In their present condition, these lands provide excellent habitat for a variety of game and non-game wildlife, and support a variety of public uses associated with this resource. On an average day during the hunting season, it is estimated that nine small game hunters and twelve deer hunters use Tracts 3 and 4. Game species found on these lands include white-tailed deer, gray squirrel, eastern cottontail, and bobwhite quail. The area has been used by the Tennessee Wildlife Resources Agency for demonstrating small game habitat

enhancement techniques, and for conducting hunter safety training. The Tennessee Wildlife Resources Agency (TWRA) also considers Tracts 1 and 3 to be the best publicly-owned small game and white-tailed deer habitat remaining in Marion County.

In a September 14, 1987 letter to TVA, Dr. Gary T. Myers (Executive Director of TWRA) identified the need to "retain and provide lands for wildlife recreation." He went on to say that Tract 3 is suitable for "intensive upland game management that includes dove, quail, and rabbit hunting along with a much needed area for retriever and pointing dog training," and that "under proper management the tract could provide additional wildlife-related benefits within three years." Wildlife-related benefits available at Little Cedar Mountain are estimated in Table 1.

Table 1. Additional Wildlife Related Benefits Available at Little Cedar Mountain

Activity	Man-days of Use
Dove Hunting	2,000
Wildlife Watching	780
Dog Training	350
Juvenile Quail Hunting	250
Rabbit Hunting	150
Deer Hunting	125
Organized Field Trials	600

Source: Tennessee Wildlife Resources Agency, September 14, 1987 letter

In a subsequent letter (December 19, 1995), Dr. Myers describes Tract 3 as "one of the last remaining properties of significant size in the vicinity of Chattanooga that remains potentially available for wildlife recreation." A copy of the latter letter is included in the Section 6 of this document.

In addition to game species, a diverse array of non-game and furbearing wildlife inhabit the tracts. Common non-game or furbearing mammals include white-footed mouse, short-tail shrew, opossum, red and gray fox, chipmunk, raccoon, coyote, eastern mole, mink, muskrat, and woodchucks. Numerous species of songbirds, including several neotropical migrants, also use the diverse mosaic of habitats present. Migratory species include yellow-billed cuckoo, wood thrush, red-eyed vireo, Kentucky warbler, oven bird, and summer tanager. Resident songbirds utilizing forested habitats would include several species of woodpecker (i.e., hairy, downy, red-bellied, pileated, and common flicker), blue jay, tufted titmouse, Carolina chickadee, and white-breasted nuthatch. Eastern king birds, prairie warblers, indigo buntings, field sparrows, song sparrows, American gold finches, purple finches, and eastern blue birds are all abundant in open-land or early successional habitats. Common birds utilizing a variety of habitat types include turkey vulture, black vulture, red-tailed and red-shouldered hawk, American crow, great horned owl, barred owl, screech owl, and northern cardinal. For forested shorelines and other riparian

habitats, typical birds would include green-backed heron, great blue heron, yellow-billed cuckoo, eastern kingbird, prothonotary warbler, common yellowthroat, red-winged blackbird, common grackle, and killdeer. Additionally, spotted sandpipers have been observed along the shoreline during the spring and early fall.

Resident and migratory waterfowl use shoreline and riparian habitats, as well as aquatic bed wetlands and deep water habitats. Common species are the Canada goose, American coot, double-crested cormorant, loon, mallard, blue-winged teal, wood duck, and bufflehead. Sandhill cranes have also been observed using agricultural fields during spring and fall migration. Bald eagles and osprey are observed on Nickajack Reservoir throughout the year, and make frequent use of shoreline areas for foraging, loafing, and perching. A great blue heron nest colony is located near Interstate 24 on an island off of Tract 5.

Numerous species of reptiles and amphibians also use the shoreline, adjacent areas of riparian habitat, and upland habitats on the tract. Common species would include northern watersnake, black rat snake, worm snake, black racer, black kingsnake, common snapping turtle, red-eared turtle, river cooter, eastern box turtle, broad-head and five lined skinks, fence lizards, and Fowler's toad.

