CHAPTER 3

3. AFFECTED ENVIRONMENT

The existing environment affected by the proposed actions is described in this chapter.

3.1. Terrestrial Ecology

Terrestrial Animals - Terrestrial animal species found within the project lands are generally common and have widespread distributions. No uncommon wildlife communities were observed within the project lands during field investigations in the summer of 2002. Forested habitats interspersed with open fields and ponds provide a mixture of wildlife habitats. Cattle have previously grazed much of the private land within the project area. Grazing has greatly reduced the amount of understory vegetation that is important to many wildlife species, including songbirds. Overall, forest roads, maintained agriculture fields, old fields, and shorelines create edge habitats and a somewhat fragmented composition of habitats. The highest value of the property to wildlife is the habitat that the area offers to regionally common game and nongame animals.

Due to the lack of features that provide high quality wildlife habitats, such as streams, springs, wetlands, caves, rock bluffs, and moist forested habitats, the overall diversity of wildlife on the site is not uncommon from a local, state, or regional perspective. Wildlife in the project lands includes species commonly found in deciduous woodlands, pine and cedar woodlands, and early successional habitats.

Amphibians and reptiles often found in upland deciduous forests, mixed deciduous woodlands, and along associated riparian areas, such as ponds, fringe wetlands, and the reservoir shoreline, include spotted salamander, Cope's gray tree frog, eastern box turtle, and northern water snake. Birds found in this type of habitat include Carolina wren, red-eyed vireo, barred owl, red-tailed and red-shouldered hawks, great blue heron, green-backed heron, and tufted titmouse. Mammals would include muskrat, eastern gray squirrel, raccoon, and white-tailed deer.

Although pine forest and areas dominated by eastern red cedar are not known for containing a diversity of wildlife, they do provide wildlife habitat. Amphibians and reptiles commonly found in pine forest include eastern narrow mouth toad, eastern spadefoot, southern five-lined skink, and black racer. Birds commonly found in this type of habitat include blue jay, northern cardinal, American crow, and a variety of woodpeckers. Edges along pine and cedar woodlands often provide habitat for mammals such as eastern cottontail rabbit, white-footed mouse, hispid cotton rat, and their associated predators.

Common amphibians and reptiles that are found in early successional habitats include American toad, spring peeper, upland chorus frog, and common garter snake. Birds that nest in these habitats include eastern towhee, brown thrasher, white-eyed vireo, field sparrow, eastern bluebird, and common yellowthroat. Mammals commonly found in this habitat type include white-tailed deer, eastern mole, eastern cottontail rabbit, woodchuck, gray fox, and coyote.

Migratory Birds are used as ecological indicators and their population numbers have been used to detect environmental changes, monitor organic pollutants, monitor radionuclide

contamination, indicate changes in water quality, and detect changes in prey stock (food webs) (Furness and Greenwood 1993). Numerous studies have supported the concept that habitat area in combination with isolation of woodland is one of the most important considerations in maintaining natural diversity of breeding bird populations (Robbins et al., 1989a).

In order to determine a habitat's viability as interior forest, Temple and Cary (1988) developed a model that that used 200 meters as the threshold distance to forest edge. In this methodology, interior-forest habitat requires at least 200-m edge from any feature that breaks the tree cover, such as roads, rivers (reservoirs), or buildings. This criterion was used to describe lands in this chapter and to evaluate lands in Chapter 4.

Several species of neotropical songbirds are expected to occur within the project lands. Neotropical migrants are those birds that nest in North American and migrate to Central and South America, Mexico or the Caribbean during our winter months. Many species in this group have undergone significant population declines in recent years. Studies indicate that many of these species are declining on a continental scale, due to changes associated with their habitat (Robbins et al., 1989b, DeGraaf and Rappole 1995).

Migratory birds that occur in the vicinity likely include several species of waterfowl, hawks, warblers, tanagers, vireos, sparrows, and blackbirds. In addition to those songbirds mentioned earlier in the different habitat types of the area, pine warblers, yellow-throated warblers, yellow-breasted chats, eastern kingbirds, summer tanagers, and indigo buntings also nest in the area.

Waterfowl species that winter near lower Jackson Bend include small numbers of mallards, American black ducks, lesser scaup, ring-necked ducks, wood ducks, gadwall, and hooded and red-breasted mergansers. Other common migratory water birds include common loon, pied-billed and horned grebe, and American coot. No uncommon assemblages of migratory birds were observed during field investigations, or are expected to occur, within the proposed project lands and adjacent reservoir area.

Invasive terrestrial animals that are expected to occur in the project vicinity include European starling, house sparrow, and rock dove. None of these species were observed, or are expected to occur, in unusually high numbers within the project lands.

Terrestrial Plants - Additional information regarding the terrestrial ecology resources, including the vegetation types, of Tellico Reservoir and surrounding lands can be found in the *Tellico Reservoir Land Management EIS* (TVA, 2000). The discussion below focuses on the lower reaches of Tellico Reservoir, in the vicinity of the proposed project lands.

The proposed project lands are located in the Ridge and Valley Physiographic Province of eastern Tennessee (Fenneman, 1938). The region is characterized by a system of parallel ridges and valleys that trend northeast and southwest. Elevation ranges from 750 to 1,000 feet throughout most of the region, however several ridge systems rise to more than 2,000 feet (Martin, 1989). More specifically, the project lands are located in east-central Loudon County just south of the confluence of the Tennessee and Little Tennessee Rivers, on the east side of Tellico Reservoir at Jackson Bend. The topography at the site includes several small finger ridges and coves that vary in both slope and aspect.

Floristically, the region is located in the Oak-Chestnut Forest Region as described by Braun (1950). American chestnut was once a dominant species in the forests of the Ridge and Valley, but has since been decimated by a fungal blight. Following the demise of the chestnut, these forests have become characterized by various species of oak and hickory, as well as red maple, black gum, and pines (Martin, 1989).

Numerous vegetative cover types occurred in what is now the project area before European settlement of the region. Human activities during the past 200 years, including agriculture, residential development, timber harvests, and the impoundment of the Little Tennessee River have greatly altered the previous vegetation and have resulted in a mosaic of cover types.

The discussion that follows distinguishes between those lands that would be directly impacted as a result of the proposed development under Alternatives A-E and those lands that have been proposed for mitigation under Alternatives C and E.

The 539 acres currently owned by Rarity Communities as well as the TVA lands (approximately 127 acres) requested by Rarity Communities were surveyed for botanical resources during the summer and early fall of 2002. Approximately 88 percent (roughly 580 acres) of these lands can be described in terms of three broad vegetation types: old fields, riparian zones, and upland woodlands (Table 3-1). The remaining 12 percent (roughly 80 acres, all owned by the applicant) of these lands was cleared of all vegetation prior to the initiation of botanical surveys ('Bare ground', Table 3-1). Therefore, the discussion that follows pertains only to the vegetated portions of these lands. Appendix D contains a list of all vascular plant species observed during these 2002 field surveys. Only the most frequently encountered species are mentioned in the vegetation descriptions below.

Table 3-1. Major Land Cover Types for Rarity Pointe Project Lands

Major Types	Subtypes	Percent Coverage
Old Field	Pine	2%
	Cedar barren	1%
Riparian Zones	Shoreline	5%
	Wet shores	< 1%
	Bluffs and rocky shores	< 1%
Bare ground	--	12%
Upland Forest	Oak-Hickory-Pine	60%
	Oak-Hickory-Cedar	2%
	North Slope Forest	1%

Less than five percent of these project lands are characterized by old field vegetation, which can be described in terms of old field and cedar barren subtypes.

The old-field subtype includes hayfields, regularly or irregularly mowed areas, and areas that in the recent past have served as pasture or cropland. When regularly mowed, these areas are dominated by grasses such as tall fescue, Johnson grass, tall redtop, foxtail

grass, orchard grass, and timothy. Within these areas, localized patches of disturbed or bare soil support several common weeds including crab grass, Bermuda grass, perennial rye grass, Japanese and Korean clover, annual ragweed, lamb's quarters, and spiny amaranth. In older fields where mowing is less frequent and succession is more advanced, coarse herbs and shrubs are prevalent. In these areas, many of the same species listed above are also common but additional species include panic grass, plume grass, sericea lespedeza, yellow crownbeard, tall ironweed, Canadian goldenrod, common blackberry, northern dewberry, Japanese honeysuckle, and winged sumac. In a few areas, particularly on drier sites over thin or eroded soil, plants characteristic of barrens are present. These species include little bluestem, broom-sage, several species of panic grass, trailing and creeping bush clovers, milk pea, sensitive brier, goat's-rue, greater coreopsis, narrow-leaf white-top aster, hyssop-leaf thoroughwort, round-leaf thoroughwort, and a few species of native sunflowers.

The cedar barren subtype includes open dry areas over thin soil where eastern red cedar is a dominant species and pine is also a significant component. Sites of this subtype occur on small ridges within the project area. Dominant species include several species of goldenrod, aster, bush clover, milkweed, tick-trefoil, sunflower, little bluestem, broom-sage, plume grass, wild oat grass, panic grass, and foxtail grass. Post oak, mockernut hickory, Virginia pine, and winged sumac are common toward the periphery of these areas.

The riparian zone encompasses lands along the shoreline of Tellico Reservoir. In some areas, the shoreline vegetation is very similar to the upland forest vegetation and consists of numerous species of oak, hickory, Virginia pine, red maple, and sourwood. Small limestone bluffs and rock outcrops are scattered along the shoreline, and are usually associated with species such as chinkapin and Shumard oaks, Carolina hickory, hop hornbeam, and yucca. Several species of ferns also occur directly on the rocks in these areas, and include black-stem spleenwort, common woodsia, Alabama lip-fern, purple cliff brake, and resurrection fern. In other areas, particularly at the back of coves where drainages enter Tellico Reservoir, small wet seeps and drainages contain a variety of species including buttonbush, silky dogwood, elderberry, hibiscus, several species of rushes and sedges, cattail, and American groundnut. The remainder of the shoreline is primarily vegetated by thickets of silky dogwood and hazel alder, interspersed with a combination of the previously mentioned species.

Upland forests cover the majority of hills and some ravines in the project area. These upland forests can be further subdivided into four forest subtypes (Table 3-2). Oaks (primarily white, post, black, and southern red), hickories (pignut and mockernut), red maple, shortleaf and Virginia pine dominate the majority of these forests, with sourwood, American hazelnut, and black gum interspersed in the sub-canopy. Rockier slopes, particularly around Jackson Bend, contain increased representation by chinkapin oak, Carolina hickory, and red cedar. On several sheltered north slopes, examples of rich ravine forests are present and include northern red oak, white oak, bitternut hickory, eastern hemlock, Carolina silverbell, Carolina holly, American holly, and mountain stewartia. A few stands of Virginia pine have established on areas that previously supported agricultural fields.

