

CHAPTER 4

4. ENVIRONMENTAL CONSEQUENCES

The potential environmental consequences of implementing each of the alternatives are discussed in this chapter. Environmental impacts are assessed by comparing actions expected to occur under the existing 2000 Land Plan to changes that would result from Rarity Communities proposal. In addition, other activities and trends affecting common resources were considered.

4.1. Terrestrial Ecology

The proposed development would be expected to contribute to increased representation by invasive plant species that occupy edge habitats. Any project-related impacts are not expected to significantly contribute to the introduction or spread of invasive, terrestrial plant species at a state or regional level (See *Invasive Species* Below).

The plant communities present on the proposed project lands are characterized by common and widespread species in east Tennessee that would not be not adversely affected by the loss of these populations. Therefore, with respect to species composition, the lands proposed for sale and/or development are representative of the region of east Tennessee in which they occur. No uncommon plant communities were identified on the proposed project lands, and no impacts to such resources are anticipated from selection of any of the proposed alternatives (discussed individually below).

However, a minimum of 520 acres (i.e., the vegetated portions of lands currently in private ownership) of primarily native vegetation would be impacted under any alternative. Depending upon the alternative selected, these impacts could extend to as many as 127 additional acres of lands currently in public ownership (i.e., the requested TVA lands). These TVA-retained lands make up roughly 6.3 percent of the acreage currently allocated to Zone 3, 4, or 6 (Sensitive Resource Management, Natural Resource Conservation, or Recreation) on the lower end of Tellico Reservoir (TVA, 2000). Seventy of these 127 acres (those on Parcel 9) are currently allocated to Natural Resource Conservation under the existing land use plan for Tellico Reservoir (TVA, 2000).

As with most development projects, the greatest impact to existing vegetation under any of the proposed alternatives would be the loss of forests that would accompany the development. These areas would be permanently converted to non-forest conditions associated with the development of the planned residences, golf courses, and marina. Approximately 65 percent, or 430 acres, of the project lands are forested. Ninety-five percent of the requested TVA lands (approximately 118 acres) are forested.

Regardless of the action taken by TVA in response to the current request, cumulative impacts to terrestrial ecology resources are ongoing and likely to continue due to the amount of land that is zoned for development along Tellico Reservoir. However, TVA's contribution to cumulative impacts to natural resources in the project area could be considerably lessened through a land exchange in which property of equal or greater ecological value were acquired and placed into the public trust in exchange for the public land currently being requested by the applicant.

In order to ensure that adequate mitigation is achieved, lands considered for this exchange should: 1) contain forest communities of equal or greater ecological value than those lands being requested from TVA, and 2) be transferred to public ownership with provisions to ensure the long-term protection of natural resources. With respect to forest communities, the ecological value of these mitigation lands depend upon several factors including the total acres of forest; the number and size forest patches (an indicator of existing levels of forest fragmentation); plant community composition; and the number and density of invasive exotic terrestrial plant species present (an indicator of current and future threats to the integrity and ecological value of the mitigation tract). The proposed Wildcat Rock site adequately meets these requirements.

Migratory Birds - Habitat fragmentation is associated with a number of changes that are harmful to Neotropical birds. These include nest parasitism by brown-headed cowbirds (*Molothrus ater*), loss of habitat, creation of barriers to dispersal between woodlots, and increased nest predation (Wilcove 1985). Robbins (1989a) found that the diversity of Neotropical birds increased as the area of forest increased.

The reproductive performance of some bird species may decrease along edges because edges attract predators and nest parasites such as cowbirds (Patton 1994, Wilcove 1985, Small and Hunter 1988, Yahner and Scott 1988, Robinson et al., 1995). Landscape fragmentation and creation of edge may allow for higher rates of brood parasitism by the brown-headed cowbird (Gates and Gysel 1978, Brittingham and Temple 1983). Cowbirds lay their eggs in the nest of "host" species that hatch and rear the parasite's young at the expense of their own young (Brittingham and Temple 1983). Areas consisting of either lawns, pastures, bare ground or a combination thereof are used by cowbirds as feeding areas, thus attracting this species (Robinson et al., 1993). Predation rates are higher in small woodlots than in large tracts and are especially intense in woodlots near suburban neighborhoods. Forest edges appear to be good habitat for many animals that prey on nests of forest-dwelling songbirds (Wilcove 1985).

The landscape of the project lands is somewhat fragmented due to the various types of land use and successional vegetation stages on the area. Potential impacts to area sensitive migratory birds were assessed by considering the amount of interior forest habitat on the project area and on the proposed mitigation sites.

Using Temple and Cary's (1988) 200-m criteria, the amount of interior forest habitat on the project lands is very limited, totaling less than 10 acres. Also as stated previously, past cattle grazing on a large proportion of this site has substantially reduced the amount of shrub sub-canopy layer under much of the forested areas. The lack of understory structure limits the use by some Neotropical birds.

A shoreline buffer zone maintained on the project lands would reduce the effects of human disturbance and shoreline development on waterfowl of the area (See Section 4.15, Commitment 1)

Invasive Species - Development entails disturbance and changes in the surrounding wildlife habitat. Often these changes foster the establishment of invasive terrestrial animals and other species that are symptomatic of disturbance, such as brown-headed cowbirds, striped skunk, and Virginia opossums. It is likely that development of the site would allow for the introduction of small populations of invasive terrestrial animals such as European starling, house sparrow, and rock dove. These species are typical in surrounding urban

environments and the development of small colonies of these species in the area would not significantly contribute to their existence.

Large-scale development can lead to increased wildlife “nuisance” problems. Animals such as white-tailed deer and raccoons may cause garden crop or ornamental shrub damage when their natural habitats are encroached upon. Depending on the amount and type of wildlife habitat that exists after development, many species can persist in golf course environments. For the most part, these species are tolerant of small fragmented habitats. They include species such as house finch, common grackle, eastern bluebird, cedar waxwing, eastern mole, house mouse, coyote, American toad, and common garter snake.

Under any alternative the proposed development would likely contribute to increased representation by invasive plant species that occupy edge habitats. Any project-related impacts are not expected to significantly contribute to the introduction or spread of invasive, terrestrial plant species at a state or regional level. In order to minimize the potential for the introduction of invasive exotic plant species on TVA owned or transferred properties the Applicant should implement the following for all action alternatives:

- Landscaping activities on development properties should not include the use of plants listed as Rank 1 “Severe Threat”, Rank 2 “Significant Threat”, and Rank 3 “Lesser Threat” on the Tennessee Exotic Pest Plant Councils list of Invasive Exotic Pest Plants in Tennessee (Appendix D).
- Re-vegetation and erosion control work should utilize seed mixes comprised of native species or non-invasive non-native species (Appendix D).

Alternative A - No Action

Under this alternative, the development of the private properties is expected to proceed without the involvement of the TVA lands (Figure 2-2). With respect to vegetation, direct impacts to terrestrial ecological resources would be similar to those that would result from selection of the Applicant’s Proposal, but would impact a lesser area more intensely because the same sized development would occur on less (by 120 acres) land. Also, many of the same effects to wildlife described in Alternative B would also occur here, including those environmental consequences described under *Migratory Birds* and *Invasive Species*.

Overall, this alternative would have the least impacts on terrestrial plants and wildlife and would maintain a higher level of wildlife habitat continuity and integrity along the shoreline of Tellico Reservoir because the TVA lands (Parcels 8 and 9) would not be developed. These impacts are expected to be localized and insignificant in a state or regional context.

Although there would be no TVA action, residential development on the private properties would contribute to ongoing cumulative impacts to terrestrial ecological resources (specifically, forest communities) on Tellico Reservoir.

Alternative B - Applicant’s Proposal

Under this alternative, development would occur on the private properties as well as all TVA lands requested by the applicant (Figure 2-3). This alternative would involve the largest amount land used for development, resulting in the greatest level of direct impacts to terrestrial ecological resources including plants and wildlife.

Construction activities on the site would remove wildlife habitat and would likely displace large animals, such as deer and turkey, from the site. Many smaller animals, such as shrews, moles, and salamanders would be destroyed by construction activities. Following the construction and re-vegetation of the site, wildlife, perhaps a somewhat different variety of species would re-colonize the area (See *Invasive Species*).

Development of the site would result in more habitat fragmentation and would increase the amount of edge and open habitats along Tellico Reservoir. Although some species prefer these conditions, small animals that have relatively small home ranges or habitat area requirements, or that require specific structural habitat characteristics, may be negatively affected by these conditions.

Development on the private properties would contribute to ongoing cumulative impacts to terrestrial ecological resources (specifically, forest communities) in the project (or Tellico Reservoir) area. TVA actions would contribute to these cumulative impacts by making additional lands (some of which are currently allocated to Natural Resource Conservation) available for further development.

The development of private project and TVA lands would result in local impacts to terrestrial plants and wildlife. Overall, there would be direct and indirect effects from the development. These effects would be insignificant at the state and regional level.

Alternative C - Partial Land Sale with Mitigation

Under this alternative, development would occur on the private properties and approximately 55 of the 127 acres of TVA lands initially requested by Rarity Communities. This alternative also includes provisions for a land exchange in which a 60-acre tract at the Wildcat Rock site on Wear Bend would be acquired by Rarity Communities and transferred to public ownership.

Under this alternative, many of the same effects to wildlife described in Alternative B would also occur, including those environmental consequences described under *Migratory Birds* and *Invasive Species*. Some forested shoreline would remain on the lower portion of Parcels 8 and 9. This alternative would maintain some additional level of habitat continuity along the shoreline, because Parcels 8 and 9 would not be developed in their entirety (Figure 2-4).

Direct impacts to vegetation resulting from this alternative would be localized and insignificant in a state or regional context. However, as with Alternative B, TVA actions would contribute to cumulative impacts to terrestrial ecological resources (at the Tellico Reservoir level) by making lands (some of which are currently allocated to Natural Resource Conservation) available for development. Although this alternative includes provisions for mitigation for the loss of public land, the proposed 60-acre mitigation tract (Figure 2-4, Table D-1) would not completely address forest community loss. In particular, the proposed mitigation would be inadequate with respect to terrestrial ecological resources because one large, nearly contiguous tract of forest would be exchanged for a smaller, linear strip of shoreline forest that has been largely degraded by cattle grazing. This would contribute to the ongoing pattern of decreased forest tract size along developed shorelines demonstrated in the *TVA Shoreline Management Initiative EIS* (TVA, 1998).

The lands proposed for mitigation under this alternative contain some desirable habitat features including a spring, a small drainage, some forested embayment acreage, and some

mature woodlands with limestone outcrops. Although this land compensates for the acres of wildlife habitat lost, the overall outcome would leave two small, fragmented parcels for wildlife at this site and the remaining portions of Parcels 8 and 9. The remaining size and fragmentation of these parcels would provide somewhat limited benefits to wildlife. The lands that are proposed for mitigation under this alternative would not adequately offset the loss of forested wildlife habitat on TVA lands (See *Comparison of TVA and Mitigated Land in Appendix D*).

The development of private project and TVA lands would result in local impacts to terrestrial plants and wildlife. Overall, there would be direct and indirect effects from the development. These effects would be insignificant at the state and regional level.

In order to reduce the impacts to terrestrial animals in the project area, TVA would implement mitigation measures on TVA lands as a condition of its approval (See Commitments 1-4, Section 4.15).

Alternative D - Small Golf Course and Marina with No Land Sale

Under this alternative, development would occur on the private properties, as well as five acres of TVA land below the 820-foot contour requested by the applicant. Development would not occur on the 118 additional acres of TVA land requested by the applicant (e.g., parcel 8 and a portion of Parcel 9).

Under this alternative, many of the same effects to wildlife described in Alternative B would also occur here, including those environmental consequences described under *Migratory Birds* and *Invasive Species*. A higher level of terrestrial plant and wildlife habitat integrity along the shoreline of Tellico Reservoir would be maintained because Parcels 8 and 9 would not be developed (Figure 2-5). Development under this alternative would include the approximately five acres of land below the 820-foot contour and the proposed marina expansion.

The development of private project lands would result in local impacts to native terrestrial plant communities and wildlife. The development of TVA lands under this alternative would result in localized impacts. Overall, there would be direct and indirect effects from the development. These effects would be insignificant at the state and regional level.

Development on the private properties would contribute to ongoing cumulative impacts to terrestrial ecology resources (specifically, forest communities) that are now occurring from scattered suburban residential development in the project area.

In order to reduce the impacts to terrestrial animals in the project area, TVA would implement mitigation measures on TVA land (where feasible and needed on the small parcels of land including the land below the 820-foot contour fronting the development) as a condition of its approval (See Comments 1, 2, and 4, Section 4.15).

Alternative E – Applicant’s Proposal with Mitigation

This alternative includes provisions for a land exchange in which a 256-acre tract would be acquired in exchange for the approximately 118 acres of requested TVA lands (Figure 2-6).

Alternative E also includes provisions for the construction of a trail terminal on Parcel 6 (which would be retained in public ownership). The projected footprint of the trail terminal

and associated facilities is expected to be small relative to the size of the entire Parcel (40.9 acres), and would not significantly impact terrestrial ecological resources.

Under this alternative, many of the same effects to wildlife described in Alternative B would also occur here, including those environmental consequences described under *Migratory Birds* and *Invasive Species*. Due to the additional clearing for trailhead development on Parcel 6 (Figure 2-6), this alternative would involve the most land clearing. However, this alternative involves a land exchange that would help offset the impacts from the sale and development of TVA lands. In terms of terrestrial ecology resources, the larger Wildcat Rock mitigation tract (Figure 2-6) is of considerably higher quality than the tract proposed as mitigation under Alternative C. The contribution of TVA's actions to cumulative impacts would be offset by the acquisition of lands of equal or greater ecological value to those being made available for development (See *Comparison of TVA Lands to Mitigated Land in Appendix D*).

Under Alternative E, a trail terminal would be developed on TVA Parcel 6 by the Applicant according to plans established by TVA. Field investigations on these lands indicate that the establishment of a greenway trail system under any of the proposed alternatives would not adversely affect terrestrial animals that occur on the site. Any future proposals to develop additions to the trail and greenway system would be appropriately reviewed.

The development of the private project and TVA lands under this alternative would result in local impacts to wildlife and vegetation. Overall, there would be direct and indirect effects from the development. These effects would be insignificant at the state and regional level.

By protecting and managing the Wildcat Rock Site (Figure 2-6) for long-term public use, the loss of TVA lands under this alternative would be favorably mitigated. The other potential exchange tract (Morganton Cemetery) site was assessed for its suitability but would not provide adequate mitigation for terrestrial ecology. These lands ranked low in terms of the quality of forested wildlife habitat offered. Although some nice woodlands remain on the steeper slopes, timber harvest, pine beetle damage, and exotic invasive plants in the area have substantially decreased the wildlife habitat suitability in the area. On an acreage basis, this area compensates for the loss of TVA land (Table D-2); however, the tract offers limited benefits to wildlife in its current state because the timber has been removed and invasive species are common. The acquisition of these lands would not have fully offset the loss of forested wildlife habitat on TVA Parcels 8 and 9.

In order to reduce further the impacts to terrestrial animals in the project area, TVA would implement mitigation measures on TVA lands as a condition of its approval (See Comments 1-4, Section 4.15).