Even though these non-game species are not sought by hunters and trappers, they are routinely utilized by the public in a variety of non-consumptive ways, including wildlife watching.

Tract 5, which includes the actual mountainous portion of "Little Cedar Mountain", consists of approximately 320 acres (130 ha) of steep, rocky land. The tract lies along the western shoreline of Nickajack Lake, immediately downstream from Interstate Highway 24. To the west and north, Tract 5 shares a common boundary with adjoining portions of Tract 3 and Tract 4, respectively. To the east and south, Tract 5 is bordered by Nickajack Lake. Historically, portions of Tract 5 have been impacted by various land uses, although the shallow soils and extensive areas of limestone outcrop have largely excluded agriculture. Still, there is evidence of a rural road bed, complete with adjacent hand laid stone retaining walls, and stone paving. Additionally, cedar fence rows border the lane, and a pair of large cedars mark the entrance way off the main road.

Tract 5 soils are described in the Marion County soil survey as limestone rocklands, with limestone ledges and outcrops occupying more than 50% of the surface area. Slopes range from 12 to 60 percent, with those between 25 and 60 percent being more common. In some areas shallow layers of soil, consisting of dark silty clay, support a forest canopy consisting of a mixture of deciduous and coniferous trees. These forested areas include post, red, and blackjack oaks; redbud; and red cedar. In several areas, the forest canopy has remained open to form distinctive "glade-like" openings. Gray's Bluff overlooks Nickajack Lake. In addition to its significance as a visual resource, this geological feature provides potential habitat for several rare plant species.

### **3.2 Forest Resources**

About 366 acres (148 ha) of the lands proposed for development in Tracts 3 and 4 are forested. Forested acreage consist of both planted/managed, and naturally reverted pine stands, mixed pine-hardwoods, and upland and bottomland hardwoods. Within these stands, age classes range from 5-100 years.

### **3.3 Prime Farmland**

Prime farmlands are those areas that offer the best available soils for producing food, feed, forage, fiber, and oilseed crops. Characteristically, prime farmlands have the soil quality, growing season, and moisture supply needed to produce high sustained yields of crops. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to air and water, and are not excessively erosion-prone or saturated with water for long periods of time. Additionally, they do not flood frequently or are protected from flooding.

Based on inspection of soil maps for Marion County, the Natural Resources Conservation Service has concluded that 397 acres (161 ha) of Tracts 3 and 4 meet established prime farmland standards. Of this total, approximately 162 acres (66 ha) are currently being licensed for agricultural uses, 50 acres (16 ha) have been allocated for wildlife habitat enhancement, and the remaining 185 acres (75 ha) are in managed forest. Additionally, TVA estimates that 85 percent of Tract 1 is prime farmland.

### **3.4 Wetlands**

Lacustrine fringe (Brinson) and lacustrine aquatic bed (Cowardin et. al) wetlands, occur along the 4.5 miles (7 km) of shoreline fronting Tracts 3 and 4 (See Appendix). These wetlands are characterized by the presence of emergent, scrub-shrub, or permanently inundated aquatic plants. Generally speaking, these types of wetlands occur in areas where suitable water depth and substrate, and sufficient light, facilitate their development. Such conditions exist within littoral zones (i.e., shallow overbank areas) adjacent to the old river channel, or within the reservoir fluctuation zone. On Nickajack Reservoir, the lacustrine fringe communities occur between elevations 633.5' and 636.0'. Lacustrine aquatic bed wetlands are usually found between elevations 621.0' and 634.0'. Fringe wetlands typically include such plant species as common cattail, woolgrass, soft rush, buttonbush, black willow, silky dogwood, river alder, river birch, sycamore, willow oak and water oak. Aquatic bed wetlands are most often formed by floating mats of Eurasian water milfoil or hydrilla.

Fringe wetlands stabilize shorelines by dispersing wave energy and currents, thereby reducing erosion and the re-suspension of sediments. This helps maintain water clarity and improves water quality. Fringe wetlands also trap sediments and nutrients carried by runoff waters from upslope areas.