Forests are a significant component of terrestrial ecology resources, both in terms of the plant communities they contain and the wildlife habitat that they provide. Loudon County, where the project lands occur, is one of several counties within the Valley in which forests located within one-fourth-mile of the reservoir make up at least 20 percent of total forested land in the county (TVA, 1998). According to a review of the United States Geological

Survey (USGS) National Land Cover Dataset for the project area and surrounding vicinity, approximately 83 percent of the land area within one-fourth mile of the shoreline surrounding Tellico Reservoir is forested. However, the largest, most contiguous patches of forest are located along the upper reaches of Tellico Reservoir, which are bordered by the United States Department of Agriculture's Cherokee National Forest. In contrast, the proposed project is located on the lower end of the reservoir, an area that primarily consists of "land associated with the Tellico Dam Reservation, which includes upland hardwoods, early successional habitats, agricultural land, and beaver pond wetlands" (TVA, 2000).

The majority (approximately 65 percent or 480 acres) of these project lands are forested. Of these 480 acres, the approximately 118 acres currently in public ownership represent roughly 6.3 percent of all TVA-retained lands allocated to Zone 3, 4, or 6 (Natural Resource Conservation, Sensitive Resource Management, or Recreation) on the lower end of Tellico Reservoir (TVA, 2000). The majority of other lands surrounding the lower end of Tellico Reservoir (downstream of the U. S. Highway 411 Bridge) are owned by TRDA, and zoned for residential or industrial development.

Invasive terrestrial plant species typify disturbed, early successional vegetation. Several invasive terrestrial plant species are present on the lands common to Alternatives A-E as well as each of the mitigation tracts (see descriptions in section 4.1 and Appendix D). In the majority of cases, these species are present in habitats and at densities that are typical throughout eastern Tennessee.

No uncommon plant communities or otherwise sensitive plant habitats were observed during field surveys of the proposed project lands.

3.2. Aquatic Ecology

Aquatic habitat in the littoral (near shore) zone is greatly influenced by underwater topography and back-lying land use. Underwater topography in the reach fronting the Rarity Pointe development varies from moderately steep, with scattered small bluffs near the river channel, to typically shallower in coves, and areas further from the river channel, and the northern reach of shoreline in the vicinity of the proposed par-3 golf course. The deeper, western shoreline is well wooded along the marginal strip fronting the Rarity Pointe property. Woody vegetation along the shoreline on the TVA tract requested for development ranges from small hardwoods and pines (including large areas of dead pine trees), to mature hardwoods. In areas where the shoreline is presently undeveloped and mostly wooded, fallen trees and brush provide woody cover. Woody habitat is generally reduced on shoreline reaches typified by smaller trees (i.e., old fields). Rock is an important constituent of littoral aquatic habitat over much of the Jackson Bend shoreline, in either 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 also typically correspond to shoreline topography and vegetation.

As part of the data collection effort for the Shoreline Management Initiative (SMI) EIS, a survey was conducted on Tellico Reservoir by TVA to arrive at a shoreline aquatic habitat index (SAHI) score which would indicate the quality of aquatic habitat conditions adjacent to various land uses. Scoring parameters (metrics) included 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 reservoir resident sport fish populations which rely heavily on shoreline areas for reproductive

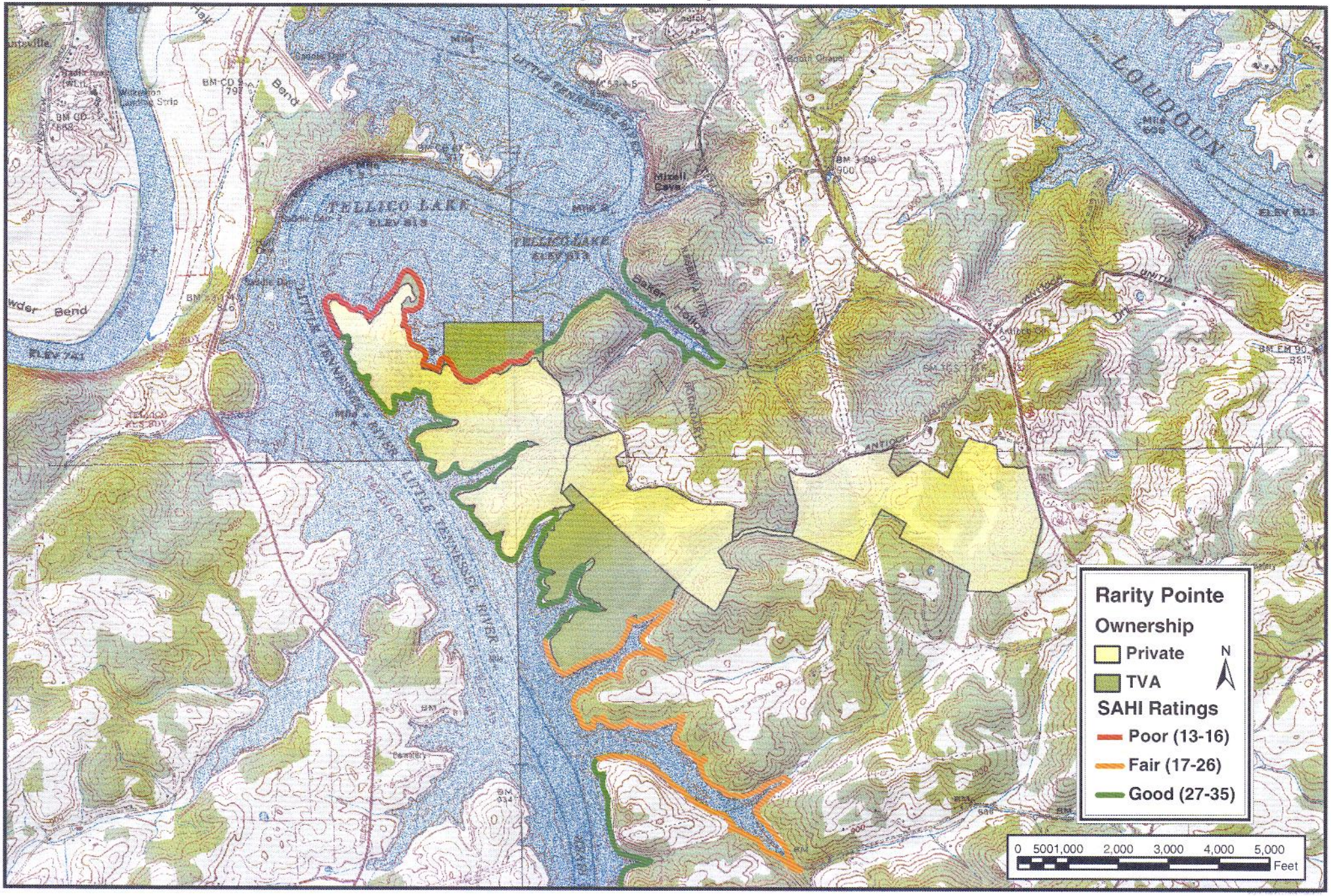
success, juvenile development, and/or feeding. Field methods and the SAHI rationale are described in Appendix G of the SMI EIS (TVA, 1998). The overall average SAHI score at Tellico was 22.2 (out of a possible 35), which indicates generally "fair" shoreline aquatic habitat within the reservoir. Average SAHI scores were higher adjacent to lands allocated for Natural/Wildlife Areas (SAHI 27="good"), and Cultural/Public Use/Open Space Areas (SAHI 24="fair"); SAHI scores adjacent to all other allocated uses averaged 14 or 15 ("poor"). In the SAHI study reported in the SMI EIS, the shoreline along the west side of tract 7 rated "good", as did the entire shoreline of Parcel 8; the shoreline of Parcel 9 rated "good" along the cove where it joins Parcel 8, and "fair" from the mouth of that cove to the eastern end of the area of Parcel 9 proposed for sale (See Figure 3-1)

TVA began a program to systematically monitor the ecological conditions of its reservoirs in 1990. Vital signs monitoring activities focus on 1) physical/ chemical characteristics of waters; 2) physical/chemical characteristics of sediments; 3) benthic macroinvertebrate community sampling; and 4) fish assemblage sampling (Dycus and Baker, 2000). Areas sampled included the forebay (area of the reservoir nearest the dam) at Little Tennessee River Mile (LTRM) 1.0, and a mid-reservoir transition station at LTRM 15.0. The overall rating for Tellico Reservoir in 2001 was poor, largely because of poor ratings for dissolved oxygen (DO) at the forebay, high chlorophyll levels (an indicator of nutrient loading) at the forebay, and poor benthic communities at the forebay and transition stations. The only indicators to rate good were DO and sediment at the transition site. The fish assemblage rated fair at both sampling sites (Draft TVA Data).

Benthic macroinvertebrate (e.g. lake bottom-dwelling, readily visible aquatic worms, snails, crayfish, and mussels) samples were taken in two areas of Tellico Reservoir in 1994, 1995, 1997, 1999, and again in 2001, as part of TVA's Reservoir Vital Signs monitoring program. Bottom-dwellers are included in aquatic monitoring programs because of their importance to the aquatic food chain, and because they have limited capability of movement, thereby preventing them from avoiding undesirable conditions. Sampling and data analysis were based on seven parameters (eight parameters prior to 1995) 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. Collection methods and rating criteria were different prior to 1994, so those results are not compared directly to samples taken using current methods. Definitive causes of such a poor benthic community are not known, but discharges from Chilhowee Dam are cold, nutrient poor, and have a low mineral content – all conditions that are not conducive to establishing a diverse, abundant aquatic community. Another possible contributor to the very low scores is that the scoring criteria used to evaluate the benthic community in Tellico are the same as for the mainstream Tennessee River reservoirs, which rarely experience low DO levels.

The Reservoir Vital Signs monitoring program also has included annual fish sampling at Tellico from 1990 through 1995, and in 1997, 1999, and 2001. The electrofishing and gill netting sampling stations correspond to those described for benthic sampling. Beginning in 1993, the transition zone sampling location was moved to its present location at LTRM 15.0, which is more characteristic of a transition environment rather than the riverine conditions present nearer Chilhowee Dam. 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

Figure 3-1 Shoreline Aquatic Habitat Index Ratings for Rarity Pointe



sampling station are analyzed to arrive at 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 sample 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, 2000). Compared to other run-of-the-river reservoirs, the fish community at both of the Tellico sampling stations rated fair in the fall 2001 samples when 34 species were collected. More abundant species in the overall sample were gizzard shad, common carp, spotfin shiner, bluegill, and largemouth bass (Draft TVA Data).