Discussion and Summary of Impacts

Previous studies have demonstrated that development along reservoir shorelines is correlated with decreases in both the proportion of forested land and the size of contiguous tracts of forest within one-fourth-mile of TVA reservoirs (TVA, 1998). The Shoreline Management Initiative EIS also presented the results of analyses of nine reservoirs, including Tellico, which showed that the proportion of forested land is significantly greater along undeveloped shorelines. This study also demonstrated that contiguous tracts of forests within one-fourth-mile of most reservoirs are significantly larger along undeveloped shorelines.

The terrestrial ecology of Tellico Reservoir is described in the 2000 Land Plan (TVA, 2000). Whereas upper reaches of the reservoir consist primarily of forested uplands, portions downstream of U.S. Highway 411 can be characterized in terms of a combination of rural landscape and lands allocated for industrial development. According to data extracted from the USGS National Land Cover Dataset, roughly 83 percent of the approximately 28,703 acres within one-fourth mile of Tellico Reservoir (upstream to Chilhowee) are forested (Table 4-1).

Land cover type	Acres	Proportion of total land area
Forest	23,707	82.5
Herbaceous: planted/cultivated	4,269	14.9
Barren	409	1.4
Developed	278	1.0
Wetlands	40	0.1
Total	28,703	100

¹ Source: USGS National Land Cover Data, 1998.

The 127 acres of TVA land considered under this proposal are less than one percent of the total acres of land within one-fourth mile of the reservoir (upstream to Chilhowee), and are also less than one percent of the total acres of forested land within this same area. Although this is a very small portion of the forested habitat along the shoreline of the reservoir, the cumulative loss of terrestrial ecology resources along the reservoir is of concern, especially downstream of U.S. Highway 411.

Küchler (1996) describes upland forests occurring along Tellico Reservoir and the surrounding vicinity as Appalachian oak. With respect to species composition, diversity, age structure, and overall quality (e.g., the presence of noteworthy habitat features, the relative abundance of invasive exotic plant species, and the extent of fragmentation), the project area does not contain any unique terrestrial ecology resources.

Further examination of USGS land cover data in conjunction with recent aerial photography indicates that the amount of fragmentation along the reservoir shoreline varies from heavily fragmented to areas of relatively contiguous forested tracts.

Development would occur on a minimum of 539 acres (the private project properties) under any alternative proposed in this EIS, further reducing the integrity and continuity of existing forest communities and associated wildlife habitats along the reservoir. Under the No Action Alternative (Alternative A), TVA would not contribute to cumulative losses of forested habitat in the Jackson Bend area.

If an action alternative is selected, TVA could help offset its contribution to the cumulative loss of terrestrial habitats by acquiring lands of equal or greater ecological value in the vicinity of Jackson Bend, and by providing for the long-term protection of the natural resources they contain.

However, even if the loss of TVA lands is mitigated through such a land exchange, factors outside of TVA's control are expected to continue to influence forested habitat changes along the reservoir. These include reasonably foreseeable private and public activities associated with industrial and residential development, recreation, and associated infrastructure.

According to the 2000 Land Plan (TVA, 2000), approximately 11,151 acres of land on the reservoir shoreline are allocated for residential, industrial or commercial use by TRDA. The majority of these lands are located downstream of U.S. Highway 411. Although all of these lands are not currently forested, they do provide an indication of where future forest loss is likely to occur on the reservoir.

The cumulative effects of development are leading toward an overall change in forest integrity, wildlife habitat, and wildlife species composition in the area, especially downstream of U.S. Highway 411. The implementation of this proposal would contribute a small amount to the overall effects on these resources.

In summary, the development of private project and TVA lands would result in direct and indirect impacts to vegetation and wildlife. However, these effects would be localized to the project lands and the immediate vicinity and would be insignificant at the state and regional level. The development would also contribute to the cumulative loss of forested habitat on Tellico Reservoir. However, the above analysis of the resource indicates that the effects of this proposal would be insignificant with respect to overall impacts to terrestrial ecological resources.

4.2. Aquatic Ecology

Impacts to aquatic resources are directly related to changes of the existing natural shoreline conditions. Aquatic resources can be impacted by changes to shoreline (riparian) vegetation, vegetation on back-lying lands, and land uses. Shoreline vegetation (particularly trees) provides shade, organic matter (a food source for benthic macroinvertebrates), and shoreline stabilization; and trees provide aquatic habitat (cover) as they fall into the reservoir. Shoreline vegetation and vegetation on back-lying land provide a riparian zone which functions to filter pollutants from surface runoff while stabilizing erodible soils. Therefore, there would likely be some degradation of aquatic habitats associated with continued development along the reservoir shoreline under any of the alternatives.

Preservation of a natural shoreline condition to the extent possible on TVA land is particularly important on Tellico Reservoir because such a large percentage of the shoreline (other than the marginal strip) is not owned by TVA. Although much of the non-TVA land is presently undeveloped, future development could greatly alter the character of much of the backlying property that is not controlled by TVA. Shoreline development can alter the physical characteristics of adjacent fish and aquatic invertebrate habitats, which can result in dramatic changes in the quality of the fish community. One of the most detrimental effects of shoreline development is the removal of riparian zone vegetation, particularly trees. Removal of this vegetation can result in loss of fish cover and shade, which elevates surface water temperatures. Also, fish spawning habitat, such as gravel and woody cover, can be rendered unsuitable by excessive siltation and erosion, which can occur when riparian vegetation is cleared (TVA, 1998). Additionally, shoreline development often results in the removal of existing aquatic habitat (i.e., stumps, brush, logs, boulders, etc.) in association with the construction of water-use facilities.

Alternative A - No Action

This alternative would not result in impacts to aquatic habitats attributable to the sale and subsequent development of TVA land, the marina expansion, or the disturbance of approximately 5 acres of TVA land below the 820-foot contour. Development of privately owned property at Rarity Pointe would continue, so impacts related to erosion runoff from the site and development of permitted waterfront facilities would occur.

Alternative B - Applicant's Proposal

Adoption of this alternative would result in extensive clearing and land disturbance on what is currently TVA property, resulting in erosion runoff from the property during construction of housing and the golf course. The dredge would reduce shallow shoreline aquatic habitat. Some runoff of pesticides and herbicides to the reservoir from the golf course, as well from residential sites, would continue during operation of these facilities. Extensive clearing of trees near the shoreline would result in a loss of shade and organic matter for aquatic life; woody habitat would likely be reduced long-term since trees that are removed would not be available as fallen dead or blown down aquatic habitat in the nearshore area. Any thinning of low-growing vegetation would result in less stability of the shoreline where soil is the main constituent. The marina would be expanded, resulting in additional disturbance of the shoreline and some alteration of shoreline vegetation in that area. Use of the 5-acre tract of TVA property below the 820-foot contour for the golf course would result in alteration of the shoreline and likely a loss of woody riparian cover there.

TVA sampling has documented the presence of PCBs and chlordane in sediments in deeper waters of Fort Loudoun Reservoir. Since the applicant is proposing to excavate a large amount of soil below the normal winter elevation of 807 feet, testing of the sediment would be required for chlordane and PCBs. The level of contamination found (if any) would determine how the spoil would be handled. TWRA has an advisory that catfish from Tellico should not be eaten because of PCB contamination. The possibility of contaminants here is increased since it is near the Tellico/Fort Loudoun canal, and even if contaminants were not initially present in the Tellico basin, they could have been transported there during flows from Fort Loudoun into Tellico. If PCBs or chlordane are detected, dredging plans will be evaluated in light of the extent and level of those contaminants at the site (See Section 4.15, commitment number 6).

Runoff of soil and chemicals from the tracts where development takes place is not quantifiable. Soil runoff would be dependant on the extent to which Best Management Practices (BMPs) were implemented by Rarity Communities and homeowners during clearing and construction phases. Chemical runoff would depend on the extent to which the golf course is designed to limit runoff and channel it to catch basins, the amount and types of herbicides and pesticides used on the golf course and by homeowners, and the extent to which applicators followed label instructions and implemented good horticultural practices. Impacts related to soil and chemical runoff can be reduced to insignificant levels with implementation of BMPs by Rarity Communities and residents to control soil erosion, and to limit chemical runoff. Loss of woody vegetation can be held to insignificant levels through TVA control of vegetation management on the marginal strip below the 820-foot contour. Maintenance of a wooded shoreline is important to maintain the currently "good" shoreline aquatic habitat that exists over most of the western shoreline of both the TVA tract proposed for sale and the balance of the Rarity Pointe development. Although aquatic impacts can be reduced to insignificant levels as noted above, this is the least desirable alternative because of the likely long-term degradation in shoreline woody vegetation, and increased erosion and

chemical runoff from back-lying lands. These impacts would be similar to those seen in areas where residential development has previously occurred on Tellico Reservoir; such impacts at the Rarity Pointe site would be in addition to impacts associated with future development of residential and industrial tracts on the reservoir.

Alternative C - Small Golf Course and Marina with Partial Land Sale

Impacts associated with marina expansion and construction of the par-3 golf course would occur. Riparian zone degradation associated with development would occur on shoreline fronting private land. The extent of runoff of soil and chemicals from back-lying private property and TVA land made available for development under this alternative would vary with the amount of resultant soil disturbance and vegetation clearing, but would likely be less than anticipated for Alternative B because of less TVA land being made available for disturbance, and because a larger reach of shoreline would remain undisturbed on TVA property at the Rarity Pointe site. Impacts to aquatic life can be reduced to insignificant levels with implementation of BMPs by Rarity Communities and residents, and with establishment of a 50-foot deep buffer zone of undisturbed vegetation along the periphery of the TVA property considered in this proposal. An exchange for approximately 60 acres at the Wildcat Rock site would help mitigate the loss of shoreline remaining under TVA control reservoir-wide, but would still allow fragmentation of shoreline under TVA control at the Rarity Pointe site. Impacts from the dredge would be the same as for Alternative B requiring the same commitments.

Alternative D – Small Golf Course and Marina with No Land Sale

Adoption of this alternative would result in development of the Marina, with the associated disturbance of the shoreline and alteration of vegetation there, and use of TVA land below the 820-foot contour for the par-3 golf course. Impacts to aquatic life resulting from these uses and associated alterations to the shoreline condition could be reduced to insignificant levels with implementation of TVA's General and Standard Conditions normally associated with such developments. Not allowing sale of the TVA property for incorporation into the Rarity Pointe development would reduce erosion and chemical runoff to the reservoir from the golf course and residential areas that would be developed on what is now TVA property. A more wooded shoreline condition would be maintained, and trees would continue to provide shade and long-term woody habitat for aquatic life. Impacts from the dredge would be the same as for Alternative B requiring the same commitments.

Alternative E – Applicant's Proposal with Mitigation

Impacts associated with development of the Rarity Pointe site described under Alternative B would occur. Impacts from the dredge would be the same as for Alternative B requiring the same commitments. Impacts related to soil and chemical runoff can be reduced to insignificant levels with implementation of Best Management Practices by Rarity Communities and residents to control soil erosion, and to limit chemical runoff. Loss of woody vegetation can be held to insignificant levels through TVA control of vegetation management on the marginal strip below the 820-foot contour, and establishment of a 50-foot deep buffer zone of undisturbed vegetation along the periphery of the TVA property considered in this proposal. The SAHI score of most of the shoreline at the Wildcat Rock site (see Figure 4-1) rated "good"; shoreline reaches where past land use practices have resulted in a loss of trees on the shoreline in the large cove and on the southern end of the site rated "poor". TVA control of the Wildcat Rock site would allow preservation of these generally good shoreline conditions.

Figure 4-1 Shoreline Aquatic Habitat Index Ratings for Wildcat Rock



4.3. Threatened and Endangered Species

Plants - No federal or state listed plant species were identified on any of the lands that would be sold and/or developed under any of the Alternatives. Therefore, no impacts to rare plant species are expected on any of these lands.

Alternatives C and E include provisions to mitigate for the loss of public land through a land exchange in which additional properties would be purchased by the applicant and transferred to public ownership. Because no rare plant species were identified on lands proposed for sale and/or development, mitigation is not required for rare plant species. However, the presence of rare plant species on any of the proposed mitigation lands would represent a net benefit with respect to these resources, because they would be transferred from TRDA property designated for industrial development to public ownership designated for conservation. Mitigation lands associated with Alternative C do not contain suitable habitat for rare plant species.

Alternative E also includes provisions for Rarity Communities to fund the construction of a trail terminal on Parcel 6 (which would be retained in public ownership, and left in Zone 4 – Natural Resource Conservation). The footprint of the trail terminal and associated facilities is expected to be small (1-2 acres) relative to the size of the entire Parcel (40.9 acres). No rare plants are expected to be impacted by development of the trail. However, if this alternative is selected, TVA will work closely with Rarity Communities to ensure that impacts to rare plant species are avoided during the construction and use of trail facilities on Parcel 6.

In summary, no adverse impacts to rare plant species are anticipated under any of the proposed alternatives.

Aquatic Animals - Since no sensitive aquatic animals are known to occur in the project area, none of the Alternatives would have an effect on endangered or threatened aquatic animals.

Terrestrial Animals - Nearly the entire potential suitable habitat for protected terrestrial animals occurs on the private lands currently owned by Rarity Communities. Therefore, impacts to potential habitat for these species are most dependent on the land actions for those properties. Because the development of private project lands is expected to go forward under any alternative, the impacts to habitat for these species vary little across the different alternatives as discussed below.

Alternative A - No Action

Under this alternative, the development of the private properties are expected to proceed without the involvement of the TVA lands (Figure 2-2). Many of the same effects to protected terrestrial animals described in Alternative B would also occur here.

Overall, this alternative has the potential to have the least impacts on protected terrestrial animals. A higher level of wildlife habitat continuity and integrity along the shoreline of Tellico Reservoir would be maintained because the TVA property (Parcels 8 and 9) would not be developed. This would maintain additional shoreline that can be used by wintering bald eagles.

The development of private project lands would result in local impacts to potential suitable habitat for protected terrestrial animals. TVA would take no further action and would not impact the resource.

Alternative B - Applicant's Proposal

Under this alternative, nearly all of the project lands would be developed (Figure 2-3). This alternative has the potential to result in the most reduction of forested habitat potentially used by protected terrestrial animals.

No nesting bald eagles are known from the vicinity of the project site. However, wintering birds are reported annually in the vicinity. Although this development would not adversely affect the overall suitability of the reservoir for bald eagles, development of this magnitude further reduces the integrity and continuity of bald eagle habitat in the immediate area, and thus slightly reduces shoreline conditions suitable for bald eagles. Potential suitable habitat for the federal-endangered Indiana bat occurs on the private project lands.

Two species listed by the State of Tennessee as "In Need of Management" may find suitable habitat within the project lands: sharp-shinned hawk and southeastern shrew. For the most part, habitat for these species would be more isolated on project lands as a result of implementation of this alternative.

Potential nesting habitat for the sharp-shinned hawk would be removed by the selection of this alternative. Clearing would involve the removal of early successional vegetation and woodlands. Because this species nests in somewhat fragmented landscape, if present, it may continue to reside on project lands after development if scattered forested tracts remain in the area. Direct disturbances to this species as a result of this alternative are expected to be minimal and temporary; and therefore, insignificant.

If southeastern shrews occur within the project lands, some individuals may be destroyed by construction activities. This mammal has relatively broad habitat requirements and has a wide geographic distribution. If present, it may continue to reside on project lands after development if scattered forested tracts surrounding moist habitats remain in the area.

Overall, the development of private project lands would result in local impacts to potential habitat for protected terrestrial animals. TVA lands (Parcels 8 and 9) provide very limited potential habitat for protected terrestrial animals. Therefore, protected terrestrial animals or their habitat would not be adversely affected under Alternative B.

