Document Type: EIS-Administrative Records
Index Field: Final Environmental Document
Project Name: Mountain Reservoirs Land Management Plan
Project Number: 2006-1

FINAL ENVIRONMENTAL IMPACT STATEMENT
VOLUME 1

MOUNTAIN RESERVOIRS LAND MANAGEMENT PLAN

Chatuge, Hiwassee, Blue Ridge, Nottely, Ocoees 1, 2, and 3, Apalachia, and Fontana Reservoirs
Georgia, North Carolina, and Tennessee

PREPARED BY:
TENNESSEE VALLEY AUTHORITY

JULY 2009

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Final Environmental Impact Statement **July 2009**

Proposed project: Mountain Reservoirs Land Management Plan
Chatuge, Hiwassee, Blue Ridge, Nottely, Ocoees 1, 2, and 3, Apalachia, and Fontana reservoirs
Fannin, Towns, and Union Counties, Georgia; Cherokee, Clay, Graham, and Swain Counties, North Carolina; and Polk County, Tennessee

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Abstract: Tennessee Valley Authority (TVA) proposes to develop a plan for managing a total of 6,220 acres of land on nine mountain reservoirs on tributaries to the Tennessee River. The nine reservoirs are Chatuge, Hiwassee, Blue Ridge, Nottely, Ocoees 1, 2, and 3, Apalachia, and Fontana and are located in northeast Georgia, southwest North Carolina, and southeast Tennessee. The proposed land plan would guide the use of the lands by allocating them into one of the following zones: Project Operations, Sensitive Resource Management, Natural Resource Conservation, Industrial, Developed Recreation, and Shoreline Access.

Three alternatives were considered in the Draft EIS: the No Action Alternative, under which TVA would not adopt a new land management plan, and two action alternatives under which TVA reservoir shorelands would be categorized and assigned into one of six land allocation zones. Under the Proposed Land Use Plan Alternative, the zone allocations would be consistent with existing land uses. Under the Proposed Modified Land Use Plan Alternative, six tracts totaling 105.6 acres would be allocated to more development-oriented uses (i.e., Developed Recreation and Industrial) than under the Proposed Land Use Plan Alternative. A third action alternative, the Blended Alternative, was developed in the Final EIS. This alternative was a blend of the two action alternatives in that only two parcels (one on Chatuge and one on Hiwassee) of the six parcels considered for reallocation under the Proposed Modified Land Use Plan Alternative would be allocated for possible development (i.e., Developed Recreation). Under all alternatives, the allocations of TVA lands committed through land use agreements with other parties would not change. The preferred alternative is Alternative D, the Blended Alternative.

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SUMMARY

PURPOSE OF AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) manages its lands to protect the integrated operation of the TVA reservoir and power systems, to provide for appropriate public use and enjoyment of the reservoir system, and to provide for continuing economic growth in the Tennessee Valley. As part of the implementation of these goals, TVA develops comprehensive plans for the management of lands associated with its reservoir projects. TVA is developing the *Mountain Reservoirs Land Management Plan* (MRLMP) to guide the management of its lands on the following reservoirs: Chatuge, Hiwassee, Blue Ridge, Nottely, Ocoees 1, 2, and 3, Apalachia, and Fontana. All public lands under TVA management on these nine reservoirs, a total of approximately 6,220 acres, are included in this planning process. About three-fourths of this land area was previously planned under the Forecast System adopted in the 1960s. The remaining lands have never been planned.

TVA has prepared this environmental impact statement (EIS) to assess the impacts of implementing the MRLMP. Alternative approaches to allocating the TVA lands to various land use categories are analyzed in this EIS. Throughout the planning process, TVA has sought public input to identify public use patterns, define alternative uses, and define issues and concerns associated with the TVA lands. These topics are addressed in the development and analysis of the various alternatives and include concerns such as the conservation of natural resources and enhancement of recreation opportunities.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

TVA has identified the following four alternatives for analysis and comparison in this EIS:

1. The No Action/Forecast System Alternative (Alternative A), under which TVA would continue to use the existing Forecast System to manage 4,611 acres of its mountain reservoir lands

2. The Proposed Land Use Plan Alternative (Alternative B), under which TVA would allocate its reservoir lands to facilitate their management and to be more consistent with their existing uses

3. The Proposed Modified Land Use Plan Alternative (Alternative C), which differs from Alternative B by including consideration of some of the land use requests submitted to TVA during the public scoping process

4. The Blended Alternative (Alternative D), which was developed in response to public input on the draft EIS and additional site suitability considerations. This alternative is a combination of Alternatives B and C.

Under the three action alternatives, i.e., Alternatives B, C, and D, TVA would allocate each parcel to one of six land use zones. A seventh zone, (Zone 1) is used to designate non-TVA shoreline. Allocations are not made to Zone 1. Under the No Action Alternative (Alternative A), these allocations would be equivalent to the existing Forecast System designation for each parcel. Under all alternatives, a parcel's allocation would guide how that parcel would be used or managed in the future. Specifically, the allocation for a parcel would determine the appropriateness of proposals for land use or management on that

parcel, including requests from outside TVA. Land use proposals inconsistent with the allocation of a parcel would be inappropriate and would not merit further consideration by TVA.

Under each of the alternatives, TVA would conduct a site-specific environmental review of proposed development or activity on TVA-managed shoreline property, provided the proposed action is consistent with the parcel allocation. This environmental review would be used to determine the significance of potential environmental effects of the actions. Such environmental reviews would be completed prior to the approval or denial of any proposed development or activity on public land managed by TVA.

No Action/Forecast System Alternative (Alternative A) - Under Alternative A, TVA would continue to use the Forecast System designations established by TVA in 1965 and applied to 4,611 acres (approximately 74 percent) of the mountain reservoir lands. Before 1979, when TVA began the comprehensive planning of its reservoir lands in a public forum, the Forecast System was used to guide land use decisions on most TVA reservoir lands. Under Alternative A, the approximately 1,630 acres of TVA mountain reservoirs lands unplanned under the Forecast System, including all TVA lands on Fontana Reservoir, would continue to be managed according to existing land use agreements and TVA's Shoreline Management Policy and Land Policy. However, the unplanned parcels are not allocated to current land use zones; therefore, complete alignment with existing policies would not occur.

Proposed Land Use Plan Alternative (Alternative B) - TVA's recent comprehensive reservoir land planning efforts allocate land to the following seven land use zones: Non-TVA Shoreland (Zone 1), Project Operations (Zone 2), Sensitive Resource Management (Zone 3), Natural Resource Conservation (Zone 4), Industrial (Zone 5), Developed Recreation (Zone 6), and Shoreline Access (Zone 7). Under Alternative B, TVA would adopt a new land management plan based on the current reservoir land planning process and zone allocation definitions to guide land use decisions over the next decade. Implementation of Alternative B would involve the lands previously planned under the Forecast System as well as the remaining TVA lands not previously planned. The allocations for the 230 previously unplanned parcels would reflect existing land uses. The vast majority of these parcels are committed due to land use agreements or deeded rights, and therefore, they are not subject to potential changes in land use.

Proposed Modified Land Use Plan Alternative (Alternative C) - The allocations under Alternative C are the same as those under Alternative B for 354 (of 360) parcels containing approximately 6,115 (of 6,220) acres. Alternative C differs from Alternative B in that additional lands would be allocated for Developed Recreation (Zone 6) and Industrial (Zone 5) uses on Chatuge and Hiwassee reservoirs under Alternative C. These allocations, developed in response to proposals received during the scoping process, affect 101.6 acres on four parcels on Chatuge Reservoir and 4.0 acres on two parcels on Hiwassee Reservoir. The four parcels on Chatuge (i.e., Parcels 10, 52, 52a, and 77) are allocated under Alternative B to Zone 4 (Natural Resource Conservation). Under Alternative C, the 27.2-acre Parcel 10 would be allocated to Zone 5 (Industrial), while Parcel 52 (6.1 acres), 52a (1.9 acres), and Parcel 77 (66.4 acres) would be allocated to Zone 6 (Developed Recreation). On Hiwassee Reservoir, Parcel 34 (2.4 acres) and Parcel 49 (1.6 acres), which are both allocated under Alternative B to Zone 4, would be allocated for Developed Recreation (Zone 6). The Alternative C allocations are the same as the Alternative B

allocations for shoreline parcels on Blue Ridge, Nottely, the Ocoees, Apalachia, and Fontana reservoirs.

Blended Alternative (Alternative D) - As the name implies, allocations under this alternative are a combination those under Alternatives B and C. Under this alternative, there would be no parcels allocated for industrial use (Zone 5). Parcels 10, 52a, and 77 on Chatuge Reservoir would be allocated to Zone 4, which is consistent with their current use and their allocation under Alternative B. However, Chatuge Parcel 52 would be allocated to Zone 6 for developed recreational use, as it would be under Alternative C. On Hiwassee Reservoir, Parcel 34 would be allocated to Zone 4, which is consistent with its current use, but Parcel 49 would be allocated to Zone 6, as it is under Alternative C. The allocation of all other parcels under the Blended Alternative would be the same as under Alternative B.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Land Use

Affected Environment - Existing land use patterns along the shoreline and back-lying land have been influenced by whether TVA acquired the land and whether TVA has subsequently sold, transferred, or retained the land. TVA originally acquired 104,837 acres of land above the full summer pool elevation on the nine mountain reservoirs. About 91 percent (95,482 acres) of this land has been transferred to other federal and state agencies for public use. Approximately 3,133 acres (3 percent) of the originally acquired land was sold for private uses. Approximately 20 acres were acquired for power assets (substations, etc.) subsequent to original project land acquisition and are not included in the acquisition total.

TVA retained a total 6,220 acres on the nine mountain reservoirs. Many of the parcels have existing land use agreements that commit them to a specific use. The majority of the land use agreements are for utilities, highways, and other public infrastructure. The acreage subject to these agreements is relatively small due to the narrow linear nature of many of the uses.

Most of the residential development along the reservoirs occurs on land TVA sold or on private land where TVA only acquired the right to flood to a certain elevation. The proportion of shoreline available for residential development varies greatly by reservoir and ranges from 57 percent on Chatuge Reservoir to none on Apalachia Reservoir. The proportion of this residential shore land that has already been developed also varies greatly and ranges from 44 percent on Nottely Reservoir to all of the available residential shore lands on the Ocoees, Hiwassee, and Apalachia. TVA's Land Policy does not allow additional land to be provided for residential use, and therefore, the amount of shoreline available for residential use will not change because of the land planning process.

Prime farmland totaling approximately six acres occurs on Parcel 52 on Chatuge Reservoir. A change in use for this acreage is proposed under Alternative C.

Environmental Consequences - Under all of the alternatives, no significant direct or indirect impacts to land use are anticipated. The amount of shoreline available for private residential water use facility development is based primarily on deeded access rights and land ownership patterns and would not change under any of the alternatives. The existing trends of increasing residential development in areas of the reservoir currently available for

development are more related to broad socioeconomic trends and would be unaffected by selection of any of the land plan alternatives.

Adoption of either Alternative A or B would not result in any parcels changing from an undeveloped land use to a developed use. Unplanned parcels are primarily committed to the existing use by transfer agreement covenants, deeded rights, or TVA land use agreements, and therefore, the land use of the unplanned committed parcels also would not change.

Implementation of Alternative C would result in changing five parcels (105.4 acres) from an undeveloped land use to a developed land use; however, at a minimum, only localized changes to land use patterns would result. When compared to the total scope of the MRLMP, these potential land use changes would be insignificant. Under Alternative C, impacts to prime farmlands are expected to be minimal due to surrounding land usage, urban buildup, and compatibility with existing agricultural use in the area.

Adoption and implementation of Alternative D would result in the change in land use of the 6.1-acre Parcel 52 on Chatuge Reservoir and the 1.6-acre Parcel 49 on Hiwassee. Both parcels are currently being used for natural resource conservation, and both would be allocated to Zone 6 for possible use for developed recreation under Alternative D. Due to the localized nature of the changes and the small amount of acreage involved, potential changes in land use would be minor and insignificant.

Recreation

Affected Environment - A recreation analysis was completed with the two primary objectives being to (1) identify recreation needs on the nine mountain reservoirs and (2) identify specific parcels on the mountain reservoirs suitable for and capable of meeting unmet recreation needs. High-priority recreation needs were determined by analyzing the National Survey on Recreation and the Environment (NSRE 1999-2005) demand data and the comments received from the public during the scoping period. This information was then compared to existing recreation facilities on each reservoir. The comparison between recreation needs and existing facilities determined that most recreational needs could be met with expansion of facilities in existing developed recreation areas or enhancements to areas being currently utilized for dispersed recreation. Development of new facilities to support unmet needs identified on some reservoirs for stream access, reservoir access, and trails would be accomplished through partnerships with other public agencies or entities to meet projected recreation demands.

Shoreline development and boating density were analyzed to determine how trends in shoreline development might affect future boating density and thus capacity issues. No areas of concern regarding boating density were identified.

Environmental Consequences - Under Alternative A, potential environmental impacts to recreation would be insignificant, as there would be no change in the use of lands presently used for recreation. Any future development of new recreation facilities would be limited to lands already forecast for this use.

Under Alternative B, all parcels that are currently committed to a Developed Recreation use would be allocated to Zone 6. These commitments include transfer agreement covenants and TVA licenses, leases, and easements. The parcels allocated to Zone 6 would include those previously allocated under Alternative A to Public Recreation as well as those parcels

allocated to Reservoir Operations that have been utilized for Developed Recreation. In addition, the unplanned parcels under Alternative A that are committed to a Developed Recreation use would be allocated to Zone 6. Any future demand for developed recreational needs would be met by expansion of recreation facilities in these existing areas, and these areas are the same under Alternative B as under Alternative A. Therefore, the potential environmental impacts would be the same. Potential impacts under Alternative B to dispersed recreation are expected to be insignificant.

Potential impacts to recreation under Alternative C would be identical to those expected under Alternative B with the exception of six parcels, four of which would be allocated for Developed Recreation (two additional parcels on Hiwassee Reservoir and two additional parcels on Chatuge Reservoir). Allocation of these parcels to Zone 6 would shift the existing dispersed recreational use to recreational activities on these parcels associated with developed recreational facilities, which could result in the elimination of dispersed recreational activities. However, these additional facilities would provide greater recreational opportunity on Chatuge and Hiwassee reservoirs. Under Alternative C, a fifth parcel (Parcel 10 on Chatuge Reservoir) would be allocated to Zone 5 (Industrial). The dispersed recreation opportunities currently available on the parcel could continue as an interim use; however, industrial development on Parcel 10 would likely eliminate those opportunities. Elimination of the dispersed recreational opportunity would be regionally insignificant due to the availability of other forest areas for similar activities.

Potential recreation-related effects under Alternative D would be similar to those anticipated under Alternative B. As with Alternative B, dispersed recreation would remain available on three parcels (Chatuge Parcels 10 and 77 and Hiwassee Parcel 34). Dispersed recreation would continue to occur on Chatuge Parcel 52 and Hiwassee Parcel 49 until new proposals for developed recreation are reviewed and approved by TVA and facilities are subsequently constructed. Recreational opportunities would be enhanced if developed recreational facilities were placed on Parcels 52 and 49.

Terrestrial Ecology

Affected Environment - The mountain reservoirs are in a heavily forested, biologically diverse region, and the major vegetative classes on and around the mountain reservoir lands are evergreen forest, evergreen-deciduous forest, deciduous forest, shrub lands, and herbaceous vegetation. A few areas of old-growth occur on the lands being planned, and invasive plants are present on several parcels.

Several forest types occur on TVA lands although the diversity of forest types on these lands is somewhat limited due to the relatively low elevation of the TVA lands. Many of the TVA lands consist of narrow strips or small blocks of forest, and many of the narrow strips are adjacent to larger contiguous blocks of forest owned by other federal and state agencies. These large forest blocks provide important habitat for area-sensitive wildlife species that favor interior woodland habitats.

Pasturelands and other early successional habitats are common around some reservoirs, notably Nottely and Chatuge reservoirs. All of the mountain reservoirs provide open water habitats and associated riparian zones that are used by a variety of wildlife. This open water habitat, however, is very limited on several of the reservoirs especially during the winter, and consequently, waterfowl numbers are relatively low. Shorebird use of the mountain reservoirs is limited, as most reservoirs have steep, rocky banks that provide few mud flat foraging areas.

Environmental Consequences - Under Alternatives A and B, there would be minor changes in the current land uses; thus, there would be insignificant effects on plant and wildlife communities. Without widespread action, invasive species would continue to proliferate, which would result in a decrease in forest productivity, forest use, and management activities, as well as the degradation of plant diversity and wildlife habitat.

Under Alternative C, the development of the five parcels allocated to industrial and developed recreational uses would affect plant and wildlife communities. These impacts would be minor on four of the tracts. The development of Parcel 10 on Chatuge Reservoir, however, would likely eliminate the old-growth forest, a rare community type and high-quality habitat for wildlife.

Under Alternative D, land use on Chatuge Parcel 52 and Hiwassee Parcel 49, containing a total of 7.7 acres, could change from its current status (Natural Resource Conservation) to developed recreation. Old-growth forest on Parcel 10 would not be disturbed, as this parcel would retain its current natural resource conservation allocation. Because of the small amount of acreage involved, potential changes in the local plant and wildlife communities are expected to be minor and insignificant.

Endangered and Threatened Species

Affected Environment - Nineteen species listed as endangered or threatened under the *Endangered Species Act* and three candidate species for listing have been reported from the counties encompassing the nine mountain reservoirs. Fourteen of these federally listed or candidate species occur on or in the immediate vicinity of mountain reservoir lands. These listed species include five plants, one mammal, one bird, two fish, one land snail, and four mussels. Critical habitat for one threatened fish species, the spotfin chub, has been designated in the vicinity of Fontana Reservoir. Several additional species listed as endangered, threatened, or of other conservation concern by the States of Georgia, North Carolina, and/or Tennessee occur on or near mountain reservoir lands.

Parcel 10 on Chatuge Reservoir contains a population of American columbo, a North Carolina state rare plant species, and Parcel 77 on Chatuge Reservoir has a population of butternut and a population of pink lady's slipper.

Environmental Consequences - Under Alternatives A and B, there would be no immediate changes in land use. Therefore, adoption of either of these alternatives would not result in a significant cumulative loss of protected terrestrial animal or plant species or their habitat or cumulative impacts to any listed aquatic animal species.

Under Alternative C, there would be changes in land use on five parcels. Most of these parcels have scant suitable habitat for protected species. Thus, adoption of this alternative would not result in cumulative impacts to protected terrestrial plant or animal species or their habitats. Parcel 10 on Chatuge Reservoir contains suitable habitat for Indiana bats and bald eagles, which would be impacted by industrial development on this parcel. Under Alternative C, no impacts to aquatic animal species are expected to occur.

Under Alternative D, the 6.1-acre Parcel 52 on Chatuge Reservoir and the 1.6-acre Parcel 49 on Hiwassee Reservoir would be allocated to Zone 6. Possible future recreation development on these two parcels is not expected to adversely affect any endangered or threatened plants or any protected terrestrial or aquatic animals. On the remainder of the

reservoirs, any potential effects to endangered and threatened species would be similar to those expected under Alternative B.

Wetlands

Affected Environment - Wetlands on and near the mountain reservoirs are primarily riverine/floodplain forests located in the floodplains of rivers and streams and small (typically less than 0.10 acre) areas of emergent/scrub-shrub wetlands along reservoir shorelines. Emergent herbaceous wetlands and scrub-shrub wetlands are uncommon on the mountain reservoirs. Isolated wetlands such as bogs, seeps, and fens are relatively rare on the mountain reservoir lands.

Environmental Consequences - Under all of the alternatives, TVA would continue to protect wetlands in accordance with the requirements of the *Clean Water Act* and Executive Order (EO) 11990 on wetlands. Because there would be essentially no change in the current land use under Alternative A or B, no effects to wetlands or their functions are expected under either of these two alternatives. With the exception of narrow fringe riparian emergent wetlands on Chatuge Parcel 52, no wetlands occur on the six tracts that would be allocated to developed uses under Alternative C. No effects to any fringe shoreline wetlands are likely to occur on the two parcels (Parcel 52 on Chatuge Reservoir and Hiwassee Parcel 49) that would be allocated for developed recreation under Alternative D. Thus, direct, indirect, or cumulative impacts to wetlands are not expected under any of the alternatives. Impacts to wetlands would be avoided under all the alternatives.

Floodplains

Affected Environment - As a federal agency, TVA is subject to the requirements of EO 11988 (Floodplain Management). The EO is not intended to prohibit floodplain development in all cases but rather to create a consistent government policy against such development under most circumstances. The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

Environmental Consequences - Under all alternatives, the development and/or management of properties and evaluations of proposed actions would be done individually to ensure consistency with EO 11988. Potential development would generally consist of water use facilities and other repetitive actions in the floodplain that would result in minor floodplain impacts. Under Alternatives A, C, and D, floodplain impacts would be somewhat greater than those expected under Alternative B because more parcels of the available land on Chatuge and Hiwassee reservoirs would be allocated to zones allowing industrial and/or recreational development. Although there are impacts to floodplains of varying degrees under all alternatives, potential impacts to floodplain values would be insignificant.

Cultural Resources

Affected Environment - Several historic properties, including both archaeological sites and historic structures such as buildings and some of the dams, occur on or near mountain reservoir lands. Surveys conducted on or near reservoir lands have identified 602 archaeological sites. Archaeological surveys have been conducted on approximately one-quarter of the lands involved in this land planning process, and many of the reported archaeological sites have not been assessed for their eligibility for the National Register of Historic Places (NRHP).

Historic structures on or in the immediate vicinity of mountain reservoir lands that are listed in the NRHP include the Ocoee 1 hydroelectric station and the Ocoee 2 hydroelectric plant. Other dams and powerhouses are eligible for listing in the NRHP.