Tellico Reservoir provides many opportunities for sport anglers. A Sport Fishing Index (SFI) has been developed to measure sport fishing quality for various species in Tennessee and Cumberland Valley Reservoirs (Hickman 1999). The SFI is based on the results of fish population sampling by TVA and state resource agencies and, when available, results of angler success as measured by state resource agencies (i.e., bass tournament results and creel surveys). In 2000, Tellico rated above average for spotted bass, walleye/sauger, striped bass, and channel catfish, but below average for largemouth and smallmouth bass, white bass, and bluegill. The Tennessee Department of Environment and Conservation (TDEC) advises that catfish from Tellico Reservoir not be eaten because of PCB contamination.

3.3. Threatened and Endangered Species

Plants

A review of the TVA Regional Natural Heritage Program database (Heritage database) indicates that there are no federal-listed and five Tennessee state-listed plant species known from within five miles of the proposed project lands (Table 3-2).

Table 3-2. Federal and State Listed Plant Species - Reported From Within Five Miles of the Proposed Project Lands, in Loudon County, Tennessee

Common Name	Scientific Name	Federal Status	State Status[a]
American barberry	*Berberis Canadensis*	--	**SPCO**
Creekgrass	*Potomogeton epihydrus*	--	**SPCO**
Spreading false foxglove	*Aureolaria patula*	--	**THR**
Largeleaf pondweed	*Potomogeton ampilifolius*	--	**THR**
Smoothleaf honeysuckle	*Lonicera dioica*	--	**SPCO**

[a] State status codes: THR: threatened; SPCO: special concern.

Lands common to Alternatives A-E - The comments below apply to the 539 acres currently owned by Rarity Communities as well as the TVA lands requested by the applicant.

Surveys for botanical resources were conducted on the 539 acres currently owned by Rarity Communities during the summer and early fall of 2002. During these inventories, areas that appeared to contain suitable habitat for rare plant species were identified and intensively surveyed. Surveys continued until the botanist determined that additional searches for rare plants would be unproductive. As stated in Section 3.1 (Affected Environment, Terrestrial Ecology), approximately 12 percent of these lands were cleared of all existing vegetation prior to the start of botanical surveys. Therefore, surveys for rare plant species were conducted on the remaining 88 percent of these lands.

One location possibly containing a state-listed plant species (spreading false foxglove, *Aureolaria patula*) was identified during the summer surveys. This is a parasitic, late summer-flowering member of the foxglove family. This species is a rather coarse, clump-forming perennial with large yellow flowers, opposite leaves, and long stems. It grows on steep, dry, partially shaded calcareous slopes, above large streams and rivers, and is usually found within a few meters of the water. Follow-up surveys conducted while these plants were in flower revealed that the plants belonged to a more common member of this genus (smooth false foxglove, *Aureolaria laevigata*). As a result, no state-listed plant species are known to occur on the proposed project lands.

No federal-listed plant species, or habitat for such species, were found during surveys of the proposed project lands.

The Wildcat Rock and Morganton Cemetery sites proposed for mitigation were surveyed for botanical resources in early January, 2003. No state or federal-listed plants were found on the Morganton Cemetery site. Part of the Wildcat Rock tract has been degraded by cattle access, and is unlikely to contain suitable habitat for rare plant species. In contrast, additional portions of the Wildcat Rock site could contain suitable habitat for several state-listed plant species (including spreading yellow false foxglove, *Aureolaria patula*; mountain honeysuckle, *Lonicera dioica*; American barberry, *Berberis canadensis*; and spreading rockcress, *Arabis patens*). However, the presence or absence of these or other rare plant species cannot be confirmed without additional surveys conducted during the growing season.

Terrestrial Animals

TVA biologists reviewed the Heritage database and conducted field investigations to determine the potential occurrence of protected terrestrial animals and their habitat in the vicinity of the project lands. With the occasional exception of wintering bald eagles, no federal-listed terrestrial animals have been reported from areas within three miles of the project lands or from Loudon County, Tennessee.

The database indicated that the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), listed as In Need of Management in Tennessee, has been reported from several areas within three miles of the project lands. Eastern hellbenders inhabit large, clear, fast-flowing streams that contain large flat rocks and logs. This salamander was reported from several localities in the Little Tennessee River prior to impoundment. It is typically confined to major streams and does not thrive in reservoir conditions; therefore, it is not expected to occur in the vicinity of the project lands.

However, four protected terrestrial animal species, which have not been previously reported from the vicinity, may find suitable habitat on project lands. The bald eagle is federally-threatened and the Indiana bat is federally-endangered. Two of these species are listed as In Need of Management in Tennessee: southeastern shrew and sharp-shinned hawk. No additional protected terrestrial animals are known or are expected to occur on the mitigation lands involved in this proposal.

Bald eagles (*Haliaeetus leucocephalus*) typically nest in mature trees near or adjacent to large rivers or reservoirs where they forage. The forested setting of the project lands likely helps to maintain the integrity of bald eagle habitat on the reservoir. Although no nesting pairs of bald eagles have been reported from the immediate area, two eagle nests have been reported from upstream of the project lands in previous years. One nest is located near Citico Creek and the other nest has been reported near Ballplay Creek. Wintering eagles have been reported from a number of localities along the reservoir. The forested shoreline along the project lands provides potential habitat that is likely used for occasional roosting and foraging activities by bald eagles. The largest portion of forested shoreline on the project lands occurs on along private properties owned by Rarity Communities.

Indiana bats (*Myotis sodalis*) are a colonial animal that hibernate in caves or mines during winter months, and can be found in tree cavities or crevices and under loose tree bark during the summer, where they form small maternity colonies. In 1999, U.S. Forest Service personnel captured one female Indiana bat in an upland forest in the Cherokee National Forest near Vonore, less than two miles from Tellico Reservoir. Bachelor colonies of Indiana bats often form near areas where the bats hibernate. The closest known hibernaculum to the project lands is located inside the Great Smoky Mountains National Park, approximately 30 miles away.

Indiana bats can live in highly altered landscapes. They prefer large trees in the open or at forest edges, open canopies, fragmented forested landscapes and forests with an open understory (USFWS, 1999). Indiana bats forage for insects primarily in riparian and upland forests. Although no Indiana bats are known from the site, upland forests, old fields and pastures with scattered trees and ponds on Rarity Communities' properties could provide potential roosting and foraging habitat for this mammal.

Southeastern shrews (*Sorex longirostris*) occur in a variety of habitats, but are typically associated with moist woodlands or wetlands where rotting logs and leaf litter occur. Riparian woodlands that occur along wet weather conveyances in the project lands may provide suitable habitat for this mammal. Primarily, these habitats are located along drainages that immediately feed into the reservoir embayments of the project lands. Most of the TVA property is upland; therefore, habitat for this species is very limited on Parcels 8 and 9.

Sharp-shinned hawks (*Accipter striatus*) often prefer to nest in coniferous woodlands; however, they have been reported from pine-oak woodlands. Mixed deciduous forest and edge habitats on Rarity Communities lands provide suitable habitat for this species.

Aquatic Animals

This potentially affected land is located adjacent to Tellico Reservoir (Little Tennessee River) in Loudoun County, Tennessee. The Heritage database indicates that the Little Tennessee River historically supported a diverse group of fish, mussels, and other aquatic life, including several State- and Federal-listed species (Table 3-2). However, all of the

sensitive species listed in Table 3-3 are dependent upon relatively free-flowing, riverine habitats. Due to the impoundment of Tellico Reservoir, no suitable habitat for these species currently exists in this portion of the Little Tennessee River. None of these species are likely to occur within the impounded area of Tellico Reservoir.

One additional State-listed species; Tennessee dace (*Phoxinus tennesseensis*) deemed In Need of Management by Tennessee W ildlife Resources Agency (TWRA), is known to occur in several tributary streams that flow into Tellico Reservoir. Tennessee dace are restricted to small stream habitats and do not occur in the main reservoir body. No perennial streams are present on the tracts of land in question.

Table 3-3. Federal and State Listed Aquatic Animals - Reported From the Little Tennessee River, Loudon and Monroe Counties, Tennessee

Common Name	Scientific Name	State Status	Federal Status
Snails			
Anthony riversnail	Athearnia anthonyi	Endangered	Endangered
Mussels			
Tan riffleshell	Epioblasma florentina walkeri	Endangered	Endangered
Cumberland monkeyface	Quadrula intermedia	Endangered	Endangered
Appalachian monkeyface	Quadrula sparsa	Endangered	Endangered
Fish			
Snail darter	Percina tanasi	Threatened	Threatened
Blue sucker	Cycleptus elongatus	Threatened	-
Blotchside logperch	Percina burtoni	In Need of Management	-

Federal Status:
Endangered = Species is threatened by extinction throughout all, or a significant portion, of its range.
Threatened = Species which is likely to become an endangered species in the foreseeable future throughout all, or parts, of its range.
State Status:
Endangered = Species is threatened by extinction throughout all, or a significant portion, of its range in Tennessee.
Threatened = Any species or subspecies of wildlife that is likely to become an endangered species within the foreseeable future in Tennessee.
In Need of Management = Any species or subspecies of non-game wildlife which should be investigated further to determine management measures necessary for their continued ability to sustain themselves successfully (analogous to Special Concern).

3.4. Water Quality

Tellico Dam is a multipurpose tributary project located on the Little Tennessee River, near its confluence with the Tennessee River, immediately downstream of Fort Loudoun Dam. Annual drawdown averages about 6 feet. At normal summer pool (813-feet MSL), the surface area of the reservoir is 16,500 acres, the shoreline is about 310 miles in length, and

water is impounded to about mile 31 of the Little Tennessee River. The summer volume is 414,600 acre-feet and the average annual discharge is approximately 5,700 cubic feet per second.

Tellico Reservoir has characteristics that are between those of mainstream Tennessee River reservoirs and tributary reservoirs. The average retention time for Tellico is about 37 days, whereas mainstream reservoirs average less than 20 days and most tributary reservoirs average well over 100 days. Tellico resembles mainstream reservoirs in depth and average annual drawdown, but Tellico's cold water inflows and greater retention time (compared to mainstream reservoirs) encourages thermal stratification, which occurs throughout much of the reservoir during the summer months.

Most of the discharge from Tellico Reservoir flows through the navigation canal into Fort Loudon Reservoir. Water characteristics in these two reservoirs differ considerably. The exchange of water through the canal significantly affects water quality within Tellico Reservoir. The canal is 20-25 feet deep, while the depth of Tellico Reservoir at the forebay is about 80 feet. Therefore, only the warmer surface layers are discharged and water below about 25 feet is trapped, in the forebay, by thermal stratification and becomes anoxic during much of the summer.