Alternative C - Partial Land Sale with Mitigation

Under this alternative, many of the same effects to protected terrestrial animals or their habitats described in Alternative B would also occur. Some forested shoreline would remain on the lower portion of Parcels 8 and 9. This alternative would maintain some additional level of habitat continuity along the shoreline, because Parcels 8 and 9 would not be developed in their entirety (Figure 2-4).

The lands proposed for mitigation under this alternative (Figure 2-4) are described in Section 4.4 Terrestrial Ecology where TVA lands and the proposed mitigation lands are compared. This land provides potential habitat for those protected terrestrial animals discussed and the acquisition of these lands would adequately replace habitat for the resource from the loss of TVA land.

In order to avoid impacts on federally-protected Indiana bat habitat on the private property, TVA would require the Applicant to implement mitigation measure number 4 as a condition of its approval (See Section 4.15 - Proposed Mitigation Measures). TVA lands (Parcels 8 and 9) provide very limited potential habitat for protected terrestrial animals. Therefore, protected terrestrial animals or their habitat would not be adversely affected under Alternative C.

Alternative D - Small Golf Course and Marina with No Land Sale

Under this alternative, many of the same effects to wildlife described in Alternative B would also occur. A higher level of wildlife habitat integrity along the shoreline of Tellico Reservoir would be maintained because Parcels 8 and 9 would not be developed (Figure 2-5). Development under this alternative would include the five acres of land below the 820-ft contour and the proposed marina expansion.

In order to avoid impacts on federal-protected Indiana bat habitat on the private property, TVA would require mitigation measure number 4 as a condition of its approval (See Section 4.15 - Proposed Mitigation Measures). Therefore, protected terrestrial animals or their habitat would not be adversely affected under Alternative D.

Alternative E - Applicant's Proposal with Mitigation

Under this alternative, many of the same effects to wildlife described in Alternative B would also occur. Due to the additional clearing for trailhead development on parcel 6 (Figure 2-6), this alternative would involve the most land clearing. However, this alternative involves a land exchange that help would offset the impacts of developing TVA lands.

The lands proposed for mitigation under this alternative are described in Section 4.4 Terrestrial Ecology where TVA lands and the proposed mitigation lands are compared. This land provides potential habitat for those protected terrestrial animals discussed and acquisition of these lands would adequately replace habitat for the resources from the loss of TVA land.

In order to avoid impacts on federal-protected Indiana bat habit on the private property, TVA would require commitment number 4 as a condition of its approval (See Section 4.15 - Proposed Mitigation Measures). Therefore, protected terrestrial animals or their habitat would not be adversely affected under Alternative E. In addition the proposed land exchange and commitments would potentially benefit this resource.

Under Alternatives E, the Applicant would build a trail terminal in accordance with plans established by TVA on Parcel 6. Although no impacts are expected, TVA biologists would ensure that construction and use of the site will not adversely affect protected terrestrial animals.

The TVA lands involved in this proposal offer very limited potential suitable habitat for protected terrestrial animals and are a very small percentage of the forested lands along the reservoir. Therefore, the development of TVA lands under this proposal would have very minor or no effects on the long-term viability of protected terrestrial animals and their habitats along the reservoir.

Development would occur on a minimum of about 539 acres (Rarity Communities' properties) under any alternative proposed in this EIS, further reducing the integrity and continuity of existing forest communities and associated wildlife habitats along the reservoir

Section 4.1 Terrestrial Ecology (*Plants and Animals*) provides an analysis of the loss of forest communities and associated wildlife habitats along the reservoir. Those findings are also relevant here. An analysis of this resource indicates that the effects of this proposal would be insignificant with respect to overall impacts to protected terrestrial animals and their habitats.

4.4. Water Quality

Potential impacts to water quality include discharge of sediment during construction, increased loading of pollutants in runoff due to the change in land use to residential and golf course, and potential spills and discharges of fuel and wastewater from boats at the proposed marina. An increase of nutrient loading could contribute to higher algal mass in the reservoir, which could in turn lead to decreased dissolved oxygen in the reservoir during periods of stratification. Increases in sediment discharge contribute to the muddy appearance of the water and interfere with the quality of aquatic habitat, and toxic materials (such as metals, hydrocarbons, and pesticides) in storm water runoff from residential and golf course areas can be toxic to aquatic organisms.

Alternative A – No Action

Under this alternative, the land would not be sold, or the par-3 golf course and marina permitted. However, construction of the main golf course and the 1,200 residential units would proceed on private property.

Minor discharges of eroded soil are likely during construction. These impacts would be minimized by maintaining buffers and employing effective erosion control BMPs. Because there would be no TVA involvement, such practices would have to be overseen by the county and the state.

Residential or resort development at this density (approximately 2.9 units per acre) results in a high percentage of land covered with impervious surfaces (roofs, streets, and parking). As a result, storm water volume and peak flows increase, and pollutant loads (including nutrients and metals) increase as materials are washed off of impervious surfaces and from lawn runoff. Shoreline buffers are helpful, but most storm water flow is in a pipe or channel, so it bypasses the buffer. Minor local impact is possible, but total loads, estimated at 0.21 tons/year of phosphorus by assuming a rate of 0.97 lb. of phosphorus per acre (USEPA, 1980), will be small compared to the total load entering Tellico Reservoir (estimated above at about 130 tons/year). Phosphorus loading as a means of comparison, because it is likely to be the limiting nutrient in the reservoir in the chain of events that leads to dissolved oxygen depletion. Other pollutants are extremely varied and much less likely to have a measurable impact on water quality.

During initial phases of development, engineered onsite wastewater treatment will be used as a temporary measure. After a pipeline is constructed, sewage will be pumped to the Niles Ferry Wastewater Treatment Facility, in Monroe County.

The plant has a capacity of 0.3 million gallons per day (MGD), and currently uses approximately two thirds of its capacity. With the additional discharge from this project when fully developed, this capacity will be exceeded. Because this area is growing and there is already a need for additional waste treatment capacity, expansion is planned that would handle the additional flow from the Rarity Pointe project.

Some increase in nutrient loading to the reservoir will result from the increased volume of the treated sewage discharge produced by the Rarity Pointe project. This increase is estimated at 3.6 tons/year of phosphorus (assuming 3 people per residential unit and a typical per capita annual loading of 0.9 kg for secondary treatment).

Golf courses use amounts of fertilizer and pesticides that are similar to, and sometimes higher than, cultivated agriculture (Tennessee Department of Agriculture, 2002). Golf courses primarily use fungicides to maintain the turf, and also use some herbicides and smaller amounts of insecticides, miticides, and nematicides. Fertilizer application rates are fairly high, but excessive fertilizer application is rare because of the cost of fertilizer-increased frequency of mowing and the need to maintain. The amount of these chemicals that escape into waterways from golf courses is usually much lower than from cultivated agriculture, because golf courses are managed to maintain turf that completely covers the soil surface. The turf acts as a filter for surface flow, and prevents the erosion of soil and the chemicals that are bound to the soil particles. In addition, golf course roughs do not receive chemical treatment and act as sinks for chemicals, and the storm water flow from the course is dispersed enough that buffers can be effective. Golf courses can use additional management practices to reduce the export of pollutants, such as enhanced buffers; use of water hazards or constructed wetlands to collect and hold runoff; and the use of selected pesticides that decay rapidly in the environment. Few studies have been done that specifically quantify pollutant loadings from golf courses, but the impact of a golf course with average management is likely to be similar to a residential area on a loading/area basis, so the golf course would add approximately 0.04 tons of phosphorus per year.

The region around Tellico Reservoir is growing rapidly (see Socioeconomics Section 3.9), and water quality in the reservoir appears to be suffering from increased nutrient loading (see Section 3.4). This development would contribute approximately 4 tons of phosphorus per year of loading to the reservoir, which would be a small increase compared to current loading, which is on the order of 130 tons. This increase along with future proposed development as allocated in the Tellico Land Use plan would not significantly worsen the existing water quality in Tellico Reservoir.

Alternative B – Applicant’s Proposal

This alternative allows the use of approximately 118 acres of TVA land for residential development, and 5 acres of TVA land for a par-3 golf course. In addition, the proposed marina would be permitted.

The use of approximately 118 acres of TVA land would reduce the density of the residential development. Because the residential area would be less compact, there would be slightly more impervious area per residential unit. However, the same number of residential units would generate approximately the same amount of pollutants, so it is unlikely that there would be any water quality change caused by residential development compared to Alternative A.

Minor discharges of eroded soil are likely during construction. These impacts would be minimized by maintaining buffers and employing effective erosion control BMPs. (Commitment 9)

This alternative would add a small par-3 golf course located on TVA land. Because of the location, there is less opportunity to establish effective buffers or other runoff treatment than

on upland sites. Because of the general lack of buffering around the project in this alternative, export of nutrients and pesticides would be higher. Compared to total loading to the reservoir, this would not be significant. This site is exposed to waves generated by wind and boat wakes, and construction of a golf course at this site could compromise the ability of the existing vegetation to resist erosion of the shoreline.

A full service marina with 349 wet slips and 200 dry stack storage spaces would generate pollutants in the form of petroleum and wastewater discharges from boats operating from the marina. The potential impacts from these pollutants include toxicity to fish, increased nutrient loads, and bacterial contamination. The impacts from this marina would not be significant in the main reservoir by themselves because of dilution, and are unlikely to be significant immediately adjacent to the marina because of its location on the main part of the reservoir. However, these pollutant loads do add incrementally to the overall load in the reservoir, and the visible location of this marina can set the standard for marina housekeeping on this reservoir.

Increased boat traffic around the marina could cause increased shoreline erosion from boat wakes.

To minimize pollutant loading and to provide an example of good stewardship to the rest of users of Tellico Reservoir, this marina should comply with the requirements of the Clean Marina program. However, at a minimum to prevent spilling fuel or wastewater, any fuel storage or dispensing facility would comply with TVA Resource Stewardship (TVARS) Guidelines for Storage Tanks (4.5.5). A Marina Sewage Pump out station will be installed and operated according to TVARS Guidelines 4.5.3, and the marina will comply with TVARS Guidelines for Discharges (4.5.1) (See Appendix F). Detailed plans of the marina will be approved by TVA before a 26a permit is issued (Commitments 10).

In order to minimize the impacts to water, Rarity Communities would implement a management plan for the golf courses based on the Tennessee Department of Agriculture's guidelines or certification of the golf courses by Audubon or similar organizations which would reduce the environmental impacts and provide a method of tracking compliance.

More detailed marina plans submitted to TVA includes a proposed dredge of approximately 10,000 cubic yards. Dredging has the potential to suspend the fine particles in the dredge material and cause high turbidity in the immediate area of the operation. Because dredging would be performed at low water level, much of the excavation area would be out of the water, so this potential would be reduced. Some of this area would be below the water surface, and this portion of the dredging work would likely result in high turbidity in the area adjacent to the operation. Water quality impacts would be confined to a small area and would not last long past the completion of dredging.

Much of the dredge spoil material would be easily handled because the work would occur at low water. However, about a third of the material would be saturated with water because it would be coming from below the water surface elevation. This material would discharge muddy water wherever it is placed. Drainage from dump trucks could cause not only water quality impacts, but road safety impacts.

The following commitments are required for the dredge (See Section 4.15, Commitment 6):

- Material to be dredged will be tested for toxic materials (PCBs and Chlordane) before dredging commences. If any toxic materials are found, dredging will not proceed

without a dredging plan that guarantees that no toxic material will be released to the environment.

- Silt curtains must be placed around the perimeter of the dredge area, so as to not allow silt laden water outside the work area.
- A dewatering plan for the saturated spoil will be developed and approved by TVA. The plan should use berms, straw bales silt fencing, or other silt control devices positioned in such a way as to not allow silt-laden water to re-enter the reservoir.
- All dredged material must be removed to an upland site (above 820-foot elevation) and contained in a manner to prevent its return to any waterbody or wetland, and permanently stabilized to prevent erosion.

Alternative C – Small Golf Course and Marina with Partial Land Sale

In this alternative, all development proposed in Alternative B would take place. Some TVA land would be retained, which would reduce the amount of development close to the shoreline, and therefore marginally reduce the amount of pollutants delivered to the reservoir.

Minor discharges of eroded soil are likely during construction. These impacts would be minimized by maintaining buffers and employing effective erosion control BMPs (Commitment 9).

This alternative also involves the conversion of 60 acres of land currently designated for industrial use to a natural resource conservation allocation. Currently, part of this land is used for grazing, and part is wooded. Removal of cattle from this area would marginally reduce pollutant delivery to the reservoir.

The increase in loading from any future industrial development at this site would depend on the nature of the industrial activity and the number of employees. At this time, there are no proposals for industrial development of any of this site. Because of the steep and rocky nature of approximately half of this site, industrial development would be difficult, and is unlikely to occur until all of the better sites in the area are used. With these factors considered, it is unlikely that more than a small fraction of the loading generated by Rarity Pointe would be offset by this change in allocation.

Increased boat traffic around the marina could cause increased shoreline erosion from boat wakes. However, impacts to water quality would be insignificant provided the commitments as described for Alternative B are implemented for this alternative.

Alternative D – Small Golf Course and Marina with No Land Sale

This alternative is similar to Alternative A, except that the marina and the par-3 golf course would be permitted as in Alternative B. Impacts would be similar to Alternative A with the additional impacts of the marina and par-3 golf course as discussed under Alternative B.

Minor discharges of eroded soil are likely during construction. These impacts would be minimized by maintaining buffers and employing effective erosion control BMPs.

Increased boat traffic around the marina could cause increased shoreline erosion from boat wakes. However, impacts to water quality would be insignificant provided the commitments as described under Alternative B for the golf course and marina are implemented.

Alternative E – Applicant’s Proposal with Mitigation

In this alternative, the approximately 118 acres of TVA land would be sold, the par-3 golf course would be permitted, and the marina approved. To mitigate for the loss of public lands, it is proposed that a 256-acre parcel currently allocated to industrial use be changed to a natural resource conservation allocation. Impacts of the development are discussed in Alternative B.

Minor discharges of eroded soil are likely during construction. These impacts would be minimized by maintaining buffers and employing effective erosion control BMPS (Commitment 9).

In addition to the commitments described in Alternative B, in order to further minimize the impacts to water quality and to be consistent with similar TVA actions, Rarity Communities will be required to maintain a 50 foot buffer and 35 foot setback on parcels 8 and 9 as described in Section 4.15, Commitment 1.

Increased boat traffic around the marina could cause increased shoreline erosion from boat wakes. However, impacts to water quality would be the least adverse of all the alternatives provided the commitments as described are implemented.

4.5. Wetlands and Floodplains

Alternative A - No Action

There would be no direct impacts to wetlands W1, W2, and W8 on TVA Parcels 8 and 9 because the land allocation would not change. There would be no impacts to wetland W4, which is on the shoreline in the area of the proposed Rarity Point Marina; wetland W5, which is partially along the shoreline in the area proposed for the par-3 golf course; and the 100-year floodplain because these uses would not be approved.

The wetlands that are wholly on land owned by Rarity Communities Properties are W9 and W10 which are fringe wetlands along small man-made ponds. The loss of these emergent wetlands would be insignificant locally and regionally because of their small size, and the common occurrence of this type of pond-associated fringe wetland community in the local area and the region at large. It is likely that the constructed ponds on the Rarity Pointe development, including permanent storm-water retention ponds and recreational ponds, could develop emergent wetlands (either by design or natural processes) which would replace the wildlife habitat functions provided by W9 and W10.