Fringe and aquatic bed wetlands also provide habitat for a diversity of wetland-dependent wildlife species including wood ducks, Canada geese, and mallards; great blue and green-backed herons; red-winged blackbirds, swamp sparrows, mink, muskrat, beavers, and raccoon; and a variety of reptiles and amphibians. These systems also help sustain the aquatic food chain by incorporating nutrients from decomposing organic debris. This process benefits plant and animal communities within the wetland, on the adjoining uplands, and in adjacent water bodies. Because of the scarcity of such habitats locally, associated values are considered important.

Elsewhere on the tracts, a recent survey confirmed the presence of sixteen jurisdictional wetlands (slope or depressional types) on Tracts 1 and 3. The methodology and results of this study are included in Section 6. As identified through the survey, Tract 3 contains two depressional wetlands ("sink hole" ponds," with well-developed lacustrine fringe communities. One of these ponds is 0.33 acres (0.12 ha) and the other is 0.75 acres (0.3 ha). The location of these two wetlands is shown on the wetlands map in the Appendix.

### **3.5 Threatened and Endangered Species**

Several animal species listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS) occur near the site proposed for development. These species are the gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and Anthony's riversnail (*Athearnia anthonyi*). All are listed as endangered. The bald eagle (*Haliaeetus leucocephalus*) and snail darter (*Percina tanasi*), both listed as threatened, have also been reported from the area. No federally-listed plant species are known from the TVA lands in question. However, Price's potato bean (*Apios priceana*), American hart's tongue fern (*Phyllitis scolopendrium*), and Eggert's sunflower (*Helianthus eggertii*), listed as threatened by USFWS, and large-flowered skullcap (*Scutellaria montana*), listed as endangered, all have known populations in Marion County, Tennessee.

The gray bat and the Indiana bat are listed by the U.S. Fish and Wildlife Service (USFWS) as endangered. Both species utilize caves as roost sites, at least during the winter months. During the summer, however, Indiana bats seem to prefer forested riparian zones, where they roost in tree cavities and under loose bark. These bats eat insects that are captured in flight. Gray bats feed almost exclusively over water, while Indiana bats select the canopy zone of nearby riparian forest. Both of these bats are known to utilize Nickajack Cave which is located within 1.25 air miles (2 km) of Tract 3. During the spring and summer, Nickajack cave supports a colony of approximately 120,000 gray bats. A small number of Indiana bats also routinely use this cave as a hibernating site. For this reason, TVA (the cave owner) has designated Nickajack Cave as a Habitat Protection Area, and the Tennessee Wildlife Resources Agency has designated the cave as a Wildlife Observation

Area and Nongame Wildlife Refuge. This latter designation is the only one of its kind in the State of Tennessee.

Recently, a second cave, located on Tract 5, was found to be supporting a summer colony of gray bats. The size of the colony, and the nature of use (i.e., bachelor, maternity, etc.) is unknown; however, estimates place the number of bats using the cave at around 3,500. Tract 5 is a TVA-designated Habitat Protection Area.

Bald eagles (Haliaeetus leucocephalus), a threatened species, are not uncommon on the lower portion of Nickajack Reservoir. These birds utilize shoreline/riparian, and shallow overbank habitats for perching, loafing and foraging. For the past 10 to 15 years, most of this use has been during the migrant-wintering period. However, in recent years nesting attempts have occurred with increasing regularity. A pair of birds is now nesting near the southwestern end of Anderson Ridge, approximately 2 miles (3 km) west-northwest of Tract 3 and just to the north of Tract 1. There is no evidence to suggest that bald eagles have ever nested on Tracts 1, 3, or 4; however, suitable habitat is present along some of the more remote segments of shoreline.

Anthony's riversnail is a federal endangered species which is known to occur in the lower Sequatchie River and in the Tennessee River near Long Island, approximately nine river miles (14 km) downstream from Nickajack Dam. In the Tennessee River, this species seems to be most abundant on submerged objects along the shore.

The snail darter is a federal threatened species which occurs in the lower Sequatchie River and in adjacent parts of the Tennessee River. Young snail darters typically spend most of their first year of life in Tennessee River habitats, then move to shoal habitats on the small stream to breed.