Upstream of the forebay, where stratification is not as strong, dissolved oxygen concentration (DO) does not get as low. In some years, a small area of deeper water has DO levels below 2 mg/L. Typically, the lower DO levels occurs during July or early August because these months are preceded by a period of reduced flows as TVA fills tributary reservoirs.

The ecological health of Tellico reservoir was rated poor by TVA in 2001. The low flows resulting from the extended drought contributed to lower then usual DO concentrations and higher chlorophyll concentrations (a measure of the amount of algae). In addition, bottom-dwelling organisms rated poor and the fish community rated fair. The most notable trend for Tellico Reservoir is the increase in chlorophyll levels, which suggest increased nutrient loading to the reservoir. However, the data covers only a 10-year period in which a wide range of meteorological and hydrological conditions have occurred.

The state of Tennessee has designated Tellico Reservoir as not supporting its designated uses, because of sediments contaminated by polychlorinated biphenyls (PCB) which is a carcinogen. The state advises against eating catfish from Tellico because of PCB contamination. There are no other fish consumption advisories as of 2001. There were no swimming advisories for bacterial contamination on Tellico Reservoir as of 2001.

Much of the shoreline of Tellico Reservoir is surrounded by residential and industrial areas, and the immediate watershed has significant amounts of agricultural land and dispersed residential area, resulting in relatively high pollutant loadings. A rough calculation based on general land use categories indicates that approximately 130 tons/year of phosphorous (usually the nutrient that limits growth of algae; estimate based on unpublished TVA land use data and Reckhow, et al., 1980) is generated in the Tennessee portion of the Little River watershed.

Most of the site of the planned development is wooded. TVA shoreline surveys, performed in 1994, indicate that the shoreline condition at the site is good, except for the north-facing section of shoreline at the base of the peninsula, which is rated fair because of a lack of a woody vegetation buffer.

3.5. Wetlands and Floodplains

Wetlands - The common wetland types associated with TVA tributary reservoirs are aquatic beds, flats, emergent, scrub-shrub, and forested wetlands (TVA, 1998). Aquatic beds and flats occur in the area between winter pool and normal summer pool elevation. Emergent wetlands typically occur in a narrow elevation zone centered on the summer pool elevation. Scrub-shrub wetlands also occur in this shoreline zone, as well as in relatively large areas in the upper ends of some large embayments. Forested wetlands associated with tributary reservoirs typically occur above summer pool in the riparian zone of the reservoir and tributary streams.

Tellico Reservoir and the land within 0.25 miles of the shoreline contain approximately 900 acres of wetlands, found in over 700 locations scattered along the length of the system (TVA, 2000). Most wetlands are located below the 820-foot maximum shoreline contour, with many found immediately adjacent to the summer pool shoreline. Aquatic beds are also found in some years, primarily in the Tellico River arm of the reservoir and the upper end of the reservoir near the mouth of Citico Creek. A survey of residential access shoreline on Tellico Lake conducted by TVA staff in the mid-1990s determined that one fourth of the residential access shoreline supports wetland vegetation (TVA, 1998).

The creation of TVA impoundments on the Tennessee River and its tributaries inundated wetland, riverine, and upslope habitats and created new wetland areas and many miles of terrestrial shoreline riparian habitat (Amundsen, 1994). There is very little quantified information describing trends in these reservoir-associated wetlands. Forested wetlands have experienced the highest acreage loss of the wetland types in the southeastern U.S., primarily due to agriculture, timber harvesting, and urban and rural development (Hefner et al., 1994). As a result of federal land ownership and management, the emergent, scrub-shrub, and forested wetlands associated with TVA reservoirs may not have experienced as much of a decline as these wetland types in the rest of the southeastern U.S. The most significant threat to reservoir wetlands may be shoreline residential development, with its consequent vegetation clearing, dock construction, shoreline alterations, and soil erosion. The SMI study for six reservoirs (Chatuge, Chickamauga, lower third of Kentucky, Tellico, Watts Bar, and Wheeler) indicated that the proportion of total wetlands acreage was greater along undeveloped shorelines than along developed shorelines (TVA, 1998).

Ten wetlands were identified in the Rarity Pointe assessment area. The total acreage of wetlands in the assessment area is approximately 1.25 acre. Table 3-4 presents details of the wetlands identified in the Rarity Pointe assessment area.

Seven of the wetlands in the assessment area are scrub-shrub wetlands located on the reservoir shoreline (W4, W5, W6, W8) and at the heads of small coves where intermittent streams enter the reservoir (W1, W2, W3). Another scrub-shrub wetland (W7) is located on the southern end of a small island just off the tip of Jackson Bend. Two emergent wetlands (W9, W10), each less than one tenth acre in size, are located on the fringe of an abandoned pond and a livestock pond, respectively. Wetlands W1 through W8 are on the TVA shoreline below the Maximum Shoreline Contour (MSC) at 820 feet elevation. Wetlands W1, W2, and W8 are on TVA Parcels 8 and 9. While wetland W3 is on Parcel 9, it is at the head of a cove just outside of the part of Parcel 9 proposed for sale. Wetlands W9 and W10 are on property belonging to Rarity Communities.

Table 3-4. Wetlands in and Adjacent to Rarity Pointe Assessment Area

Wetland ID	Classification (Cowardin, et al. 1979)	Approximate Area (acres)	Location	Land Ownership
W1	PSS1E	<0.1	At mouth of an intermittent stream at the head of a cove	TVA (below MSC 820)
W2	PSS1E	<0.1	At mouth of an intermittent stream at the head of a cove	TVA (below MSC 820)
W3	PSS1E	<0.1	At mouth of an intermittent stream at the head of a cove on the southern edge of Request Area.	TVA (below MSC 820)
W4	PSS1E	~0.5	Shoreline on northeast side of Jackson Bend	TVA (below MSC 820)
W5	PSS1E		Shoreline on northeast side of Jackson Bend; Partially in Request Area	TVA (below MSC 820);
W6	PSS1C	~0.04	Shoreline on northeast side of Jackson Bend	TVA (below MSC 820)
W7		<0.3	South end of small island at tip of Jackson Bend. The island is not in Request Area.	TVA
W8	PSS1E	<0.1	Small inlet within a cove on the southern shore of 118-acre Request Area.	TVA (below MSC 820)
W9	PEM1E	<0.05	Abandoned pond at head of intermittent stream.	Rarity Communities Properties
W10	POWH/PEM1C	<0.1	Farm pond in old field at head of a wet-weather conveyance. Approximately 90% of acreage is pond open water area. 10% of acreage is vegetated wetland on pond fringe.	Rarity Communities Properties

MSC = Maximum shoreline contour. TVA owns the land up to MSC 820-feet.

All of the wetlands on TVA property (W1 through W8), would be protected from most direct impacts through compliance with federal mandates and legal requirements for protection of wetlands. Regulatory protection is extended to wetlands under Section 404 of the Clean Water Act, and TVA is subject to EO 11990, Protection of Wetlands, the goal of which is to "minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands…" Consistent with this goal, TVA would, to the extent practicable, take measures to either avoid adverse impacts to wetlands or mitigate unavoidable effects to wetlands in decisions relating to the proposed actions.

The USACE has determined that the shoreline wetlands (W1 through W8) are jurisdictional and, thus, subject to permitting requirements under the Clean Water Act Section 404 (Cathy Elliott, USACE, Lenoir City, personal communication, January 16, 2003).

Although the wetlands on the Rarity Pointe site are few in number and small in size, they provide a number of important functions. The primary functions include shoreline stabilization, provision of wildlife habitat; provision of plant species and landscape diversity; retention of sediments; removal or transformation of contaminants; and nutrient cycling. Past residential development of Tellico Reservoir shoreline has probably cumulatively affected the wetland resources in the area. This increases the importance of the remaining wetlands in providing these functions.

Floodplains - The proposed development is located on the left bank of Tellico Reservoir between Little Tennessee River miles 2.2 and 5.2 in Loudon County, Tennessee. The 100-year floodplain for this reach of the Little Tennessee River would be the area below elevation 816.2 feet MSL. The TVA Flood Risk Profile (FRP) elevation for the Little Tennessee River between miles 2.2 and 5.2 would be elevation 817.0 feet MSL. The FRP is used to control flood damageable development for TVA projects, and residential and commercial development on TVA lands. At this location, the FRP elevation is equal to the 500-year flood elevation. The 500-year flood elevation is also used to establish the "critical action floodplain". A "critical action" is defined in the Water Resource Council Floodplain Management Guidelines as any activity for which even a slight chance of flooding would be too great.

3.6. Recreation

Recreation Allocations and Use – One purpose of the Tellico project was to provide significant opportunities for recreation, and substantial amounts of public use opportunities where virtually none was available (TVA, 1972). The most recent gathering of recreational use information on Tellico occurred through the public involvement process for the 2000 Land Plan. Over eighty percent of the respondents to a questionnaire identified water-related activities as being preferred. Fifty-one percent indicated if appropriate facilities were provided they would participate in bike riding, camping at developed sites, hiking, horseback riding, special events, or swimming in designated areas. The 2000 Land Plan public involvement process focused on three land use alternatives: 1) the proposed Tellico Landing, Inc. (TLI) development, 2) a river corridor designation on the Tellico River, and 3) a greenway on the lower right bank between Lotterdale Cove and Lower Jackson Bend. The TLI proposal was dropped from consideration and designations in the 2000 Land Plan for the river corridor and greenway were approved.

TVA and TRDA have provided public access to the reservoir with 14 boat ramp areas, and there are four commercially operated campgrounds. TVA recently developed a new day use area on the Tellico Dam Reservation with a picnic shelter, beach area, and trail. Public golf is provided on the reservoir at four privately owned 18-hole golf courses, three of which are located below U. S. Highway 411 Bridge. The Town of Vonore operates the only local park on Tellico Reservoir. The TDEC manages the 395-acre Fort Loudoun State Historic Park, 38-acre Tellico Blockhouse State Historic area, and 1-acre Tanasi Memorial recreation area. No overnight lodging exists at any reservoir recreation area. Although TRDA serves as provider of park and recreation areas in Loudon County and manages the Lotterdale Cove recreation area, there is no parks department in the county and TVA's land serves as the major provider of public open space.

The 2000 Land Plan allocated 37 acres in Vonore, Tennessee at Tellico River mile 0.5 for commercial recreation purposes, approximately 19.5 river miles upstream of Rarity Pointe. Interest has been expressed over the last several years by the Eastern Band of the Cherokee Indians to develop this property for commercial recreation purposes. An additional area at Little Tennessee River mile 12.5 in Bat Creek allocated for commercial recreation purposes was sold to TRDA and remains undeveloped. The only other commercial recreation development existing on the reservoir is the Tellico Harbor Marina at Little Tennessee River mile 20.0. The reservoir receives substantial boating use as a result of the existing public access areas, private residential docks, community docks, and Tellico Village Yacht club.