There will be no direct impacts to shoreline wetlands (W1, W2, W3, W4, W5, W6) or the island wetland (W7) on land in TVA ownership below the maximum shoreline contour (MSC) 820-feet because these wetlands will not be disturbed and there will be a vegetated buffer on TVA land below MSC 820-feet between the wetlands and adjacent development and other land disturbance. Potential indirect impacts to these wetlands include increases in inputs of sediments from land erosion and contaminants associated with residential and golf course developments, such as oil and grease, nitrogen, phosphorus, pesticides, and litter. These impacts to wetlands are expected to be avoided since storm water detention ponds, vegetated buffers, and structural erosion controls would be used to avoid the introduction of sediments and contaminants into surface waters and wetlands

Wetland impacts under the No Action Alternative are expected to be insignificant. Any future plans for greenway trails that are not related to the current development would be reviewed for environmental impacts when they are proposed.

Alternative B - Applicant's Proposal

Potential impacts and impact avoidance for wetlands W1, W2, W3, W6, W7, W8, W9 and W10 are expected to be as described above in the No Action Alternative.

Under Alternative B, the marina and par-3 golf course would be approved by TVA. It is likely that wetland W4 would be lost for marina development. The new marina is expected to be placed in the same location and harbor limits as an older, now dismantled, marina. This placement is the most practicable alternative because of the economic and environmental benefits. The applicant would not have to do extensive property clearing, etc. Although the marina would adversely impact the W4 wetland, the benefits and practicality of placing the marina in the proposed location makes this the only practicable alternative. This action would be mitigated by requiring the Applicant to provide shoreline stabilization, alternative wetland creation on the site, or other shoreline habitat enhancement.

Impacts to wetland W5 would consist primarily of limited vegetation removal and trimming of some individual plants. TVA would require the Applicant to fully mitigate the impact in the same manner as the potential impacts to wetland W4 would be mitigated. TVA would require the following mitigation for unavoidable permanent or temporary loss of some or all wetland functions in wetlands W4 and W5. W4 and W5 are to be mitigated under the Wetlands Mitigation Plan found in Appendix C.

Mitigation would consist of a combination of shoreline stabilization, wetland creation, and shoreline habitat enhancement, on the Rarity Pointe and/or TVA shoreline to achieve shoreline erosion control, wildlife habitat creation, and an increase in native plant diversity. This mitigation would be applied at a minimum 3:1 ratio of mitigation area to lost wetland area and affected shoreline length. Suitable areas for shoreline stabilization and wetland creation are available along the shoreline between the western end of the proposed marina and wetland W5, and around the par-3 golf course peninsula. See Mitigation Plan in Appendix C (Commitment 7).

Vegetated buffers would be established between the wetlands and adjacent development and other land disturbance to minimize indirect impacts. In areas where establishing standard 100 foot wetland buffers is infeasible, one or more of the following three options would be used to compensate for the reduced buffer area and prevent degradation of wetland functions, see Mitigation Plan in Appendix C (Commitment 7):

1. Use of variable width buffers, where encroachments are offset by proportionally increasing buffer width in other areas.
2. Establishment of a 150 foot sub-zoned buffer, with usage limitations decreasing farther from the wetland. In this case parts of the golf course itself would be counted as the outer part of the buffer. Areas would be counted as part of the buffer where limitations are established on pesticide usage, impervious surface area, and excavation, and/or where native vegetation with the greatest capability to remove sediments and contaminants over shorter distances is incorporated into the landscaping.

3. To compensate for the reduced buffer area additional areas of shoreline stabilization, wetland creation, and/or other shoreline habitat enhancement, would be substituted for the reduced buffer area on a 1:1 basis.

Wetland impacts resulting from this alternative are expected to be insignificant because wetlands impacts would be avoided, minimized, or compensated.

The proposed development involves the construction of residential structures, golf courses and a marina. TVA would retain ownership of all land below elevation 820.0 feet MSL and all development subject to flood damage (including all residential structures and the dry boat storage building) would be located off of TVA retained land and, therefore, above the TVA Flood Risk Profile elevation. Within the 100-year floodplain, the proposed marina facilities consist of floating boat slips, fuel dock, floating restaurant and breakwater, and a boat launching ramp. For compliance with Executive Order (EO) 11988, these are considered to be repetitive actions in the floodplain that generally result in minor floodplain impacts. The par-3 golf course is not on the list of repetitive actions, however, a golf course is considered to be a recreational use of the floodplain. Recreational use of the floodplain is acceptable provided no flood damageable facilities or equipment are located in the floodplain. The activities proposed for the golf course (landscaping, vegetation management, pedestrian walkways, driveway and parking lots) would have minor floodplain impacts. There would be no loss of flood control storage associated with the construction of the golf course which would comply with the TVA Flood Control Storage Loss Guideline.

Overall, impacts to floodplains would be minor and insignificant. To prevent an increase in future flood damages, the following commitments, would be included in the final Section 26a permit and land use approval:

- The applicant will securely anchor all floating facilities to prevent them from floating free during major floods
- Any future facilities or equipment subject to flood damage would be located above the TVA Flood Risk Profile elevation of 817.0 feet MSL
- Any future development proposed within the limits of the 100-year floodplain, elevation 816.2 feet MSL, would be consistent with the requirements of EO 11988
- All future development would be consistent with the requirements of TVA's Flood Control Storage Loss Guideline.

Alternative C – Small Golf Course and Marina with Partial Land Sale

The floodplain and wetland impacts and their impact mitigation requirements of this alternative are the same as described in Alternative B. Wetlands W2, W3, and W8 will be closer to developed areas under this alternative, but indirect impacts will be avoided through implementation of BMPs and/or mitigated as described above.

Impacts to wetlands occurring on the proposed land exchange sites are expected to be beneficial because these sites would be transferred to TVA and designated for natural resource and recreational purposes. Existing sources of adverse wetland impacts on these sites, such as cattle on the Wildcat Rock site, will be removed.

Alternative D – Small Golf Course and Marina with No Land Sale

The floodplain and wetland impacts and the impact mitigation requirements of this alternative are the same as described in Alternative B with the exception that the potential for indirect impacts to wetlands W2 and W8 will be greatly minimized because of their distance from developed areas.

Alternative E – Land Exchange with Mitigation

The floodplain and wetland impacts of this alternative are expected to be the same as described in Alternative B including required mitigation measures.

TVA is not aware of other planned projects with the potential to cumulatively affect floodplains or the types of wetlands impacted by the Rarity Pointe project beyond those contemplated by the 2000 Land Plan EIS. It might be expected that future potential impacts to wetlands will continue to be avoided, minimized, or losses mitigated because of existing regulatory protections and E.O. 11990. Most of the wetlands in the Rarity Pointe assessment area will be avoided. Wetlands W9 and W10 are associated with manmade ponds. The loss of these two pond emergent wetlands, totaling less than 0.15 acres, will not contribute significantly to cumulative wetland losses in the region or Tellico Reservoir area because they are likely to be replaced by fringe wetlands associated with the storm water and recreational ponds on the Rarity Pointe development. The potential loss of wetland W4 and indirect impacts to wetland W5 that could occur under Alternatives B, C, D, and E will be mitigated by wetland creation and/or shoreline stabilization and, thus, will not contribute to cumulative wetland losses.

4.6. Recreation

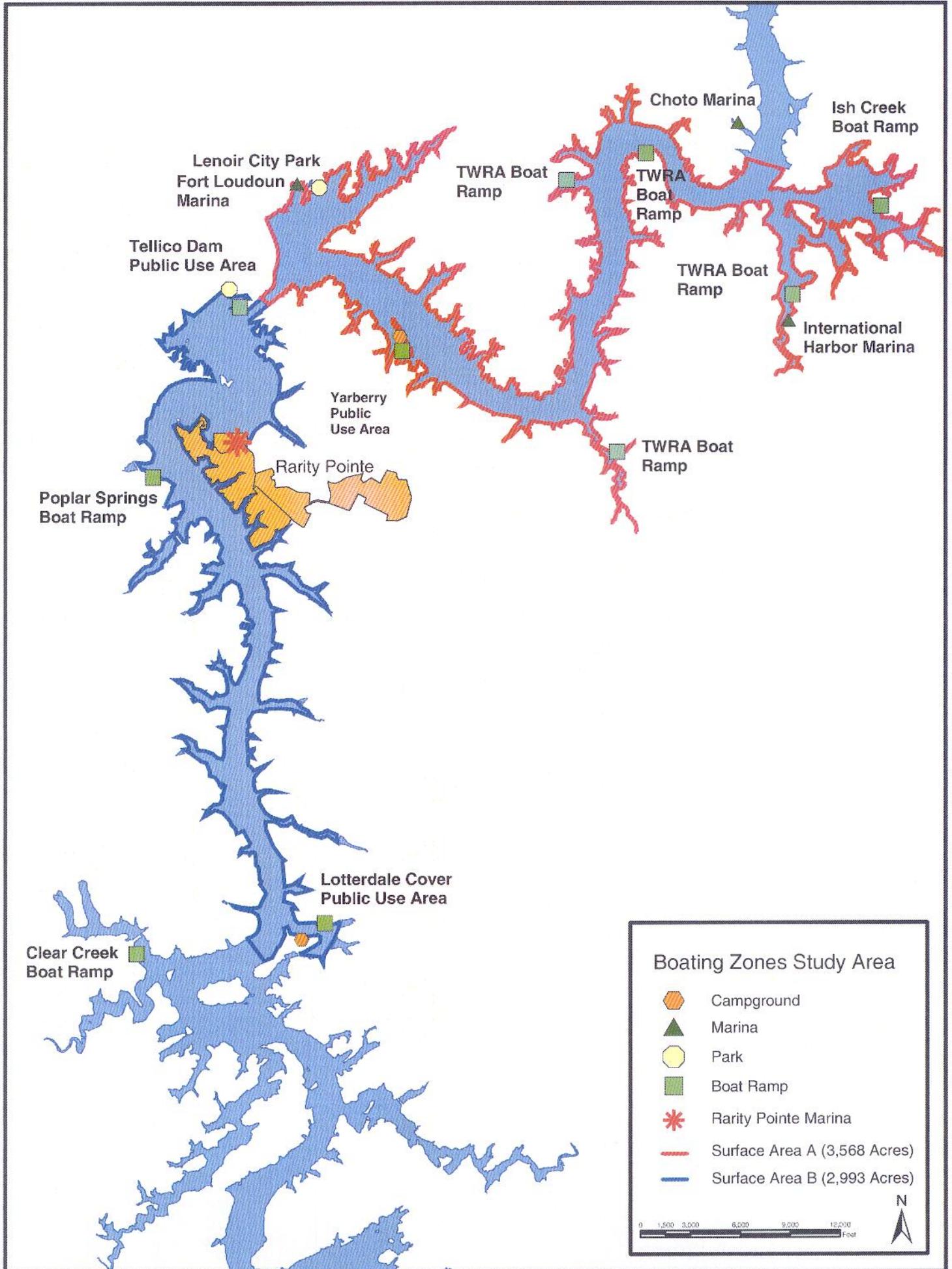
Boating

The public scoping process identified increased boating as a concern which prompted an evaluation in this analysis. An estimated twenty-two mile long boating use zone was assumed as a reasonable area for analysis of boating impacts associated with the new marina. This zone reflects reasonable distances which the majority of boat users from the marina would travel on a recreational outing. It stretches from Little Tennessee River mile 10.0 on Tellico Reservoir to Tennessee River mile 612.2 on Fort Loudoun Reservoir. The Tellico boating zone represents 2,993 acres, and the Fort Loudoun zone represents 3,568 acres creating a total zone of 6,561 surface acres of water. This area is depicted in Figure 4-2 the Rarity Pointe Boating Zones. TVA staff observations reflect a consistently low level of boating use during weekdays, and high use during weekends or Holidays, during the primary boating season of April-September. Other months of the year typically do not produce significant boating density issues.

Increased boating use affects the quality of the recreational experience. One way of assessing increased boating use is through the concept of recreation carrying capacity. Recreation carrying capacity can be defined as the amount, type, and distribution of recreation use that can occur without having unacceptable impacts on the recreation experience. A metric of boats per acre has been used here as a proxy measure for recreation carrying capacity and to produce estimates of boating impacts.

Tims Ford Reservoir is the only TVA reservoir for which the experience of boaters was assessed from a study in which boaters were asked questions about their recreational experience (TVA, 2002). This study, as well as several previous studies on non-TVA

Figure 4-2 Rarity Pointe Boating Zones



Rarity Pointe Commercial Recreation and Residential Development on Tellico Reservoir

reservoirs, relies on three different density levels in an effort to compare people's perceptions of various crowding issues (Titre, et al., 1995). These recreation use density levels are: 10 to 15 acres per boat for high use; 15.1 to 20 acres per boat for moderate use; and 20.1 to 25 acres per boat for low use.

Titre, et al. (1995), states that their density levels should not be considered as a space standard. However, the upper end of the density range for the high use category (10 acres per boat) corresponds to the level that many reservoir managers use as a guideline indicating that a reservoir is becoming crowded and, therefore, may need an assessment to manage boating use. An Urban Research and Development Corporation study (1977) found that, on the average, the State Comprehensive Outdoor Recreation Plan standard used was 8 acres per boat and that those reservoir managers surveyed used 9 acres per boat. Since boats are bigger and more powerful today and personal watercraft did not exist, a conservative planning tool of 10 acres per boat has been used as a guideline indicating potential for crowding, a reduced value in the recreation experience, and an increased concern expressed by boaters for their safety. However, it should be noted from the above literature review that this planning guideline is somewhat subjective since the studies are based on responses to questionnaires from boaters about their perception of what would constitute an interference with the recreational experience.

In order to estimate the impact of the proposed marina project at Rarity Pointe on boaters' experiences, the level of current and reasonably foreseeable future use is first estimated for the boating use zones (see Figure 4-2, Boating Zones Study Area). These estimates, i.e., maximum total number of boats/jet skis likely to be in this zone at the same time, are provided below in Table 4-4. According to the SMI EIS (TVA, 1998), the average width of a residential shoreline lot on Fort Loudoun is 160 feet. To estimate the number of future private docks, the "open" residential access shoreline (shoreline which can be considered for private water use facilities) on Fort Loudoun was measured. This shoreline measured approximately 333,194 feet. This total linear footage (333,194 feet) was then divided by 160 feet, which equals an estimated 2,082 total potential shoreline lots. From this number of lots, 2,082, the 618 lots with existing permitted docks are subtracted. Under this scenario, as many as 1,464 future private docks could potentially be constructed, if approved by TVA.

The Tellico Village Master Plan, approved by TVA, authorizes up to 900 individual and 1,800 community docks for the entire residential community. With this authorization, 290 residential lots have developed private water use facilities within the boating use zone and the balance of the platted lots in this zone can produce another 242 docks. There are 583 community slips existing within the boating zone area of the village, and in addition, the Master Plan anticipates approximately 270 community slips and 200 dry storage slips.

It is not likely that all of the potential docks would be built within the boating use zone in the near future. In the past 5 years, TVA has averaged issuing 94 (46 for Fort Loudoun; 48 for Tellico) Section 26a permits per year for private docks in this study area. It is assumed, for purposes of this cumulative impact analysis that a similar growth pattern will continue in the area during the next 10 years, resulting in an additional 942 private docks. Because of current interest and continuing development of Tellico Village, for the purposes of this analysis, the 200 dry storage slips and the 270 community slips will have also been anticipated in the next 10 years.