No federal or state-protected endangered or threatened aquatic species are known to occur in the portion of Nickajack Reservoir near Tracts 3 or 4. That part of the reservoir is no longer suitable habitat for protected aquatic species, nearly all of which are adapted to life in flowing water.

None of the streams on Tracts 1, 3, or 4 are likely to support Anthony's riversnail, the snail darter, or other protected aquatic species. The streams on Tracts 3 and 4 are quite small and have little or no flow during much of the year. Both of the larger streams on Tract 1 have been substantially modified and do not contain suitable flowing water habitat for protected aquatic species.

### **3.6 Water Quality**

Water quality in the Tennessee River in the vicinity of Little Cedar Mountain is good. The waters are moderately hard, moderately turbid, and are slightly alkaline. Nutrient levels are low. Iron, an indicator of mining runoff, was lower than generally found in this stretch

of the river. TVA's "1994 RiverPulse", a report on the condition of the Tennessee River, designated Nickajack Lake as the healthiest lake on the river system (from an ecological standpoint) for the second consecutive year. However, the State of Tennessee has issued a precautionary advisory for catfish in Nickajack because of PCB contamination.

Two small streams flow across much of Tract 1 and empty into the Tennessee River at approximately TRM 424.4 and TRM 423.4 just below Nickajack Dam. The more easterly stream, Stream 1, has two forks. One fork originates at a shallow pond which is likely intermittent and fed by surface flow. However, ground water seeps are found nearby and may also contribute to flow. The other fork, which originates in a swale, is probably intermittent, and is fed by surface runoff and "red water" seeps. The red water seeps indicate that iron is present in the water. Immediately below the red water seeps are black encrusted rocks, which may be an indication of manganese in the ground water. Beavers have dammed this stream near its mouth and a marsh-like settling basin has developed. The other stream, Stream 2, originates in a swale and is fed by red water seeps and runoff. Because this stream has been channelized along approximately the lower half of its length, it is probably intermittent, drying up in the summer. Approximately 100 yards from its mouth, this stream drops into a ravine and is little more than a ditch filled with turbid water.

Stream flow on Tracts 3 and 4 is highly variable; direct runoff supplies most of the water volume. During a November 28, 1995 site survey, only one of the streams depicted on the Sequatchie Quadrangle map contained flowing water, although there had been a 2-inch (5 cm) rainfall event two days before. Two streambeds located in Tract 4 exhibited evidence of sheet flow and erosion (episodic flooding). The streambed bordering the west-bound lane of the interchange between Shellmound Road and Interstate 24 flows through the limestone riprap lining the road bed. Debris indicated sheet flow is prevalent at this stream also. On Tract 3, the stream adjacent to Shellmound Recreation Area was the only stream with flowing water during the November 28 site survey; stream flow reached neither bank, indicating that the stream is subject to episodic flooding. Streams on the site flow to the Tennessee River. Area runoff is estimated at 24 inches (60 cm) per year, approximately half the annual rainfall.

Area groundwater quality is good with relatively soft water and some iron. Numerous wells serve the residential community east of Anderson Ridge. Septic tanks are used for wastewater treatment. Based on what is known about the geology of the area, capacity to produce ground water is moderate to low. Infiltration rates are slow, causing high runoff. No springs are recorded on Tracts 3 or 4.

Municipal water from the City of Jasper is available on Tract 3 at Nickajack Dam and Shellmound Recreation Area. The nearest municipal sewage treatment line is several miles away in Jasper. The plant is operating at approximately 50 percent capacity.



### **3.7 Reservoir Operating Levels and Areas Subject to Flood**

For Tract 1, the 100-year floodplain varies from elevation 615.6 at TRM 423.0 to elevation 616.2 at TRM 424.7 (immediately downstream of Nickajack Dam). The 500-year (or critical action) floodplain varies from elevation 618.8 at TRM 423.0 to elevation 619.9 at TRM 424.7. Guntersville Reservoir normally operates between a normal minimum pool elevation of 593.0 and a normal maximum pool elevation of 595.0. The normal minimum pool elevation is typically reached around January 1 and the normal maximum pool elevation around April 15. The top-of-gates elevation at Guntersville Dam is 595.44. The TVA Flood Risk Profile elevations are the same as the 500-year flood elevations for this tract.