Environmental Consequences - Regardless of the alternative selected, TVA will continue the present case-by-case assessments of proposed land-disturbing actions such as shoreline stabilization, construction of water use facilities, or recreational development through phased identification and evaluation of historic properties. Archaeological resources identified within these areas would be avoided and protected whenever possible. If avoidance were not possible, then proper procedures would be implemented in the mitigation of the historic property. Under any alternative, the cumulative effects to significant archaeological resources would be minimized by avoidance and protection of the resource or by mitigation through data recovery excavations pursuant to 36 Code of Federal Regulations (CFR) Part 800.

Managed Areas and Ecologically Significant Sites

Affected Environment - A large portion of the TVA mountain reservoir lands adjoin managed areas such as national forests, state parks, and the Great Smoky Mountains National Park. The only TVA land formally designated as a managed area is the Raven Rock Small Wild Area on the Hiwassee Dam Reservation.

Environmental Consequences - No adverse effects to managed areas or ecologically significant sites would result from adoption of Alternative A or B because current land uses would not change. Under Alternatives C and D, because the proposed land use changes would not deviate substantially from current land uses, continued benefits to natural areas in the vicinity of these reservoirs are anticipated. No TVA natural areas occur on or adjacent to the parcels that would be subject to different allocations under Alternative C or D. Thus, no TVA natural areas would be affected under Alternative C or D.

Visual Resources

Affected Environment - All of the reservoir lands have distinctive scenic attractiveness and high scenic integrity. There are a variety of landforms, including rock, mixed vegetation, and other features that contrast with the reservoirs. Reservoir lands appear intact and unaltered, with minor deviations along the developed parcels. Most views from the water have high scenic visibility and are in the foreground and middle ground of contrasting elements, such as scenic bluffs along the shoreline and prominent peaks at greater distances.

Environmental Consequences - Under Alternative A or B, there would be no major changes in the land use or management of the subject reservoir properties. Thus, the adoption of Alternative A or B would not affect visual resources adversely, as there would be no noticeable change in the visual character of these TVA lands. Under Alternative A, the potential development of the two parcels (Parcels 35 and 36) on Hiwassee Reservoir currently allocated for Industrial use could affect visual resources. Although overall impacts to visual quality would likely be insignificant, under Alternative C or Alternative D, development on Chatuge Reservoir would result in impacts to the visual landscape character. For these parcels and land within their view shed, scenic value class and aesthetic sense of place would be reduced. However, scenic integrity would remain moderate or higher for the entire reservoir. The developments proposed on Hiwassee Reservoir are unlikely to cause adverse visual impacts.

Water Quality and Aquatic Ecology

Affected Environment - TVA has monitored the ecological health of the mountain reservoirs on an annual or biennial basis since the early 1990s. The ecological health scoring system is based on five indicators: dissolved oxygen, chlorophyll, sediment quality, benthic macroinvertebrates, and fish assemblage. The overall reservoir ecological health ratings for the mountain reservoirs are as follows: "poor" for Chatuge and Nottely reservoirs, "fair" for Hiwassee, Ocoee 1, and Fontana reservoirs, "fair-good" for Apalachia Reservoir, and "good' for Blue Ridge Reservoir. TVA does not routinely sample the reservoir ecological health of Ocoee 2 or Ocoee 3 reservoirs.

Environmental Consequences - There is a small amount of TVA land on the mountain reservoirs compared to the overall area land base. Under any of the alternatives, various state and federal environmental regulations would apply, and the use of identified impact reduction methods, including best management practices, would be applied. Thus, development opportunities on TVA lands would have insignificant direct, indirect, and cumulative impacts to water quality and aquatic ecology. Cumulative impacts to water quality and aquatic life associated with the implementation of Alternative C or D are anticipated to be insignificant, and the overall reservoir ecological health of Chatuge and Hiwassee reservoirs would most likely not change if either of these alternatives were adopted.

Air Quality and Noise

Affected Environment - All of the counties containing the mountain reservoirs are currently in attainment of the National Ambient Air Quality Standards except for the portion of Swain County, North Carolina, that is in the Great Smoky Mountains National Park, which is in nonattainment of the 8-hour ozone standard.

Although there are many sources of noise, the greatest potential for noise impacts comes from industrial development, which could occur on Parcel 10 on Chatuge Reservoir under Alternative C. Likewise, Parcels 35 and 36 on Hiwassee Reservoir would be available for industrial use under Alternative A. However, development on either of the two parcels on Hiwassee Reservoir is unlikely due to local topography. Potential noise impacts due to industrial development would largely depend on the type of industry recruited. Noise could be generated by activities on those parcels allocated for developed recreation (Parcels 52 and 77 on Chatuge Reservoir and Parcels 34 and 49 on Hiwassee. Because of the size of Parcel 77 and the likelihood that more extensive recreational development could occur on it, activities on this parcel would be more likely to generate noise than actions on the other parcels. However, the potential noise effects from recreational development and use would depend on the type of facilities available, hours of operation, and noise attenuating measures implemented in the development of these parcels.

Environmental Consequences - Because the current uses of the great majority of the TVA lands on the mountain reservoirs would not change under any of the alternatives, potential impacts to air quality and potential noise-related effects would likely be minor. For Blue Ridge, Nottely, Fontana, Apalachia, and the Ocoees reservoirs, there is little to no difference in anticipated air quality and noise impacts among the various alternatives. There is a somewhat greater potential for air quality and localized noise-related impacts due to the land allocations for Industrial use on Hiwassee and Chatuge reservoirs under Alternative A and Alternative C.

Socioeconomics

Affected Environment - The primary drivers of the economy and population growth in the area are the housing and tourism sectors, which are dependent on the natural scenery associated with the reservoir and adjacent lands. Incomes tend to be lower and poverty rates higher than national averages because of fewer high-wage jobs such as manufacturing and professional services. Unemployment rates tend to be somewhat higher than national averages because of the decline of manufacturing jobs in recent years.

The counties are very rural, with low population densities and only a few small towns. Most of the subject counties have high percentages of land in governmental ownership, particularly for national and state forests and the Great Smoky Mountains National Park. Populations of most of the counties have grown rapidly in recent years, especially for those counties with good roads connecting them to the Atlanta metropolitan area. On the other hand, populations have actually decreased in some of the counties with the poorest access to Atlanta or other nearby large population centers and the most land in governmental ownership and thus least available for second-home development. Minority populations are much lower than national averages except for Swain County, North Carolina, where many members of the Eastern Band of Cherokee Indians live.

Environmental Consequences - Potential socioeconomic impacts under any of the alternatives are expected to be minor and insignificant. The overall TVA land base is small, and the existing uses of the majority of the TVA land would not change. With the possible exception of Parcels 35 and 36 on Hiwassee Reservoir, which would be allocated for industrial uses under Alternative A, the TVA parcels on all reservoirs would continue to be managed as they are now under Alternatives A and B.

Under Alternative C, the allocation of Parcel 10 on Chatuge Reservoir to Zone 5 could create the potential for new jobs in the area, which would be beneficial to the economy of the area. An additional benefit would be increased property taxes from private ownership of Parcel 10. However, depending on the type of industrial development, this could have some negative socioeconomic impacts by lowering the value of nearby property and interest in residential development of available nearby property, at least relative to other properties in the area. Upgrades to the existing infrastructure, e.g., roads, power, water, sewer service, etc., would be necessary should an industrial facility choose to locate on Parcel 10 on Chatuge Reservoir. The change of Parcels 52, 52a, and 77 on Chatuge Reservoir to Zone 6 could enhance the attractiveness of the community and indirectly contribute to further population and economic growth. However, as noted above, the reservoir and scenery are the main economic drivers in the area, and high-intensity developed recreational use on Parcels 52, 52a, and 77 could be incompatible with overall enjoyment of the reservoir and scenic quality. Although this is not expected to lower appraised property values, it could potentially affect the marketability of local residential properties and possibly reduce the interest in the residential development of available nearby property. Infrastructure improvements, especially upgrading Mull Road, would be required to accommodate a large-scale recreational development on Parcel 77.

Under Alternative C, the use of two parcels on Hiwassee Reservoir for developed recreation would enhance the attractiveness of the area, thus possibly indirectly contributing to further population and economic growth. Under Alternative C, the change of these parcels to developed recreation, which could include walking trails and public river access, would enhance the availability of parks in the area to all area residents, including low-income citizens.

Development of the 6.1-acre Parcel 52 on Chatuge Reservoir and the 1.6-acre Parcel 49 on Hiwassee for recreational uses under Alternative D could provide some economic benefit by increasing the attractiveness of the local area. However, the direct economic benefit would likely be small based on the limited size of these two parcels. Potential aesthetic concerns could possibly result in decreased marketability of residential property values near Parcel 52, depending on the nature of future recreational development on that parcel.

The proposed allocations under all of the alternatives are consistent with existing transportation easements and known upgrades. TVA would be willing to work with the various state transportation departments in the event future road upgrades could involve property managed by TVA. Thus, the ability of the respective state transportation departments to implement improvements to the local road systems would not be affected significantly under any of the alternatives.

PREFERRED ALTERNATIVE

The preferred alternative is Alternative D, the Blended Alternative.

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GLOSSARY (TERMS, ABBREVIATIONS, AND ACRONYMS)

§	Section
100-Year Floodplain	The area inundated by the 1 percent annual chance (or 100-year) flood
500-Year Floodplain	The area inundated by the 0.2 percent annual chance (or 500-year) flood
Agricultural Licensing	TVA land licensed to a private individual for the production of agricultural crops; the land use is an interim use of TVA land.
Alcoa	Aluminum Company of America
APE	Area of Potential Effect, i.e., the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist
ARPA	*Archaeological Resources Protection Act*
Attainment Areas	Those areas of the U.S. that meet National Ambient Air Quality Standards as determined by measurements of air pollutant levels
ATV	All-Terrain Vehicle
Benthic	Refers to the bottom of a stream, river, or reservoir
BMP(s)	Best Management Practice(s)
BRMEMC	Blue Ridge Mountain Electric Membership Corporation
CFR	Code of Federal Regulations
Cfs	Cubic Feet per Second, a measure of the rate of flow of water
Controlled Burn	A managed fire to remove vegetation for the benefit of silviculture or wildlife management
Cumulative Impacts	Impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions (40 CFR Section [§] 1508.7)

Dam Reservation	Lands generally maintained in a park-like setting by TVA to protect the integrity of the dam structure, hydroelectric facilities, and navigation lock; the reservation also provides for public visitor access to the TVA dam facilities and recreation opportunities, such as public boat access, bank fishing, camping, picnicking, etc.
DDE	Dichlorodiphenlydichloroethylene, a compound formed by the decay of the insecticide dichlorodiphenyltrichloroethane (DDT). DDE can accumulate in the fat tissues of animals and may cause physiological problems.
Direct Impacts	Effects that are caused by the action and occur at the same time and place (40 CFR § 1508.8)
Dissolved Oxygen (DO)	The oxygen dissolved in water, necessary to sustain aquatic life, usually measured in milligrams per liter or parts per million
Drawdown	The lowering of the reservoir pool elevation required to accomplish a variety of multipurpose operational objectives
E. coli	*Escherichia coli*, a type of bacteria commonly found in the lower intestine of animals
EIS	Environmental Impact Statement
Emergent Wetland	Wetlands dominated by erect, rooted herbaceous plants, such as cattails and bulrushes
Endangered Species	A species in danger of extinction throughout all or a significant portion of its range or territory; endangered species recognized by the *Endangered Species Act* or similar state legislation have special legal status for their protection and recovery.
EO	Executive Order--directive from the President to federal agencies or officers regarding the operation of the government
ESA	*Endangered Species Act*
Flood Guide	The reservoir elevation used to define the seasonally varying allocation of flood control storage. Typically, the flood guide elevation is at a maximum on June 1 when the storage allocation is at a minimum and at a minimum on January 1 when the storage allocation is at a maximum.

Floodplains	Any land area susceptible to inundation by water from any source by a flood of selected frequency; for purposes of the National Flood Insurance Program, the floodplain, as a minimum, is that area subject to a 1 percent or greater chance of flooding (100-year flood) in any given year.
Flowage Easement Tracts	Privately owned lakeshore properties where TVA has (1) the right to flood the land as part of its reservoir operations, (2) no rights for vegetation management, and (3) the authority to control structures under Section 26a of the *TVA Act*
Fragmentation	The process of breaking up a large area of relatively uniform habitat into one or more smaller, disconnected areas
G1 (Critically Imperiled)	A conservation status rank assigned by NatureServe (a conservation organization that tracks information on plants, animals and ecosystems) indicating that a particular species is at very high risk of extinction at the global (i.e., “G”) level due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors
G2 (Imperiled)	A NatureServe conservation status rank indicating that a species is at high risk of extinction at the global level due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors
G2G3	A NatureServe conservation status indicating a rank between G2 and G3
G3 (Vulnerable)	A NatureServe conservation status rank indicating that a species is at moderate risk of extinction at the global level due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors
Ga.	Georgia
GAEPD	Georgia Environmental Protection Division
Globally Rare Plant Community	A plant community consisting of a unique assemblage of species found almost nowhere else in the world that has been ranked by NatureServe providing a global conservation status rank (G-rank) that reflects an assessment of the condition of the species or ecological community across its entire range based on consideration of size, condition, and landscape context
GSMNP	Great Smoky Mountains National Park

HRM	Hiwassee River Mile
Ibid	Abbreviation for the Latin term, *ibidem*, meaning “in the same place”; refers to the immediately preceding work cited
Indirect Impacts	Effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR § 1508.8)
June 1 Flood Guide	The reservoir elevation required on June 1 to satisfy the minimum allocation of flood control storage for flood damage reduction
January 1 Flood Guide	The reservoir elevation required on January 1 to satisfy the maximum allocation of flood control storage for flood damage reduction
L	Left Bank
L&N	Louisville and Nashville Railroad
LIP	Lake Improvement Plan
LTRM	Little Tennessee River Mile
Macroinvertebrates	Bottom-dwelling aquatic animals without vertebrae, such as mussels and crayfish
Mainstream Reservoirs	Impoundments created by dams constructed across the Tennessee River
Marginal Strip	The narrow strip of land owned by TVA between the water’s edge and the adjoining private property line, on which the property owner may construct private water use facilities if the property owner has the appropriate land use rights and upon approval of plans by TVA
Maximum Shoreline Contour (MSC)	An elevation typically 5 feet above the top of the gates of a TVA dam; it is often the property boundary between TVA marginal strip property and adjoining private property.
MGD	Millions of Gallons per Day
mg/L	Milligrams per Liter
MRLMP	Mountain Reservoirs Land Management Plan
msl	Mean Sea Level, i.e., the average level of the sea over a long period or the average level that would exist in the absence of tides
NARSAL	Natural Resources Spatial Analysis Laboratory

National Ambient Air QualityStandards (NAAQS)	Uniform, national air quality standards established by the U.S. Environmental Protection Agency that restrict ambient levels of certain pollutants to protect public health (primary standards) or public welfare (secondary standards); standards have been set for ozone, carbon monoxide, particulates, sulfur dioxide, nitrogen, nitrogen dioxide, and lead.
N.C.	North Carolina
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
n.d.	Indicates “no date” or date that Web site was accessed is unknown
NEPA	*National Environmental Policy Act*
NHPA	*National Historic Preservation Act*
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NRM	Nottely River Mile
NSRE	National Survey on Recreation and the Environment
NWI	National Wetlands Inventory
ORM	Ocoee River Mile
Overstory	The tallest and dominant community of trees of a forest
PA(s)	Programmatic Agreement(s)
PCBs	Polychlorinated Biphenyls; a class of chlorinated organic compounds used for a variety of uses. PCBs are considered persistent organic pollutants and can accumulate in animal tissues.
Physiographic Province	General divisions of land with each area having characteristic combinations of soil materials and topography

Plan Parcel	A numbered parcel of TVA fee-owned land
$PM_{2.5}$	Particulate matter with a diameter less than or equal to 2.5 micrometers
ppm	Parts per Million
Prime Farmland	Generally, the best land for farming, i.e., areas that are flat or gently rolling and are usually susceptible to little or no soil erosion. Prime farmland produces the most food, feed, fiber, forage, and oil seed crops with the least amount of fuel, fertilizer, and labor.
PSD	Prevention of Significant Deterioration
R	Right Bank
Riparian	Of, pertaining to, or situated adjacent to a stream, river, or reservoir
Riparian Zone	An area of land that has vegetation or physical characteristics reflective of permanent water influence, typically a streamside zone or shoreline edge
Riprap	Stones placed along the shoreline for bank stabilization and other purposes
RLMP(s)	Reservoir Land Management Plan(s)
ROS	Reservoir Operations Study
RV	Recreational vehicle
RVSMP	Reservoir Vital Signs Monitoring Program
SAMAB	Southern Appalachian Man and the Biosphere, a consortium of state and federal agencies that deal with environmental issues in the southern Appalachian mountains
SBRE	Southern Blue Ridge Ecoregion
Scrub-Shrub	Woody vegetation less than about 20 feet tall; species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
Section 26a	Section 26a of the *TVA Act* states that plans for actions that involve obstructions to navigation or flood control, such as docks, fills, bridges, outfalls, water intakes, and riprap, require TVA review and approval before they may be constructed across, in, or along the Tennessee River and its tributaries.

SFI	Sport Fishing Index
Shoreline Management Zone	A barrier of vegetation established or left undisturbed around a reservoir in order to buffer the adverse impacts resulting from development and increased human activity
SHPO	State Historic Preservation Officer
SMI	Shoreline Management Initiative
SMI EIS	*Shoreline Management Initiative Environmental Impact Statement*
SMP	Shoreline Management Policy
SR	State Route
Stratification	The seasonal layering of water within a reservoir due to differences in temperature or chemical characteristics of the layers
Summer Pool Elevation	The normal upper level to which the reservoirs may be filled; where storage space is available above this level, additional filling may be made as needed for flood control
TDEC	Tennessee Department of Environment and Conservation
Tenn.	Tennessee
TEPCO	Tennessee Electric Power Company
Threatened Species	A species threatened with extinction throughout all or a significant portion of its range or territory; threatened species recognized by the *Endangered Species Act* or similar state legislation have special legal status for their protection and recovery.
ToRM	Toccoa River Mile
Tributary Reservoirs	Impoundments created by dams constructed across streams and rivers that eventually flow into the Tennessee River
Turbidity	All the organic and inorganic living and nonliving materials suspended in a water column; higher levels of turbidity affect light penetration and typically decrease productivity of water bodies.
TVA	Tennessee Valley Authority

TVARAM	TVA Rapid Assessment Method for wetlands, a version of the Ohio Rapid Assessment Method designed specifically for the TVA region
TWRA	Tennessee Wildlife Resources Agency
Understory	The lowest dominant community of trees of a forest, consisting mainly of shade-tolerant species
US	U.S. Highway
U.S.	United States
USA	United States of America
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
Wetlands	As defined in *TVA Environmental Review Procedures*, wetlands are "those areas inundated by surface water or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds."
Wildlife Management Area	Land and/or water areas designated by state wildlife agencies, such as TWRA, for the protection and management of wildlife; these areas typically have specific hunting and trapping regulations as well as rules regarding appropriate uses of these areas by the public.
Winter Drawdown	The period of time in which the reservoir water level is lowered during fall to provide storage capacity for winter and spring floodwaters
WWTP	Wastewater Treatment Plant

CHAPTER 1

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Background

Tennessee Valley Authority (TVA) has been charged by Congress with improving navigation, controlling floods, providing for the proper use of marginal lands, providing for industrial development, and providing affordable power, all for the general purpose of fostering the physical, economic, and social development of the Tennessee Valley region. The lands that TVA holds as steward in the name of the United States are some of the most important resources of the region. They have provided the foundation for the large dams and reservoirs that protect the region from flooding and secure for its residents the benefits of a navigable waterway and low-cost hydroelectricity. TVA's lands are the sites for its power generating system and arteries for delivering power to those that need it. Many of the region's parks, recreation areas, and wildlife refuges that are so important for the region's quality of life are on lands TVA made available. TVA lands often have been the catalyst for public and private economic development that supports all of these activities.

The United States of America (USA), through TVA, originally acquired approximately 1.3 million acres of land in the Tennessee River Valley. The construction and operation of the reservoir system inundated approximately 470,000 acres with water. Approximately 508,000 acres have already been transferred by TVA to other federal and state agencies for public uses or sold for residential development. The USA owns approximately 293,000 acres that TVA manages pursuant to the *TVA Act*.

As stewards of this important resource, TVA's policy is to manage its lands to protect the integrated operation of the TVA reservoir and power systems, to provide for appropriate public use and enjoyment of the reservoir system, and to provide for continuing economic growth in the Tennessee Valley region. TVA recognizes that historical land transfers have contributed substantially to meeting these multipurpose objectives. TVA's policy is to preserve reservoir lands remaining in public ownership under its control except in those rare instances when the benefits to the public would be so significant that transferring the land is justified.

1.2 Purpose and Need

TVA develops reservoir land management plans (RLMPs) to facilitate the management of reservoir lands in its custody. In general, TVA manages public land to protect and enhance natural resources, generate prosperity, and improve the quality of life in the Tennessee Valley region (see Appendix A, TVA Land Policy). RLMPs are submitted to the TVA Board of Directors for approval and provide a plan for long-term land stewardship and accomplishment of TVA's responsibilities under the *TVA Act*.

TVA proposes to develop a Mountain Reservoirs Land Management Plan (MRLMP) to guide land use approvals, private water use facility permitting, and resource management decisions for the nine mountain-region reservoirs illustrated in Figure 1-1 and listed in Table 1-1. All lands under TVA management on these nine reservoirs, a total of approximately 6,220 acres, are under consideration in this planning process.