As part of the 2000 Land Plan, a greenway was proposed which encompassed much of the eastern shore land and included the subject approximately 118 acres. The public's review of the 2000 Land Plan supported this allocation and resulted in TVA designating nine tracts of land encompassing a total of 1,071 acres on the eastern shore between Little Tennessee River miles 4-10 as a greenway in the plan. Parcel 8 (47 acres) was allocated for future day use recreation activities and a terminus for the greenway trail development. The adjoining portion of Parcel 9 was allocated for natural resource conservation and intended to be used as a component of the greenway and trail system. The greenway allocation of these nine tracts was intended to create an interconnecting trail system with day use areas and access nodes at appropriate intervals, and maintain substantial open space for public use.

As part of Contract TV-60000A, approximately 216 acres were allocated for commercial recreation use and sold to TRDA in December 1982, in anticipation of being developed as a commercial recreation resort. This property, now owned by Rarity Communities, is a component of the Rarity Pointe master plan development and adjacent to the approximately 118 acres being sought for residential/golf course development. It is restricted by deed to be used only for commercial recreation purposes which includes uses such as a lodge, spa, golf course, vacation homes, and restaurant. Facilities constructed on this piece of property cannot be used as primary residences. Previous attempts have been made to develop the 216 acres for commercial recreation purposes; however, none were successful. International Harbor Marina was located on the tract in 1987 and remained in existence with harbor limits and 68 slips, until land rights were terminated in 2001.

The par-3 golf course proposed on a 5-acre portion of TVA land identified as Parcel 7 in the 2000 Land Plan was allocated for commercial recreation use. It fronts the 216 acres now owned by Rarity Communities, Inc. The commercial recreation rights conveyed with the Rarity Communities' property allow development and management of appropriate recreation amenities within the context of the commercial recreation use of the property, and include the right to request TVA approval to construct, operate, and maintain water use facilities between the 820-foot contour and adjacent waters of Tellico Reservoir. The proposed par-3 golf course is consistent with the designated land use and existing rights.

The 118-acre parcel is part of a contiguous block of eastern shore land available for public use extending 13.5 miles upstream of the Tellico Canal, and encompasses approximately 2.5 miles of the potential greenway trail. Typical activities include camping, hiking, bird watching, bank fishing, and wildlife viewing. The coves fronting the eastern shore property provide protected, undeveloped areas where boaters can seek refuge. The parcel has the potential to accommodate a variety of trails serving diverse segments of the population and provide opportunities for refreshment of one's mental and physical state and solace in a natural setting. It is close to an urban area, and is accessible by boat and foot.

WATeR has submitted a master plan to TVA for development of the greenway trail system focusing on the right bank of Tellico Reservoir, potentially connecting the Tellico Dam reservation via public property to Lotterdale Cove Campground, and possibly further upstream. WATeR has requested that TVA partner with the watershed organization to initiate development of the greenway. The partnership concept parallels a similar partnership between TVA and the Boy Scouts of America (BSA) which resulted in the initiation of development in 2002 of the four-mile-long Hall Bend Trail on the Tellico Dam Reservation. The WATeR proposal, as does the BSA proposal, involves commitments of financial and in-kind resources from TVA, the organizations, and volunteers. The WATeR

trail system proposal is envisioned to accommodate a variety of interests and physical capabilities to serve all segments of the population and could be accomplished over a period of time as resources and user demand warrant.

There appears to be increased interest from the private sector in acquiring residential access rights on Tellico Reservoir, and on nearby Fort Loudoun Reservoir from government agencies owning former TVA land conveyed for public recreation purposes and the private sector. TVA considers development requests on a case by case basis, considering potential environmental impacts, including cumulative impacts.

Outdoor Recreation Trends - The National Golf Foundation (NGF) reports that golf participation increased from 19.9 to 26.4 million golfers from 1986-1998, and the number of rounds played increased from 401.9 to 528.5 million. However, most of this growth occurred between 1986 and 1990 when growth in golfers outpaced the growth in supply, with participation increasing 39 percent from 19.9 to 27.8 million. This trend reversed between 1991 and 1998, as growth in supply outpaced growth in golfers, and participation only increased 6.6 percent from 24.8 to 26.4 million participants. NGF also reported that over-saturation may be possible in certain local market areas. When this occurs, the successful golf courses (such as destination resorts) in a saturated market will likely be the ones that provide appropriate market niches for specific segments of the market.

The most recent Tennessee State Comprehensive Outdoor Recreation Plan (SCORP) identified statewide recreation priorities through 1999. The East Tennessee Planning Region, which includes Loudon County, placed a high priority on greenways through public input to the SCORP process. In 2001, the Tennessee Greenways and Trails Plan captured a vision and importance of greenways and trails for the future of Tennesseans. The plan promotes policies for creating an interconnected, accessible network of greenways and trails across Tennessee to create recreation opportunities, connect communities, protect wildlife and migration patterns, buffer waterways, and enhance the scenic and aesthetic quality of our state.

Hunting and Wildlife Observation Trends - Since TVA acquired project lands beginning in the 1960's, and in particular following the inundation of the reservoir in 1979, much of the retained property on the eastern shoreline downstream of U. S. Highway 411 has been used for a variety of outdoor pursuits including hunting and wildlife observation. These uses played a part in the resultant designation of parcels XTELR-23PT, 11PT and 9PT as Zone 4, Natural Resources Conservation in the 2000 Land Plan (TVA, 2000). In recent years, Parcels 8, 9, and 10PT have supported increased usage by hunters, especially those in pursuit of white-tailed deer and eastern wild turkey. The increased use of this property for hunting reflects the growing popularity of deer and turkey hunting in conjunction with a shrinking land base to support such recreational pursuits on a local and statewide basis.

Public Hunting Lands managed by the Tennessee Wildlife Resources Agency (TWRA) (most under agreements with private timber companies) have decreased from 800,000 acres to 375,000 acres over the last 2-3 years (Mark Gudlin, TWRA, personal communication, 2002). In addition, the remaining privately owned lands and those managed by timber companies are being leased by hunting clubs at increasing rates that range from 4 to 7 dollars per acre (Dr. Mark Fly, University of Tennessee, Department of Forestry, Wildlife, and Fisheries, personal communication, 2002) These situations, coupled with the fact that active farmland is being converted to suburban/urban uses at a current rate

of 91,000 acres per year in Tennessee (Mark Gudlin, TWRA, personal communication, 2002), have increased the importance of public lands in meeting the demand for recreational hunting opportunities.

The recently released U.S. Fish and Wildlife Service (USFWS) 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFS, 2002a) reports that while overall hunting participation dropped 7 percent from 1996 to 2001, the numbers of big game (deer) hunters remained steady with a significant increase in the total amount spent by hunters. In Tennessee alone during 2001, there were 359,000 hunting participants who spent over 576 million dollars in pursuit of their sport (USFWS, 2002b).

In recent years, there has also been an enhanced interest in wildlife watching on Tellico Reservoir properties which tracks a national trend. In 2001, more than 66 million people in the United States 16 years old and older, fed, photographed, and observed wildlife and spent 40 billion dollars on their activities. Of this number, 11 million visited public parks or natural areas to enjoy wildlife (USFWS 2002b). In Tennessee during 2001, there were 1.6 million wildlife-watching participants who spent over 807 million dollars in pursuit of this activity. A 1994-95 National Survey on Recreation and the Environment conducted by the University of Georgia found that 27 million Americans considered themselves active birders. That is a 155 percent increase since 1982-83, making birding one of the fastest-growing recreational activities in the country, well ahead of golf, downhill skiing, and hiking (Weidensaul, 1999).

Local interest in wildlife watching, in particular bird watching, is further substantiated by the growing number of Tellico Village residents participating in an annual bird watching field trip at the Tellico Dam Reservation sponsored by TVA's Little Tennessee Watershed Team and the Knoxville Chapter of the Tennessee Ornithological Society. Of the 40 plus participants on the March 2002 bird walk, approximately 25 people were Tellico Village and Lenoir City residents. These public use/stakeholder needs were identified during the development of the Tellico Reservoir Land Management Plan and were important factors in the designation of the bulk of the retained property on the eastern downstream shoreline to Natural Resource Conservation and Public Recreation uses.

Boating - The proposed marina at Rarity Pointe is located approximately two miles from the Tellico Canal which connects Tellico and Fort Loudoun Reservoirs. The canal is commonly recognized as one of the more congested boating areas on the two reservoirs. The TWRA has placed four buoys at the canal to inform the public that the area is congested and that slow boating speeds should be observed. During peak boating periods, commonly recognized as Holiday or weekend days from noon to 8:00 PM, TWRA, as well as other law enforcement agencies, increase boating patrols to help maintain safe boating conditions for the general public. Observed recreational vessel counts (boats and jet skis) at the canal on July 4, 2002, averaged 177 per hour from noon to 3:30 PM, and vessel speed was enforced by TWRA and Loudon County Sheriff patrols.

The National Marine Manufacturers Association estimates that recreational boats owned nationwide has increased from 11.8 million in 1980 to 16.9 million in 2000. According to TWRA Boating Accident Reports for 1999, 2000, and 2001, between 1962 and 1999 registered boats in Tennessee increased from 48,341 to 314,583. The annual fatality rate per 100,000 registered boats remained fairly stable from the late 1960's through the 1970's averaging around 21.8 per year. In 1981, this fatality rate began to decrease and through

2001 averaged 8.9 per year. The accident rate per 100,000 has stayed fairly constant in the range 33 to 55 from the early 1970's through 1999. The accident rate for 1999, 2000, and 2001 has been higher than the previous years: 59, 82, and 68, respectively. The injury rate per 100,000 has risen from 8.5 in 1964 to 52.3 in 2000 (and 43.2 in 2001). Total boating accidents in the state have steadily increased since 1993. Table 3-5 presents TWRA's data for annual boating accidents.

Table 3-5. Boating Accidents in Tennessee

Years	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number	82	109	151	154	119	168	186	221	174

Across Tennessee, Fort Loudoun had the highest number of reservoir accidents (15) in 1999, and Tellico Reservoir ranked in the bottom twenty-five percent with 3. In 2000 and 2001, the reservoirs with the most accidents in the state ranged from 10-19. Fort Loudoun had 9 accidents and Tellico had 10 accidents during this two-year period.