For Tracts 3 and 4, the 100- and 500-year (or critical action) floodplains are the areas lying below elevation 635.0. Nickajack Reservoir is operated to fluctuate between a normal minimum pool elevation of 632.0 and a normal maximum pool level elevation of 634.0 year-round. The top-of-gates elevation at Nickajack Dam is 635.0. The TVA Flood Risk Profile elevation is 639.0.

Marion County has adopted the 100-year flood as the basis for its floodplain regulations. There is an adopted floodway along this reach of the Tennessee River.

### **3.8 Aquatic Life**

Because Nickajack Reservoir is the healthiest reservoir in the Tennessee River system, it supports an abundance and variety of aquatic life. Recent sampling not far upstream from Nickajack Dam indicates that 20 or more types of bottom-dwelling aquatic species and 40 or more fish species occur near Tracts 3 and 4. The bottom-dwelling species include many types of insects, some crustaceans, a few types of worms, and the Asiatic clam. Some thin-shelled freshwater mussels also occur in the shallows but no stocks of thick-shelled (commercially-valuable) mussels are known to survive in this part of Nickajack Reservoir. Sport fish which are relatively abundant in this part of the reservoir include bluegill, largemouth bass, yellow bass, redbreast sunfish, channel catfish, and spotted bass.

The embayments and other shallow-water habitats in Nickajack Reservoir near Tracts 3 and 4 provide spawning and feeding sites for many aquatic species, especially the sunfish, bass, and catfish which sportsmen value. Vegetation contained within aquatic bed and shoreline fringe wetlands provides habitat for prey species and cover for young fish and larger predators.

While maps of Tracts 3 and 4 indicate that several small streams flow across the property into Nickajack Reservoir, those streams have surface flow only during rainy weather. Field examination showed that the beds of these streams were covered with grasses and other terrestrial vegetation. No springs or other flowing-water aquatic habitats were observed on these tracts. See Section 3.7 for additional information.

Tract 1 occurs along a substantially different Tennessee River aquatic habitat. Downstream from Nickajack Dam, the river flows essentially within its original banks, has obvious current, and the bottom is composed of rocks and gravel. Recent sampling in this area indicates that 30 or more bottom-dwelling aquatic species and at least 30 species of fish occur there. The most abundant bottom-dwelling species is the Asiatic clam, followed by crustaceans and aquatic insects. Several species of thick-shelled freshwater mussels are known from this part of the river; however, they are not abundant enough to support a commercial fishery. Sport fish which are relatively abundant in this area include bluegill, redear sunfish, channel catfish, blue catfish, spotted bass, and largemouth bass.

Two small streams flow across much of Tract 1 and empty into the Tennessee River within the first mile downstream from Nickajack Dam. Both of these streams originate in wet woodlands but flow through substantially disturbed areas on this tract. The small stream which enters the river halfway between the dam and the mouth of the Sequatchie River has been dredged for much of its length. Both of these streams contain some aquatic life; however, neither appears to support a diverse flowing-water community.

### **3.9 Navigation**

All three tracts being considered are located on the right bank between Tennessee River. Tract 4 is not near the commercial navigation channel. The channel follows the right bank side of the river fronting Tract 3; however, only a small portion of the tract's shoreline fronts directly on the channel. The remainder of the shoreline fronts on large embayments on both the downstream and upstream end of the tract. Little Cedar Mountain Light is located upstream from Tract 3 at river mile 426.9R (km 688.5), and Nickajack Lock is approximately 1.5 miles (2.4 km) downstream. Two federal mooring cells used by the towing industry to tie off during the locking process are also located downstream from Tract 3. Tract 1 is downstream from Nickajack Lock. The navigation channel in this stretch of the river was dredged through rock during construction of Nickajack Lock and Dam. Buoys have been installed to mark the outside limits of the 9-foot draft channel. In addition, there are two federal mooring cells fronting the upstream end of Tract 1.