The following factors or assumptions contributed to the Table 4-2 estimates of use below:

1. Visual inspections of approved private docks within the twenty-two mile zone indicate an average of 1.7 vessels (boats and jet skis) per private lot.
2. Since public access areas are well dispersed around the reservoir and there is ample weekday parking capacity, no additional public ramp parking would be made available.
3. Tellico Village is pre-approved for 470 additional slips.
4. The last five years produced an average of 94 private dock permits per year.

Table 4-2. Estimated Total Boat Storage and Launching Capacity of Motorized Water Vessels (Boats and Jet Skis) Now and Future Within the Boating Use Zone

Source	Existing Use				Projected Future Use (10 years)			
	Marinas	Public Ramps	Private Docks	Community Slips	Private Docks	Village Dry Storage	Village Com. Slips	Rarity Pointe Marina
Fort Loudoun vessels	711	119	854	0	462	0	0	0
Tellico vessels	0	185	433	583	480	200	270	529
Total vessels	711	304	1287	583	942	200	270	529

The following conservative assumptions are used to develop likely scenarios of boating use as reflected in Table 4-3:

1. On an average summer weekend day, no more than 25 percent of marina boats, existing dock owner boats/jet skis, or boats from existing public ramps would likely be on the water at one time and at the same time.
2. On a holiday weekend day, no more than 35 percent of marina boats, existing dock owner boats/jet skis, or boats from existing public ramps would likely be on the water at the same time.

Table 4-3. Estimated Vessels at One Time From Various Reservoir Facility Types in the Boating Use Zone

Source	Existing Use				Projected Future Use (10 years)			
	Marinas	Public Ramps	Private Docks	Community Slips	Private Docks	Village Dry Storage	Village Com. Slips	Rarity Pointe Marina
Average Weekend Day (25%)	178	76	322	146	236	50	68	132
Holiday Weekend Day (35%)	249	106	450	205	330	70	95	185

Based on the data and assumptions, the potential numbers of boaters for hypothetical scenarios were derived as shown in Table 4-4.

Table 4-4. Scenarios Representing Different Use Levels in the Boating Use Zone by Weekend Day and Holiday Weekend Day and Number of Acres per Vessel		
Scenario	Weekend day Vessels and Number of Vessels/Surface Acre (25%)	Holiday Weekend day Vessels and Number of Vessels/Surface Acre (35%)
Scenario 1 (Existing use)	722 (9.1 acres/vessel)	1010 (6.5 acres/vessel)
Scenario 2 (Existing use, plus all Future Docks)	1076 (6.1 acres/vessel)	1505 (4.4 acres/vessel)
Scenario 3 (Existing use, plus all Future Docks and Marina)	1208 (5.5 acres/vessel)	1690 (3.9 acres/vessel)

Alternative A - No Action

The commercial recreation development of the former TVA/TRDA property already sold to Rarity Communities, Inc. will likely continue and accomplish one of the original land use allocations of reservoir property. However, the par-3 golf course and marina would not be developed resulting in a reduction of commercial recreation services. The existing Tellico land use allocations would remain on Parcels 8 and 9 which would continue to be available for the uses described in the plan, including the potential development of a day use recreation area with trail hub, and designation of land for the Greenway and trail system. The proposed WATeR reservoir trail system master plan could be considered as proposed. The continuation of the trail across Rarity Pointe to other TVA property further downstream could not occur. Approximately 1.7 miles of shoreline will remain available for the boating publics' continued use of water fronting undeveloped land.

Hunting opportunities on Parcels 8 and 9 would be negatively affected somewhat if future trail development and use occurred. It is anticipated that specific trail signage regarding hunting and hunting seasons would be needed with Safety Zones established around trailhead facilities and the final trail footprint. Development on the adjacent privately owned land would also affect current hunting use on the property with the possible addition of Safety Zones along the private land boundary. Wildlife observation opportunities would not be materially changed by trail development.

Based on the Rarity Pointe master plan, the proposed unit allocations for development are as follows: former TRDA land (216 acres) = 2.4 units /acre; requested TVA land (118 acres) = 2.8 units /acre; and Rarity Communities, Inc. privately acquired land (323 acres) = 1.06 units /acre. Rarity Communities, Inc. has provided a Development Plan Summary which reflects the developer's position if the No Action Alternative is selected. It states, "dwelling unit size and values would need to change to achieve the total number of units and unit values necessary to produce the projected gross revenues required to fund the existing golf course design and construction of planned amenity structures." Alternatives would include planning high-rise condominium buildings to achieve a higher unit count vertically, reducing the size of one-story unit lots, thus decreasing the overall value per unit resulting in need for

more than 1,200 units, (i.e.) 1,600 units on 548 acres would increase the overall density to 3 dwelling units per acre, thus limiting open space and park area. Additionally, the revised routing plan for the golf course would not allow for tournament play where typically the golf club house is positioned at the number 1 and 18 hole. The current condition of the 118-acre tract left undeveloped would detract from the overall “place-making” of the community, leaving the land unmanaged and giving way to trespassers at Rarity Pointe.”

It is expected that the boating activity in the boating use zone could result in a boating density ranging from 6.5 to 9.1 acres per boat (Table 4-4, Scenario 1). Some members of the public have expressed opinions that current boating use is too high and may have already changed their boating habits. Although this range is below the recommended threshold of 10 acres per boat, there does not appear to be any significant evidence to indicate that boating activities are being reduced and the accident rates do not indicate any specific negative trends. It is usually when use attains the high-density range that previous studies have found a substantial increase in boaters 1) expressing concerns for safety, 2) exhibiting avoidance behavior (staying away from certain areas of the reservoir), and 3) experiencing levels of dissatisfaction in the quality of the recreational experience. Public boating pressures will likely continue to increase, but any additional boating capacity impacts associated with the proposed expansion of the marina would not occur under the No Action Alternative. Increased boating activity associated with development of private docks independent of the applicant’s proposal could still occur. Such individual actions would be reviewed on a case-by-case basis.

Rarity Communities intent to proceed with an alternative development plan without use of TVA land will add recreation services and amenities, even though they would be modified somewhat with an alternative golf course layout. With the addition of recreation amenities, preservation of open space/informal use, and possible greenway development, short-term recreation benefits would be beneficial and cumulative recreation benefits should be enhanced.

Alternative B - Applicant’s Proposal

TVA would change the allocation on Parcel 8 and a portion of Parcel 9 to allow for the property’s development. The golf course, planned unit construction, marina, and par-3 golf course would be developed as proposed on TVA fee land and TVA land below the 820-foot contour. TVA would issue a Section 26a permit resulting in the 349 wet slips and 200 dry slips. The Greenway designation would be eliminated and the potential trail development would not occur on the affected land. The allocation change on approximately 118 acres would reduce the greenway allocation area by about eleven percent and preclude the development of a 45-acre day use recreation area on Parcel 8. It is estimated that approximately 12-14 miles of trails of varied types and lengths could be developed within the greenway corridor. The loss of the approximately 118 acres would eliminate approximately 2.5 miles (18 percent) of the trails. Approximately 1.7 miles of shoreline would not be available for the boating public’s continued use of water fronting undeveloped land.

An upscale, more formal form of recreation use which serves the public would displace an existing, informal recreation use which also serves the public. Although the new amenities would provide additional recreation opportunities, they do so at the loss of existing and planned opportunities of another type. Changing the recreation and natural resource conservation land use allocations to residential/commercial recreation use, and changing the character of undeveloped shoreline to that of developed shoreline will result in adverse effects on informal recreation use. As part of the larger block of eastern shore land

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committed to public use, informal recreation activities include camping, hiking, bird watching, bank fishing, and wildlife viewing would be eliminated. The coves fronting the property would no longer be available for boaters to seek refuge from development along the reservoir. Although the public has rights to use land below the 820-foot contour this seldom occurs when residential use exists on the immediate back-lying property, because of the public's perception that the property is privately controlled.

Although additional beneficial recreation amenities would result at Rarity Pointe, the loss of open space, day use area, informal recreation opportunities, and diminished greenway potential would offset these benefits. This loss of existing/planned recreation opportunities would result in cumulative adverse effects on recreation.

Under this alternative, cumulative impact to hunting and wildlife observation opportunities on the lower portion of Tellico Reservoir would occur. This is based primarily on actions that would have similar impacts on these recreational opportunities upstream from Rarity Pointe. The prime example of this is TRDA's Wears Bend property located on the right bank of the reservoir just downstream of the U.S. Highway 411 which contains approximately 2,000 acres. This area is designated for future industrial development and is currently managed by the Tennessee Wildlife Resources Agency under an interim use agreement from TRDA as the Wear Bend Unit of the Tellico Lake Wildlife Management Area. The area receives significant use by hunters, wildlife/bird watchers, hikers, and horseback riders. With the eventual development of the Wears Bend area, the bulk of these uses would be eliminated, leaving only about 1,340 acres of publicly owned property on the right downstream bank of Tellico Reservoir to meet these stakeholder recreation needs. Alternative B would reduce the remaining acreage by another approximately 118 acres or approximately 6.3 percent and would exacerbate this loss.

Boating activity is anticipated to reach a density range of 4.4 to 6.1 acres (Table 4-4, Scenario 2) without the development of the marina. With the marina, it is anticipated that the boating activity in the boating use zone could result in a density ranging from 3.9 to 5.5 acres per boat (Table 4-4, Scenario 3). Although this range is below the recommended threshold of 10 acres per boat, it is close to the existing low end of the existing Scenario 1 range and could be within tolerable limits of public acceptability. If not, the increased boating associated with adding 500 slips, or the normal annual increase in private docks, may result in users having to change the time of day in which they boat, use other areas of the reservoirs, boat on weekdays, or select other reservoirs for boating on weekends and Holidays. Based on current minimal weekday boating use, increases in boating during the weekdays would not create significant effects. Increased boating activity could result in adverse recreation effects both on a short-term and cumulative basis.

Alternative C – Partial Land Sale with Mitigation

This alternative does not permit residential development of TVA land, but adds commercial and public recreation amenities and services. Development of recreation amenities at Rarity Pointe and boating effects would be the same as in Alternative B. TVA would provide approximately 49 acres of the upland portions of requested Parcels 8 and 9 to construct the golf course as planned. Rarity Communities would provide a right-of-way across Rarity Pointe from Antioch Church Road for vehicle and trail access so that a trail terminal and greenway could be established on the remainder of Parcel 9 land. Approximately 1.5 miles of shoreline would remain available for the boating public's continued use of water fronting undeveloped land.

The allocation change on 49 acres would reduce the greenway allocation area by about five percent and preclude the development of a 45-acre day use recreation area on Parcel 8. The loss of the 49 acres would eliminate approximately 1.0 mile (eight percent) of planned trail. The alternative commits 60 acres of land at Wildcat Rock (Figure 2-4) to natural resource conservation which is otherwise committed to industrial use, creating a net gain of 11 acres. The mitigation property consists of a meadow/pastureland, marshy area, small wooded area, and has a portion of a protected cove encompassing 0.5 mile of shoreline, creating a net gain of 0.3 mile. The property has access to a public road and is accessible by boat.

Under this alternative waterfowl hunting on Parcel 5 would essentially be eliminated following construction of the par-3 golf course and expansion of the marina site. Other hunting activities on Parcels 8 and portions of 9 would also be eliminated as only a small portion of Parcels 8 and 9 would remain for public use. The development of a trail terminal on this small remaining portion of Parcel 9 would require the establishment of some type of Safety Zone and because of the limited land that would be left hunting activities, if Safety Zones and signage were established, would be extremely diminished. Wildlife observation opportunities would also be negatively affected, as the bulk of the property would be converted from its existing habitat to other uses. However, trailhead development on a portion of Parcel 9 would allow access for stakeholders to pursue wildlife observation opportunities further up the trail system.

The proposed 60-acre mitigation tract at Wildcat Rock (Figure 2-4) would meet stakeholder needs for wildlife observation; however, the limited size of the tract, in conjunction with anticipated adjacent industrial development, would not allow for a positive hunting experience and conflicts with other users would be expected.

Although additional beneficial recreation opportunities would result at Rarity Pointe and the opportunities for a greenway trail and trail hub development would be enhanced, the primary negative aspect to this alternative is it erodes the integrity of an existing large block of public land eliminating some recreation opportunities on a short-term basis, and does not adequately address replacement of these opportunities on a cumulative basis. While there would be some recreational benefits, the 60-acre isolated mitigation tract is not sufficient to offset the loss of the existing large block of TVA land.

Alternative D – Small Golf Course and Marina with No Land Sale

TVA would not change the existing use allocations of Parcels 8 and 9 and the land would not be available for sale and development. It would continue to be available for the uses described in the 2000 Land Plan, including the design and establishment of the greenway and trail system and informal recreation use. The continuation of the trail across Rarity Pointe to other TVA land further downstream would not occur. The marina, a modified golf course layout, and par-3 golf course would be developed on privately owned land and TVA land below the 820-foot contour where rights exist, and planned unit development density would increase on the private property. TVA would issue a Section 26a permit resulting in the 349 wet slips and 200 dry slips.

Potential effects of this alternative on hunting and wildlife observation opportunities is similar to those described for the No Action Alternative, with the exception that waterfowl hunting opportunities currently available on Parcel 5 would essentially be eliminated due to the development of the par-3 golf course and the expanded marina complex.

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The effects on boating activities would be the same as described in Alternative B, the Applicant's Proposal. The effects to existing recreation use would be the same as described in the No Action Alternative. The potential cumulative recreation effects under this action would be beneficial as new recreation amenities would be provided and existing opportunities would still be available for informal recreation use and potential greenway development.

Alternative E – Applicant's Proposal with Mitigation

The golf course, planned commercial recreation unit construction, marina, and par-3 golf course would be developed as proposed on TVA fee land and TVA land below the 820-foot contour. TVA would issue a Section 26a permit resulting in the 329 wet slips and 200 dry slips. Boating effects will be the same as described in Alternative B, the Applicant's Proposal. An up-scale, more formal form of recreation use would displace an existing, informal recreation use on a portion of public land.

As mitigation for lost wildlife observation opportunities, the applicant would agree to the development of a portion of a proposed trail system, and continuing trail access across Rarity Pointe would be available to TVA's downstream property. A trail terminus and recreation day use area trail hub would be developed by Rarity Communities at no cost to the public or WATeR on Parcel 6, with vehicular access available via Antioch Church Road. A right-of-way does not exist to develop a trail along Antioch Church Road; however, the public could still use the road to access segments of a greenway trail system, for details see figure G-2 in Appendix G.

Potential effects on hunting opportunities on Parcels 8 and 9 would be similar to those described for Alternative B. While wildlife observation opportunities would be essentially lost on Parcels 8 and the sold portion of 9, these opportunities could be enhanced with the establishment of trail terminals either upstream or downstream of the developed properties with a connection across Rarity Pointe property.

As mitigation for environmental impacts, 256 acres of land committed to industrial use known as Wildcat Rock at Wear Bend (Figure 2-6) would be committed to natural resource conservation management. The property offers a mix of meadow, hardwood forest, and ridge land, protected coves, and 2.45 miles of shoreline. The property has access to a public road, is accessible by boat, and receives some informal camping and horseback riding use. Its physical features offer opportunities for a variety of informal recreation use and could stand alone as a park that could support day use facilities and a trail system.