3.7. Cultural Resources

For at least 12,000 years, the Tennessee River and the Little Tennessee River Valley have been an area for human occupation which became more intense through succeeding cultural periods. In the upper east Tennessee area, archaeological investigations have demonstrated that Tennessee and the eastern Ridge and Valley Region were the setting for each one of these cultural/temporal traditions, from the Paleo-Indian (12,000-8000 B.C.), the Archaic (8000-1200 B.C.), the Woodland (1200 B.C.-1000 A.D.), the Mississippian (1000-1500 A.D.), to the Protohistoric-Contact Period (1500-1750 A.D.). Prehistoric archaeological stages are based on changing settlement and land use patterns and artifact styles. Each of these broad periods is generally broken into sub-periods (generally Early, Middle, and Late), which are also based on artifact styles and settlement patterns. Smaller time periods, known as "Phases" are represented by distinctive sets of artifact remains. In addition, historic era cultural traditions have included the Cherokee (1700 A.D.-present), European- and African-American (1750 A.D.-present) occupations.

The Paleo-Indian Period (12,000-8000 B.C.) represents the documented first human occupation of the area. The settlement and land use pattern of this period were dominated by highly mobile bands of hunters and gatherers. The subsequent Archaic Period (8000-1200 B.C.) represents a continuation of the hunter-gatherer lifestyle. Through time, there is increasing social complexity and the appearance of horticulture late in the period. The settlement pattern during this period is characterized by spring and summer campsites. Increased social complexity, reliance on horticulture and agriculture, and the introduction of ceramic technology characterize the Woodland Period (1200 B.C.-1000 A.D.). The increased importance of horticulture is associated with a less mobile lifestyle as suggested by semipermanent structures. The Mississippian Period (1000-1500 A.D.), the last prehistoric period in east Tennessee, is associated with the pinnacle of social complexity in the southeastern United States. This period is characterized by permanent settlements, maize agriculture and chiefdom level societies.

The Archaic through Mississippian Periods have been intensively investigated along the Little Tennessee River Valley (Chapman 1973, 1975, 1977, 1978, 1979a, 1979b, 1981; Cridlebaugh, 1981; Kimball, 1985; Polhemus, 1987; Davis, 1990; Guthe and Bistline, 1981).

In addition, it is widely known historically that many settlements along the Little Tennessee River were Overhill Cherokee villages (Timberlake, 1927; Bartram, 1995). Many archaeological investigations in the 1960s and 1970s focused on the Cherokee occupation of the area (Schroedl, 1985; Baden, 1983; Russ and Chapman, 1984). Also, studies of the trade relation between European-American and Cherokee have been conducted in the Tellico Reservoir (Polhemus, 1979). All of these investigations have provided additional details about the changing environments, shifting subsistence strategies and settlement patterns, and variations in the cultural material associated with each major stage.

TVA will ensure that identification, evaluation, and treatment of historic properties are carried out prior to the commencement of any ground-disturbing activities. TVA is mandated under the National Historic Preservation Act (NHPA) of 1966 and the Archaeological Resources Protection Act (ARPA) of 1979 to protect significant archaeological resources and historic properties located on TVA lands or affected by TVA undertakings. In 2000, the Tellico Land Reservoir Land Management Plan Memorandum of Agreement (MOA) was executed to address effects on historic properties by TVA's undertakings on Tellico Reservoir. This agreement allows for a phased identification, evaluation, and treatment of historic properties.

TVA conducts inventories of its lands to identify historic properties. For the applicant's proposal (Alternative B), the Area of Potential Effect (APE) is the entire residential/golf complex proposed for the project. This includes the TVA land to be transferred, the private property incorporated, and the marina area. The Tennessee State Historic Preservation Officer (SHPO) concurred with this APE. The other alternatives have differing APEs based on the activities involved. The APE as defined in 36 CFR Part 800.16(d) 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."

Existing data along with the recent survey results were reviewed, and over 750 archaeological resources have been identified within and along the Tellico Reservoir. An archaeological resource is defined as an area with any grouping of five or more nonmodern historic or prehistoric artifacts. A large number of these resources have been inundated due to reservoir impoundment.

The following surveys were conducted by means of a pedestrian survey and systematic shovel testing from existing humus to culturally sterile subsoil. The soil matrix was screened through a one-fourth inch wire mesh screen. Crew members walked the areas in 30 meter transects and excavated shovel tests pits on 30 meter centers along each transect in zones of low slope and/or high site probability. Previously, the Lower Jackson Bend land tract (245 acres) was surveyed by TRC Garrow in 2000 for archaeological resources. No archaeological resources eligible or potentially eligible for listing to the NRHP were identified on the Lower Jackson Bend tract. However, a Mid-19th century cemetery, Wyly Cemetery, was identified within the tract. Only two of the fifty marked graves have discernible headstones- James and Mary Wyly. James Wyly was a Revolutionary War veteran who served from 1779-1781. The Wyly Cemetery was recommended for avoidance. The SHPO concurred with these findings (see SHPO letter in Appendix E).

3.8. Visual Resources

Tellico Reservoir, newest of the Tennessee Valley reservoirs, offers a variety of visual characteristics ranging from gently rolling valleys, to the mountains, and the clear water

mountain stream of the Little Tennessee below Chilhowee Dam to the reservoir above Tellico Dam. Prior to impoundment, the area terrain was a mix of open rolling farmland combined with an expanse of river-bottom cropland, which was intermingled with wooded foothills, ridges, and fence rows. After the reservoir's impoundment in 1979, the landscape was similar, although the river bottom cropland has been replaced with a winding expanse of water and residential development along the shoreline.

Background - The physical, biological, and cultural features seen in the landscape give Tellico Reservoir its distinct visual character and sense of place. The project area is evaluated in terms of its landscape characteristics and visual qualities in order describe the existing environment and determine the current scenic value class. The same process used to determine the extent and magnitude of potential changes. The criteria for visual resource evaluation and classification are shown in Table 3-6.

The 2000 Land Plan EIS (TVA, 2000) indicated that the reservoir areas of greatest scenic value are those not yet developed, those that are in predominant views of homeowners, and the undisturbed coves. It also noted that a greenway along the east side would provide two-fold preservation of visual and aesthetic qualities, serving as a visual buffer from the reservoir and a viewing corridor from which to see the reservoir landscape. Preservation of the natural landscape and scenic character was a reoccurring theme during the public review process for that EIS. It was often included in the comments regarding land use, recreation, proposed development, natural resources, and aesthetics. In recent public comments regarding the Rarity Pointe project, preservation of the visual qualities and undisturbed natural character were among the most frequently expressed concerns.

Table 3-6 Criteria for Visual Resource Assessment and Classification

Scenic Attractiveness - 3 levels

A measure of scenic importance based on intrinsic beauty of a physical landscape, as seen in the visual attributes of landforms, rock outcrops, water bodies, islands, wetlands, vegetation patterns, and other natural features. The valued attributes include variety, uniqueness, scale, contrast, color, harmony, pattern, balance, mystery, and vividness.

Category 1: Distinctive - Areas having one or more distinctive features along with strong, positive attributes; OR, areas in a strategic location having more common features and strong attributes.

Category 2: Common - Areas having ordinary features of the typical landscape with generally positive attributes.

Category 3: Minimal - Areas having insignificant natural features and little visual change, with weak, missing, or discordant attributes.

Scenic Integrity - 4 levels

A measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character, along with the absence of disruptive or discordant elements.

High: Area appears to be natural and unaltered, with any deviations not readily evident.

Moderate: Areas that appear slightly altered, with the noticeable deviations visually subordinate to the natural landscape.

Low: Areas that appear modestly altered, with deviations that begin to dominate but remain somewhat compatible with the natural landscape.

Very Low: Areas that appear heavily altered, with strongly dominating deviations. These alterations may be visually disruptive and provide negative contrast in the landscape.

Scenic Visibility - 2 parts, 3 levels each

A measure of scenic importance based on human concern for scenic qualities of the land being viewed. It is expressed in terms of sensitivity and the level of detail seen. Sensitivity includes the view location, frequency, and duration of view. Public input is used to help derive and confirm the level of sensitivity. View distance determines the degree of visible detail and scale of change.

Table 3-6 Criteria for Visual Resource Assessment and Classification (cont.)

Sensitivity

High (Level 1): Areas seen by lake users, lake shore and lake view residents where the number of viewers, frequency, duration, and concern is normally quite high.

Moderate (Level 2): Areas seen from principle roads and use areas where concern is normally high while the number of viewers, frequency, and duration are moderate.

Low (Level 3): Areas seen from secondary roads and use areas where concern may be high in selected locations but the number of viewers and frequency is low.

View Distance

Foreground: 0 to ½ mile; provides the greatest visual detail with features being most distinct within 0 - 300 feet.

Middleground: ½ mile to 4 miles; provides larger patterns and form with less detail. Visible alteration can be more disruptive when seen in this broader context.

Background: 4 miles to horizon; provides outline pattern and form with little or no detail.

Scenic Value Class - 4 levels

The scenic value class of a land area is determined by combining the levels of scenic attractiveness, scenic integrity and visibility. Each of the four classes is based on an integrated combination of these three component measures. The selection matrix below shows the various combinations and the resulting scenic value class. It is a guide, which is intended to complement a thorough field analysis and review of the visual absorption capacity.

Excellent: Outstanding unaltered features OR unaltered more common features in a strategic location; highly visible from land and water in fore and middleground.

Good: Common features; minor compatible alteration barely visible in the foreground with little visibility in middleground; highly visible from land and water.

Fair: Common or minimal features; moderate human alteration with discordant form, size, color or materials visible in foreground and less noticeable in the middleground; relatively high visibility from land and water.

Poor: Minimal features and/or severe human disruption; discordant contrast of alterations in the natural landscape due to incompatible form, size, color, and materials; clearly visible in foreground and middleground from both land and water.

Table 3-6 Criteria for Visual Resource Assessment and Classification (cont.)

SCENIC VALUE CLASS SELECTION MATRIX													
Visibility Levels: Sensitivity / **View Distance**		**1** **foreground**			**1** **middleground**			**2** **foreground**			**2** **middleground**		
Scenic Attractiveness Categories		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
	High	E	G	F	E	E	G	E	G	F	E	E	G
Scenic Integrity Levels	**Moderate**	G	G	F	E	G	F	G	G	F	E	G	F
	Low	F	F	P	F	F	P	F	F	P	F	F	P
	Very low	P	P	P	F	P	P	P	P	P	F	P	P
		Scenic Value Class: **E** = Excellent; **G** = Good; **F** = Fair; **P** = Poor											

Affected Environment - The visual landscape surrounding the project area is a rural ridge and valley countryside where the reservoir is the dominant scenic feature. The east bank is all forested with one rock bluff just downstream and little development. It is a notable contrast to the suburban character of residential areas in Tellico Village on the west bank. Rapid subdivision development has occurred along this area within the past ten years resulting in the numerous visible homes, lawn areas, and covered docks. As development trends continue and rural areas disappear, the scenic value and importance of undisturbed reservoir lands will increase substantially. The back-lying lands have a pastoral character where woodlands are seen intermixed with farmsteads, pastures, and scattered homes. TVA reservation lands around Tellico dam are located across the reservoir just downstream from the project area. They have a similar appearance of undisturbed woodland and open grass areas, along with the related operational facilities.