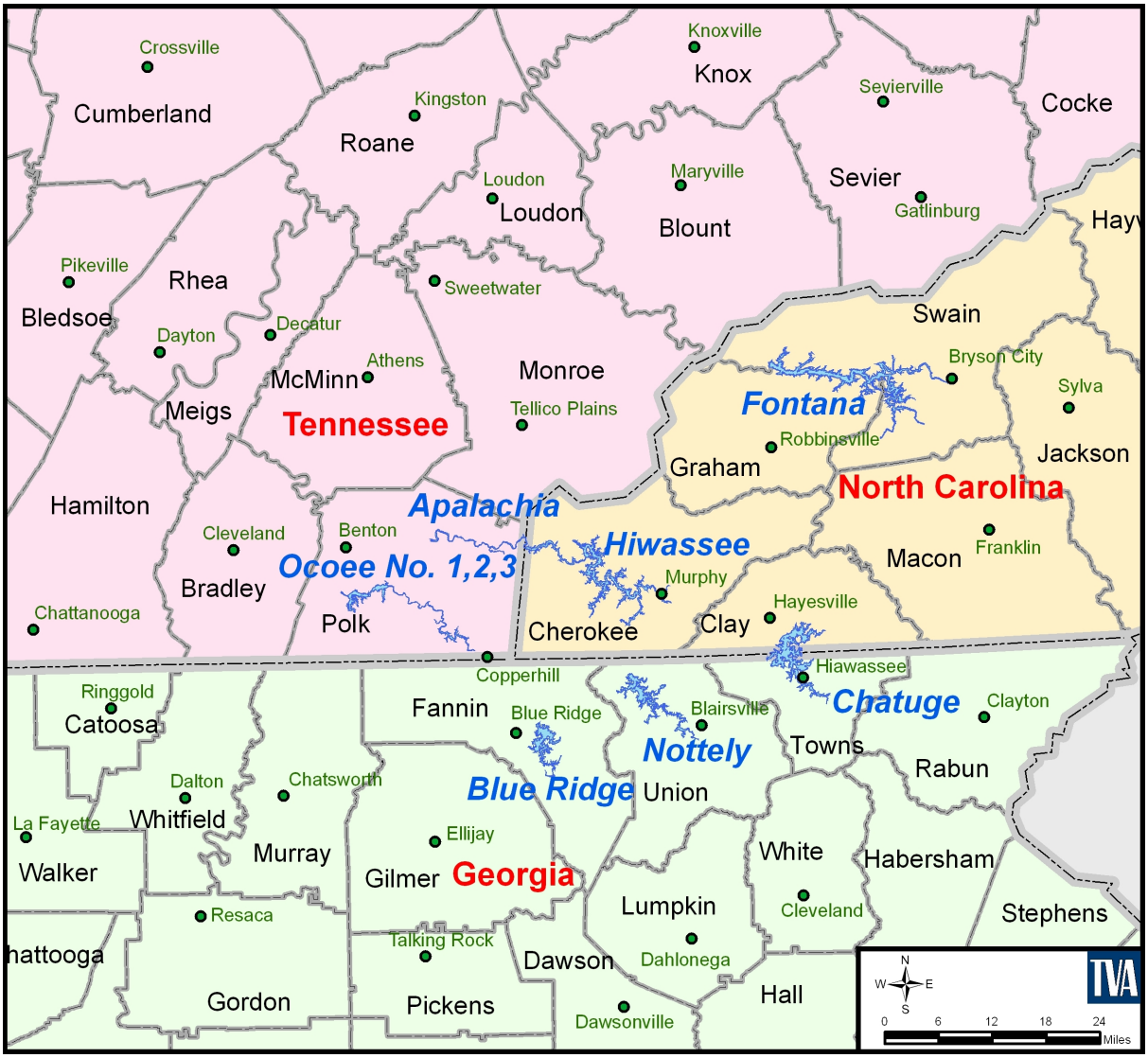

Figure 1-1. Mountain Reservoirs (Chatuge, Hiwassee, Blue Ridge, Nottely, the Ocoees, Apalachia, and Fontana) Vicinity Map

Land acquisition and disposal information for the nine tributary mountain reservoirs is presented in Table 1-1. Some properties (approximately 20 acres) were acquired specifically for power assets (substations, etc.) subsequent to original project land acquisition and are not included in the acquisition total. The acreages listed in the table were calculated from georeferenced mapping data and aerial photography of the reservoir land parcels and do not completely align with acreage totals in recorded deeds. The acreages also do not include land acquired and retained that is below the full summer pool elevations of the reservoirs.

Table 1-1. Mountain Reservoirs Land Acquisition and Disposal Data

Reservoir	Location (County, State)	Total Land Originally Acquired* (Acres)	Transferred Lands* (Acres)	Sold Lands* (Acres)	Total Lands Disposed* (Acres)	Percent of Original Acquisition Sold or Transferred	TVA-Retained Land* (Acres)
Chatuge	Clay County, N.C. Towns County, Ga.	3,557	1,161	629	1,790	50	1,767
Hiwassee	Cherokee County, N.C.	19,046	17,280	759	18,039	95	1,007**
Blue Ridge	Fannin County, Ga.	6,495	5,919	106	6,025	93	470**
Nottely	Union County, Ga.	3,136	2,031	276	2,307	74	829
Ocoee 1	Polk County, Tenn.	4,135	3,925	133	4,058	98	77**
Ocoee 2	Polk County, Tenn.	389	309	0	309	79	80**
Ocoee 3	Polk County, Tenn.	3,261	3,043	0	3,043	93	218**
Apalachia	Cherokee County, N.C. Polk County, Tenn.	7,506	6,661	2	6,663	89	843**
Fontana	Graham County, N.C. Swain County, N.C.	57,312	55,153	1,228	56,381	98	931**
Total		**104,837**	**95,482**	**3,133**	**98,615**	**93**	**6,220**

* Does not include land inundated by the reservoirs; acreages are approximate

** Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

The goals of the proposed MRLMP include the following:

Goal 1: Apply a systematic method of evaluating and identifying the most suitable uses of TVA public lands using resource data, stakeholder input, suitability and capability analyses, and TVA staff input.

Goal 2: Identify land use zone allocations to optimize public benefit and balance competing demands for the use of public lands.

Goal 3: Identify land use zone allocations to support TVA's broad regional resource development mission. TVA reservoir lands are managed to provide multiple public benefits including recreation, conservation, and economic development.

Goal 4: Provide a clear process, consistent with TVA's Land Policy, by which TVA will respond to requests for use of public land managed by TVA.

Goal 5: Comply with federal regulations and executive orders (EOs).

Goal 6: Ensure the protection of significant resources, including threatened and endangered species, cultural resources, wetlands, unique habitats, natural areas, water quality, and the visual character of each reservoir.

Goal 7: Provide a mechanism that allows for local, state, and federal infrastructure projects when the use is compatible with the zone allocation and TVA's Land Policy.

TVA has prepared this environmental impact statement (EIS) to assess the potential environmental impacts of implementing a RLMP on the nine mountain reservoirs.

Alternative approaches to allocating the TVA-managed lands were analyzed in this EIS. Throughout the planning process, TVA has also sought to address issues and concerns

raised by the public regarding management of the TVA parcels. These issues were addressed in the environmental analyses of the various alternatives and include concerns such as protection of sensitive resources, natural resource conservation, and recreation.

1.3 The Decision

The TVA Board of Directors will decide which of the MRLMP action alternatives to adopt or whether to continue use of the Forecast System[1] parcel designations on the mountain reservoirs properties.

1.4 Other Pertinent Environmental Reviews and Documentation

***Reservoir Operations Study Final Programmatic Environmental Impact Statement* (TVA 2004)**

In this study, TVA evaluated alternative ways to operate the TVA reservoir system to produce greater overall public value. Specific changes in the operation of the reservoirs included in the MRLMP were implemented in 2004 as a result of this study, including:

- Limiting the reservoir drawdowns from June 1 to Labor Day on Blue Ridge, Chatuge, Fontana, and Hiwassee reservoirs. The January 1 Flood Guide[2] elevations of these reservoirs were increased. Tailwater releases at Apalachia and Ocoee 1 were modified to improve tailwater recreational opportunities.

- Implementation of continuous flows in the tailwater between Apalachia Dam and the downstream powerhouse from June 1 to November 1 to support aquatic life.

***Shoreline Management Initiative (SMI): An Assessment of Residential Shoreline Development Impacts in the Tennessee Valley Final Environmental Impact Statement* (SMI EIS) (TVA 1998)**

In this 1998 EIS, TVA analyzed possible alternatives for managing residential shoreline development throughout the Tennessee River Valley. The alternative selected established TVA's current Shoreline Management Policy (SMP), which incorporates a strategy of maintaining and gaining public shoreline through an integrated approach to conserve, protect, and enhance shoreline resources and public use opportunities while providing for reasonable and compatible use of the shoreline by adjacent residents. The standards for vegetation management, docks, shoreline stabilization, and other residential shoreline alterations were defined in the SMP. The SMI EIS is available on TVA's Web site at http://www.tva.gov/river/landandshore/landuse_shore.htm. More information on TVA's SMP may found on TVA's Web site at: http://www.tva.gov/river/landandshore/pdfs/shorelnk.pdf. The MRLMP EIS tiers from the final SMI EIS.

The analysis of shoreline data compiled for the SMI EIS revealed that about 38 percent of the shoreline along TVA reservoirs was available for residential use and that about 13

[1] The Forecast System was used internally by TVA to guide land use policy on lands managed by TVA. Under the Forecast System, current and prospective uses were considered in assigning a parcel to one of 13 categories: Dam Reservation, Public Recreation, Reservoir Operations (Islands), Reservoir Operations (Mainland), Power Transmission and Power Needs, Commercial Recreation, Minor Commercial Landings, Industrial, Navigation Safety Harbors or Landings, Forestry Research, Steam Plant Study, Wildlife Management, and Small Wild Areas.

[2] Flood Guide elevations are the calculated target reservoir elevations that allow the reservoir to meet the desired flood storage capacity.

percent was developed at that time. The SMI EIS shoreline ownership data for the nine mountain reservoirs are presented in Table 1-2. Residential shoreline on Chatuge Reservoir comprised 15 percent of the total (18.8 miles); Hiwassee Reservoir, 12 percent (20.3 miles); Blue Ridge Reservoir, 17 percent (11.4 miles); and Nottely Reservoir, 5 percent (5 miles). There is no residential shoreline on Ocoee 1, 2, or 3 (collectively referred to as the Ocoees), Apalachia, or Fontana reservoirs.

Table 1-2. Mountain Reservoirs Shoreline Ownership

Reservoir	Flowage Easement Shoreline		TVA-Owned Residential Access Shoreline		TVA-Owned and Jointly Managed Shoreline		TVA-Owned and -Managed Shoreline		Total Shoreline Miles
	Miles	% of Total Miles	Miles	% of Total Miles	Miles	% of Total Miles	Miles	% of Total Miles	Miles
Chatuge	60.8	48	18.8	15	31.8	25	16.6	13	128.0
Hiwassee	0.0	0	20.3	12	141.0	86	3.5	2	164.8
Blue Ridge	14.6	21	11.4	17	37.4	55	4.7	7	68.1
Nottely	53.8	53	5.0	5	36.4	36	6.9	7	102.1
Ocoees	0.0	0	0.0	0	109.5	100	0.0	0	109.5
Apalachia	0.0	0	0.0	0	28.3	90	3.2	10	31.5
Fontana	19.3	8	0.0	0	216.6	91	1.9	1	237.8

In accordance with TVA's SMP, TVA has traditionally categorized the residential shoreline for previous land plans based on resource data collected from field surveys. A resource inventory was conducted for sensitive species and their potential habitats, archaeological resources, and wetlands along the residential shoreline. The shoreline categorization system established by SMP was composed of three categories: Shoreline Protection, Residential Mitigation, and Managed Residential.

As new data were collected on the spatial location and significance of endangered species, wetlands, cultural resources, or navigation restrictions, adjustments to category boundaries have been necessary. Through experience with the shoreline categorization process set up in 1999 by the SMI EIS, TVA believes that the value of advance categorization is less than when SMP was implemented. Today's technology provides the ability to identify sensitive resources during permitting evaluations. Today's resource databases are interactive and are updated continually to allow ease of use of the latest information in permitting decisions. Furthermore, TVA's experience in permitting suggests that the Shoreline Protection category is not a prohibition on permitting because mitigation techniques are often available. Because resource data are continually updated, shoreline categorized as Managed Residential may change as updated resource surveys are conducted. Based on these considerations, TVA is not providing a complete categorization of residential shoreline with the MRLMP.

With the MRLMP, TVA has categorized shoreline in areas undergoing high development pressure as indicated by the volume of Section 26a and land use requests in the last few years. In the future, the shoreline will be gradually categorized in response to permit

requests. Because the permit reviews provide current real-time information, over time this will result in more accurate shoreline resource inventories, thus meeting the intent of the SMP shoreline categorization system.

***Regulations Under Section 26a of the TVA Act for Nonnavigable Houseboats, Storage Tanks, Marina Sewage Pump-Out Stations, Wastewater Outfalls and Septic Systems, and Development Within Flood Control Storage Zones Environmental Assessment* (TVA 2001)**

Complete details on the Section 26a regulations may be obtained from TVA watershed teams or by viewing the regulations at http://www.tva.gov/river/26apermits/index.htm.

***Blue Ridge Mountain Electric Membership Corporation Proposed Substation, Chatuge Reservoir, Towns County, Georgia Environmental Assessment* (TVA 2009)**

The Blue Ridge Mountain Electric Membership Corporation (BRMEMC) expressed an urgent need for property to construct a substation. TVA prepared this environmental review to identify and document the potential environmental effects of the transfer of 1.4 acres and the granting of a permanent easement on 0.4 acre of Parcel 52 on Chatuge Reservoir and the subsequent construction and operation of the proposed facility. The document is available online at the following site:
http://www.tva.gov/environment/reports/BRMEMC_Substation/

***North Shore Road Final Environmental Impact Statement* (National Park Service [NPS] 2007)**

This study dealt with alternatives for construction of a road along the northern shore of Fontana Reservoir to discharge and satisfy obligations associated with a 1943 memorandum of agreement among the Department of Interior; TVA; Swain County, North Carolina; and the State of North Carolina. A detailed description of resources on the Fontana Dam Reservation and along the northern shore of Fontana Reservoir was provided in this EIS. In a record of decision issued in December 2007, the NPS selected the Monetary Settlement Alternative, under which the road would not be built. TVA was a cooperating agency in the preparation of the EIS.

***Control of Oriental Bittersweet (Celastrus orbiculatus) on TVA Property Near Fontana Dam, Graham and Swain Counties, North Carolina, Environmental Assessment* (TVA 1997)**

This environmental assessment addressed the potential environmental effects of invasive species control and related natural resource management issues on the Fontana Dam Reservation.

***Upper Ocoee River Corridor Recreational Development Final EIS* (U.S. Forest Service [USFS] 1997)**

TVA was a cooperating agency in the development of this EIS, which described resources in the vicinity of the Ocoee projects, with an emphasis on recreational activities.

***Land and Resource Management Plan - Nantahala and Pisgah National Forests* (USFS 2003)**

This report is available at the following site:
http://www.cs.unca.edu/nfsnc/nepa/nantahala_pisgah_plan/plans.htm.

***Environmental Impact Statement and Revised Land and Resource Management Plan, Cherokee National Forest* (USFS 2004a)**

This USFS report may be accessed at http://www.fs.fed.us/r8/cherokee/planning/final_forest_plan/plan.pdf.

***Land and Resource Management Plan - Chattahoochee and Oconee National Forests* (USFS 2004b)**

To retrieve this USFS report, go to the following Web site: http://www.fs.fed.us/conf/200401-plan/index.htm.

***Ocoee and Hiwassee Rivers Corridor Management Plan, Cherokee National Forest* (USFS 2008)**

This USFS report is available at http://www.fs.fed.us/r2/cdi/portfolio/interpretive_products/interp_master_plans/pdfs/Ch2_Interpretive_Plan.pdf

1.5 The Scoping Process

With respect to the *National Environmental Policy Act* (NEPA), "scoping" refers to the process of identifying the range of actions, alternatives, and impacts to be considered in the environmental review. This process involves the determination of the physical and conceptual extent of the analysis as well as the identification of the environmental issues and resources to be considered. The scoping process for this EIS began when TVA published in the *Federal Register* on June 1, 2007, a notice of intent (NOI) to prepare the EIS. TVA sought comments from various state and federal agencies, elected officials, resource conservation groups, tribes, and other organizations and individuals.

In addition to the notice in the *Federal Register*, TVA advertised the scoping effort by issuing news releases and placing advertisements in 11 local newspapers and through public service announcements on local radio and television stations. Letters and questionnaires were sent to individuals in the MRLMP area, to stakeholder organizations, and to local, state, and federal agencies. Fourteen stakeholder meetings were held with state-elected officials, electric distributor cooperatives, marina operators, watershed associations, and other key stakeholders. In addition, information about the proposed land plan and an interactive questionnaire form were available on the TVA Web site.

TVA hosted a public meeting at The North Georgia Technical College in Blairsville, Georgia, on June 21, 2007. During the public meeting, information forms, writing materials, and a stenographer were available on site for attendees to make comments. A total of 83 participants attended the public meeting.

1.5.1 Summary of Public Participation

TVA received 473 comments during the public scoping effort in various forms, including questionnaires completed on the TVA Web site, questionnaires mailed to TVA, letter and e-mail responses, and oral comments in the public meeting. All public comments were compiled and analyzed to identify the range of issues and concerns to be addressed in the EIS. Many commenters also recommended specific land uses or provided information regarding resources present on TVA lands. Each comment was categorized by its major issue, and comments were sorted into themes by reservoir and summarized in a scoping

document, which is contained in Appendix B. This summary includes the potential environmental issues and comment themes addressed in all the public comments received during the scoping process.

1.5.2 Scoping Response

The following five predominant themes or general issues were identified from the comments: Land Planning and Policy, Recreation, Natural Resources, Compliance, and Reservoir Levels. Other comment areas included Power Delivery and Industrial Development and Appreciation for TVA Land Management Practices.

- **Land Planning and Policy**
  Land planning and land management policy-oriented comments that were received dealt with loss of public lands, maintaining natural areas, future development, land use, and other considerations for the current land planning effort.

- **Recreation**
  Most recreation comments favored the use of hiking and mountain biking trails and requests to build additional trails on public lands. Comments regarding boating restrictions, off-road vehicle use, camping, and available facilities were also submitted.

- **Natural Resources**
  Comments were received concerning all aspects of natural resource preservation and management including water quality and aquatic habitats, air quality, sedimentation and shoreline erosion, wildlife, and forestry. Concerns about cultural resources were also presented.

- **Compliance**
  Areas discussed as needing attention included littering of informal and dispersed camping areas, houseboats and all-terrain vehicle (ATV) use, boating restrictions, unpermitted boat docks, and illegal waste dumps.

- **Reservoir Levels**
  Many comments were received concerning low reservoir levels and their associated impacts. The development and implementation of the MRLMP would not affect reservoir levels. Management of water levels in TVA reservoirs was addressed in the Reservoir Operations Study (TVA 2004).

Scoping participants were asked to describe their use of and their method of access to the reservoirs. They were also asked to indicate from a list of recreation activities the frequency of their participation in each activity. Additionally, scoping participants were asked to provide their opinion regarding the allocation of public land to specific uses and whether there is currently enough, too much, or an adequate amount or availability for these uses. As shown in Table 1-3, the majority of the 473 respondents indicated a general preference for no changes in existing land uses.

Table 1-3. Land Use Preferences of Scoping Participants

Land Use	Too Much Land	About Right Amount	Need More Land	No Opinion
Industry/light manufacturing	206	97	7	59
Preserve natural areas/open space	4	113	247	15
Forest management/habitat improvement	8	154	182	24
Wildlife observation/photography areas	0	178	141	53
Horseback riding trails	62	163	42	98
Mountain bike trails	12	47	324	22
Hiking trails (dirt)	2	132	228	23
Greenways and paved trails	24	128	191	33
Stream/river access sites	6	184	146	41
Water trails	0	145	132	87
Hunting areas	79	145	33	110
Fishing berms or piers	22	177	48	117
Undeveloped or primitive camping areas	15	164	132	54
Recreation day use areas (swimming areas, picnic areas)	14	203	113	42
Year-round boat ramps	17	217	49	83
Developed campgrounds	25	194	94	54
Commercial marinas	78	184	15	79
Overnight lodging (cabins, cottages, resort lodges)	43	189	83	56
Museums/nature centers	15	173	108	70
Visitor centers/overlooks	10	217	84	53
Other				
Off-road trails	1		2	
Ball fields			1	
Rock climbing			1	
Disc golf			1	

The public scoping questionnaire results indicate that the activities with the most frequent participation on the mountain reservoirs are mountain biking on dirt trails, sightseeing and viewing natural scenery, swimming in lakes and streams (including beach use), hiking on dirt trails, motorized boating, nonmotorized/paddle-craft boating, biking on paved trails, and walking on paved trails. The next highest-ranking activities are developed camping, primitive camping, and bank fishing.

The comments that TVA received during the public scoping period indicate that the majority of people who responded generally show a preference for the existing land uses. Of the land uses listed in Table 1-3, the majority of respondents stated that they believe that the mountain reservoirs have “about the right amount” of developed land uses such as recreation day use areas, marinas, and developed campgrounds. However, the majority of respondents believe there is too much land available for industry or light manufacturing in the area. Most respondents stated that they believe more land is needed for undeveloped

land uses such as natural areas and land use that supports forest management and trails. The majority of respondents felt the recreation uses that “need more land” are mountain bike trails, hiking trails, and greenways and paved trails.