By securing the Wildcat Rock site and protecting and managing this land for natural resource conservation management and informal recreation, the loss of hunting and wildlife observation opportunities on Parcels 8 and 9 under this alternative would be mitigated. Although this site is available for these recreational pursuits now, currently planned future uses of the site would preclude these activities.

This alternative produces a loss of approximately 118 acres (11 percent) of a larger block of existing public land allocated for natural resource management and recreation use, a net gain of 141 acres of land (a return of 2.2 to 1), and nets an additional 0.75 shoreline miles. Although it reduces informal recreation opportunities in one location, it should significantly enhance these opportunities in another location on the reservoir. The primary negative aspect to the alternative is it erodes the integrity of an existing large block of public land and eliminates some recreation opportunities in the short-term.

With the creation of additional recreation opportunities at Rarity Pointe, provision for access over Rarity Pointe for a public trail, and development of a new hub terminal for greenway expansion which should enhance greenway/trail potential, cumulative recreation benefits should be enhanced. The acquisition of the Wildcat Rock property will help offset the loss of 118-acres of TVA land dedicated to public use. However, increased boating activity would still result in some adverse recreation effects.

4.7. Cultural Resources

Alternative A- No Action

No historic properties were identified on the private portions of the development. Accordingly, this alternative would have no impact on cultural resources.

Alternative B- Applicant Proposal

The entire development has been surveyed for historic properties and no historic properties were identified. No historic properties would be affected within the golf/residential complex development. The SHPO concurred that no historic properties would be affected in this alternative.

There is a potential for buried archaeological deposits which has not been field verified, for a small area of the proposed dredge at the marina site. Since this type of work was not previously requested, it was not subjected to an archaeological investigation. Prior to any dredging or other disturbance, TVA Cultural Resources will review the area during low winter pool to determine if a potential does exist for buried cultural remains.

Alternative C- Partial Land Sale with Mitigation

The entire development has been surveyed for historic properties and no historic properties were identified. The SHPO concurred that no historic properties would be affected within the golf/residential complex development and the TVA retained land. However, the land to be acquired by TVA (60 acres) would be subject to a phased process of cultural resources survey per the conditions set forth in the Tellico Land Plans Memorandum of Agreement (MOA).

TVA Cultural Resources will review the proposed dredge site area during low winter pool, prior to any disturbance, to verify the previous archeological survey.

Alternative D- Small Golf Course and Marina with No Land Sale

The entire development has been surveyed for historic properties and no historic properties were identified. The SHPO concurred that no historic properties would be affected within the golf/residential complex development and the TVA retained land.

TVA Cultural Resources will review the proposed dredge site area during low winter pool, prior to any disturbance, to verify the previous archeological survey.

Alternative E- Applicants Proposal with Mitigation

The entire development has been surveyed for historic properties and no historic properties were identified. The SHPO concurred that no historic properties would be affected within the golf/residential complex development. However, the Trail Terminal and the land to be acquired by TVA (Wildcat Rock site- 256 acres) would be subject to a phased process of cultural resources survey per the conditions set forth in the MOA.

TVA Cultural Resources will review the proposed dredge site area during low winter pool, prior to any disturbance, to verify the previous archeological survey.

4.8. Visual Resources

Visual consequences are examined in terms of visible changes between the existing landscape character and proposed actions, the visibility of proposed changes, sensitivity of the public viewing points, and the viewing distances. The visual assessment criteria used to evaluate the extent and magnitude of these changes was previously described in Section 3.8, Table 3-6.

Alternative A – No Action

TVA Tracts - This alternative (Figure 2-2) would preserve the landscape character and the visual qualities of public land in the residential and reservoir viewsheds. It would reduce the extent of adverse visual change along the east bank and provide a buffer to help screen the proposed back-lying development. The TVA parcels would be retained and their scenic value would increase over time. The adverse visual impacts would be limited to those resulting from development of the two privately owned sections of the project. This alternative would have the least visual impacts for the immediate future.

Under this alternative, the two TVA parcels would not be sold and their attractive natural character would remain intact. The wooded ridges would not be disturbed, allowing the moderate-sized hardwoods on Parcel 8 to mature. Continuing natural succession would replace the dead pine with hardwoods on Parcel 9, which would improve scenic integrity and attractiveness over the next 12-15 years. The trees would continue to provide a pleasing natural appearance. The visual harmony and tranquil sense of place would be preserved for recreational visitors to these parcels, and for the more distant residential and reservoir viewsheds. Boat traffic using the two wooded coves upstream would remain relatively secluded from development, while those in the downstream cove would see the new residential area along the north bank. Both TVA parcels would continue to provide views of undisturbed shoreline and naturally scenic woodland for the residential areas and other viewing points described in the Affected Environment Section 3.8. They would continue to serve as a 0.5-mile setback buffer between the water and planned development to the east on Rarity Communities private land. The wooded ridge tops would screen most views of new structures depending on the height, color, and the season of view.

Also under this alternative, the 5-acre TVA tract below elevation 820-feet would retain its natural appearance for now. Alterations to support commercial recreation development may occur in the future. Until then, the young trees would continue to grow and provide an increasing visual buffer over time. The buffer would screen a small portion of back-lying area, and would appear as a green space within the surrounding development. The proposed lighthouse to be constructed on the former TRDA property would likely remain visible above the trees. Most impacts of adjacent development would still be seen from the reservoir and canal area.

Private Tracts - Under this alternative, development has begun and would likely continue on the privately owned lower Jackson Bend peninsula (216 acres) and back-lying tract (323 acres). This part of the project would substantially alter the visual landscape character by changing several hundred acres of wooded reservoir land and back-lying pastoral property

to a suburban-scale residential area and resort. These alterations would reduce the scenic value class from good to poor and result in significant visual impacts, as described below.

Continued project construction on the private land and former TRDA property would probably disturb 75 percent or more of the site and would severely impact the visual landscape with a wide variety of discordant alterations. Construction activities would include extensive tree clearing and earth-moving operations along with construction of roads, multiple buildings of various heights, a 50 to 60 foot high lighthouse feature, golf course, and commercial area that would all contribute substantial adverse contrast. As taller structures become complete, they would likely be visible above the remaining vegetation. Visibility would increase further if trees are removed to the 820-foot contour, and erosion has already removed some shoreline vegetation up to that elevation. Material delivery trucks and construction force traffic would substantially increase visual congestion for at least 2 years on Antioch Church road and 3.5 years longer on U.S. Highway 321. Additional ROW would be cleared and a new power line would be built along Antioch Church road. The changes would be seen from the same reservoir and residential viewing points described in the Affected Environment Section 3.8. The construction disturbance would reduce scenic integrity to very low, and the natural scenic attractiveness would be minimal. The scenic value class would be poor, and most visual tranquility would be lost. The visual discord of principal construction activities would be seen for about 5.5 years based on the projected completion date. Intermittent residential construction would continue to be seen for an unknown period of at least 10 years or more.

The completed development would replace the visual character of woodland ridges and meadow areas with a suburban-scale residential area and resort. The extensive changes would add substantial adverse contrast to the natural reservoir landscape along the east side, and to the back-lying rural countryside. Several hundred acres of various-sized condominiums would be seen along with a variety of residential units ranging from small cottages to large estate homes. The multi-story facilities would add vertical forms that increase adverse variety, add discordant contrast to the rural landscape, and replace the woodland skyline. The size, color, and density of these buildings could increase or lessen their impact. Yard areas, roads, a lodge, marina facilities, lighthouse, golf course, and a commercial area would also be seen among the remaining trees. The 50 to 60-foot high lighthouse structure would remain visible above the trees for at least 20 years. The overall appearance would be similar to the Tellico Village development across the reservoir, with taller structures and somewhat higher density but no individual water use facilities.

Without the TVA parcels, Rarity Communities would consider high-rise condominiums and greater housing density which would further increase the impact. Several stories of the back-lying high-rise units would likely be seen above woodlands on the TVA parcels. Visibility of the development would be greatest during seasons when leaves are down. More lighting would be visible across the night landscape, and night sky brightness would increase somewhat depending type of lighting used. Together these features would dominate the visible landscape and result in a major adverse impact to the surrounding viewsheds. These include locations and viewing points on the reservoir, west bank residential areas, the dam reservation, and nearby roads, as described in the Affected Environment Section 3.8. Additional watercraft use resulting from the marina and residential development would increase visual congestion on the waters nearby. Scenic integrity would be very low due to the heavily altered landscape, and scenic value class would be poor due to the extensive disturbance. Most of the visual tranquility and harmony would be lost on the private tracts, which would adversely change the aesthetic sense of place.

Alternative B – Applicant’s Proposal

Under this alternative, the project would be developed as shown in Figure 2-3, which would result in the most severe visual impacts among the proposed alternatives. The proposed master plan for development is shown in Figure 2-1. Impacts resulting from development of the privately owned peninsula (216 acres) and back-lying tract (323 acres) would be the same as described in Alternative A. However, in this alternative, residential development would also occur on the TVA parcels, which would add similar but somewhat greater changes and substantially increase the extensive adverse impacts. About 1.7 miles of additional west-facing shoreline (a 67 percent increase) and an additional approximately 118 acres of shoreline land (a 55 percent increase) would be largely altered. The TVA parcels would no longer provide views of naturally scenic woodland and undisturbed shoreline for the residential areas and other viewing points on the reservoir. These alterations would reduce the scenic value class from excellent to poor and result in significant visual impacts.

Impacts from construction activity on the TVA parcels would be similar but somewhat more severe than those described for the peninsula development. Construction would probably disturb 85 percent or more of the approximately 118 acres, since it would include about twice as much golf course area and a greater residential density. It would also disturb the 5-acre TVA tract below 820-foot elevation and additional shoreline along the marina area. The activities would be seen from additional reservoir and residential viewing points. Scenic integrity would be very low, scenic value class would be poor, and visual tranquility would be lost over a larger area. Visual discord of initial and intermittent construction on the TVA parcels would be seen for about the same time periods as for other parts of the project.

As with the private tracts, completed development on the TVA parcels would replace the visual character of undisturbed woodland ridges with a residential area and golf course. These extensive changes would add further adverse contrast to the natural reservoir landscape. About 325 additional condominiums and/or residential units of various sizes would be seen, along with the golf clubhouse and several parts of the course. The area of natural wooded skyline lost to these features would increase substantially. Residential density seen on the two parcels would be over 4 units/acre (excluding the golf course and clubhouse area), notably higher than the 2.5 units/acre seen on the peninsula (excluding the golf course, lodge and marina land). The resulting visual congestion would be about 65 percent greater on the TVA land. The building forms and open fairways would increase adverse variety and add discordant contrast visible through remaining trees. The size and color of the buildings could increase or lessen their impact. Visibility of these features would increase during seasons when leaves are down. More lighting would be visible across the night landscape, and night sky brightness would increase somewhat depending on the type of exterior lighting used. The level of added brightness would be most noticeable for residents and traffic closest to the project.

Development seen on the TVA parcels combined with the rest of the project would further dominate the visible landscape, resulting in a greater impact to the reservoir and residential viewsheds. It would increase the negative impact on 52 (60 percent) of the waterfront home sites and 21 (35 percent) of the lake view sites that would see the peninsula development. It would impact about 20 additional waterfront and 48 additional lake view home sites further upstream, an increase of 24 and 84 percent respectively. The alterations would also impact the middle ground view of about 100 home sites located at higher elevations to the west of Tellico Parkway. This portion of undisturbed reservoir landscape would be lost to current and future observers alike. The shoreline and coves seen by boat traffic would no longer be wooded or secluded, and additional watercraft use resulting from greater residential

development would increase visual congestion on the waters nearby. The visiting public would no longer have access to walk the property and see the woodland character in close foreground views. Overall, the scenic integrity would be very low due to the heavily altered landscape, and the scenic value class would be reduced to poor due to the extensive disturbance. Most of the visual tranquility and harmony would be lost. Development of the TVA parcels would substantially alter the aesthetic sense of place from natural, unpopulated, and available for public use, to one of developed, private homes, and unavailable for public use.

Also under this alternative, the natural appearance and tree cover of the 5-acre TVA tract below the 820-foot elevation would be replaced with a par-3 golf course. The permanent tree removal and other changes would increase the visibility and discordant contrast of adjacent back-lying residential development and lighthouse structure as seen from the reservoir and canal area. The expanded marina facilities would add further visual discord along the shoreline and would be seen from the same areas. However, the visual changes associated with anticipated water use facilities and shoreline development would be normal in an area designated for a marina. Although the marina size may dominate the original landscape character, the scale, form, color, and reflectance of planned facilities could notably lessen or increase their visual contrast.

Alternative C - Partial Land Sale and Mitigation

Under this alternative (Figure 2-4), the extensive visual impacts resulting from development of the privately owned peninsula (216 acres) and back-lying tract (323 acres) would be the same as described under Alternative B. The negative impacts of developing the 5-acre TVA tract below elevation 820-feet and the enlarged marina would also be the same, as would the impacts of developing the eastern part of the TVA parcels. However, commitments would be required to avoid night sky impacts (see Section 4.15, commitment number 5). The applicant would be required to use fully shielded light fixtures or those with internal low-glare optics (so no light is emitted from the fixture at angles above the horizontal). This would reduce upward light and wasted energy at least 35 percent and help minimize potential lighting impacts. The wooded shoreline character along the western part would be retained and would provide a partial visual buffer of development to the east. This alternative would have the second-greatest impact on the residential viewshed and the least gain of visual resources from mitigation exchange.

This alternative would preserve some of the landscape character and visual qualities of public land seen in the residential and reservoir viewsheds. About 220 homes would not be built on the shoreline and ridge tops of the western part (67 acres), which would reduce the extent of adverse visual change seen along the east bank. The scenic value of the remaining wooded shoreline would increase over time. The western part would also provide a setback buffer averaging about 1,200 feet between the water and planned development to the east. The remaining woodland would limit some views of that development. However, elevations of the eastern part are 30-50 feet higher so clearing for the golf course and at least 106 structures would eliminate most the woodland skyline. The vertical forms of multi-story facilities would increase adverse variety and add discordant contrast to the rural landscape, and would likely be visible above the western treetops. The size, color, and density of these buildings could increase or lessen their impact. Rarity Communities indicated that without TVA land they would consider high-rise condominiums and/or greater housing density, which would further increase the negative impact. Several stories of the back-lying high-rise units would likely be seen above the remaining TVA woodlands.

Development seen on the eastern part combined with the rest of the project would further dominate the visible landscape, resulting in a greater impact to the reservoir and residential viewsheds than the peninsula development alone. It would increase the negative impact on 52 (60 percent) of the waterfront home sites and 21 (35 percent) of the lake view sites that would see the peninsula development. It would also be seen from about 20 additional waterfront and 48 additional lake view home sites further upstream, an increase of 24 and 84 percent respectively. The alterations would also impact the middle ground view of about 100 home sites located at higher elevations west of Tellico Parkway. Additional watercraft use resulting from the marina and residential development would increase visual congestion on the waters nearby. About three fourths of the shoreline and coves seen by boat traffic would remain wooded and partially secluded. The visiting public would have access to walk the western part of the TVA property and could see the woodland character in close foreground views. Visual impacts may also result from future public road access on the western portion to the trail terminal.

Overall, scenic integrity of the TVA parcels would be low due to the heavily altered landscape, and the scenic value class would be reduced to poor due to the dominant visual disturbance. Much of the visual tranquility and harmony would be diminished since the eastern part would be developed.