The two undeveloped TVA parcels (approximately 118 acres) shown in Figure 2-3 are moderately sloping woodland ridges that form peninsulas along the eastern bank. The three coves bordering them have a year round water depth of at least 7 feet and vary in length from 1,200 to 2,400 feet. The relatively wide ridge tops slope gently at 5 percent while the steeper side slopes vary between 18-30 percent. The ridge top elevations average near 890 feet MSL; about 77 feet above the 813 feet full pool elevation. Parcel 8 peaks about the 920 feet elevation along the back-lying property line, and is about 2,000 feet long from there to the western tip of shoreline. It is covered with moderate sized hardwoods except for a small group of evergreens along the southwest point. The woodland has little undergrowth due to previous grazing, which creates uncommon spaciousness under the canopy. The slopes are gentle along the wooded shoreline with no visible erosion. Parcel 9 is about 2,800 feet long from the western tip to the back-lying property line where it peaks slightly above the 920-foot elevation. The eastern portion averages about the 910-foot elevation. The tree cover is about 1/3 hardwood and 2/3 pine. Beetle damage has killed much of the pine, but intermixed hardwood, cedar, and substantial deciduous undergrowth are contributing to woodland recovery and helping to minimize the discordant contrast. The wooded shoreline slopes more steeply along the tip where eroded banks up to 3 feet high are visible.

The natural woodland character of these parcels has pleasing attributes but no uniquely distinct physical features. They are typical of the landscape seen along the east side of the reservoir. However, the scenic attractiveness is distinctive since the parcels are a major residential viewshed. Scenic integrity is high since no human alteration is visible. The integrity of Parcel 9 is somewhat lower due to the short-term pine beetle disturbance. Visual sensitivity is high since it is a residential viewshed, and the overall scenic value class is excellent. The parcels are seen in the immediate foreground by those who visit on the property. Visitors have intimate views of the site features and attributes that are not experienced from off-site viewing points, as well as broader more distant vistas seen from various places on the property. The parcels are seen in further foreground from about 72 waterfront home sites and 68 water view sites along the west bank, where the closest views are from the Tommotley Shores area about 2,000 feet away. They are also seen in middle ground views from 70-90 home sites about a mile away, located at higher elevations west of the Tellico Parkway. The views of undisturbed woodland seen across the broad ribbon of water provide a tranquil sense of place that is attractive and satisfying to most observers. Several boats could anchor overnight in the coves and be relatively secluded. The parcels are visible in the immediate foreground from boats in the coves and up to 1.5 miles away on the reservoir. They are visible from the Tanasi clubhouse and dock area, and briefly by motorists on the parkway nearby. They also provide a setback buffer of about 0.5 miles between the water and planned development to the east, which serves to screen most views from the reservoir area.

The reservoir management plan has identified these two parcels as major residential viewsheds. It indicates the entire Parcel 9 is intended to protect the viewshed and undisturbed woodland coves, and is considered a suitable scenic greenway corridor along the east side of the reservoir. The plan also indicates Parcel 8 would be managed for activities such as picnicking and hiking rather than commercial development, and that regardless of use the visual values would receive a high priority.

TVA Parcel 6 (about 17.0 hectares (42 acres)) shown in Figure 2-6 is the location of the greenway trailhead proposed under Alternative E. It is bordered by TVA land to the east, the Jackson Bend tract to the west, and private property to the south. The parcel is a ridge with steep sides that average about 40 percent and gentler slopes along the top that peak just above elevation 980 feet MSL. An old roadbed runs about half the shoreline length from the west and is lined with litter. Mixed woodland of mostly hardwood covers the slopes along the north and west sides, which makes the parcel appear fully wooded from most off-site viewpoints. In 1995 about 15 acres of pine was harvested along the south side of the parcel, extending almost to the crest. The area was left to natural succession and is covered with a mix of volunteer pines and hardwoods averaging 7-12 feet high.

The steep woodland has no unique physical features so the scenic attractiveness is common. Scenic integrity is moderate since some human alteration is visible, but not from the reservoir. Visual sensitivity is high and the overall scenic value class is good. The parcel is seen in the immediate foreground by those who visit on the property. They have intimate views of the landscape that are not experienced from off-site viewing points, along with more distant vistas seen from the ridge top. It is also seen by motorists and a couple homes near the end of Antioch Church Road. The parcel is visible in the immediate foreground from boats along the shoreline, as well as from the canal and on the reservoir up to 1.5 miles away. Visitors can also see the parcel from the beach and boat ramp on Tellico dam reservation near the canal.

The lower Jackson Bend tract (216 acres) shown in Figure 2-3 is a prominent peninsula about a mile long and bordered by TVA lands on each side. The principal landscape character is a series of moderately sloping woodland ridges quite similar to the TVA parcels upstream. The ridge top elevations average about 910 feet MSL, and peak on the east side about elevation 960 feet MSL at the proposed lodge area. Just below it, the shoreline slopes gently around the marina site where no facilities currently exist. The wooded shoreline and coves along the west side are similar to those along the TVA parcels, although the northern most cove is about 800 feet square. Just north of it is a section of shoreline with low rock outcrops along the water, and further north is a section of eroded banks 5-7 feet high. Tree cover on the tract was about 40 percent moderate sized hardwood, with the balance consisting of relatively young pine and a few small meadow areas. The small TVA parcel (5.4 acres) below the 820-foot elevation just north of the designated marina site also slopes gently, and is covered with young trees and brush 12-18 feet high. The overall visual character of this tract is in transition because project construction has begun. Trees have been removed in several large areas along ridge slopes on the east side. Exposed earth slopes and heavy equipment operations are visible in the planned lodge, marina, and residential areas. A couple smaller but similar areas are visible on the west side.

The natural character of this tract has typical reservoir landscape attributes but no unique physical features, so the scenic attractiveness is common. However, it has been more distinctive since the tract is part of a major residential viewshed. The attractiveness is declining along with visual tranquility and harmony. Scenic integrity has been moderately high, but is declining at the same pace as the expanding construction and development alterations. Visual sensitivity is high. The overall scenic value class has been good but is declining. The natural features can be seen in the immediate foreground. The tract is visible in foreground from about 86 waterfront home sites and 57 water view sites, plus quite a few more that also view the TVA parcels. The closest views are from the Coyatee and Tommotley Shores area along the west bank about 2,000 feet away. It is also seen in middle ground views from 90-120 home sites located at higher elevations west of the Tellico Parkway. The tract is visible from the TRDA boat ramp, and by passing motorists on the nearby parkway. It is also visible in the immediate foreground from boats in the coves, as well as from the canal and on the reservoir up to 1.5 miles away. Visitors can see both the lodge and marina area from the beach and boat ramp on Tellico dam reservation near the canal.

The remaining project lands (323 acres) shown in Figure 2-3 are back-lying properties that border the TVA parcels and extend east to U. S. Highway 321. The landscape character is a rolling pastoral area of moderately steep ridges separated by gently sloping drainages. The elevation difference between ridges and valleys is about 140 feet. The ridge top elevations average about 930 feet MSL on the western part, 1,080 feet MSL on the eastern part, and peak near 1,120 feet at the east end. About a third of the tract is open meadow and the balance is a mix of hardwood and pine stands. A few farmstead buildings remain on the tract. Antioch Church Road borders the north boundary in several sections totaling about a mile. It is a narrow country road of repeated curves, with several farms and homes along it. U. S. Highway 321 borders about 800 feet of the east boundary, where most of the adjacent valley area lays about 100 feet below. It is a rural highway with a few scattered homes, a couple of small stores and a church along the nearest 3-mile section. The landscape character of the back-lying land is typically pastoral with no unique physical features, so the scenic attractiveness is common. Scenic integrity is moderate since human alteration is noticeable but not dominant. Visual sensitivity is moderate (level 2) and the

overall scenic value class is good. The tract is seen in foreground views from about a dozen homes along Antioch Church Road, and by local automobile traffic. The eastern end is visible to passing motorists on U. S. Highway 321 and a few homes. The wooded ridge tops of the western section are visible behind the TVA parcels from boats along the west side of the reservoir, as well as from homes in the shoreline communities. The natural features can be seen in the immediate foreground.

The potential mitigation parcel for Alternative C is about 60 acres of the Wildcat Rock tract as shown in Figure 2-4. The visual character of this parcel is included in the description of the entire Wildcat Rock tract provided for Alternative E below. The portion identified for this parcel includes part of the eastern 2/3 of the valley and most of the hillside along the south side. It also includes the shoreline around the eastern half of larger embayment and an area of large trees near the north side. The parcel is not a self-enclosed viewshed and surrounded by other areas in the valley that remain available for industrial development. The landscape character includes an attractive stream area and rock outcrops, but is otherwise similar to the TVA parcel that would be sold under Alternative C. It does not include the prominent ridge, hardwood slopes, or unusual rock formations seen in other parts of the Wildcat Rock tract.

Scenic attractiveness of this parcel is common since the features and variety are not unique. Scenic integrity is moderate since about 20 percent of the parcel is actively used for pasture. Visual sensitivity is moderate since the viewshed limited. The overall scenic value class is good. Visitors to the property have intimate views of the scenic features and attributes that are not experienced from off-site viewing points, along with occasional more distant views from the shoreline or hillsides. The parcel is visible in the immediate foreground from boats in the cove, and limited views from the reservoir. It is also seen by passing motorists on the local road to the east and from surrounding industrial lands.

The potential mitigation parcel for Alternative E is the Wildcat Rock tract (256 acres) shown in Figure 2-6. The pastures and scattered woodlands of undeveloped industrial lands form the boundaries along two sides. The mostly wooded parcel is a scenic valley about a mile long that surrounds two embayments. The parcel extends up the slopes that border it on the north and south and forms a self-enclosed viewshed. Tree cover along the slopes is predominantly hardwood with some areas of larger trees and a few stands of evergreens. The parcel includes both sides of the steep dissected ridge along the north, which rises about 180 feet above full pool. The slopes vary between 20-50 percent and the ridge top elevation averages about 1,000 feet MSL, with several high points just above 1,040 feet MSL. An informal trail runs along the crest providing distant views of 3 miles or more, and there are a couple springs on the south slope. A communications tower and yard are located near the eastern end with off-site access from the north. The hillsides along the south side of the parcel rise about 60 feet above the valley with frequent rock outcrops, and the highest elevations are just above 920 feet MSL. These slopes average 25 percent and are wooded to the crest where they meet adjacent off-site pastures.