Finally, the respondents were asked to identify for each reservoir whether the number of facilities available met their current needs. The scoping results indicated a high level of interest in development and expansion of hiking and mountain biking trails, as well as improvements at existing recreation areas. Both hiking and mountain biking trails are compatible with several of TVA’s current land use allocations on the mountain reservoirs and would be compatible with some of the allocations proposed under the Action Alternatives described below in Chapter 2. Due to the large interest identified during public scoping regarding mountain biking in the mountain reservoirs region, TVA included an inventory of mountain bike trails in the region as Appendix C.

1.5.3 Land Use Proposals

Several parcel-specific comments were received during scoping and are listed by reservoir in Appendix B. A majority of the parcel-specific comments can be accommodated within the existing allocations, such as mountain bike trails, hiking trails, and natural resource conservation efforts on lands previously allocated for Natural Resource Conservation. On both Chatuge and Hiwassee reservoirs, there were several comments suggesting new recreation areas for water access and trail expansion. A county government official also provided a comment regarding interest in ball fields. Most of the requests for recreation were for trails. A parcel on Chatuge Reservoir was also identified for consideration for placement of an industrial water intake. However, this request was later withdrawn. Several comments regarding Nottely Reservoir called for expansion of the existing recreation facilities, such as Poteete Creek Campground, to accommodate growing recreation demands on this reservoir.

A portion of the approximately 9-acre tract originally indentified as Parcel 52 on Chatuge Reservoir was identified during scoping as a potential site for a new substation to serve the Blue Ridge Mountain Electric Membership Corporation (BRMEMC). BRMEMC expressed an urgent need to meet the projected load growth in the area and meet a substation in-service date of June 2009. Due to this urgent public infrastructure need, this 1.4-acre portion of Parcel 52 was considered for use as a substation site and was evaluated independently from the current land planning effort. TVA has approved the sale of this 1.4-acre parcel at public auction pursuant to Section 31 of the TVA Act. The remainder of the original Parcel 52 was subsequently subdivided to create the new 6.1-acre Parcel 52 and the 1.9-acre Parcel 52a, which were evaluated in the FEIS.

1.5.4 Issue and Resource Identification

TVA internal reviews of current and historical information, reservoir data collected, and public input were used to identify the following resources/issues for evaluation in the MRLMP. The effects of implementing each alternative were evaluated with respect to the following issues:

Existing Land Use patterns along the shoreline and back-lying land have been largely determined by previous TVA land acquisition, disposals, and land use agreements. Many of the parcels are committed to existing land uses with little or no potential for change in the

10-year planning horizon. Proposed allocations of the remaining uncommitted parcels will be evaluated using the goals of the MRLMP and consistent with TVA policies and regulations.

Recreation comprises a broad range of human activities on the nine mountain reservoirs. Recreation opportunities are an important resource for public use of the mountain reservoirs lands and waters.

Terrestrial Ecology includes the plants and animals comprising the terrestrial ecosystems and natural community types found adjacent to the nine mountain reservoirs. Considerations include the identification and protection of significant natural features, rare species habitat, important wildlife habitat, or locally uncommon natural community types. Pursuant to EOs 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) and 13112 (Invasive Species), TVA considers potential impacts to migratory birds and invasive species.

Endangered and Threatened Species are populations of state-listed, federally listed, or rare plants and animals known to exist in the vicinity of the nine mountain reservoirs, including their occurrence and habitats on TVA lands and waters.

Wetlands are an important ecosystem for many types of plants and animals found on TVA land and along the mountain reservoirs shoreline. Pursuant to EO 11990 (Protection of Wetlands) and the *Clean Water Act*, TVA considers impacts to wetlands.

Floodplains are important to flood control and water quality issues and are productive natural areas. Pursuant to EO 11988 (Floodplain Management), TVA considers impacts to floodplains.

Cultural Resources are archaeological sites, historic buildings, and cultural landscapes and properties on or near the nine reservoirs lands, including sites listed in the National Register of Historic Places (NRHP).

Managed Areas and Ecologically Significant Sites are special and unique natural areas on or in the vicinity of the nine mountain reservoirs set aside for a particular management objectives or lands that are known to contain sensitive biological, cultural, or scenic resources.

Visual Resources relate to the scenic qualities of the nine mountain reservoirs and the lands surrounding them.

Water Quality conditions affect the overall ecological conditions of the nine mountain reservoirs. Water quality is influenced by activities causing shoreline erosion as well as pollution, litter, and debris control. Aquatic ecology includes the plants and animals found in the waters of the mountain reservoirs and their tributaries. Issues include the identification and protection of rare species' habitat, important aquatic habitat, or locally uncommon aquatic community types.

Air Quality and Noise are important resources for public health and welfare. An important issue is compliance with National Ambient Air Quality Standards (NAAQS), which establish safe concentration limits of various air pollutants.

Socioeconomic issues include the potential impacts of the MRLMP on current population, labor force, employment statistics, income, and property values of the mountain reservoirs region. A subset of these issues is environmental justice, the potential for disproportionate impacts to minority and low-income communities.

1.6 Public Review Process

The Notice of Availability of the DEIS was published in the *Federal Register* on August 15, 2008. TVA held an open house from 4 p.m. to 8 p.m. at the Blairsville Campus of North Georgia Technical College on August 27, 2008, to solicit public comments on the DEIS. Copies of the DEIS were sent to interested federally recognized Indian tribes, government agencies, interested organizations, and members of the public. The original comment period for the DEIS was from August 15 to September 29, 2008. The comment period was subsequently extended to October 31, 2008.

Printed copies of the DEIS were made available to the public at local libraries and at the Chickamauga-Hiwassee Watershed Team Office in Murphy, North Carolina. Electronic versions of the document were posted on the TVA Web site, where comments could be provided electronically. TVA also accepted comments by regular mail, e-mail, telephone, and by facsimile. TVA also held briefings with community leaders and representatives of interest groups to share information and to receive their input.

Including form letters and petitions, TVA received 722 sets of comments. These comments came from approximately 575 individuals, 7 citizens' organizations, 2 local governments, 3 federal agencies, 8 state agencies, and 1 local governmental agency. Additionally, TVA received comments from the Eastern Band of the Cherokee Indians. TVA has reviewed and responded to these comments, and in some cases, the EIS was changed because of information or issues provided. Because of the large number of similar comments, like comments were combined and paraphrased to permit a collective response. Responses to comments are provided as Volume 2.

1.6.1 Public Comments

The vast majority of the public comments received dealt with proposed allocation changes on Chatuge Reservoir. There were a few comments about Hiwassee and the Ocoee Reservoirs. These comments were generally supportive of proposals on Hiwassee.

Public comments reflected strong concerns about maintaining the aesthetic qualities, especially the tranquil character, of Chatuge Reservoir. Concerns about water quality were also common. Many comments were opposed to any change of parcel allocation from current uses on Chatuge. These commenters were concerned that the potential change in visual character would decrease property values, jeopardize income from tourism, and generally make the area a less desirable place to live and recreate. Other commenters stated that the county needs more developed recreational facilities and supported allocation changes that would support recreation.

There was strong opposition to the proposed allocation of Parcel 10 for future industrial use, and many commenters believed that construction of industrial manufacturing facilities on Parcel 10 would be imminent should it be allocated for industrial use (i.e., to Zone 5). Major concerns included the potential for air and water pollution, excessive noise and loss

of aesthetic character, loss of old-growth forest on the site, decrease in local property values, and loss of habitat for bald eagles.

Some commenters supported the allocation of Chatuge Parcel 52 for developed recreation use. However, others expressed concerns about potential visual effects, noise, loss of local property values, the possible need for fill below the 1,933-foot elevation contour, and the loss of wildlife habitat.

The proposed allocation of Parcel 77 for developed recreational use also generated many comments. Although some comments supported this allocation, others expressed concerns about noise, excessive lights, traffic on the access road, loss of local property values, loss of wildlife habitat, and potential decreases in water and air quality. Some commenters questioned the county's ability to develop and manage a large recreational facility on Parcel 77. Other commenters believed that Parcel 77 was not a suitable location for recreational development because of its topography, its distance from town, and the condition of the only access road to the parcel.

1.6.2 Agency Comments

The U.S. Environmental Protection Agency (USEPA) commented that it does not favor Alternative A for no action and prefers Alternative B or C over Alternative A. Alternative B is preferred from a water quality perspective. USEPA expressed several concerns related to water quality and encouraged various measures to protect or improve water quality. USEPA stated that the proposed industrial use of Parcel 10 is not adequately described and was unclear of the need for the allocation of this particular waterfront parcel. Thus, USEPA recommended additional disclosure and evaluation of project impacts associated with the industrial development of Parcel 10. USEPA also requested additional clarification about future requests on the portion of Parcel 52 requested by BRMEMC. Clarification on the scope of environmental reviews of proposed future actions was requested. Although USEPA preferred adoption of Alternative B, it suggested that TVA develop an additional action alternative bracketed by Alternative B and Alternative C. USEPA rated the DEIS as an "EC-2" (i.e., Environmental Concern, additional information requested), based on concerns for potential environmental impacts from parcel reallocation under Alternative C.

The Atlanta office of the U.S. Fish and Wildlife Service (USFWS) stated that adoption of the No Action Alternative is not appropriate, and that Alternative B is the least environmentally damaging alternative. The USFWS was opposed to allocating Parcel 10 on Chatuge

Reservoir for industrial use because of unacceptable adverse effects on important wildlife habitat, riparian cover, and old-growth forest. The USFWS also opposed reallocating Chatuge Parcel 52 from its current use, citing loss of important riparian habitat and areas of mature hardwood forest. Allocation of Parcels 34 and 40 on Hiwassee for developed recreation was opposed due to the presence of other nearby facilities, important forested riparian areas, and rare aquatic species. USFWS did not oppose the allocation of Parcel 49 on Hiwassee for public recreation. USFWS recommended that TVA reconsider its Zone 7 allocation policy under Alternative A, B or C on all but extremely isolated or developed shoreline parcels on Blue Ridge, Chatuge, Hiwassee, Fontana, and Nottely reservoirs and encouraged TVA to balance the needs of adjacent private landowners and developers with the need for undeveloped shoreline in a manner that protects fish and wildlife habitats. USFWS has determined that adoption of the MRLMP would not likely have an adverse

effect on listed species and recommends that TVA adopt an alternative that has the least effects on migratory birds or their habitats.

The Cookeville, Tennessee, office of the U.S. Fish and Wildlife Service (USFWS) stated no objection to the selection of Alternative A as the preferred alternative. This office also recommended that the tailwater reaches below Apalachia Dam and below Ocoee #2 and #3 be designated for sensitive resource management (i.e., Zone 3) due to the presence of Ruth's golden aster, the tan riffleshell, and the Cumberland bean pearlymussel, should Alternative B be selected. USFWS also noted that the designation of parcels for development on Chatuge and Hiwassee Reservoirs under Alternative C would likely not have adverse effects on listed species in Tennessee.

The USFS expressed no particular concerns, but did suggest allocation modifications (i.e. allocation to Zone 6) to TVA parcels adjacent to National Forest lands on Fontana Reservoir, Chatuge Reservoir, and the Hiwassee River.

The Tennessee Department of Transportation replied that the project would not impact any program or highway project in Tennessee.

The Tennessee Wildlife Resources Agency stated a preference for Alternative B because the other alternatives would divert more land away from dispersed recreational use to developed recreation. The agency also noted that adoption of Alternative C would pose more potential effects to plant and wildlife communities.

Following review of the DEIS, the Tennessee Historical Commission determined that the project may adversely affect properties that are eligible for listing in the NRHP and recommended that TVA begin immediate consultation.

The Georgia Department of Natural Resources, Wildlife Resources Division, stated a preference for keeping lands zoned as Natural Resource Conservation Areas. The department did not support the allocation of Parcel 10 on Chatuge Reservoir for industrial use because it would be detrimental to local natural resources. The department also favors protecting shorelines with vegetation, especially forest, to protect wildlife habitat and water quality. The department did not support the allocation of Chatuge Parcel 77 for developed recreation due to the potential for loss of forest cover along the shoreline, the increase in impervious surface area on the site, and nighttime lighting.

The North Carolina Department of Transportation expressed concern that the EIS did not explain how proposed changes in parcel allocation might affect the department's ability to implement improvements to the North Carolina transportation system.

North Carolina Department of Environment and Natural Resources stated a preference for planning under Alternative B or C as opposed to the continued use of the Forecast System. The department noted the presence of several rare or listed aquatic species near Parcels 34 and 49 on Hiwassee Reservoir and recommended the use of strict erosion and sediment control measures during construction of recreational facilities.

1.7 Necessary Federal Permits, Licenses, and Consultations

No federal permits are required to develop or implement the MRLMP. Site-specific information on reservoir resources has been characterized in this EIS, and potential

impacts on these resources were considered in making land use allocation recommendations. Appropriate agencies regulating wetlands, endangered species, and historic resources have been consulted during this planning process. When specific actions are proposed, additional environmental reviews for these actions would be undertaken as necessary to address potential site-specific impacts and the need for permits or mitigation.

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CHAPTER 2

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 The Allocation Process

As part of the process of developing alternatives for the MRLMP, TVA reviewed existing and newly collected field data, both on the condition of and on resources on the lands being planned. Each parcel of land was reviewed to determine its physical capability for supporting potential suitable uses (see Appendix D, Suitability/Capability Analyses). Based on this information, the TVA planning team "preallocated" land parcels to one of the seven allocation zones used in recent TVA reservoir land plans and described in Table 2-1. The results of preallocation were presented to the public for comment during the scoping period.

Table 2-1. Land Use Zone Definitions

Zone		Definition
1	**Non-TVA Shoreland**	Shoreland that TVA does not own in fee or land never purchased by TVA. Non-TVA Shoreland allocations are based on deeded rights and, therefore, will not change as a result of the land planning process. This category is provided to assist in comprehensive evaluation of potential environmental impacts of TVA's allocation decision. Non-TVA shore land includes: • ***Flowage easement land***—Privately or publicly owned land where TVA has purchased the right to flood and/or limit structures. Flowage easement rights are generally purchased to a contour elevation. Since construction on flowage easement land is subject to TVA's Section 26a permitting requirements, the SMP guidelines discussed in the definition of Zone 7 would apply to the construction of residential water use facilities fronting flowage easement land. SMP guidelines addressing land-based structures and vegetation management do not apply. • ***Privately owned reservoir land***—This was land never purchased by TVA and may include, but is not limited to, residential, industrial, commercial, or agricultural land. This land, lying below the 500-year flood elevation, is subject to TVA's Section 26a approvals for structures.
2	**Project Operations**	All TVA reservoir land currently used for TVA operations and public works projects, including: • ***Land adjacent to established navigation operations—****Locks, lock operations and maintenance facilities, and the navigation work boat dock and bases.* • ***Land used for TVA power projects operations—****Generation facilities, switchyards, and transmission facilities and rights-of-way.* • ***Dam reservation land—****Areas acquired and managed for the primary purpose of supporting the operation and maintenance of TVA dams and associated infrastructure; secondary uses may also include developed and dispersed recreation, maintenance facilities, watershed team offices, research areas, and visitor centers.* • ***Navigation safety harbors/landings—****Areas used for tying off commercial barge tows and recreational boats during adverse weather conditions or equipment malfunctions.*

Zone		Definition
		• ***Navigation dayboards and beacons—****Areas with structures placed on the shoreline to facilitate navigation.* • ***Public works projects***—Includes public utility infrastructure, such as substations and rights-of-way for sewer lines, water lines, transmission lines, and major highway projects. • ***Land planned for any of the above uses in the future.***
3	**Sensitive Resource Management**	Land managed for protection and enhancement of sensitive resources. Sensitive resources, as defined by TVA, include resources protected by state or federal law or executive order and other land features/natural resources TVA considers important to the area viewscape or natural environment. Recreational natural resource activities, such as hunting, wildlife observation, and camping on undeveloped sites, may occur in this zone, but the overriding focus is protecting and enhancing the sensitive resource the site supports. Areas included are: • TVA-designated sites with potentially ***significant archaeological resources***. • TVA public land with ***sites/structures listed on or eligible for listing on the National Register of Historic Places***. • ***Wetlands***—Aquatic bed, emergent, forested, and scrub-shrub wetlands as defined by TVA. • ***TVA public land under easement, lease, or license to other agencies/individuals*** for resource protection purposes. • ***TVA public land fronting land owned by other agencies/individuals*** for resource protection purposes. • ***Habitat Protection Areas***—These TVA Natural Areas are managed to protect populations of species identified as threatened or endangered by the U.S. Fish and Wildlife Service, state-listed species, and any unusual or exemplary biological communities/geological features. • ***Ecological Study Areas***—These TVA Natural Areas are designated as suitable for ecological research and environmental education by a recognized authority or agency. They typically contain plant or animal populations of scientific interest or are of interest to an educational institution that would utilize the area. • ***Small Wild Areas***—These TVA Natural Areas are managed by TVA or in cooperation with other public agencies or private conservation organizations to protect exceptional natural, scenic, or aesthetic qualities that can also support dispersed, low-impact types of outdoor recreation. • ***River Corridor with sensitive resources***—A River Corridor is a segment of a river and the adjacent land along the banks. River Corridors often consist of a linear green space of TVA land serving as a buffer to tributary rivers entering a reservoir. These areas will be included in Zone 3 when identified sensitive resources are present. • ***Significant scenic areas***—Areas designated for visual protection because of their unique vistas or particularly scenic qualities. • ***Champion tree site***—Areas designated by TVA as sites that contain the largest known individual tree of its species in that state. The state forestry agency "Champion Tree Program" designates the tree, while TVA designates the area of the sites for those located on TVA public land.

Zone		Definition
		• ***Other sensitive ecological areas***—Examples of these areas include heron rookeries, uncommon plant and animal communities, and unique cave or karst formations. • ***Land planned for any of the above uses in the future.***
4	**Natural Resource Conservation**	Land managed for the enhancement of natural resources for human use and appreciation. Management of resources is the primary focus of this zone. Appropriate activities in this zone include hunting, timber management to promote forest health, wildlife observation, and camping on undeveloped sites. Areas included are: • ***TVA public land under easement, lease, or license to other agencies*** for wildlife or forest management purposes. • ***TVA public land fronting land owned by other agencies*** for wildlife or forest management purposes. • ***TVA public land*** managed for wildlife or forest management projects. • ***Dispersed recreation areas*** maintained for passive, dispersed recreation activities, such as hunting, hiking, bird watching, photography, primitive camping, bank fishing, and picnicking. • ***Shoreline Conservation Areas***—Narrow riparian strips of vegetation between the water's edge and TVA's back-lying property that are managed for wildlife, water quality, or visual qualities. • ***Wildlife Observation Areas***—TVA Natural Areas with unique concentrations of easily observed wildlife that are managed as public wildlife observation areas. • ***River Corridor without sensitive resources present***—A River Corridor is a linear green space along both stream banks of selected tributaries entering a reservoir managed for light boat access at specific sites, riverside trails, and interpretive activities. River Corridors will be included in Zone 4 unless sensitive resources are present (see Zone 3). • ***Islands of 10 acres or less.*** • ***Land planned for any of the above uses in the future.***
5	**Industrial**	Land managed for economic development, including businesses in distribution/ processing/assembly and light manufacturing. Preference will be given for businesses requiring water access. There are two primary types of uses for TVA land allocated for Industrial: **(1) Access for water supply or structures associated with navigation such as barge terminals, mooring cells, etc., or (2) Land-based development potential.** Areas included are: • ***TVA public land under easement, lease, or license to other agencies/ individuals*** for purposes described above. • ***TVA public land fronting land owned by other agencies/individuals*** for industrial purposes described above. • ***In some cases, TVA land allocated to industrial use would be declared surplus and sold at public auction.*** Types of development that can occur on this land are: • **Light Industrial**—TVA waterfront land that would support businesses and light manufacturing activities. Industrial parks should not include retail, service-based businesses like assisted living, retirement centers, or walk-in-type businesses (excluding retail use).

Zone		Definition
		• **Industrial Access**—Access to the waterfront by back-lying property owners across TVA property for water intakes, wastewater discharge, or conveyance of commodities (i.e., pipelines, rail, or road). Barge terminals are associated with industrial access corridors. • **Barge Terminal Sites**—Public or private facilities used for the transfer, loading, and unloading of commodities between barges and trucks, trains, storage areas, or industrial plants. • **Fleeting Areas**—Sites used by the towing industry to switch barges between tows or barge terminals that have both offshore and onshore facilities. • **Minor Commercial Landing**—A temporary or intermittent activity that takes place without permanent improvements to the property. These sites can be used for transferring pulpwood, sand, gravel, and other natural resource commodities between barges and trucks.
6	**Developed Recreation**	The designations below are based on levels of development and the facilities available to the public. Parcel descriptions should describe the primary type of use and identify access potential for infrastructure and potential for development: **Water Access**—Small parcels of land, generally less than 10 acres, and typically shoreline areas conveyed to public agencies for public access. **Public**—More recreational opportunities, some facilities, more than a parking lot and boat ramp. This includes areas conveyed for public recreation. **Commercial**—Property suitable and capable to support commercial water-based operations. This includes areas conveyed for commercial recreation. Land managed for concentrated, active recreational activities that require capital improvement and maintenance, including: • ***TVA public land under easement, lease, or license to other agencies/individuals* for recreational purposes.** • ***TVA public land fronting land owned by other agencies/individuals* for recreational purposes.** • ***TVA public land* developed for recreational purposes, such as campgrounds, day use areas, etc.** • ***Land planned for any of the above uses in the future*.** Types of development that can occur on this land are: • ***Water access***, e.g., areas that tend to have limited development and can include a launching ramp, courtesy piers, canoe access, parking areas, picnic areas, trails, etc. • ***Public Recreation***—recreation on publicly owned land. These areas typically have facilities or uses developed by a public agency and provide amenities open to the general public. Facilities at "public recreation" areas could include: playgrounds/play structures, picnic facilities, tennis courts, horseshoe areas, play courts, recreation centers, athletic fields, trails, natural areas, amphitheaters, food concessions (vending, snack bar), access to water for fishing and boating, swimming areas and swimming pools, marina facilities owned by the public entity, parking, and campgrounds.