The proposed exchange of a portion of the Wildcat Rock tract (60 acres) would protect the visual character of that parcel from potential development. It would preserve views of boats in the cove but not a residential viewshed. Protecting a larger parcel with similar attractiveness, less watercraft viewshed, and slightly more interesting landscape character in a different area of the same reservoir would provide some positive impacts. The gain of visual resources on the exchange property would mitigate the visual impacts for those visiting the TVA parcel and using the reservoir nearby. However, the exchange would not preserve or replace the scenic undisturbed residential viewshed from Tellico Village, which is a principal loss of developing the TVA parcel. The substantially altered landscape would adversely change the viewshed of about 250 home sites without mitigation. These alterations would reduce the scenic value class from excellent to poor and result in significant visual impacts.

The exchange property is described in Section 3.8. It has about 22 percent more reservoir land and about the same amount of undisturbed shoreline (about 2,600 feet overall). It also has about the same cove access and shoreline slope as the TVA parcel. The exchange property would preserve the scenic features, visual harmony, and tranquil sense of place for recreational visitors. However, the property is a low-lying area with limited visibility while the TVA parcel is a ridge area with high visibility. Land between the exchange property and the reservoir would remain available for industrial development along with the rest of the tract. This could substantially diminish scenic value of the property in the future. Land between the TVA parcel and the reservoir is identified to remain as natural resource conservation which would help preserve the scenic value.

Alternative D – Small Golf Course and Marina with No Land Sale

Under this alternative (Figure 2-5), the adverse visual impacts resulting from development the privately-owned peninsula (216 acres) and back-lying tract (323 acres) would be about the same as described under Alternative A. Development of the 5-acre TVA tract below elevation 820 and the marina expansion would add further negative changes, so this alternative would have the second-least overall visual impacts.

The natural appearance and tree cover of the 5-acre TVA tract below the 820-foot elevation would be replaced with a par-3 golf course. The permanent tree removal would increase the visibility and discordant contrast of adjacent back-lying residential development and lighthouse structure, as seen from the reservoir and canal area. The expanded marina facilities would add further visual discord along the shoreline and would be seen from the same areas. However, the visual changes associated with anticipated water use facilities and shoreline development would be normal in an area designated for a marina. Although the marina size may dominate the original landscape character, the scale, form, color, and reflectance of planned facilities could notably lessen or increase their visual contrast. Commitments to reduce night sky impacts to minimize visual impacts would be the same as Alternative C (see Section 4.15, commitment number 5).

Alternative E - Applicant Proposal with Mitigation

Under this alternative (Figure 2-6), the project would be developed as proposed, and would have the same extensive impacts as described for Alternative B. However, commitments would be required to minimize night sky lighting (see Section 4.15, Commitment 5). The applicant would be required to use fully shielded light fixtures or those with internal low-glare optics (so no light is emitted from the fixture at angles above the horizontal). This would reduce upward light and wasted energy at least 35 percent and help minimize potential lighting impacts. In addition, Rarity Communities would be required to maintain a vegetated buffer 50 feet wide along the shoreline of Parcels 8 and 9 (see Section 4.15, Commitment 1). If the buffer is maintained essentially undisturbed in could help screen development from the nearby views of boat traffic. The vegetation is not likely to provide much buffer for the residential viewshed due to the elevation of existing homes and proposed development. This alternative would also have the second greatest gain of visual resources from the mitigation exchange. The proposed exchange of the Wildcat Rock tract (256 acres) would protect the visual character of that property from potential development, and would preserve the views from nearby areas on the reservoir but it would not protect the residential viewshed. Protecting a larger parcel with a greater variety of scenic features, the watercraft viewsheds, and a more unique landscape character in a different area of the same reservoir would provide some positive impacts. This gain of visual resources on the exchange property would mitigate the visual impacts for those visiting the TVA property and using the reservoir nearby. However, the exchange would not preserve the scenic natural landscape visible from existing residential areas, which is a principal loss of developing the two TVA parcels. The substantially altered landscape would adversely change the viewshed of about 250 home sites. These alterations would reduce the scenic value class from excellent to poor and result in significant visual impacts.

The exchange property at Wildcat Rock is described in the Affected Environment Section 3.8. It has longer, more secluded coves and somewhat steeper waterfront than the two TVA parcels. The property also has 44 percent more undisturbed shoreline (about 12,900 feet overall), and about 2.2 times more reservoir land. It has somewhat greater scenic attractiveness and scenic integrity, but less visual sensitivity than the two TVA parcels. The exchange property would preserve the variety of attractive scenic features, visual harmony, and tranquil sense of place for recreational visitors to the tract. It would also preserve somewhat more distinctive viewsheds for boats on the reservoir and in the coves, but not for any waterfront or lake view home-sites.

Minor visual discord would occur during construction of the proposed greenway trailhead facilities on Parcel 6. The facilities would include an access drive and parking, several picnic sites, signs, and a toilet building. The development would be located in the former

timber harvest area on the south side and below the ridge crest where there would be little if any off-site visibility. Less than an acre of small trees would be cleared. Within 3 years, the surrounding growth of young trees would fully screen the small building and other features from all but the intended visitors.

Another mitigation option, the Morganton Cemetery parcel (232 acres), discussed in Section 2.3, was not selected as a mitigation option (Figure 2-7) since it did not meet the requirements of several other resource areas. If it had been selected, the exchange would protect that undisturbed shoreline property from potential development, and most importantly, it would preserve the natural scenic character for a sizeable part of two residential viewsheds on the same reservoir. However, the obtaining this tract would not preserve or benefit the viewshed seen from Tellico Village.

This property tract has one more undisturbed cove than the two TVA parcels, although the longest is about half the length of the one along parcel 9. The property also has 78 percent more undisturbed shoreline (about 16,000 feet overall), and about twice as much reservoir land. It has the same scenic integrity, sensitivity, and scenic value class as the TVA parcels. The exchange property would preserve very similar viewsheds for almost as many waterfront homes as the entire proposed project (89 rather than 96), and a potentially larger number of lake-view homes (more than 120). It would also preserve very similar viewsheds for boats on the reservoir and in the wooded coves, as well as similar visual character and tranquil sense of place for recreational visitors to the tract.

Visual Impact Summary

As a valley-wide trend, TVA's SMI EIS (TVA, 1998) reported that since the mid-1980's land-use pressures have been shifting to private residential shoreline development, and that pressures to protect water quality and aesthetic resources have increased significantly. Participants in the SMI scoping stated they wanted TVA to preserve the shoreline's natural beauty, that the visual quality of the environment is important to ensuring the quality of outdoor experiences, and that residential development would affect the visual quality of reservoir shorelines. The SMI EIS also noted that similar concerns were expressed by USACE and TWRA regarding the proliferation of various shoreline development activities and the associated negative aesthetics.

When Tellico reservoir was completed (1979), TVA sold 11,000 acres to TRDA with about 96 percent designated for development. Most of it is located on the lower portion of the reservoir downstream of the U.S. Highway 411 Bridge. About 5,500 acres were for residential use, 4,450 acres for industrial use, and the balance for commercial recreation development. The residential area consisted primarily of the Tellico Village development along with several small subdivisions. In 1994, about 1,060 acres were changed from industrial to residential for the Rarity Bay development. The area of geographic focus is the reservoir area from about 4 miles above the U.S. Highway 411 Bridge down to the dam where visual impact potential is the highest. Most TVA land upstream from the bridge is committed to wildlife areas, designated for sensitive resource management, or generally unsuited for development.

The Land Plan EIS (TVA, 2000) indicated that the reservoir areas of greatest scenic value are those not yet developed and those that are predominant views of homeowners. In locations where both conditions occur together, the land has the highest level of visual sensitivity. Loss of the undisturbed scenic character in these areas would result in the greatest visual impact, since the alterations would be seen year round from residential

viewsheds for years to come. Preservation of undisturbed reservoir lands and their scenic natural character were among the most frequently expressed public concerns during the Management Plan's environmental review and those that have followed, including the current proposal.

A majority of the TRDA residential land has been or is being developed, while a much smaller part of the industrial land has been developed. As the TRDA property becomes fully developed nearly all of those reservoir lands would be substantially altered. The result would be a loss of the attractive natural character and scenic value, which would contribute to the cumulative impact on visual resources.

TVA retained land for resource management and conservation along much of the east bank and some areas upstream from the U.S. Highway 411 Bridge. The scenic natural character of that shoreline property remains undisturbed. If any proposals were approved on these reaches of shoreline, they would likely reduce the scenic value of those parcels and further impact the overall visual character of the reservoir landscape.

The residential viewshed of Tellico Village below the U.S. Highway 411 Bridge includes about 1,380 acres of TVA land along 8 miles of the east bank, as well as the 216-acre TRDA tract. Development of this tract is continuing and the scenic natural character will be lost. Alternatives B and E of the current proposal would increase the loss by 50 percent, amounting to about 8.3 percent of the TVA land in this viewshed. The loss would be somewhat less with Alternative C and minimal with Alternatives A and D. Any additional loss of TVA lands for development would add to this cumulative visual impact.

Upstream, the final development of TRDA lands will alter about half viewshed seen from Rarity Bay and Foothills Point developments which will also contribute visual impacts. The viewshed of Tellico Village upstream of the U.S. Highway 411 Bridge includes relatively narrow parcels of TVA shoreline land. Development of the privately owned back-lying property would add to cumulative impacts seen in the reservoir landscape

Much of the private back-lying property is at elevations 40-100 feet higher than TVA's reservoir land. Further visual impacts could result from potential lake-view residential or commercial development along these ridges. The undisturbed woodland skyline may be replaced with a variety of discordant features, resulting in a loss of scenic visual resources and attractive natural character. The alterations could impact both year round residential viewsheds and seasonal views from the water, depending on the location. Potentially the total cumulative impact to visual resources would be the sizeable loss of a part of the undisturbed, naturally attractive reservoir landscape seen in residential viewsheds.

4.9. Socioeconomics

Alternative A - No Action

Under the no action alternative, TVA would not change the existing land management plan, approve plans for a marina, or allow the par-3 golf course on TVA public land. However, Rarity Communities plans to continue the construction and operation of a golf course, related facilities, lodge, and residential construction on the land it already owns including the former TRDA property. Acreage limitations would prevent laying out a "championship" golf course, and with less land for residential development, Rarity Communities proposes to generate required revenue by decreasing lot sizes and/or building high-rise condominiums (i.e., constructing more, lower value units).

The socioeconomic impacts of the no action alternative can be described most easily in terms of variations from the full-scale impacts associated with Alternative B (Applicant's Proposal). It is conceivable that the golf course would get less play than Alternative B because a non-championship course would be built under Alternative A, and any income generated by a tournament (requiring a championship course) would be lost. However, there is no practical way to quantify these impacts. The absence of a marina could have an adverse impact on the sale of homes to those who desire a place for a boat, but, again, this is difficult to quantify. The proposal to build more but lower value residential units is aimed at generating comparable revenue; hence, there is reason to think that the total value of residential property may not differ appreciably between Alternatives A and B, and, as a result, residential property tax revenues may be comparable under Alternatives A and B. If, in fact, a greater number of residential units (of lower average value) are constructed, this would contribute to a somewhat larger population increase.

Other differential impacts vis-à-vis Alternative B would be slightly less construction and operational employment and income in the absence of the par 3 golf course and marina. The applicant estimates that 9 fewer construction jobs would be created (over 2 years) without the par 3 golf course, and 38 fewer jobs (over 3 years) without the marina. Together this represents a maximum reduction in projected construction employment of 7 percent (over 2 years). In addition, 4 fewer employees would be needed once the golf facilities were operational, and the absence of a par three golf course would reduce the value of the golf facilities by about 7 percent or \$0.5 million, which would reduce county property tax revenues by about 3,600 dollars per year.

Therefore under Alternative A, the beneficial socioeconomic impacts (increased tax revenues and jobs) would continue as long as Rarity Communities continued the project on private lands, although slightly less than other alternatives.

Alternative B - Applicant's Proposal

Under the applicant's proposal, TVA would sell Rarity Communities approximately 118 acres, permit construction of a marina, and allow construction of a par-3 golf course on TVA land. The land purchased from TVA would enable the applicant to construct a championship golf course and allow for less dense construction of residential units, with higher average values.

Employment - Construction employment would include those involved in building the golf courses, marina, and lodge, along with those involved in the construction of homes and condominiums. Most of the workforce likely would be drawn from existing residents of Loudon and surrounding counties. With few workers moving into the area, the impact on the local economy and on community and government services would be minimized. Construction of the golf courses would be completed in 2004, the lodge in 2005, and the marina in 2006. All additional construction, excluding residential units would be completed by 2008. Construction of 1,200 homes and condominiums would begin in 2004 and continue through 2013, with peak annual construction of 144 units from 2007-2010, according to applicant projections.

Construction employment (excluding residential units) would average 142 annually over seven years, attaining a peak of 236 in 2005, according to applicant projections. Residential construction would employ an average of 503 annually over ten years, with a peak of 604 sustained over four years. (The impact of residential construction described here does not take account of any reductions in construction that might occur in nearby Tellico Lake

developments as a result of the proposed development. Quantifying the net impact on the area would be very difficult and would involve substantial speculation.)

Total average annual employment of 645 would represent 4.1 percent of current employment for Loudon County, or 0.1 percent of labor market area employment. This number of jobs could contribute to a modest decline in the unemployment rate for Loudon and surrounding counties.

Operational employment at the golf courses and lodge would reach 66 by 2006 and remain at that level, according to applicant projections. 66 permanent jobs would represent 0.4 percent of current Loudon County employment. A small number of additional jobs would be associated with the marina office and floating restaurant.

In addition to the direct employment described above, additional (indirect and induced) jobs would be created as a result of spending by those directly employed on the project. The applicant has assumed that an additional 20 percent would be employed in the area as a result of this multiplier effect. This estimate is reasonable, although the multiplier effect from temporary construction jobs would also be temporary.

Income – Annual income for construction workers, excluding residential construction workers, would vary from 3.3 million to 7.0 million dollars over seven years, averaging 4.2 million dollars, according to applicant projections. Income for residential construction workers would vary from 5.8 million to 20.7 million dollars over ten years, averaging 16.6 million dollars. Together, these sources of income would boost (current) Loudon County personal income by about two percent annually on average. Operational income for golf course and lodge workers would average 1.7 million dollars annually. A small amount of additional income would be earned by marina office and restaurant workers.

As with employment, income directly generated by the project would generate additional income through a multiplier effect, as the initially generated income is spent in the area. The assumption of an additional 20 percent income is, again, reasonable.

The overall impact of income generated by construction and ongoing operations would not be very large across Loudon County and far less so across the LMA and the majority of the impact would cease with the completion of construction.

Population - There would be very little impact on the population of the area from construction given that most of the workers would come from those already living in the area. Proximity to a large labor market ensures this, and any population increase due to construction workers could be only temporary.

Operational employees required at the golf course and related facilities would also likely be drawn from existing residents of the labor market area. Even if 66 permanent employees moved into Loudon County, that would amount to only 0.2 percent of county population which is insignificant.

Of 1,200 projected housing units, just over half would be occupied by permanent residents. The others would be rental units. With very few children living in similar Tellico Lake developments, an estimate of 2 persons occupying each house is reasonable. This would lead to a population increase of just over 1,200 (permanent residents), once development is completed, representing a population increase of about 3 percent for Loudon County.