Approximately 25 percent of the total barge traffic moving on the Tennessee River passes through Nickajack Lock. A total of 895 tows, about 2.7 tows per day, passed through the lock in 1994 in transit to and from the 33 barge terminals located upstream from the lock. Approximately 5.3 million tons (4.8 million metric tons) of commodities consisting primarily of wood products, grain and grain products, limestone, cement, petroleum products, coal, and salt were handled at these terminals during this period.

### **3.10 Existing Public Recreation Opportunities**

Tracts 1, 3, and 4 have a gently rolling topography, large open spaces, panoramic mountain views and open expanses of water. This is in stark contrast to shoreline properties on the upper sections of Nickajack Reservoir which are characterized by steep

bluffs and a riverine setting. To the east, Tract 3 adjoins a 320-acre (130-ha) tract of TVA land (Tract 5) allocated for wildlife management and habitat protection in the Nickajack Reservoir Land Management Plan. TVA's Shellmound recreation area is located on the southern portion of Tract 3, adjacent to Nickajack Dam, and provides a variety of developed recreation facilities including a boat ramp and courtesy pier, paved parking lot, 34-unit campground with toilet/shower building and dump station, 1/2 mile (1 km) hiking trail, 22 picnic units, amphitheater, 2 pavilions, athletic field, multi-purpose tennis court, toilet building, swimming beach, and fishing pier. In addition, this recreation area has been used for the past 27 years as the site for the annual Fall Color Cruise Festival, sponsored by the Chattanooga area Shriners. The festival typically draws in excess of 75,000 visitors and is held during the last two weeks in October.

There are no developed recreation facilities on Tract 1 or 4; however, both tracts are well-suited for informal recreation activities and are frequently used for bank fishing, picnicking, camping, wildlife observation, hiking, and hunting.

Because Chattanooga, South Pittsburg and Jasper are nearby, there are considerable land-based and water-based recreational activities occurring on and around the site, including wildlife observation, pleasure walking, fishing (bank and boat), skiing, and pleasure boating, in addition to hunting described previously. These activities are expected to increase as residential development increases on the surrounding private lands.

Other TVA developed recreation areas within the immediate project area include Maple View day use area at TRM 425.1L (km 685.6L), Cole City Creek boat access at TRM 425.8L (km 686.8L), and Guild boat access area at TRM 430.5L (km 694.4L). Developed facilities at Maple View include a paved boat ramp and 74 unit car/trailer parking lot, 30 picnic sites, toilet building, and swimming beach. This area also provides access for persons visiting Nickajack Cave. The cave is home to a federally endangered gray bat population and has been designated by the Tennessee Wildlife Resources Agency as a Wildlife Observation Area and nongame refuge (see Section 3.5). The area provides viewing opportunities for those wishing to observe the evening emergence of approximately 120,000 gray bats as they leave the cave to feed on insects over Nickajack Reservoir. Developed facilities at Guild and Cole City Creek boat access include a paved boat ramp and 64 unit car/trailer parking lot at each site.

Additional public recreation facilities are located at Marion County Park (TRM 428.2R or km 690.6R), immediately upstream from Tracts 3 and 4. The park is managed by Marion County and provides boating access, camping, picnicking and swimming opportunities. In addition, the county has a license on a three-acre (1.2 ha) tract of TVA land in the Guild Community (TRM. 430.2L or km 693.8L) for an undeveloped community park that provides informal recreation opportunities.

Existing commercial recreation development in the project area includes one full service marina, Hales Bar Resort and Marina at TRM 431.2L (km 695.5L), one commercial dock, Anchor Inn Bait and Tackle at TRM 429.7L (km 693.1L) and one commercial

campground, Camp On The Lake at TRM 429.0L (km 691.9L). Hales Bar Resort and Marina offers boating access, boat rentals, marine fuel, boat storage, snacks and camping services. Anchor Inn Bait and Tackle offers marine fuel, boating access, boat rentals, grocery supplies and camping services. Camp On The Lake provides campsites with water and electric hookups and boating access.