Zone		Definition
		Public recreation, time-forward, will not include residential use, cabins, or other overnight accommodations (other than campgrounds), except if a recreation area is owned by a State or State Agency and operated as a component of a State Park system, in which case cabins and other overnight accommodations will be permitted. Public recreation uses typically include areas and facilities owned and operated by the federal, state, county, or local government (municipalities/communities). However, private entities may operate recreation facilities on public property as concessionaires under agreement with the public entity controlling the property. The use of the facilities may be offered free or for a fee. This does not allow for public-private partnership where facilities are owned by private investors. All structures and facilities should be owned by the agreement holder. • ***Commercial Recreation***—is defined as recreation amenities that are provided for a fee to the public intending to produce a profit for the owner/operator. These primarily water-based facilities typically include: marinas and affiliated support facilities like restaurants and lodges; campgrounds; cabins; military vessel attractions; and excursion tour vessels (restaurant on the water). These uses and activities can be accommodated through changes in existing conveyance agreements. These areas do not include residential use, long-term accommodations or individually owned units. Where applicable, TVA will request appropriate compensation for the use of the property. • ***Greenways***—Linear parks or developed trails located along natural features, such as lakes or ridges, or along man-made features, including abandoned railways or utility rights-of-way, which link people and resources together.
7	**Shoreline Access**	TVA-owned land where Section 26a applications and other land use approvals for residential shoreline alterations are considered. Requests for residential shoreline alterations are considered on parcels identified in this zone where such use was previously considered and where the proposed use would not conflict with the interests of the general public. Types of development/management that may be permitted on this land are: • ***Residential water use facilities***, e.g., docks, piers, launching ramps/driveways, marine railways, boathouses, enclosed storage space, and nonpotable water intakes. • ***Shoreline access corridors***, e.g., pathways, wooden steps, walkways, or mulched paths that can include portable picnic tables and utility lines. • ***Shoreline stabilization***, e.g., bioengineering, riprap and gabions, and retaining walls. • ***Shoreline vegetation management.***

Committed Land

Most likely, land currently committed to a specific use would be allocated to that current use unless there is an overriding need to change the use. Committed lands include the following: properties where TVA has granted landrights (easements, leases, etc.) for specific uses, properties where TVA has previously identified resources in need of protection, TVA Project Operations lands (transmission lines, dam reservations, etc.), and lands fronting national forest properties.

Possible reasons to change a committed land use would be to prevent or remedy ongoing adverse impacts resulting from the actions of a license or easement holder. No committed lands are proposed for change on any of the nine mountain reservoirs. Some committed land uses are determined by the covenants and provisions of easements, leases, licenses, and sale and transfer agreements. Other committed uses are determined by TVA to be critical to the operation of the integrated reservoir system, such as power transmission lines and dam reservations. Approximately 3,024 acres (49 percent) of the TVA land surrounding the mountain reservoirs are committed due to existing TVA or other public infrastructure projects. Altogether, approximately 5,142 acres (83 percent) of the TVA land surrounding the mountain reservoirs are committed. Agricultural licenses are not considered committed uses because they are an interim use of TVA land. The committed and uncommitted lands on the nine mountain reservoirs are summarized as Table 2-2.

Table 2-2. Committed and Uncommitted Parcels on the Mountain Reservoirs

Reservoir	Committed		Uncommitted		Total Number of Parcels	Total Acres
	Number of Parcels	Acres	Number of Parcels	Acres		
Chatuge	82	1,047.6	28	717.5	**110**	**1,765.1**
Hiwassee	60	780.7	14	226.7	**74**	**1,007.4**
Blue Ridge	38	456.6	4	12.9	**42**	**469.5**
Nottely	39	707.7	3	120.9	**42**	**828.6**
Ocoee 1	29	77.4	0	0	**29**	**77.4**
Ocoee 2	4	79.6	0	0	**4**	**79.6**
Ocoee 3	6	218.3	0	0	**6**	**218.3**
Apalachia	7	843.3	0	0	**7**	**843.3**
Fontana	46	931.0	0	0	**46**	**931.0**
Total	**311**	**5,142.2**	**49**	**1078.0**	**360**	**6,220.2**

In the allocation process, if sensitive resources were identified on a committed parcel, that parcel would remain zoned for the committed use unless an ongoing adverse impact was found. However, TVA approval, subsequent to an appropriate level of environmental review, would be required prior to future activities that could impact the identified sensitive resources.

Since originally acquiring the mountain reservoirs lands, TVA has sold over 3,000 acres but retained an adjacent strip of land lying below the maximum shoreline contour (MSC). The MSC is defined as the contour, usually five feet above the ordinary shoreline, which marks the landward limit of permanent flood rights. The majority of these sales occurred in the mid- to late 1950s. The bulk of the public land TVA retained below the MSC has deeded rights of ingress and egress for water access from the back-lying property. Based on the TVA SMP, these back-lying property owners with access rights may apply to TVA for approval to construct private water use facilities on the TVA-managed shoreline land.

TVA also transferred thousands of acres of land to other federal and state agencies, primarily the USFS. TVA typically retained the fee interest of the land below the MSC elevation of the specific reservoir. However, the transfer agreements allowed for management of the TVA-retained land below the transfer contour by these agencies consistent with the objectives exercised on the back-lying public land. The TVA-retained

land fronting transferred land is not represented in the acreage totals for Fontana, Hiwassee, Apalachia, and the Ocoees reservoirs. The width of this strip of TVA-retained land located between June 1 Flood Guide and the transfer tracts varies from reservoir to reservoir. Although the width of this strip may vary, the total acreage for a reservoir may be substantial due to the total length of the shoreline. For example, the acreage of the TVA-retained land located below the transfer elevation on Nottely Reservoir (1,785-foot contour) and above the June 1 Flood Guide (1,777-foot contour) is over 150 acres. Although TVA does not have exact acreages for some of the reservoirs, planning objectives are not impacted because these lands are committed to the back-lying land use by covenants and provisions in the transfer agreement. The committed use is either Zone 4 (Natural Resource Conservation) or Zone 6 (Developed Recreation) and is primarily dependent on the level of recreation use, i.e., developed or informal/dispersed.

Uncommitted Land

The balance of TVA land on the mountain reservoirs (1,078 acres or 17 percent) is not committed to a specific use. Technical specialists collected field data on many uncommitted parcels to identify areas containing sensitive resources. Representatives from different TVA organizations including power generation, land and water stewardship, recreation, and economic development met to allocate the parcels of TVA public land into the seven planning zones. Maps that identified the location of known and potential sensitive resources (e.g., cultural resources, wetlands, and threatened and endangered species) were used in determining the capability and suitability for potential uses of each parcel.

Property Administration

The MRLMP identifies the suitable uses for each tract of TVA-managed land around the nine mountain reservoirs, consistent with TVA policy and guidelines and applicable laws and regulations. As administrators of TVA land, the watershed team will use the MRLMP along with TVA policies and guidelines to manage resources and to respond to requests for the use of TVA land. All inquiries about, or requests for, the use of TVA land on the mountain reservoirs should be made to the TVA Environmental Information Center at 1-800-882-5263.

Pursuant to the TVA Land Policy, TVA would consider changing a land use designation outside of the normal planning process only for water-access purposes for industrial or commercial recreation operations on privately owned back-lying land or to implement TVA's SMP.

There are three non-Zone 7 parcels on the mountain reservoirs over which the private backlying property owners currently have deeded access rights. In the MRLMP, these parcels would be allocated consistent with the current backlying land use. Should the private backlying land become residential, a request for a change of allocation of any or all of the subject TVA parcels to Zone 7 (Shoreline Access) would be subject, with appropriate environmental review, to action by the TVA Board or to Board-approved policy.

Consistent with the TVA Land Policy, those parcels or portions of parcels that have become fragmented from the reservoir may be declared surplus and sold at public auction. Parcel 29, which is approximately 0.5 acre in size, on Hiwassee Reservoir meets these criteria.

Public works/utility projects such as easements for pipelines, power or communication wires, roads or other public infrastructure proposed on any TVA public land that do not affect the zoned land use or sensitive resources would not require an allocation change so

long as such projects would be compatible with the use of the allocated zone. Proposed public works/utility projects would, however, be subject to a site-specific environmental review. Any other requests involving a departure from the planned uses would require the approval of the TVA Board of Directors.

Proposals consistent with TVA's Land Policy and the allocated use and otherwise acceptable to TVA will be reviewed in accordance with NEPA and conform to the requirements of other applicable environmental regulations and other legal authorities.

2.2 Alternatives

TVA identified three alternatives in the draft EIS. However, after considering public input and comments from public agencies and officials, a new alternative, the Blended Alternative, was developed. The following four feasible alternatives are analyzed and compared in the final EIS:

- The No Action/Forecast System Alternative (Alternative A), under which TVA would continue to use the Forecast System to manage 4,611 acres of its mountain reservoirs lands. The remaining 1,609 acres of land that were not planned under the Forecast System would be subject to management in accordance with existing commitments and land use agreements as well as the TVA SMP and Land Policy.

- The Proposed Land Use Plan Alternative (Alternative B), under which TVA would allocate its lands to one of the six zones described in Table 2-1. (TVA does not allocate any of its lands to Zone 1, which is Non-TVA Shoreland.) This allocation process would facilitate the management of these lands. Allocations would be consistent with existing uses of the reservoir lands.

- The Proposed Modified Land Use Plan Alternative (Alternative C), which is similar to Alternative B. However, under Alternative C, a few parcels would be allocated to more development-oriented uses in response to requests received during the public scoping process.

- The Blended Alternative (Alternative D), which is a combination of Alternative B and Alternative C. Under this alternative, two parcels would be allocated to recreational use as they are under Alternative C, while the balance of the parcels would be allocated to the same uses as under Alternative B.

Regardless of the alternative, the following conditions would apply.

- Any proposed development or activity on public land will be subject to TVA approval pending the completion of a site-specific environmental review to evaluate the potential environmental effects of the proposal. As necessary, TVA would impose any necessary mitigative measures as conditions of approval for the use of public lands to prevent adverse environmental effects or to reduce potential effects to insignificant levels.
- Future activities and land uses will be guided by the TVA Land Policy.
- TVA land use allocations are not intended to supersede deeded landrights or land ownership (see Section 2.1, the Allocation Process, for more information).

In addition to the provision of a new alternative, minor changes were made in parcel delineations on Chatuge and Hiwassee reservoirs in the final EIS. Specifically, the 7.4-acre Parcel 52 on Chatuge Reservoir was split into two parcels -- Parcel 52 (6.1 acres) and Parcel 52a (1.9 acres). Also, two parcels were added to Hiwassee Reservoir. The addition of these two parcels was necessary to accommodate a reallocation of shoreline property fronting the USFS recreation facilities at Grape Creek. These changes involved no additional acreage and are shown in the attached pocket maps.

2.2.1 Alternative A – The No Action/Forecast System Alternative

Eight of the nine mountain reservoirs involved in this current land planning effort were planned previously utilizing the Forecast System developed in 1965. The ninth, Fontana Reservoir, has never been forecast or planned. Before 1979, when TVA began the comprehensive planning of its reservoir lands in a public forum, the Forecast System was used to guide land use decisions on most TVA reservoir lands. The Forecast System was an in-house process to document actual and prospective uses for all TVA public land around a reservoir using a somewhat variable set of Forecast System designations (see Appendix E). Under the Forecast System, land was allocated into one of 13 categories. Of these 13 categories, the following six were used to classify TVA land surrounding the eight mountain reservoirs previously forecast: Dam Reservations, Public Recreation, Reservoir Operations (Islands), Reservoir Operations (Mainland), Power Transmission and Power Needs, and Industrial. TVA presently manages approximately 4,611 acres on the mountain reservoirs utilizing the Forecast System. These lands, as well as an additional 1,609 acres that were not planned under the Forecast System, are the subject of the current planning process.

Under Alternative A, the No Action/Forecast System Alternative, TVA would continue to use the Forecast System designations to manage the 4,611 acres (approximately 74 percent) that were previously forecast in the 1970s out of the total of approximately 6,220 acres on the nine mountain reservoirs. TVA has revised these designations to reflect changes in land use that have occurred over the past 40+ years. For example, if a parcel was forecast for Industrial and TVA later provided an easement for a major highway right-of-way, the easement area would be segregated from the original parcel and allocated to Project Operations. Under Alternative A, the approximately 1,609 acres of TVA mountain reservoirs lands unplanned under the Forecast System, including all TVA-owned Fontana Reservoir lands, would continue to be managed according to existing land use agreements and TVA's SMP and Land Policy. However, the unplanned parcels are not allocated to a current land use zone (as listed in Table 2-1) under this alternative. Therefore, complete alignment with current TVA policies and guidelines would not occur.

To facilitate the comparison of alternatives in this EIS, the Forecast System designations for all parcels previously planned have been converted to the equivalent current land use zone designations. For example, a parcel with a Forecast System designation of Dam Reservation would be converted to Project Operations, a Zone 2 allocation. In situations where a Forecast System designation could be converted to more than one zone allocation, the zone allocation was chosen based on existing land use. In some cases, a parcel with the appropriate multiple land uses was split in order to allocate the varying uses to the compatible zone. Additionally, some adjacent parcels with similar land uses were combined and allocated to the compatible zone. The conversions are identified for individual parcels on each reservoir in Appendix F, and the converted designations are used in many of the discussions below.

Under Alternative A, only five of the currently used seven land use zone designations were utilized for the 4,611 acres previously planned. These zone designations included: Project Operations, Natural Resource Conservation, Industrial, Recreation, and Shoreline Access (see Table 2-3). Under Alternative A, no TVA parcels were planned for Sensitive Resource Management because the Forecast System did not have an equivalent designation for that zone. Only two acres were allocated to Shoreline Access. The vast majority of land currently committed to shoreline access was not planned in the Forecast System. Zone 1 (Non-TVA Shoreland) is not represented in the following tables because the parcels are private land (in which TVA owns certain rights) and their land uses will not change because of the land planning process.

Table 2-3. Alternative A – Area by Equivalent Current Land Use Designations by Reservoir

Equivalent Current Designation	Area in Acres by Reservoir						
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana
Project Operations	374.0	366.4	287.0	443.3	375.3	760.5	0.0
Natural Resource Conservation	733.5	471.2	0.0	123.2	0.0	0.0	0.0
Industrial	0.0	80.5	0.0	0.0	0.0	0.0	0.0
Recreation	370.0	38.9	10.5	91.9	0.0	82.8	0.0
Shoreline Access	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total	**1,479.1**	**957.4**	**297.5**	**658.4**	**375.3**	**843.3**	**0.0**

The number and acreages of planned and unplanned parcels of TVA land around the nine mountain reservoirs under Alternative A are shown in Table 2-4. As shown in Table 2-4, 231 of the total 360 parcels are unplanned. However, because these unplanned parcels tend to be small, they total only 1,609.2 acres. Of the 360 parcels, 311 are committed (see Table 2-2). Of the 49 parcels that are uncommitted, 12 are unplanned. These 12 parcels comprise a total of 14.9 acres.

Table 2-4. Alternative A – Planned and Unplanned Parcels and Area by Reservoir

Reservoir	Total Number of Parcels	Total Number of Acres	Number of Unplanned Parcels	Unplanned Acres	Percent Planned	Percent Unplanned
Chatuge	110	1,765.1	57	286.0	83.8	16.2
Hiwassee	74	1,007.4*	22	50.0*	95.0	5.0
Blue Ridge	42	469.5*	40	172.0*	63.4	36.6
Nottely	42	828.6	37	170.2	79.5	20.5
Ocoee 1	29	77.4*	27	*	99+	<1
Ocoee 2	4	79.6	0.0	0.0	100.0	0.0
Ocoee 3	6	218.3	0.0	0.0	100.0	0.0
Apalachia	7	843.3*	2	*	99+	<1
Fontana	46	931.0*	46	931.0*	0.0	100.0
Total	**360**	**6,220.2**	**231**	**1,609.2**		

*Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

2.2.2 Alternative B – The Proposed Land Use Plan Alternative

TVA's recent comprehensive reservoir land planning efforts allocate land to the following seven land use zones: Non-TVA Shoreland (Zone 1), Project Operations (Zone 2), Sensitive Resource Management (Zone 3), Natural Resource Conservation (Zone 4), Industrial (Zone 5), Developed Recreation (Zone 6), and Shoreline Access (Zone 7). These zones are described in detail in Table 2-1.

Under Alternative B, the Proposed Land Use Plan Alternative, TVA would adopt a new land management plan based on the current reservoir land planning process and zone allocation definitions to guide future land use decisions over the next decade. Acreages for each of the proposed zone allocations are summarized by reservoir in Table 2-5, and the zone allocation for each individual parcel is identified in Appendix F. In addition to the 4,611 acres previously planned under the existing Forecast System (Alternative A), the 1,609 acres and corresponding 231 parcels not already planned would be allocated under this alternative. The proposed allocations are the result of the allocation process described above in Section 2.1.

Table 2-5. Alternative B – Area by Current Allocation Zone by Reservoir

Current Allocation Designation	Acreage by Reservoir							Total (acres)
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana	
Zone 2	381.2	366.4	293.1	443.3	375.3	760.5	404.8	**3,024.6**
Zone 3	16.7	114.7	12.2	0.0	0.0	0.0	0.0	**143.6**
Zone 4	874.6	442.8	27.7**	270.3	**	**	50.4**	**1,165.8**
Zone 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Zone 6	414.2	40.6**	14.6**	94.5	**	82.8	434.6	**1,081.3**
Zone 7	78.4	42.9	121.9	20.5	0.0	0.0	41.2	**304.9**
Total	**1,765.1**	**1,007.4****	**469.5****	**828.6**	**375.3****	**843.3****	**931.0****	**6,220.2**

**Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

Differences in parcel allocations under Alternative A (the Forecast System) and Alternative B are listed in Table 2-6. These allocation differences would occur on two of the nine reservoirs -- Chatuge and Hiwassee reservoirs. No changes in the proposed parcel allocations under Alternative B have been determined for any parcels planned under the Forecast System for Blue Ridge, Nottely, the Ocoees, or Apalachia reservoirs. Under Alternative B, new allocations for the 231 parcels that were previously unplanned would reflect existing land uses. The vast majority of these are committed due to land use agreements or deeded rights; therefore, they were not subject to potential changes in land use.

Table 2-6. Allocation Differences Between Alternative A and Alternative B

Parcel Number	Acres	Forecast System Alternative A	Proposed Land Plan Alternative B	Description and/or Current Use
Chatuge Reservoir				
60	1.8	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
Hiwassee Reservoir				
26	12.6	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
31	3.3	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
35	9.8	Industrial	Zone 4 (Natural Resource Conservation)	Upland Mixed Pine Hardwood
36	70.7	Industrial	Zone 4 (Natural Resource Conservation)	Unique Topography with Multiple Natural Habitat Features
40	17.4	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
42	3.4	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
44	6.6	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
46	17.2	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
52	14.6	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
54	9.8	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
55	3.6	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
59	5.8	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
62	11.6	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
63	4.0	Natural Resource Conservation	Zone 3 (Sensitive Resource Management)	Protection of Sensitive Natural Resources
Total	**192.2**			

2.2.3 Alternative C – The Proposed Modified Land Use Plan Alternative

Under Alternative C, the Proposed Modified Land Use Plan Alternative, the allocations are the same as those under Alternative B for 351 (of 360) parcels containing approximately 6,115 (of 6,220) acres. The land areas for each of the proposed zone allocations are summarized by reservoir in Table 2-7, and the zone allocation for each individual parcel is identified in Appendix F.

Table 2-7. Alternative C – Area by Proposed Allocation Zone by Reservoir

Allocation Zone	Acreage by Reservoir							Total (acres)
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana	
Zone 2	381.2	366.4	293.1	443.3	375.3	760.5	404.8	**3,024.6**
Zone 3	16.7	114.7	12.2	0.0	0.0	0.0	0.0	**143.6**
Zone 4	773.0	438.8	27.2	270.3	**	**	50.4	**1,560.2**
Zone 5	27.2	0.0	0.0	0.0	0.0	0.0	0.0	**27.2**
Zone 6	488.6	44.6	14.6	94.5	**	82.8	434.6	**1,159.7**
Zone 7	78.4	42.9	121.9	20.5	0.0	0.0	41.2	**304.9**
Total	**1,765.1**	**1,007.4**	**469.5**	**828.6**	**375.3****	**843.3****	**931.0**	**6,220.2**

** Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

Alternative C differs from Alternative B in that additional lands would be allocated for Developed Recreation (Zone 6) and Industrial (Zone 5) use on Chatuge and Hiwassee reservoirs. These allocations, developed in response to proposals received during the scoping process, affect 101.6 acres on four parcels on Chatuge Reservoir and 4.0 acres on two parcels on Hiwassee Reservoir, for a total of 105.6 acres. The parcels on Chatuge and Hiwassee reservoirs that would be allocated differently under Alternative C as compared to Alternative B (see Figures 2-1 through 2-5) are listed in Table 2-8. The allocations for the other parcels on Chatuge and Hiwassee, as well as all parcels on the other mountain reservoirs, would be the same as those under Alternative B.