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Tax Revenue - Loudon County property tax revenues would be generated by the golf courses, lodge, marina, and residential units. The applicant estimates the total market value of the commercial properties upon completion at 18.5 million dollars. This would generate approximately 133 thousand dollars in property tax revenue annually. The average value of the 1,200 proposed residential units (condominiums and single-family homes) is projected by the applicant to be 406,666 dollars. This would generate 2.2 million dollars in annual property tax revenue for Loudon County.

Additional county and state tax revenues would come from sales at the golf course, lodge, and marina. A lack of sales volume projections precludes estimating these taxes

Still additional sales tax revenues would be generated by purchases made by new homeowners and any employees who locate to the area. With a possible population increase of 3 percent, additional sales tax revenues of 3 percent would be a reasonable assumption.

In 2000, Loudon County spent an average of 1,105 dollars per capita on county services. So the county could be expected to spend at least 1.3 million dollars on the 1,200 permanent Rarity Pointe residents. A precise estimate for county costs or benefits is difficult, as Loudon County would receive more from these residents and visitors as a result of increased sales tax revenues than the 2.2 million dollars in property taxes, and the Rarity Pointe residents may be more costly to serve than the average Loudon County resident. However, it is unlikely that the county will incur costs in excess of tax revenues generated by the new residents.

Overall, under Alternative B, socioeconomic benefits (increased tax revenues and jobs) from the entire project would accrue to Loudon County and the LMA, with TVA actions providing a small increment to total benefits. These would be offset to some degree by the cost of public services and infrastructure.

Alternative C - Partial Land Sale with Mitigation

This alternative would allow for construction of the par-3 golf course and marina, and sale of enough TVA land (about 49 acres) to build the championship golf course, but none for (additional) residential developmental. As with Alternative A, Alternative C would result in higher density, lower value residential construction on land already owned by the applicant, with the intent of generating revenue comparable to that under the applicant's proposal (Alternative B). On this count, the impacts of this alternative are likely to be similar to those of Alternative B.

This alternative also involves a land exchange, whereby TVA, in exchange for 49 acres it would agree to sell, would receive approximately 60 acres within the Wildcat Rock Site at the Loudon County-Monroe County line. This land is currently zoned industrial, but TVA would designate it for conservation to make up for the loss of 49 acres to development. If this land were well suited to industrial development, then TVA's acquisition and designation change could ultimately mean less industrial development within Loudon County. These 60 acres are located close to a major highway, rail, water, and a water treatment plant; however, the topography of the land is not ideally suited to industrial development. About half of the 60 acres are probably too steep for development, which leaves only a long narrow strip (ranging from perhaps 300-700 feet wide) for potential industrial sites. The Tennessee Valley Industrial Development Association currently lists, as available, 2,430 acres of industrial sites in Loudon County, and 1,911 acres in Monroe County. Hence, the

loss of perhaps 30 acres is unlikely to affect industrial development adversely in Loudon County.

Under Alternative C, socioeconomic benefits (increased tax revenues and jobs) from the entire project would accrue to Loudon County and the LMA, with TVA actions providing a small increment to total benefits. These would be offset to some degree by the cost of public services and infrastructure. Overall, the impact would be a slightly greater than Alternative A and perhaps a slightly less than Alternative B if residential development falls slightly short of Alternative B.

Alternative D – Small Golf Course and Marina with No Land Sale

This alternative would differ from the no action alternative only in allowing the construction of the marina and a par-3 golf course on TVA land. This would mean an additional 9 golf construction jobs for 2 years and 38 marina construction jobs for 3 years vis-à-vis the no action alternative, along with an additional 4 operational golf course employees. Moreover, county property tax revenues would increase by approximately \$3,600 per year as a result of the par-3 golf course. In addition, the availability of a marina would enhance the marketability of homes in the development, although this would be difficult to quantify.

Under Alternative D, socioeconomic benefits (increased tax revenues and jobs) from the entire project would accrue to Loudon County and the LMA, with TVA actions providing a small increment to total benefits. These would be offset to some degree by the cost of public services and infrastructure. Overall, the impact would be a slightly greater than Alternative A and slightly less than Alternative B and C.

Alternative E- Applicant's Proposal with Mitigation

This alternative is essentially Alternative B (Applicant's Proposal) with mitigation for the loss of public lands, terrestrial habitat, public recreation, and for adverse environmental impacts. The mitigation proposed involves the transfer of approximately 256 acres at the Wildcat Rock Site to TVA, whereupon its industrial designation would be changed to conservation. This tract of land includes the 60 acres proposed for exchange under Alternative C. However, the 256 acres includes very little land suitable for industrial development over what is included in the 60-acre tract already discussed. An optimistic assessment of all 256 acres puts the total at 50 acres of marginal industrial land. The loss of 50 acres of potential industrial land would have little impact on Loudon County in the foreseeable future, given the availability of at least 2,430 acres of industrial sites.

Overall, under Alternative E, the socioeconomic impacts would be identical to Alternative B.

The question of cumulative impacts is the question of whether the full impact of TVA actions presently under consideration would exceed the incremental impacts described here. A socioeconomic threshold exists at the point where existing or incremental additions to infrastructure are inadequate to serve a given population. Crossing such a threshold could require a major public investment in the form of a new water treatment plant, school, library, highway, etc. This would generate cumulative impacts greater than the incremental impacts described here. As suggested in the above analysis of alternatives, none of the proposed actions by TVA are likely to contribute significant socioeconomic impacts above and beyond those created by the applicant's actions (which will occur regardless of TVA's actions). For this reason, none of the alternative TVA actions would generate additional cumulative impacts. It is more difficult to say whether the unilateral actions of Rarity Communities would contribute to cumulative impacts in crossing a socioeconomic threshold. However,

the fact that the zoning for the land already owned by Rarity Communities is consistent with the proposed development suggests that local government believes it can adequately serve the development.

There will be a temporary increase in the amount of traffic on Antioch Church Road. The Applicant estimates that construction traffic will peak at 198 trips per day by December 2003 as more houses and facilities are developed. This temporary increase in traffic will be noticeable to local residents until a new entrance to the Applicant's development from U.S. Highway 321 is completed in 2004. The additional construction traffic is not expected to affect the service level of U.S. Highway 321.

Environmental Justice

TVA is not subject to Executive Order No. 12898 but addresses the requirements of this order as a matter of policy. The action proposed by Rarity Communities would constitute a significant physical alteration to the area. However, the impacts of construction and any adverse operational environmental or health impacts would not disproportionately affect minorities or low-income populations. The Loudon County minority population (4.8 percent) is well below that of the surrounding (labor market area) counties (9.5 percent), and the state (20.8 percent). The poverty rate for Loudon County (10.0) is similarly below that of the surrounding area (12.5) and the state (13.5). The minority population and low income populations for the census tract containing the proposed project are 2.4 and 7.3 percent respectively, both lower even than Loudon County. The situation is the same for the census tract immediately across the lake from the proposed project.

4.10. Air Quality

Pollution from fossil-fuel combustion in construction equipment, fugitive dust emissions from operation of this equipment during dry conditions, and increased traffic during construction would cause some minor and temporary air quality degradation in the development locality. However, state air pollution rules require construction projects to use reasonable precautions to prevent fugitive dust emissions. After construction is completed, normal commercial, residential, and rental area activities, such as use of wood stoves, fireplaces, gas-powered lawnmowers, and increased traffic from new residents, second-home residents, rental visitors, tourists, and commercial vehicles would contribute somewhat to deterioration in local air quality. Significant contribution to deterioration of regional air quality is not expected.

Emissions of air pollutants including nitrogen oxides and volatile organic compounds involved in ozone formation would occur with all of the alternatives. Alternative B, the applicant's proposal alternative, would have the greatest impact, but this impact would not be significant under regulatory criteria. However, the development and its residents would be expected to be subject to whatever 8-hour ozone standard attainment strategies are developed for the Knoxville MSA under the EPA Early Action Compact. These may include such actions as vehicle performance testing and inspections, car-pooling, and curtailment or scheduling of lawn mowing during periods of high ozone concentrations. The least impact will be associated with Alternative A, the No Action Alternative, but this alternative would also have the same types of emissions of air pollutants because Rarity Communities will proceed with development tailored to the property under its control. This alternative and the remaining alternatives would also be subject to ozone attainment strategies that are implemented to comply with the Early Action Compact. The relative ranking of these

alternatives, from most to least impact on local air quality, is the following: Alternative B, Alternative E, Alternative C, Alternative D, and Alternative A.

4.11. Unavoidable Adverse Effects

Unavoidable adverse effects of Alternatives B, C, D, and E could include the destruction of terrestrial vegetation within construction areas, some additional vehicle traffic and minor impact to local infrastructure. Appearance on Jackson Bend would change from forested hills and shoreline to residential with buildings, yards, roads, and golf courses and marina. The impacts by the development of private project lands would occur with or without TVA's approval of the proposal, although they may cover less area and/or be more concentrated.

4.12. Relationship of Short-Term Uses and Long-Term Productivity

Given current trends, it is unlikely that any private land on Tellico Reservoir would remain undeveloped over the long term. Disposition and commitment of the TVA lands and shoreline to residential and commercial recreation development is a long-term decision that would decrease the productivity of the land for forest, wildlife, recreational, agriculture, and natural area management while increasing the economic productivity of the land. As a matter of course, the long-term productivity of the land for terrestrial habitat in the form of a mature hardwood forest would be lost once it is transferred from public to private ownership.

4.13. Irreversible and Irretrievable Commitments of Resources

Fossil fuels and materials used for construct equipment and transportation of materials and personnel while developing the site would likely be irreversible or irretrievable. Forested and open space land would likely be irreversibly converted to commercial recreational and residential land uses in the immediate project area.

4.14. Energy Resources and Conservation Potential

Energy would be used by machines for fuel to maintain houses, buildings, lawns, roads, other service or recreation infrastructure, and at least one full sized golf course under all alternatives. There would also be short-term energy uses required for the construction and establishment of the residences, facilities, and infrastructure in all the alternatives. Alternative E, where the applicant's proposal is implemented with the designation of new public land available for public recreation, would have the greatest energy demand, followed in order by Alternatives B, C, D, and A. Alternatives A and D would tend to conserve energy as development on private lands would be more compact under Alternative D and no par-3 golf course or marina would occur in Alternative A. A commitment to use fully shielded light fixtures or those with internal low-glare optics (so no light is emitted from the fixture at angles above the horizontal) would reduce upward light and wasted energy at least 35 percent and help minimize potential lighting impacts.

4.15. Proposed Mitigation Measures

The following environmental safeguards will be considered by TVA in its decision should an action alternative be selected:

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1. A vegetated buffer zone of at least 50 feet will be maintained along the shoreline from the summer pool level and around the periphery of Parcels 8 and 9 land transferred by TVA in order to maintain continuity on the site, and reduce the impacts to water quality and wetlands. (Alternatives B, C and E).
2. In order to minimize the impacts to water quality and avoid wildlife exposure to pesticides, Rarity Communities will utilize golf course management practices included in Tennessee Department of Agriculture guidelines and approved by TVA or certification of the golf courses by Audubon or similar organizations which would reduce the environmental impacts and provide a method of tracking compliance. The site administrators will handle and administer any pesticides used on the site in a responsible manner and in accordance with state and federal laws in order to avoid pesticide exposure to wildlife (Alternatives C and E).
3. Rarity Communities will replace forested wildlife habitat and recreation land lost from the development of Parcels 8 and 9 through a land exchange at the Wildcat Rock site as described in Alternatives C or E if either of these alternatives are selected. TVA and/or TRDA will maintain the acquired parcel for long-term protection and public use. (Alternatives C and E).
4. Dead trees and mature trees greater than 14 inches in diameter will not be harvested on the project area, especially oak and hickories with loose, shaggy bark, until Indiana bats are not likely to be present (October 15 – March 31) (Alternatives C, D, E).
5. Fully shielded light fixtures or those with internal low-glare optics (so no light is emitted from the fixture at angles above the horizontal) will be used in the development (Alternatives C, D, and E).
6. The following commitments are required for the dredge. (Alternatives B, C, D, and E):
 - A. Testing of the sediment from the dredge would be required for chlordane and PCBs. The level of contamination found (if any) would determine how the spoil would be handled.
 - B. Material to be dredged will be tested for toxic materials (PCBs and Chlordane) before dredging commences. If toxic materials are detected, dredging plans will be evaluated in light of the extent and level of those contaminants at the site. Dredging will not proceed without a dredging plan that guarantees that no toxic material will be released to the environment.
 - C. Silt curtains must be placed around the perimeter of the dredge area, so as to not allow silt laden water outside the work area.
 - D. All saturated spoil will be dewatered using berms, straw bales silt fencing, or other silt control devices positioned in such a way as to not allow silt-laden water to re-enter the reservoir. The method of dewatering must be approved by TVA.

- E. All dredged material must be removed to an upland site (above 820-foot elevation) and contained in a manner to prevent its return to any waterbody or wetland, and permanently stabilized to prevent erosion.
7. Rarity Communities will mitigate impacts to wetlands (W4 and W5) by implementing the wetland mitigation plan in Appendix C. (Alternatives B, C, D, and E).
8. The indicated conditions of TVA's General and Standard Conditions for Section 26a and Land Use approvals will be implemented. These include the reduction of impacts related to soil and chemical runoff will be reduced to insignificant levels with implementation of Best Management Practices by Rarity Communities and residents to control soil erosion, and to limit chemical runoff. See Appendix G. (Alternatives C, D, and E)
9. To minimize pollutant loading and prevent spilling fuel or wastewater any fuel storage or dispensing facility will comply with TVA Resource Stewardship (TVARS) Guidelines for Storage Tanks (4.5.5), including the preparation and implementation of a Spill Prevention and Control Plan. A Marina Sewage Pump out station will be installed and operated according to TVARS Guidelines 4.5.3, and the marina will comply with TVARS Guidelines for Discharges (4.5.1) (See Appendix F). (Alternatives C, D, E)
10. Rarity Communities will provide a right-of-way trail for vehicle access to Parcel 9, and provide 60 acres of the Wildcat Rock property to TVA (Alternative C).
11. Rarity Communities will construct a trail terminal on TVA Parcel 6, consisting of a paved access road, paved parking lot for 18 vehicles, walks, 6 picnic sites, and restroom in accordance with TVA design specifications, and permit public ingress/egress across Rarity Pointe property to access the proposed greenway trail system on TVA's adjoining upstream and downstream property. (Alternative E)
12. Rarity Communities will provide 256 acres of the Wildcat Rock property to TVA (Alternative E)
13. The deed for land transferred by TVA will state that no residential access for personal water use facilities will be considered anytime in the future by TVA.(Alternatives B, C, and E)
14. To prevent an increase in future flood damages, the following routine commitments, would be included in the final Section 26a permit and land use approval (Alternatives B, C, D, and E):
 - A. The applicant will securely anchor all floating facilities to prevent them from floating free during major floods
 - B. Any future facilities or equipment subject to flood damage would be located above the TVA Flood Risk Profile elevation of 817.0 feet MSL
 - C. Any future development proposed within the limits of the 100-year floodplain, elevation 816.2 feet MSL, would be consistent with the requirements of EO 11988

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- D. All future development would be consistent with the requirements of TVA's Flood Control Storage Loss Guideline.
15. TVA Cultural Resources will review the proposed dredge site area during low winter pool, prior to any disturbance, to verify the previous archeological survey.
(Alternatives B, C, D, and E)