The valley is about 800 feet wide and steps up gently toward the steeper slopes with a variety of rock outcrops. A local paved road borders the east end. Most of the valley is covered with about equal areas of evergreen and deciduous trees, with mature hardwoods scattered along the north side. A small open grass area is located at the southwestern end, and about 12 acres of grass and scattered trees occur at the eastern end. A creek meanders through this area from a spring near the east end, and crosses several areas of exposed rock in the woods before reaching the main embayment. The western end of the

valley is a wooded ridge of unusual linear rock formations and fissures. It separates the two embayments and forms a bluff on the reservoir about 30 feet high. The main embayment is about 3,000 feet long and averages 300 feet wide, while the smaller one is about 1,000 feet long and averages 200 feet wide. Both have wooded shoreline, year round water depth, and they slope more steeply at the shoreline than the TVA parcels. Several boats could anchor overnight in the coves and be relatively secluded. Overall, this site has a variety of attractive natural features, which include the vegetation, topography, rock formations, and water features. The undergrowth is spare along much of the valley and ridge tops. Together they give this parcel a rather unique and naturally appealing park-like character.

Scenic attractiveness of this parcel is distinct due to the diversity of scenic features and park-like character. Scenic integrity is moderately high since little human alteration is seen other than some active grazing. Although it is not in a residential viewshed, visual sensitivity is moderately high since the north ridge is among the highest and most prominent seen from this area of the reservoir and U. S. Highway 411. The shoreline rock outcrops are also prominent. The overall scenic value class is excellent. The parcel is seen in the immediate foreground by those who visit on the property. They have intimate views of the scenic features and attributes that are not experienced from off-site viewing points, along with broader more distant vistas seen from the ridge top. The parcel is visible in the immediate foreground from boats in the coves, and up to 2 miles away on the reservoir. It is also seen by passing motorists on the local road to the east and U. S. Highway 411 Bridge to the south, as well as from surrounding industrial lands.

3.9. Socioeconomics

Population

The proposed golf courses, lodge, marina, and residential development would be located in Loudon County, Tennessee, which had an estimated 2000 population of 39,086 (See Table 3-7). The labor market area (LMA) had an estimated population of 738,157; this includes Anderson, Blount, Knox, McMinn, Monroe, and Roane counties, in addition to Loudon County. The LMA is dominated by Knox County with over 51 percent of the area's population. Loudon County's population is exceeded by all but one county (Monroe) in the LMA. However, Loudon County population has been growing much faster than the LMA, the state, and the nation in the previous decade. The LMA's growth rate fell between that of the state and the U.S.

Table 3-7. Population

	1980	1990	2000	Percent Increase 1980-90	Percent Increase 1990-00
Anderson Co.	67,346	68,250	71,330	1.3	4.5
Blount Co.	77,770	85,969	105,823	10.5	23.1
Knox Co.	319,694	335,749	382,032	5.0	13.8
Loudon Co.	**28,553**	**31,255**	**39,086**	**9.5**	**25.1**
McMinn Co.	41,878	42,383	49,015	1.2	15.7
Monroe Co.	28,700	30,541	38,961	6.4	27.6
Roane Co.	48,425	47,227	51,910	-2.5	9.9
Labor Market Area	612,366	641,374	738,157	4.7	15.1
Tennessee	4,591,120	4,877,185	5,689,283	6.2	16.7
U.S.	226,546,000	248,791,000	281,421,906	9.8	13.1

Source: U.S. Department of Commerce, Bureau of the Census

Labor Force and Unemployment

In 2000, Loudon County had an average labor force of 21,280 workers, of which 740 (3.5 percent) were unemployed (Table 3-8). The LMA had an average labor force of 378,280 workers, with an unemployment rate of 3.6 percent. These unemployment rates fall below those for the state (4.5 percent) and the nation (4.8 percent). Across the LMA, unemployment ranged from 2.5 percent in Knox County to 7.7 percent in McMinn County.

Table 3-8. Unemployment, 2001 (annual average)

Location	Unemployment Rate
Anderson Co.	4.0
Blount Co.	4.0
Knox Co.	2.5
Loudon Co.	**3.5**
McMinn Co.	7.7
Monroe Co.	7.2
Roane Co.	4.5
Labor Market Area	3.6
Tennessee	4.5
U.S.	4.8

Source: Tennessee Department of Labor & Workforce Development Employment Security Division, Research & Statistics

Employment by Industry

Loudon County has a far greater share of farming employment than the LMA, the state, and the U.S. (Table 3-9). In contrast, the labor market area as a whole has a farming employment share similar to that of the nation, but smaller than the state. Manufacturing employment share in Loudon County also exceeds that of the LMA, the state, and the U.S. In contrast, services account for a smaller share of employment in Loudon County. Manufacturing and services employment in the LMA are close to those of both the state and the nation.

Table 3-9. Employment by Industry, 2000 (Full-time and Part-time Workers)

Location	Total Employment	Percent in Farming	Percent in Manufacturing	Percent in Services
Anderson Co.	50,984	1.1	21.1	34.6
Blount Co.	50,723	2.7	18.0	22.3
Knox Co.	273,547	0.6	8.3	31.8
Loudon Co.	**15,886**	**9.5**	**19.4**	**19.9**
McMinn Co.	25,366	5.5	30.8	19.4
Monroe Co.	16,414	6.8	33.2	15.3
Roane Co.	24,281	2.8	10.4	17.8
Labor Market Area	457,201	1.8	13.4	28.6
Tennessee	3,506,618	3.0	14.8	28.6
U.S.	167,465,300	1.9	11.4	31.8

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Per Capita Personal Income

Per capita personal income in Loudon County in 2000 was 26,241 dollars, just above the state figure (25,946 dollars), but below the national figure (29,469 dollars) (See Table 3-10). Per capita income for the labor market was almost identical to that of the state at 25,798 dollars. Per capita income across LMA counties ranged from 17,335 dollars in Monroe County to 28,281 dollars in Knox County.

Between 1990 and 2000, Loudon County gained ground on the nation in terms of per capita income, increasing from 80.1 percent to 89.1 percent of the national average. In contrast, the LMA fell slightly from 89.0 to 87.5 percent, while state per capita income increased from 85.9 to 88.1 percent of the national figure.

Table 3-10. Per Capita Personal Income

Location	Per Capita Personal Income 1990	Per Capita Personal Income 2000	Percent of Nation 1990	Percent of Nation 2000
Anderson Co.	$17,450	$26,032	89.2	88.3
Blount Co.	$16,431	$24,262	84.0	82.3
Knox Co.	$18,966	$28,281	96.9	96.0
Loudon Co.	**$15,685**	**$26,241**	**80.1**	**89.1**
McMinn Co.	$14,367	$19,855	73.4	67.4
Monroe Co.	$12,019	$17,335	61.4	58.8
Roane Co.	$15,475	$22,000	79.1	74.7
Labor Market Area	$17,413	$25,798	89.0	87.5
Tennessee	$16,808	$25,946	85.9	88.1
U.S.	$19,572	$29,469	100.0	100.0

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Environmental Justice

The 2000 population of Loudon County consists of 4.8 percent minorities (Table 3-11), less than the LMA (9.5 percent), and far less than the state (20.8 percent) and the nation (30.9 percent). The minority population for the U.S. Census tract (604) containing the proposed development is 2.4 percent. The census tract immediately across the lake (605) from the proposed development has a minority population of 2.2 percent.

The poverty rate in Loudon County in 2000 was 10.0 percent, again, less than the LMA (12.5 percent), state (13.5 percent), and nation (12.4 percent). The poverty rate for the census tract containing the proposed development is 7.3 percent. The census tract immediately across the lake from the proposed development has a poverty rate of 8.3 percent.

Table 3-11. Minority and Low-Income Population

Location	Total Population 2000	Nonwhite Population 2000	White Hispanic Population 2000	Percent Minority Population 2000	Percent Below Poverty 2000
Anderson Co.	71,330	4,737	469	7.3	13.1
Blount Co.	105,823	5,582	645	5.9	9.7
Knox Co.	382,032	45,461	2,578	12.6	12.6
Loudon Co.	**39,086**	**1,604**	**272**	**4.8**	**10.0**
McMinn Co.	49,015	3,570	415	8.1	14.5
Monroe Co.	38,961	1,999	285	5.9	15.5
Roane Co.	51,910	2,470	241	5.2	13.9
Labor Market Area	738,157	65,423	4905	9.5	12.5
Tennessee	5,689,283	1,125,973	57,380	20.8	13.5
U.S.	281,421,906	69,961,280	16,907,852	30.9	12.4

Source: U.S. Department of Commerce, Bureau of the Census.

3.10. Air Quality

National Ambient Air Quality Standards (NAAQS) limit concentrations of six pollutants in the outside air: particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, and lead. These standards are designed to protect public health and welfare. An area where any air quality standard is violated is designated as a nonattainment area for that pollutant, and emissions of that pollutant, or in the case of ozone the precursor pollutants, from new or expanding sources are carefully controlled.

Currently there are no designated nonattainment areas at or near the proposed development location. However, the Environmental Protection Agency (EPA) has issued a new 8-hour standard for ozone and a new standard for particulate matter (PM) having diameters 2.5 micrometer (µm) or smaller, and these are scheduled for implementation in the near future. Ozone nonattainment is expected and PM-2.5 nonattainment is possible for Knox and surrounding counties, including Loudon County. The most immediate of these standards is the ozone standard, which is currently scheduled to be implemented in 2004. Designations of attainment or nonattainment areas for the 8-hour ozone standard are scheduled to be announced in April 2004. The State of Tennessee and the counties in the Knoxville MSA have agreed to participate in EPA's Early Action Compact to develop strategies for bringing ozone nonattainment areas into attainment early.

In addition, Prevention of Significant Deterioration (PSD) regulations protect national parks and wilderness areas which are designated PSD Class I air quality areas. A new or expanding major air pollutant source within 31 miles of a Class I area would be required to estimate potential impact on the air quality of that Class I area. In addition, the federal land manager having jurisdiction over the Class I area may request similar action for large sources at distances of 31 to 62 miles or discretionary greater distances.

There are two PSD Class I areas within 62 miles of Tellico Reservoir. The Great Smoky Mountains National Park is 19 miles to the southeast of the Rarity Pointe location, and the Joyce Kilmer/Slickrock Wilderness Area is 26 miles to the southeast.