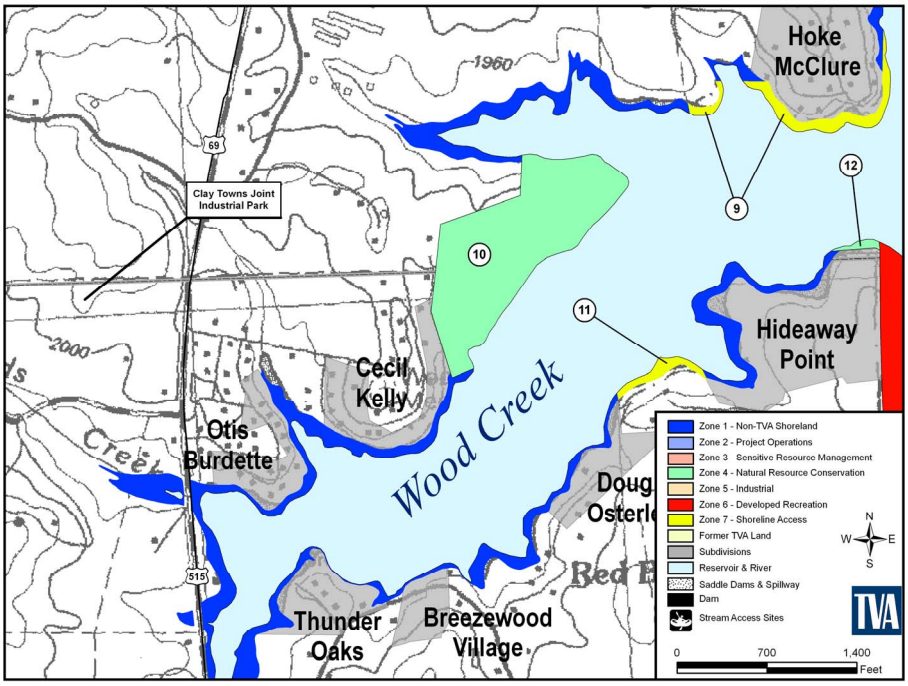

Figure 2-1. Chatuge Reservoir, Parcel 10

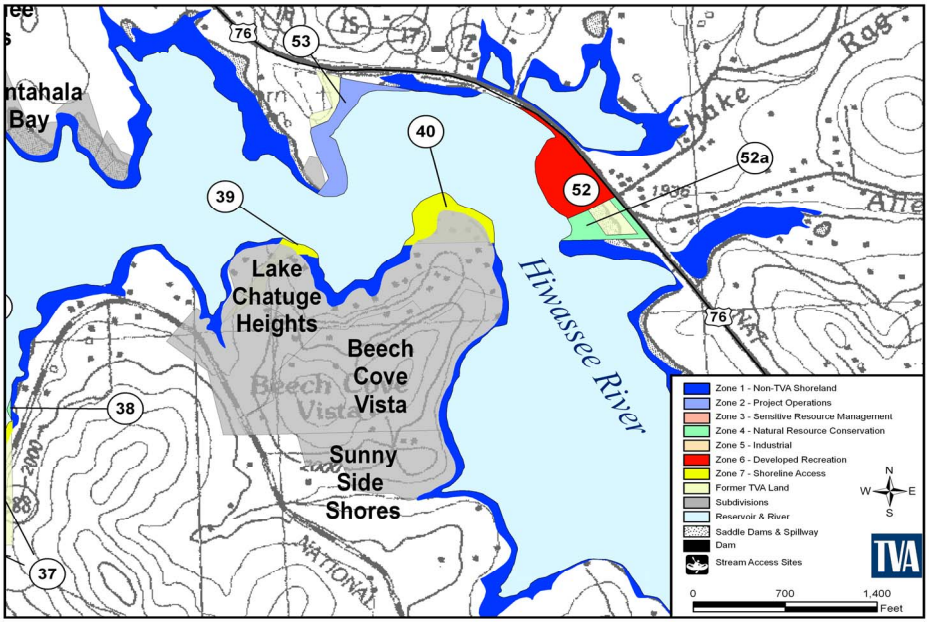

Figure 2-2. Chatuge Reservoir, Parcel 52

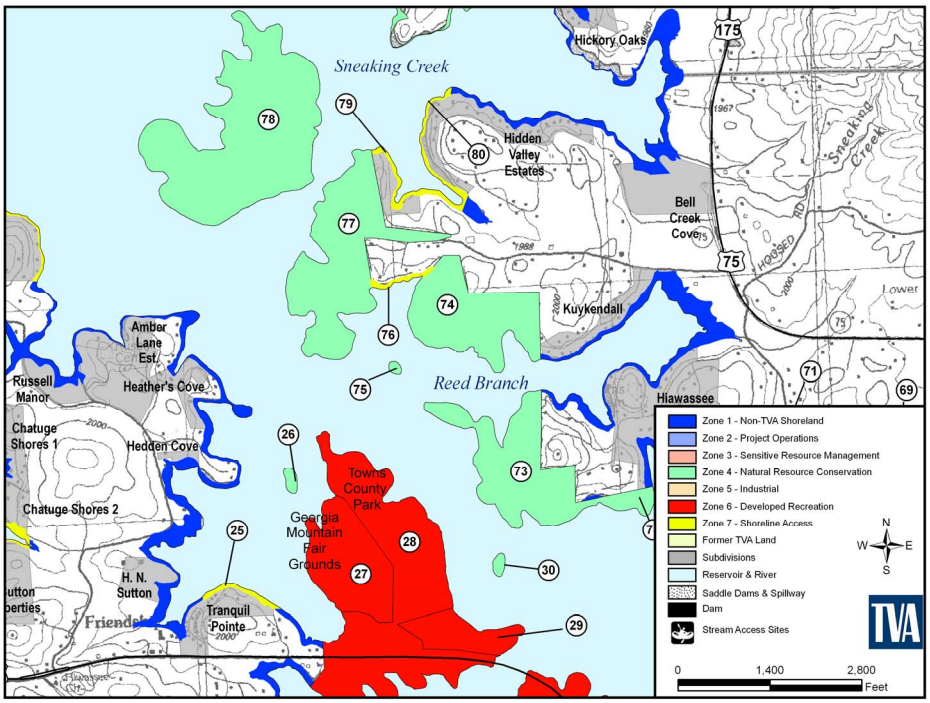

Figure 2-3. Chatuge Reservoir, Parcel 77

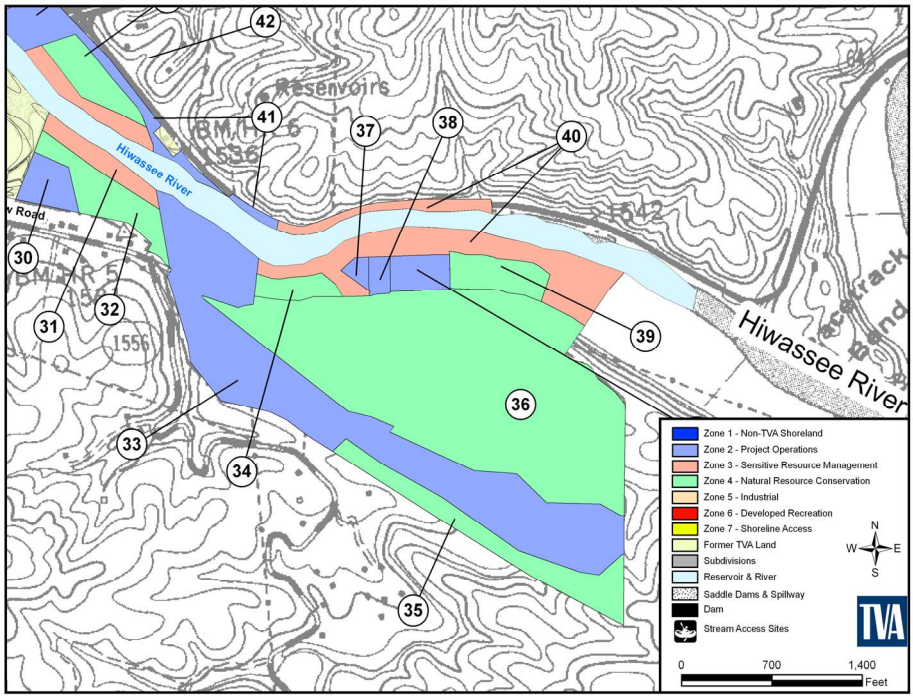

Figure 2-4. Hiwassee Reservoir, Parcel 34

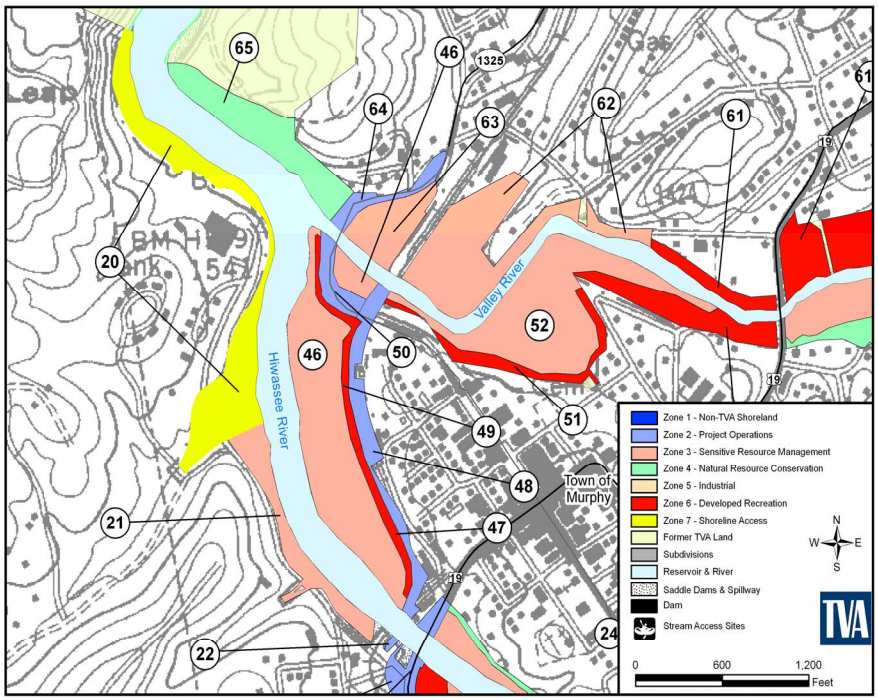

Figure 2-5. Hiwassee Reservoir, Parcel 49

Table 2-8. Allocation Differences Between Alternative B and Alternative C

Parcel Number	Area in Acres	Proposed Land Use Plan Alternative B	Proposed Modified Land Use Plan Alternative C	Basis for Proposed Allocation Change
Chatuge Reservoir				
10	27.2	Zone 4	Zone 5	Request by BRMEMC for Industrial to allow for sale of parcel for private industrial use; request withdrawn
52	6.1	Zone 4	Zone 6	Request by Towns County, Ga., City of Hiawassee, Ga., and Georgia Department of Natural Resources for recreation area to include year-round boat-launching ramp, fishing piers, and trails
52a	1.9	Zone 4	Zone 6	
77	66.4	Zone 4	Zone 6	Request by Towns County, Ga., and City of Hiawassee, Ga., for development of a multiple-field sports complex and associated recreational facilities
Total	**101.6**			
Hiwassee Reservoir				
34	2.4	Zone 4	Zone 6	Request by Town of Murphy, N.C. for stream access site along Hiwassee River for wade fishing
49	1.6	Zone 4	Zone 6	Request by Town of Murphy, N.C. and Heritage Riverwalk Partners for extension of Heritage Riverwalk Trail
Total	**4.0**			

Under Alternative C, parcels requested by the public for a different, more development-oriented use were evaluated by TVA to determine if they were both capable of and suitable for the proposed use. Parcels were evaluated using established criteria for each allocation category or zone. The capability/suitability criteria for Zones 4, 5, and 6 for the parcels listed in Table 2-8 are provided as Appendix D.

Under Alternative C, Parcel 10 on Chatuge Reservoir was allocated to Zone 5 for possible industrial use based on a request from BRMEMC, which had expressed an interest in locating an industrial water intake on the parcel. This intake would serve the nearby industrial park. However, during the preparation of the FEIS, BRMEMC withdrew the request for Zone 5 allocation. For purposes of consistency, TVA chose to retain Alternative C, including the Zone 5 allocation of Parcel 10, in the FEIS.

2.2.4 Alternative D – The Blended Alternative

Based on comments received on the draft EIS and other considerations, TVA developed a third action alternative, Alternative D, the Blended Alternative. This alternative is similar to Alternative B and Alternative C. However, this alternative does not involve the allocation of as many parcels for development-oriented uses as Alternative C. Specifically, the 6.1-acre Parcel 52 on Chatuge Reservoir would be allocated to Zone 6 for recreational use. This allocation is the same as proposed under Alternative C. However, under Alternative D, Parcel 52a, a 1.9-acre parcel adjacent to the 1.4 acres approved for disposal under Section 31 of the TVA Act (see Section 1.5.3) would be allocated to Zone 4 (Natural Resource Conservation). Following preparation of the DEIS, BRMEMC withdrew is request for allocation of Chatuge Parcel 10 for industrial use. Consequently, under the Blended Alternative, Parcel 10 would be allocated to Zone 4, rather than to Zone 5 (Industrial) as

under Alternative C. The 66.4-acre Parcel 77 on Chatuge would not be allocated for Developed Recreation (Zone 6) under the Blended Alternative; it would be allocated to Zone 4.

On Hiwassee Reservoir, Parcel 49 would be allocated to Zone 6 for developed recreation, as it was under Alternative C. However, under Alternative D, Parcel 34 would be allocated to Zone 4, its allocation under Alternative B. The land areas for each of the proposed zone allocations under the Blended Alternative are listed by reservoir in Table 2-9. Zone allocations for individual parcels are provided as Appendix F.

Table 2-9. Alternative D – Area by Proposed Allocation Zone by Reservoir

Allocation Zone	Acreage by Reservoir							Total (acres)
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana	
Zone 2	381.2	366.4	293.1	443.3	375.3	760.5	404.8	**3,024.6**
Zone 3	16.7	114.7	12.2	0.0	0.0	0.0	0.0	**143.6**
Zone 4	868.5	441.2	27.7	270.3	**	**	50.4	**1,658.1**
Zone 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Zone 6	420.3	42.2	14.6	94.5	**	82.8	434.6	**1,089.0**
Zone 7	78.4.4	42.9	121.9	20.5	0.0	0.0	41.2	**304.9**
Total	**1,765.1**	**1,007.4**	**469.5**	**828.6**	**375.3**	**843.3**	**931.0**	**6,220.2**

** Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

Alternative D differs from Alternative B in that an additional 6.1 acres (i.e., Parcel 52) would be allocated to development-oriented uses (developed recreation) on Chatuge Reservoir. Similarly, on Hiwassee, the 1.6-acre Parcel 49 would be allocated for developed recreation. Under Alternative B, these parcels are designated as Zone 4. Excluding Parcel 52 on Chatuge and Parcel 49 on Hiwassee, allocations of all other parcels would be the same under Alternative B. As compared to Alternative C, Alternative D involves the allocation of two parcels for more developed uses (specifically, developed recreation), whereas Alternative C involves 6 parcels being allocated to Zones 5 or 6 (see Table 2-10).

Table 2-10. Allocation Differences Between Alternatives B, C, and D

Parcel Number	Area in Acres	Allocation by Alternative			Basis for Proposed Allocation Change
		Alt. B	Alt. C	Alt. D	
Chatuge Reservoir					
10	27.2	Zone 4	Zone 5	Zone 4	Request by BRMEMC for Industrial to allow for sale of parcel for private industrial use; request withdrawn
52	6.1	Zone 4	Zone 6	Zone 6	Request by Towns County, Ga., City of Hiawassee, Ga., and Georgia Department of Natural Resources for recreation area to include year-round boat-launching ramp, fishing piers, and trails
52a	1.9	Zone 4	Zone 6	Zone 4	
77	66.4	Zone 4	Zone 6	Zone 4	Request by Towns County, Ga., and City of Hiawassee, Ga., for development of a multiple field sports complex and associated recreational facilities
Total	**101.6**				

Parcel Number	Area in Acres	Allocation by Alternative			Basis for Proposed Allocation Change
		Alt. B	Alt. C	Alt. D	
Hiwassee Reservoir					
34	2.4	Zone 4	Zone 6	Zone 4	Request by Town of Murphy, N.C., representatives for stream access site along Hiwassee River for wade fishing
49	1.6	Zone 4	Zone 6	Zone 6	Request by Town of Murphy, N.C., and Heritage Riverwalk Partners for extension of Heritage Riverwalk Trail
Total	**4.0**				

2.3 Comparison of Alternatives

Under Alternative A, the No Action/Forecast System Alternative, no parcels would be allocated, as they would be under the three action alternatives. Rather, the land use categories assigned to each parcel under the Forecast System would be retained (see Section 2.2.1). To allow a comparision of land use allocations among the four alternatives, those parcels that had been assigned a land use category (i.e., "planned") under the Forecast System were consolidated and re-assigned the appropriate comparable zone allocation. Land use allocations for each reservoir are summarized by alternative in Table 2-11. The combined acreage for all parcels not assigned a category under the Forecast System is presented in the "Unplanned" row of Table 2-11 for each reservoir.

Table 2-11. Comparison of Allocations (in Acres and Percent of Total) by Alternative

Current Allocation Designation	Alternative A		Alternative B		Alternative C		Alternative D	
	acres	%	acres	%	acres	%	acres	%
Chatuge Reservoir								
Project Operations (Zone 2)	374.0	21.2	381.2	21.6	381.2	21.6	381.2	21.6
Sensitive Resource Management (Zone 3)	0.0	0.0	16.7	0.9	16.7	0.9	16.7	0.9
Natural Resource Conservation (Zone 4)	733.5	41.6	874.6	49.5	773.0	43.8	868.5	49.2
Industrial (Zone 5)	0.0	0.0	0.0	0.0	27.2	1.5	0.0	0.0
Developed Recreation (Zone 6)	370.0	21.0	414.2	23.5	488.6	27.7	420.3	23.8
Shoreline Access (Zone 7)	1.6	0.0	78.4	4.4	78.4	4.4	78.4	4.4
Unplanned	286.0	16.2	0.0	0.0	0.0	0.0	0.0	0.0
Total	**1,765.1**		**1,765.1**		**1,765.1**		**1,765.1**	
Hiwassee Reservoir								
Project Operations (Zone 2)	366.4	36.4	366.4	36.4	366.4	36.4	366.4	36.4
Sensitive Resource Management (Zone 3)	0.0	0.0	114.7	11.4	114.7	11.4	114.7	11.4
Natural Resource Conservation (Zone 4)	471.2	46.8	442.8**	44.0	438.8	43.6	441.2	43.8
Industrial (Zone 5)	80.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0
Developed Recreation (Zone 6)	38.9	3.9	40.6**	4.0	44.6**	4.4	42.2	4.2
Shoreline Access (Zone 7)	0.4	0.0	42.9	4.3	42.9	4.3	42.9	4.3
Unplanned	50.0**	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**1,007.4**		**1,007.4**		**1,007.4**		**1,007.4**	

Current Allocation Designation	Alternative A		Alternative B		Alternative C		Alternative D	
	acres	%	acres	%	acres	%	acres	%
Blue Ridge Reservoir								
Project Operations (Zone 2)	287.0	61.1	293.1	62.4	293.1	62.4	293.1	62.4
Sensitive Resource Management (Zone 3)	0.0	0.0	12.2	2.6	12.2	2.6	12.2	2.6
Natural Resource Conservation (Zone 4)	0.0	0.0	27.7**	5.9	27.7**	5.9	27.7**	5.9
Industrial (Zone 5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Developed Recreation (Zone 6)	10.5	2.2	14.6**	3.1	14.6**	3.1	14.6**	3.1
Shoreline Access (Zone 7)	0.0	0.0	121.9	26.0	121.9	26.0	121.9	26.0
Unplanned	172.0**	36.6	0.0	0.0	0.0	0.0	0.0	0.0
Total	**469.5**		**469.5**		**469.5**		**469.5**	
Nottely Reservoir								
Project Operations (Zone 2)	443.3	53.5	443.3	53.5	443.3	53.5	443.3	53.5
Sensitive Resource Management (Zone 3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Resource Conservation (Zone 4)	123.2	14.8	270.3	32.6	270.3	32.6	270.3	32.6
Industrial (Zone 5)	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0
Developed Recreation (Zone 6)	91.9	11.1	94.5	11.4	94.5	11.4	94.5	11.4
Shoreline Access (Zone 7)	0.0	0.0	20.5	2.4	20.5	2.4	20.5	2.4
Unplanned	170.2	20.5	0.0	0.0	0.0	0.0	0.0	0.0
Total	**828.6**		**828.6**		**828.6**		**828.6**	
Ocoee Reservoirs								
Project Operations (Zone 2)	375.3	100	375.3	100.0	375.3	100.0	375.3	100.0
Sensitive Resource Management (Zone 3)	0/0	0/0	0.0	0.0	0.0	0.0	0.0	0
Natural Resource Conservation (Zone 4)	0.0	0.0	**	<0.1	**	<0.1	**	<0.1
Industrial (Zone 5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Developed Recreation (Zone 6)	0.0	0.0	**	<0.1	**	<0.1	**	<0.1
Shoreline Access (Zone 7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unplanned	**	<0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	**375.3**		**375.3**		**375.3**		**375.3**	
Apalachia Reservoir								
Project Operations (Zone 2)	760.5	90.2	760.5	90.2	760.5	90.2	760.5	90.2
Sensitive Resource Management (Zone 3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Resource Conservation (Zone 4)	0.0	0.0	**	<0.1	**	<0.1	**	<0.1
Industrial (Zone 5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Developed Recreation (Zone 6)	82.8	9.8	82.8	9.8	82.8	9.8	82.8	9.8
Shoreline Access (Zone 7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unplanned	**	<0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	**843.3**		**843.3**		**843.3**		**843.3**	

Current Allocation Designation	Alternative A		Alternative B		Alternative C		Alternative D	
	acres	%	acres	%	acres	%	acres	%
Fontana Reservoir								
Project Operations (Zone 2)	0.0	0.0	404.8	43.4	404.8	43.4	404.8	43.4
Sensitive Resource Management (Zone 3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Resource Conservation (Zone 4)	0.0	0.0	50.4**	5.4	50.4**	5.4	50.4**	5.4
Industrial (Zone 5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Developed Recreation (Zone 6)	0.0	0.0	434.6**	46.7	434.6**	46.7	434.6**	46.7
Shoreline Access (Zone 7)	0.0	0.0	41.2	4.4	41.2	4.4	41.2	4.4
Unplanned	931.0**	100	0.0	0.0	0.0	0.0	0.0	0.0
Total	**931.0**		**931.0**		**931.0**		**931.0**	
TOTALS (ALL RESERVOIRS)								
Project Operations (Zone 2)	2,606.5	41.9	3,024.6	48.6	3,024.6	48.6	3,024.6	48.6
Sensitive Resource Management (Zone 3)	0.0	0.0	143.6	2.3	143.6	2.3	143.6	2.3
Natural Resource Conservation (Zone 4)	1,327.9	21.4	1,665.8	26.8	1,560.2	25.1	1,658.1	26.7
Industrial (Zone 5)	80.5	1.3	0	0.0	27.2	0.4	0	0
Developed Recreation (Zone 6)	594.1	9.6	1,081.3	17.4	1,159.7	18.6	1,089.0	17.5
Shoreline Access (Zone 7)	2.0	0.0	304.9	4.9	304.9	4.9	304.9	4.9
Unplanned	1,609.2	25.9	0.0	0.0	0.0	0.0	0.0	0.0
Total	**6,220.2**		**6,220.2**		**6,220.2**		6,220.2	

**Includes narrow strip of TVA-retained land along shoreline; acreage not calculated

Under Alternative A, the No Action/Forecast System Alternative, TVA would not have a management plan for 1,609 acres (26 percent) of its land on the mountain reservoirs, including all Fontana Reservoir lands. Under Alternative A, no land is allocated to Sensitive Resource Management, and only 2 acres are allocated for Shoreline Access. A smaller total percentage of the planned lands are allocated under this alternative for Project Operations (42 percent) and Recreation (10 percent) than would be allocated under Alternative B, C, or D. Under Alternative A, a smaller total percentage of planned lands is allocated for Natural Resource Conservation than would be allocated under Alternative B, C, or D. Approximately 80 acres were forecast for industrial use on Hiwassee Reservoir and are allocated to Zone 5 under Alternative A. However, these two parcels are currently undeveloped, and development is unlikely because of the steepness of the sites. Thus, because there would be no changes in land use allocations, changes in land use from the current situation under Alternative A are unlikely. As stated in Section 2.2, any proposed activity on public land is subject to TVA approval following an appropriate environmental review. TVA could impose necessary mitigative measures to avoid adverse effects or reduce the severity of such effects as conditions of approval.