### **3.11 Existing Visual Setting**

The lower two-thirds of Tract 3 is visible to lake users while portions of the whole land base are visible to travelers along Shellmound Road and the dam reservation access road. Tract 4 is a partially wooded tract that lies in direct view of north-bound travelers along both I-24 and US 41-64-72. A restaurant and a few residences lie across Highway 41-64-72 from the tract while a large fireworks store occupies private land on a portion of the interstate median to the south and west of the tract. Views from within the tract are of the highway corridors, Marion County Park toward the main channel, and of Raccoon and Sand Mountains in the background.

Viewers from an interstate rest area located on an island in Nickajack Reservoir have somewhat distant views of portions of Tracts 3 and 4. Views into the subject tracts from the other side of the reservoir are generally from distances in excess of one mile (2 km).

Adjoining Tract 3 is Little Cedar Mountain (Tract 5), which makes up the southern tip of the Cedar/Little Cedar Mountain chain. This low-lying mountainous shoreline stretches northward for six miles (10 km), forming the western bank of Nickajack Reservoir. Little Cedar Mountain is tree-covered with a cedar/hardwood mix. Bluff-like portions with limestone outcrops front the main channel opposite the much higher Sand and Raccoon Mountains on the opposite shore. One third of Tract 3 is screened from the main channel by Little Cedar Mountain. Little Cedar Mountain screens Tract 3 almost entirely from view of I-24 travelers as they look downstream.

Viewers of Little Cedar Mountain from the dam reservation access road see it as wooded middle ground, backdropped by the distant high mountains on the opposite bank of the reservoir. Viewers of the western shore of Little Cedar Mountain from Tract 3 across a cove off the main channel find the shoreline accented by the remains of a limestone quarry.

Across Nickajack Reservoir from Tract 3 is a residential development called "The Bluffs." This site is currently under development and would be visible from Tract 3.

### **3.12 Historical and Cultural Resources**

The Office of Archaeological Research at the University of Alabama conducted a cultural resources survey of Tracts 1, 3, and 4 on Nickajack Reservoir in 1987. Ten archaeological sites were identified on Tract 1, but of these ten, only two were deemed

eligible for inclusion in the National Register. Both of these sites represent an important archaeological research resource. The first site (40MI188) dates to the Middle and Late Woodland Periods while the second site (40MI21) dates to the Woodland Period and Pre-Ceramic, probably Late Archaic Period or Periods. Eleven archaeological sites were identified on Tracts 3 and 4; four are late 19th or early 20th century house sites, one is a historical cemetery, and six are prehistoric stone tool sites (lithic scatters). Of these sites, the cemetery (40MI194) must be protected, and one of the lithic scatters (40MI197) has been judged as potentially eligible for inclusion in the National Register of Historic Places. Although cemeteries are not normally considered eligible for inclusion in the National Register of Historic Places, this cemetery derives its primary significance from age and may be eligible. There is one marked grave dating to 1820, and other unmarked graves may be present.

### **3.13 Socioeconomic Conditions**

The land affected by the proposed action is located in Marion County, Tennessee, about 20 miles (30 km) west of Chattanooga near Interstate 24. Marion County has close economic ties to Chattanooga, as shown by its inclusion in the Chattanooga Metropolitan Statistical Area. According to the U. S. Bureau of the Census, the population of Marion County was 26,469 in 1995. The age distribution of the population is similar to that of the state. However, a slightly smaller share of persons of working age are in the younger age categories. Of the population between the ages of 18 and 64 in 1990, about 65 percent were younger than 45, compared to 68 percent in the state. Per capita personal income in 1993 was \$14,415, about 69 percent of the national average. Total employment in the county was 8,561, of which about 80 percent are wage and salary workers and the remainder business owners. Much of the income of county residents is earned elsewhere, to a large extent in neighboring Hamilton County (Chattanooga). Almost 23 percent of the jobs and 27 percent of the earnings of persons who work in Marion County are in the manufacturing sector; however, half of the manufacturing earnings in the county are from the generally low-wage textile and apparel industries. Both retail trade and services account for large shares of jobs and income also. Retail trade provides slightly over 23 percent of the jobs and 18 percent of the earnings, while services accounts for 20 percent of the jobs and 19 percent of the earnings. Together these three sectors provide almost two-thirds of the jobs and earnings in the county.