The Forecast System is not comprehensive, nor does not align with TVA's SMP and Land Policy. Therefore, Alternative A does not represent an optimal plan by which TVA would continue to manage the approximately 4,611 acres of previously planned TVA land on the mountain reservoirs.

Under Alternative B, the Proposed Land Use Plan Alternative, parcels would be allocated to one of seven zones (see Table 2-1). Land use zone allocations were based on committed land uses, existing conditions, and protection of sensitive resources. About one fourth of the TVA land on the nine mountain reservoirs would be used for natural resource conservation purposes by allocating approximately 1,665.8 acres (27 percent) to Zone 4. There would be no Zone 5 (Industrial) allocations. A new allocation not previously represented under Alternative A would include 143.6 acres (2.3 percent) allocated to Zone 3 (Sensitive Resource Management). Additional lands (a total of 1,081.3 acres or 17.4 percent) would be allocated to Zone 6 (Recreation), and 304.9 acres (4.9 percent) would be allocated to Zone 7 (Shoreline Access). Under Alternative B, Zone 2 (Project Operations) properties would constitute roughly half (48.6 percent) of all of the planned lands.

Under Alternative C, the Proposed Modified Land Use Plan Alternative, 27.2 acres (0.4 percent) would be allocated to Zone 5 (Industrial) and an additional 78.4 acres (for a total of 1,159.7 acres or about 19 percent) would be allocated to Zone 6 (Developed Recreation) as compared to Alternative B. The parcels for which Alternative C allocations differ from Alternative B allocations are located on Chatuge Reservoir (101.6 acres) and Hiwassee Reservoir (4.0 acres). Adoption and implementation of Alternative C would decrease the total acreage allocated to Natural Resource Conservation (Zone 4) by 105.6 acres as compared to Alternative B. Allocations under Alternatives B and C would be the same for the remaining lands on Chatuge and Hiwassee reservoirs and for all lands on the other reservoirs.

Under Alternative D, the Blended Alternative, land use allocations would be very similar to those under Alternative B, except for two parcels. These two parcels, the 6.1-acre Parcel 52 on Chatuge Reservoir and the 1.6-acre Parcel 49 on Hiwassee, would be allocated to Zone 6 (Developed Recreation). As with Alternative B, no allocations to Zone 5 (Industrial) would occur under this alternative. The amount of land allocated to Zone 2 (Project Operations), Zone 3 (Sensitive Resource Management), Zone 4 (Natural Resource Conservation), and Zone 7 (Shoreline Access) under Alternative D would be that same as under Alternative B.

2.4. Impacts Summary

The summary of potential environmental impacts for Chatuge and Hiwassee reservoirs is presented in Table 2-12. The summary of environmental impacts for Blue Ridge, Nottely, the Ocoees, Apalachia, and Fontana reservoirs is presented in Table 2-13.

Table 2-12. Summary of Environmental Impacts by Alternative for Chatuge and Hiwassee Reservoirs

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Land Use	Chatuge Reservoir Would not likely result in any parcels changing from an undeveloped land use to a developed land use Hiwassee Reservoir Two presently undeveloped parcels remain available for industrial development No significant direct or indirect impacts expected	Chatuge and Hiwassee Reservoirs Represents existing land use condition; would not result in any parcels changing from an undeveloped land use to a developed land use No significant direct or indirect impacts expected	Chatuge and Hiwassee Reservoirs Would result in change from an undeveloped land use to a developed industrial or recreational use on four parcels (Parcels 10, 52, 52a, and 77) on Chatuge Reservoir and two parcels (Parcels 34 and 49) on Hiwassee Reservoir Zone 4 allocations would be 105.6 acres less than under Alternative B No significant direct or indirect impacts expected Minor insignificant prime farmland impacts	Chatuge and Hiwassee Reservoirs Would result in change from an undeveloped land use to a developed recreational use on Parcel 52 on Chatuge Reservoir and Parcel 49 on Hiwassee Reservoir Zone 4 allocations would be 7.7 acres less than under Alternative B No significant direct or indirect impacts expected Minor insignificant prime farmland impacts
Recreation	Chatuge Reservoir No adverse impacts to developed or dispersed recreation opportunities Hiwassee Reservoir No adverse impacts to developed recreation opportunities; potential industrial development of two parcels would decrease dispersed recreation opportunities	Chatuge and Hiwassee Reservoirs No change from existing opportunities for developed or dispersed recreation; additional recreation facility development would occur at existing recreation areas	Chatuge Reservoir Additional Zone 6 allocations (74.4 acres) over Alternative B would increase developed recreation facilities and decrease dispersed recreation opportunities; allocation of Parcel 10 to Zone 5 would decrease dispersed recreation opportunities currently available on the parcel (27.2 acres) Hiwassee Reservoir Additional Zone 6 allocations (4.0 acres) would allow for development of new walking trails and a new river access site that would provide for increased dispersed recreation opportunities	Chatuge Reservoir Additional Zone 6 allocation of Parcel 52 (6.1 acres) would increase developed recreation facilities but decrease dispersed recreation opportunities Hiwassee Reservoir Additional Zone 6 allocation of Parcel 49 (1.6 acres) for walking trail would provide increased dispersed recreation opportunities.

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Terrestrial Ecology - Plants	Chatuge and Hiwassee Reservoirs No changes in land use likely to occur on parcels containing rare plant communities Impacts to plant communities would be insignificant	Chatuge and Hiwassee Reservoirs Impacts similar to those under Alternative A Allocating several parcels to Zone 3 would result in long-term beneficial effects to plants Hiwassee Reservoir Two parcels allocated to Zone 5 under Alternative A would be allocated to Zone 4, thus providing additional protection on these parcels No significant direct or indirect impacts expected	Chatuge and Hiwassee Reservoirs Impacts similar to Alternative B except for five parcels Chatuge Reservoir Parcel 10 - Destruction of old-growth forest; potential spread of invasive species Insignificant impacts to common plant communities from development of Parcel 52 for recreation Potential impacts to common plant communities from recreational development of Parcel 77 would be regionally insignificant Hiwassee Reservoir Insignificant impacts to common plant communities from development of two parcels for recreation	Chatuge and Hiwassee Reservoirs Impacts similar to Alternative B except for two parcels Chatuge Reservoir Insignificant impacts to plant communities from development of Parcel 52 for recreation Hiwassee Reservoir Insignificant impacts to plant communities from development of Parcel 49 for recreation
Wildlife	Chatuge Reservoir Changes in wildlife habitat restricted to changes in land use on existing developed parcels and therefore insignificant No adverse impacts to wildlife Hiwassee Reservoir Possible wildlife impacts from parcels allocated for industrial development	Chatuge and Hiwassee Reservoirs Allocations reflect existing land use and would not result in adverse cumulative impacts to wildlife and habitat Allocating several parcels to Zone 3 would enhance management of wildlife resources	Chatuge Reservoir Parcel 10 – negative effects to wildlife; however, regionally would be minor; Parcel 52 has limited wildlife value; impacts to wildlife would be minor; development of Parcel 77 would have negative local impacts to wildlife Hiwassee Reservoir Insignificant impacts to wildlife and wildlife habitat due to recreational development on Parcels 34 and 49	Chatuge Reservoir Parcel 52 has limited wildlife value; impacts to wildlife would be minor Hiwassee Reservoir Insignificant impacts to wildlife and wildlife habitat due to recreational development on Parcel 49

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Threatened and Endangered Species	Chatuge and Hiwassee Reservoirs No direct impacts to federally listed plant, terrestrial animal, or aquatic animal species are expected	Chatuge and Hiwassee Reservoirs No adverse direct, indirect, or cumulative impacts to federally listed species are expected Parcels containing listed plants or animals would be allocated to Zone 3	Chatuge and Hiwassee Reservoirs Potential loss of a population of American columbo on Parcel 10. No adverse affects to listed terrestrial animals are expected No federally or state-listed aquatic animal species are known to occur near any parcels proposed for development under Alternative C Parcels containing listed plants or animals would be allocated to Zone 3	Chatuge and Hiwassee Reservoirs No adverse affects on listed plants or terrestrial animals are expected No federally or state-listed aquatic animal species are known to occur near either parcel proposed for development under Alternative D Parcels containing listed plants or animals would be allocated to Zone 3
Wetlands	Chatuge and Hiwassee Reservoirs Unplanned and uncommitted parcels containing wetlands would generally continue to be managed as they have been in the past, and actions with the potential to affect wetlands would be assessed prior to their implementation No significant adverse impacts expected	Chatuge and Hiwassee Reservoirs No direct impacts Less potential for adverse impacts than Alternative A Parcels containing wetlands would be allocated to Zone 3 No cumulative impacts to wetlands expected	Chatuge and Hiwassee Reservoirs Parcels containing wetlands would be allocated to Zone 3 No significant adverse effects to wetlands associated with Chatuge Parcels 10, 52, or 77 or Hiwassee Parcels 34 or 49 No significant cumulative impacts to wetlands expected	Chatuge and Hiwassee Reservoirs Parcels containing wetlands would be allocated to Zone°3 No wetlands associated with Chatuge Parcel 52 or Hiwassee Parcel 49 No significant cumulative impacts to wetlands expected
Floodplains	Chatuge and Hiwassee Reservoirs Insignificant floodplain impacts	Chatuge and Hiwassee Reservoirs Floodplain impacts less than Alternative A	Chatuge and Hiwassee Reservoirs Floodplain impacts somewhat greater than Alternative B because more parcels allocated to Developed Recreation and Industrial; overall impacts insignificant	Chatuge and Hiwassee Reservoirs Floodplain impacts somewhat greater than Alternative B because two parcels would be allocated to Developed Recreation; overall impacts insignificant

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Archaeological Resources	Chatuge and Hiwassee Reservoirs Archaeological resources would be avoided or protected when complying with *National Historic Preservation Act* (NHPA) and *Archaeological Resources Protection Act* (ARPA); if avoidance is not possible, potential adverse effects to significant resources would be mitigated; adverse effects would be minimized to archaeological resources		Chatuge and Hiwassee Reservoirs Development of the five additional parcels may adversely affect archaeological resources through ground-disturbing activities Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects cannot be avoided, mitigation through archaeological excavations or other means would be required	Chatuge and Hiwassee Reservoirs Development of the two additional parcels may adversely affect archaeological resources through ground-disturbing activities Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects cannot be avoided, mitigation through archaeological excavations or other means would be required
Historic Structures	Chatuge and Hiwassee Reservoirs Potential effects to historic structures would be insignificant	Chatuge and Hiwassee Reservoirs Potential effects to historic structures would be insignificant	Chatuge and Hiwassee Reservoirs Potential effects to historic structures from development of Chatuge Parcels 10, 52, and 77 and Hiwassee Parcels 34 and 49 would be avoided or mitigated to an insignificant level	Chatuge and Hiwassee Reservoirs Potential effects to historic structures from development of Chatuge Parcels 10 and Hiwassee Parcel 49 would be avoided or mitigated to an insignificant level
Managed Areas	Chatuge and Hiwassee Reservoirs No adverse effects to TVA or other managed areas including Raven Rock Small Wild Area on Hiwassee		Chatuge and Hiwassee Reservoirs No TVA natural areas occur on or adjacent to the five parcels proposed for development	Chatuge and Hiwassee Reservoirs No TVA natural areas occur on or adjacent to either of the two parcels proposed for recreational development
Visual Resources	Chatuge Reservoir No significant changes in existing land use expected; recreational development would be limited to existing developed areas; no significant visual impacts are expected Hiwassee Reservoir Potential for adverse visual impacts if the 2 parcels allocated for Industrial are developed	Chatuge and Hiwassee Reservoirs Scenic integrity would remain moderate or higher; greater protection to visual resources than under Alternative A	Chatuge and Hiwassee Reservoirs Minor adverse impact to visual resources	Chatuge and Hiwassee Reservoirs Minor adverse impact to visual resources

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Water Quality and Aquatic Ecology	Chatuge Reservoir Significant land use changes from undeveloped to developed use are unlikely; therefore, no significant impacts expected. Hiwassee Reservoir Potential impacts if the two parcels on Hiwassee were developed for industrial use; insignificant cumulative impacts to water quality and aquatic ecology	Chatuge and Hiwassee Reservoirs No parcels changing from undeveloped to developed land use allocation. Insignificant cumulative impacts to water quality and aquatic ecology	Chatuge and Hiwassee Reservoirs Recreational and industrial development would be subject to best management practice (BMP) implementation and regulatory controls Insignificant cumulative impacts to water quality and aquatic ecology	Chatuge and Hiwassee Reservoirs Recreational development would be subject to best management practice (BMP) implementation and regulatory controls Insignificant cumulative impacts to water quality and aquatic ecology
Air Quality	Chatuge Reservoir Insignificant impacts to local air quality Hiwassee Reservoir Greatest potential for air impacts from potential future industrial development. Minor decrease in air quality, expected to be insignificant	Chatuge and Hiwassee Reservoirs No Industrial allocation Decrease in potential for air pollutants compared to Alternative A	Chatuge Reservoir Greater potential than Alternative B for air impacts from industrial development Potential increase in air pollutants over Alternative B Hiwassee Reservoir Insignificant impacts to local air quality	Chatuge and Hiwassee Reservoirs No industrial allocations Decreased potential for air pollutants compared to Alternative A Insignificant impacts to local air quality
Noise	Chatuge Reservoir Insignificant impacts Hiwassee Reservoir Greatest potential for noise impacts from Industrial	Chatuge and Hiwassee Reservoirs Insignificant impacts	Chatuge Reservoir Greatest potential for noise impacts from Industrial; lesser potential from Developed Recreation Hiwassee Reservoir Insignificant impacts	Chatuge Reservoir Potential for localized noise impacts from Developed Recreation Hiwassee Reservoir Insignificant impacts

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternative B Proposed Land Use Plan	Alternative C Proposed Modified Land Use Plan	Alternative D Blended Alternative
Socio-economics	Chatuge Reservoir No change from current situation Hiwassee Reservoir Potential for new industry and new jobs on Hiwassee Reservoir	Chatuge and Hiwassee Reservoirs Impacts are expected to be insignificant	Chatuge Reservoir Potential for new jobs from industrial development of Chatuge Parcel 10 Hiwassee Reservoir Insignificant impacts	Chatuge and Hiwassee Reservoirs Impacts are expected to be insignificant

Table 2-13. Summary of Environmental Impacts by Alternative for Blue Ridge, Nottely, the Ocoees, Apalachia, and Fontana Reservoirs

Potential Resources Impacted	Alternative A No Action/Forecast System	Alternatives B, C, and D
Land Use	All Reservoirs Would not result in any parcels changing from an undeveloped land use to a developed land use allocation Insignificant impacts to land use expected	All Reservoirs Allocations consistent with existing land uses; no changes in land use proposed Insignificant impacts from existing uses No prime farmland impacts to any reservoir
Recreation	All Reservoirs No new recreation areas; any new facilities would be located within existing recreation areas; potential impacts to formal and dispersed recreation expected to be insignificant	
Terrestrial Ecology - Plants	All Reservoirs Insignificant impacts to terrestrial plant communities	All Reservoirs Insignificant impacts to terrestrial plant communities Sensitive resource allocation (Zone 3) should add greater protection
Wildlife	All Reservoirs Insignificant impacts to wildlife communities	All Reservoirs Insignificant impacts to wildlife Sensitive resource allocation (Zone 3) would afford greater protection
Endangered and Threatened Species	All Reservoirs No adverse direct, indirect, or cumulative impacts to federally listed species are expected	
Wetlands	All Reservoirs No adverse effects to wetlands	
Floodplains	All Reservoirs No adverse effects to floodplains	
Archaeological Resources	All Reservoirs Archaeological resources would be avoided or protected when complying with NHPA and ARPA; if avoidance is not possible, potential adverse effects to significant resources would be mitigated; adverse effects would be minimized to archaeological resources	
Historic Structures	All Reservoirs Potential effects to historic structures would be insignificant	
Managed Areas	All Reservoirs No adverse effects to TVA or other managed areas	
Visual Resources	All Reservoirs Scenic integrity would remain moderate or higher	
Aquatic Ecology and Water Quality	All Reservoirs Insignificant cumulative impacts to water quality and aquatic ecology	
Air Quality and Noise	All Reservoirs Insignificant Impacts	
Socioeconomics	All Reservoirs No change from current situation	

2.5 The Preferred Alternative

TVA proposes to update the current Forecast System allocations by adopting a new land management plan based on the seven land use zones listed in Table 2-1. Implementation of Alternative B, C, or D would establish this new land plan. Implementation of Alternative D would afford protection to sensitive resources and offer additional informal and developed recreation opportunities. Under this alternative, land use allocation changes would occur on less than 8 acres of the 6,220 acres on the mountain reservoirs properties. No significant adverse environmental effects are expected if Alternative D were adopted. Thus, TVA's preferred alternative is Alternative D, the Blended Alternative.

Under Alternative B, eight fewer acres would be allocated to development-oriented uses than under Alternative D. Given the scope of the proposal under consideration and these minor allocation differences, Alternatives B and D are virtually indistinguishable in terms of their potential environmental effects.

2.6 Summary of TVA Commitments and Proposed Mitigation Measures

Mitigation measures are actions that could be taken to avoid, minimize, rectify, offset, reduce, or compensate for adverse impacts to the environment. In considering requests for use of TVA lands allocated under the MRLMP, TVA will implement the following commitments and mitigation measures.

- TVA has executed a programmatic agreement (PA) with the Tennessee State Historic Preservation Officer (SHPO) for RLMPs and will execute separate PAs with the Georgia and North Carolina SHPOs for the identification, evaluation, and treatment of all cultural resources adversely affected by future proposed uses of TVA lands planned in RLMPs. All activities will be conducted in accordance with the stipulations defined in these PAs. Until these PAs are executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively mitigate adverse effects to historic properties as required by Section 106 of the NHPA.

- Prior to approving any use of land on the mountain reservoirs, TVA would conduct an appropriate level of environmental review to determine the potential environmental effects of the proposed use.

    - In the event that a land use request involves industrial development, the subject environmental review will determine and document the extent of expected air quality impacts. Should the requested parcel be located in or potentially affect a nonattainment area for ozone or $PM_{2.5}$, TVA shall require a conformity applicability determination pursuant to regulations implementing Section 176(c) of the *Clean Air Act* to assure compatibility with measures in local plans for achieving attainment.

    - In the event that a land use request is determined to have the potential to affect summer roost habitat for Indiana bats, the subject environmental review will include surveys to determine the presence of Indiana bats and the suitability of habitat for Indiana bats.

- As necessary, based on the findings of the environmental review, TVA may require the implementation of appropriate mitigative measures, including BMPs, as a condition of approval for land use on the mountain reservoir properties.

CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter contains a description of the current conditions of various resources in the area of the nine mountain reservoirs and how these resources could be affected by implementation of the Mountain Reservoirs Land Management Plan (MRLMP). The discussion is organized by reservoir. This is followed by a regional overview of potentially affected resources and descriptions of the anticipated impacts across the planning area. More detailed descriptions of the affected resources and potential impacts for each reservoir are presented in the remainder of Chapter 3.

3.1 The Mountain Reservoirs

This proposed land plan and EIS address nine TVA tributary reservoir projects in the southeast corner of Tennessee, the southwest corner of North Carolina, and northeast Georgia (see Figure 1-1). The mountain reservoirs are operated for many purposes, including flood control, augmentation of flows for navigation, hydropower production, water quality, recreation, and aquatic ecology. Several characteristics of these reservoirs are listed in Table 3-1.

Table 3-1. Physical Characteristics of the Mountain Reservoirs

Reservoir	Dam Location	Length of Reservoir (miles)	Reservoir Surface (Acres)	Shoreline (miles)	June 1 Flood Guide (feet above msl*)	Top of Gates Elevation (feet above msl*)	Annual Pool Variation (feet)
Chatuge	HRM 121.0	13	6,840	128	1926	1928.0	8
Hiwassee	HRM 75.8	22.2	5,860	164.8	1521	1526.5	36
Blue Ridge	ToRM 53.0	11	3,180	68.1	1687	1691.0	19
Nottely	NRM 21.0	20.2	3,950	102.1	1777	1780.0	15
Ocoee 1	ORM 11.9	7.5	1,930	47	829	837.7	9
Ocoee 2	ORM 24.2	negligible	negligible	negligible	N/A	N/A	N/A
Ocoee 3	ORM 29.2	7	360	24	1435	1435.0	7
Apalachia	HRM 66.0	9.8	1,070	31.5	1280	1280.0	8
Fontana	LTRM 61.0	29	10,230	237.8	1703	1710.0	50

* Mean Sea Level HRM = Hiwassee River Mile NRM = Nottely River Mile ToRM = Toccoa River Mile
N/A = Not Applicable LTRM = Little Tennessee River Mile ORM = Ocoee River Mile

Chatuge Reservoir

Chatuge Reservoir is located in Clay County, North Carolina, and Towns County, Georgia. The dam is on the Hiwassee River 4.5 miles upstream from Hayesville, North Carolina, and 2.5 miles downstream from the North Carolina-Georgia state line. This project was completed in 1942 without any hydroelectric generating facilities and was used to store water to augment generation at TVA's downstream Hiwassee and Apalachia dams as well as at TVA mainstream dams on the Tennessee River. The

dam was retrofitted with a powerhouse containing a single generating unit, which was completed in 1954.

Hiwassee Reservoir
Hiwassee Reservoir is located in Cherokee County, North Carolina. The dam is located on the Hiwassee River 20 miles downstream from Murphy, North Carolina. The concrete gravity dam contains two generating units with a combined capacity of 185,000 kilowatts. One unit is reversible and capable of pumping water from the tailwater of Apalachia Reservoir back into Hiwassee Reservoir. Construction began in 1936, and the dam was completed in 1940 with one operating generating unit. The second unit was placed into operation in 1956. Hiwassee Reservoir is fed by releases from TVA's Nottely and Chatuge dams and unregulated inflows from the 565-square-mile local drainage area.

Blue Ridge Reservoir
Blue Ridge Reservoir is on the Toccoa River in Fannin County, Georgia, and within the Chattahoochee National Forest. The dam is located west of Morganton, Georgia, and 2.5 miles east of Blue Ridge, Georgia. The Toccoa River becomes the Ocoee River when it enters Tennessee, and Blue Ridge Reservoir is the uppermost TVA project on this river system. Blue Ridge Dam was built by Tennessee Electric Power Company (TEPCO) and was completed in 1931. TVA purchased it and the reservoir in 1939 as a single-purpose power project. Blue Ridge Dam is constructed of earth fill with one primary generating unit and a second small unit for providing minimum flows. Blue Ridge Reservoir's annual pool variation is primarily for power generation, but Blue Ridge drawdowns also provide limited seasonal flood storage. The reservoir is periodically lowered to a much greater depth for dam safety inspections. In a separate NEPA review, TVA is evaluating structural modifications to the dam that would eliminate the need for future deep drawdowns.

Nottely Reservoir
Nottely Reservoir is located entirely in Union County, Georgia, and within the Chattahoochee National Forest. The dam is located southwest of Murphy, North Carolina, and 2.3 miles upstream from the Georgia-North Carolina state line. Nottely Reservoir is a multipurpose tributary project located on the Nottely River, a tributary of the Hiwassee River. The project was originally completed in 1942 without any hydroelectric generating facilities and was operated to augment generation at downstream dams. The powerhouse and the single generating unit were completed in 1956.

Ocoee (1, 2, and 3) Reservoirs
The three Ocoee projects are located in Polk County, Tennessee. Ocoee 1 Reservoir (commonly known as Parksville Reservoir) is farthest downstream. The dam is located at Parksville, 16 miles east of Cleveland. Both the Ocoee 1 and Ocoee 2 projects were originally built by TEPCO and were acquired by TVA in 1939. Ocoee 1 was originally a single-purpose power project, and it has very limited flood storage capacity. Most of the Ocoee 1 Reservoir shoreline is part of the Cherokee National Forest.

Ocoee 2 Dam is located approximately 12.3 miles upstream from Ocoee 1 Dam and 5 miles downstream from Ocoee 3 Dam. The reservoir has no significant storage and is dependent on Ocoee 3 and Blue Ridge reservoirs for streamflow regulation. Ocoee 2 is unique in the TVA system as the dam diverts water into a five-mile-long wooden flume,

which conveys water to the powerhouse at River Mile 19.7. During routine power production operations, the entire flow of the river is diverted through the flume to the powerhouse. If excess water is being released upstream, some flow will be spilled at the Ocoee 2 Dam and flow through the original river channel. When water is not being diverted, the stretch of the Ocoee River between the Ocoee 2 Dam and Powerhouse is used heavily for whitewater boating.

Ocoee 3 Dam is located approximately 5 miles upstream from Ocoee 2 Dam. In order to generate electricity, the dam is used to divert water into a two-mile tunnel to the powerhouse at Ocoee River Mile (ORM) 25.0, 0.8 mile upstream from Ocoee 2 Dam. Completed in 1942, Ocoee 3 is the only one of the four single-purpose power projects on the Toccoa/Ocoee River (Blue Ridge and Ocoee 1 and 2) that was built by TVA. Ocoee 3 Reservoir has a very limited storage volume capable of providing only daily flow regulation. Releases from Ocoee 3 are used to support whitewater recreation in the reach below the dam. Blue Ridge Reservoir, located upstream, provides some seasonal flow regulation.

Apalachia Reservoir

Apalachia Dam and Reservoir are located in Cherokee County, North Carolina, on the Hiwassee River 9.8 miles downstream from Hiwassee Dam and about 0.1 mile east of the Tennessee-North Carolina state line. The dam diverts water into an 8.3-mile pipeline and tunnel system that connects to the powerhouse 12 miles downstream of the dam in Polk County, Tennessee. Apalachia was constructed as a single-purpose power project. It has very limited storage in its normal operating range and is primarily a run-of-river project. Upstream seasonal storage is provided by Hiwassee, Chatuge, and Nottely reservoirs. Apalachia Reservoir also serves as the tail pond for the pump-turbine unit located immediately upstream at Hiwassee Dam. Almost all of the Apalachia Reservoir shoreline is surrounded by the Nantahala National Forest. The powerhouse and most of the pipeline/tunnel system is in the Cherokee National Forest.

Fontana Reservoir

Fontana Reservoir is located in Graham and Swain counties, North Carolina. The dam is 9.6 miles upstream from Cheoah Dam; 20 miles west of Bryson City, North Carolina; and 6.75 miles east of the Tennessee-North Carolina state line at Deals Gap. Fontana Dam was built during World War II to provide power for the war effort. It is TVA's highest dam and is one of the highest dams east of the Rocky Mountains. The Great Smoky Mountains National Park (GSMNP) borders the reservoir to the north, and the Nantahala National Forest borders the reservoir to the south. Fontana Reservoir has the greatest annual pool variation of any TVA reservoir (see Table 3-1).

3.1.1 Land Use

3.1.1.1 Affected Environment

Existing land use patterns along the shoreline and back-lying land have been influenced by whether TVA acquired the land and whether TVA has subsequently sold, transferred, or retained the land. TVA originally acquired 104,837 acres of land on the nine mountain reservoirs (see Table 1-1). About 91 percent (95,482 acres) of this land has been transferred to other federal and state agencies for public use. The present National Forest System land along the shorelines of the mountain reservoirs was originally acquired by TVA and transferred to the USFS. As described in Chapter 2,

TVA typically retained the land below the MSC fronting these transferred lands. The transfer agreements allow for the management of these retained lands by the agencies consistent with their management of the adjacent back-lying land. TVA sold about 3,133 acres (3 percent) of the originally acquired land. Again, TVA typically retained the land below the MSC where these parcels were sold. The sale deeds normally allow rights of ingress and egress across the TVA-retained strip of land, and therefore, the back-lying landowners typically have the right to apply to TVA for approval to construct private water use facilities on the TVA-retained land.

Most of the residential development along the reservoirs is on land TVA sold (with residential access rights across the retained land below the MSC) or on private land where TVA only has the right to flood to a certain elevation (i.e., Zone 1 property). Across the TVA reservoir system, 38 percent of the total shoreline is available for residential development, and a third of that shoreline had been developed by the mid-1990s (see Section 1.4).

In order to understand shoreline development trends on the mountain reservoirs better, TVA used aerial photography and Geographic Information System mapping to estimate the amount of shoreline that is available for residential development that has actually been developed. The amount of developed residential shoreline as compared to the amount of "developable" shoreline ranges from 44 percent on Nottely Reservoir to 100 percent on the Ocoees, Hiwassee, and Apalachia (see Table 3-2). The fully "built-out" reservoirs all have a relatively low proportion of the shoreline available for residential use. The residential development on the Ocoees is comprised of the "Cabin Sites" area on Ocoee 1 (Parksville Reservoir). These private cabins are located on National Forest System land under USFS special use permits (see Ocoee Projects Reservoir Land Plan Map). The vast majority of the residential use shoreline on Hiwassee Reservoir fronts the Bear Paw Community (see Hiwassee Reservoir Land Plan Map).

Table 3-2. Percent of Shoreline Open for Residential Development and Percent of Available Shoreline Developed

Reservoir	Percent of Total Shoreline Available for Residential Development*	Percent of Developable Shoreline in Residential Use	Percent of Total Shoreline in Residential Use
Chatuge	57	74	42
Hiwassee	4	100	4
Blue Ridge	38	71	27
Nottely	41	44	18
Ocoees	23	100	23
Apalachia	0**	100	0
Fontana	11	64	7

* Sum of flowage easement and residential access shoreline
** A negligible amount of residential shoreline development exists

The ratio of developed to undeveloped shoreline on all reservoirs with undeveloped shoreline available for residential use has increased since the mid-1990s. This increase has been greatest on Chatuge Reservoir, where nearly three-quarters of the property available for residential development (approximately 57 percent of the total shoreline) is now occupied by residential use. Chatuge Reservoir also has the greatest proportion of shoreline, with over half (57 percent) of the total shoreline available for

residential use. The differences between the amounts of shoreline available for residential development are based on differences in the way that TVA originally acquired land and later transferred and/or sold it. For example, Chatuge and Nottely reservoirs have more private shoreline available for residential use because TVA acquired less total acreage and more flowage rights than on the other mountain reservoirs. TVA's Land Policy does not allow additional land to be provided for residential use; therefore, the amount of shoreline available for residential use will not change because of the land planning process.

TVA retained a total of 6,220 acres of land on the nine mountain reservoirs. Many of the parcels have existing land use agreements that commit a parcel to a specific use. The majority of the land use agreements are for uses such as utilities, highways, and other public infrastructure. Many of these public infrastructure uses affect narrow linear tracts with small acreages.

Many of the land use agreements are for recreational use of TVA land, and the majority of those are for public recreation (see Table 3-3). A large proportion of the 529 acres associated with the public recreation agreements are for campgrounds and day use areas developed by TVA and operated by local, county, and state government agencies. These include Poteete Creek Recreation Area on Nottely Reservoir and Clay County Park on Chatuge Reservoir. Other agreements are for municipal parks such as Konehete Park on Hiwassee Reservoir. There are 25 commercial recreation agreements for whitewater rafting on the Ocoee River downstream of the Ocoee 2 and 3 dams.

Table 3-3. Mountain Reservoirs Land Use Agreements by Category, 2008

Land Use Agreement Category	Number of Agreements	Acres (approximate)
Recreation		
Public recreation	31	529
Commercial recreation	35	473
Land fronting National Forest System lands	17	130
Project Operations		
Highways/roads	46	731
Railroad	3	4
Municipal uses (office buildings, parking lots, etc.)	8	9
Wastewater treatment	7	14
Sewer lines	7	5
Electric lines	33	57
Telephone lines	7	2
Water lines	10	29
Other		
Sufferance agreements*	2	2
Private - homes/driveways	5	<1
Total	**211**	**1,987**

*An agreement whereby TVA agrees to tolerate an infringement upon its use of property

Prime Farmland

Prime farmland is defined by the U.S. Department of Agriculture (USDA) as land that has the best combination of chemical and soil physical characteristics for meeting the nation's short- and long-range needs for food and fiber. Prime farmland can consist of cultivated land, pastureland, or forestland, but it is not urban, built-up land or covered by water. Concern over the conversion of prime farmland to urban or industrial use prompted the passage of the *1981 Farmland Protection Policy Act.* This act requires that all federal agencies evaluate impacts to farmland prior to converting such land permanently to nonagricultural land use. Form AD 1006, "Farmland Conversion Impact Rating," must be completed by federal agencies with assistance from the Natural Resources Conservation Service (NRCS) before action involving farmland is taken.

Prime farmland soils surrounding the nine mountain reservoirs being evaluated as part of this environmental review are limited in acreage. The majority of soils designated as being prime farmland soils are found in narrow drainageways intersecting the various lakes and parcels of land that would be considered too small for intensive agricultural production. Based on acreage, those parcels containing sufficient prime farmland to warrant the completion of a Form AD 1006 are presented in the following sections. Although the acreage within selected parcels may warrant completion of Form AD 1006, several factors that would require the consideration of alternative actions within each location may be missing. Primary among these are unit size, the availability of farm support services, distance from urban buildup, and compatibility with existing agricultural use.

3.1.1.2 Environmental Consequences

Under any of the alternatives, no significant direct or indirect impacts to land use are expected. The amount of shoreline available for residential development would not change, and the existing trends of increasing residential development in areas of the reservoirs currently available for development are more related to broad socioeconomic trends and would be unaffected by the land plan alternatives. Additionally, TVA's Land Policy prohibits allocation of additional lands or landrights for residential use or the disposal of reservoir lands for residential use. All alternatives are consistent with this policy.

Alternatives A and B do not involve the change in allocation of any parcels from an undeveloped land use to a developed use. Under Alternative C, six parcels (105.6 acres) would change from an undeveloped land use allocation to a developed land use allocation; however, at a minimum, only localized changes to land use patterns would likely result. Under Alternative D, two parcels (Parcel 52 on Chatuge and Parcel 49 on Hiwassee) comprising 7.7 acres would change from an undeveloped land use allocation (i.e., Zone 4, Natural Resource Conservation) to a developed land use allocation (Zone 6, Developed Recreation). When compared to the total scope of the MRLMP, these potential land use changes would be insignificant. Thus, any potential cumulative environmental effects from changing the allocation on these two parcels are likely to be minor and insignificant.

Alternative A

Selection of Alternative A would not result in changes in existing land use for any of the planned parcels on any of the reservoirs. Two currently undeveloped parcels (Parcels 35 and 36) totaling 79 acres on Hiwassee Reservoir are allocated for industrial use and

could potentially be developed. Most unplanned parcels are committed to their existing uses by transfer agreement covenants, deeded rights, or TVA land use agreements. Thus, the land use of the unplanned committed parcels not likely to change. The 12 unplanned parcels (14.9 acres) that are not committed to an existing use would be managed consistent with TVA's Land Policy and SMP and applicable laws, regulations, and EOs. Any request for a land use on public lands managed by TVA would be subject to TVA approval pending the completion of an environmental review.

Alternative B
Under Alternative B, all of the TVA lands would be allocated to one of the seven zones. This would not result in any changes in the existing land use for any of the parcels. The land use of the committed parcels would not change.

Alternative C
Under Alternative C, the potential impacts on land use would be the same as those expected under Alternative B on seven of the nine reservoirs. On Chatuge and Hiwassee reservoirs, an additional 27.2 acres would be allocated to Zone 5 (Industrial), and an additional 78.4 acres would be allocated to Zone 6 (Developed Recreation) under Alternative C. The area allocated to Zone 4 (Natural Resource Conservation) under Alternative B would decrease by 105.6 acres on Chatuge and Hiwassee reservoirs under Alternative C.

Alternative D
The potential impacts on land use under Alternative D would be essentially the same as those anticipated from the adoption of Alternative B. However, under Alternative D, two parcels, Parcel 52 on Chatuge and Parcel 49 on Hiwassee, would be allocated to Zone 6 for potential developed recreation use. Under Alternative B, these two parcels are allocated to Zone 4 (Natural Resource Conservation). Total acreage of these two parcels is 7.7 acres. Thus, change in land use under Alternative D would be minor and insignificant.

3.1.2 Recreation

3.1.2.1 Affected Environment

Most TVA mountain reservoir lands are available for some type of recreational use. TVA's Zone 6 (Developed Recreation) land use allocation typically includes lands managed for concentrated, active recreational activities that require capital improvements and maintenance. The types of uses allowed on Developed Recreation lands are described in Table 2-1 and include for-profit commercial facilities available to the public for a fee, public recreation facilities, and water-access facilities such as boat ramps and fishing piers.

TVA maintains recreation facilities such as picnic areas, beaches, and boat ramps on some properties allocated for Zone 2 (Project Operations). Several of the dam and powerhouse reservations, such as Ocoee 2, provide important recreation opportunities. TVA would continue to make these facilities available, provided they are compatible with TVA's operational needs.

In May 2007, TVA completed a recreation analysis to support this planning effort. There were two primary objectives of the analysis: (1) to identify recreation needs on

the nine mountain reservoirs and (2) to identify specific parcels on the mountain reservoirs suitable for and capable of meeting unmet recreation needs. TVA has recently inventoried water-based recreation areas directly bordering the reservoir shorelines. This inventory includes the following ownership categories:

- Public (TVA, other federal, state, county/municipal)
- Private (private commercial areas operated for profit, noncommercial areas for members/residents only)
- Quasipublic (areas serving members of nonprofit organizations)

Only those recreation areas with some level of facility development and evidence of maintenance were included in the inventory. By these criteria, undeveloped lands managed by TVA or by other public agencies were excluded. The results of this inventory are described in the reservoir-specific recreation sections.

High-priority recreation needs were determined by the National Survey on Recreation and the Environment (NSRE 1999-2005) demand data and from comments received during public scoping. This information was compared to existing recreation facilities on each reservoir. TVA used the results of this comparison to evaluate the need for expansion of existing facilities or development of new facilities, often through a partnership, to meet projected recreation demands. Potential partnership opportunities include development of trails at several of the mountain reservoirs, development of courtesy piers, expansion of recreation facilities on Parcel 3 of Blue Ridge Reservoir, and the development and management of stream access sites.

On the nine mountain reservoirs, a Zone 6 capability/suitability analysis based on physical capabilities to support recreation uses and other factors was performed for each TVA parcel not committed to a long-term use. Thirteen parcels on four reservoirs were identified as capable of and suitable for Zone 6 allocation. Shoreline development and boating density data were then considered to determine how trends in shoreline development from additional Zone 6 land allocations would affect future boating density and capacity. This, in turn, could affect the need to establish additional developed recreation facilities. Parcels 18 and 52 on Chatuge Reservoir are capable of and suitable for supporting future public recreation facilities. On Hiwassee Reservoir, Parcel 49 is capable of and suitable for expansion of a greenway trail, and Parcel 34 is capable of and suitable for providing a site for water access.

While most developed recreation use occurs on parcels allocated to Zone 6, most dispersed recreation occurs on Zone 4 (Natural Resource Conservation) parcels. Dispersed recreation activities also occur on parcels allocated for other zones, including Zone 3 (Sensitive Resource Management), Zone 2 (Project Operations), and Zone 6. These lands are managed for the particular objectives of the zone allocation. However, they can also support compatible passive recreation activities such as hunting, primitive camping (at undeveloped sites), birding and other wildlife viewing, hiking, bank fishing, biking, and picnicking.

TVA recently began an inventory and assessment of active dispersed recreation areas (Guerry 2005) to determine their location, type of use, size, and the amount and extent of ecological impact associated with dispersed recreation activities. The inventoried dispersed recreation areas are described in the reservoir-specific recreation sections. This inventory does not include areas with more passive recreation uses such as

hunting, wildlife observation, mountain biking, hiking, horseback riding, bank fishing, viewing and photographing nature, and picnicking.

Shoreline development and boating density were analyzed to determine how trends in shoreline development might affect future boating density and capacity issues. Based on the results of this analysis, no areas of the mountain reservoirs are expected to have boating densities high enough to exceed the local carrying capacity or reduce boating safety during the next decade (see Appendix G).

3.1.2.2 Environmental Consequences

Changes in the recreational uses of Zone 2 parcels are not proposed under any of the alternatives considered.

Alternative A

Nineteen parcels totaling approximately 594 acres are allocated to Zone 6 (Developed Recreation) under Alternative A. Parcels previously allocated under the Forecast System that support a developed recreation use are designated Public or Commercial Recreation. Some parcels allocated to Reservoir Operations under Alternative A have also been utilized for developed recreation. In addition, under Alternative A, some unplanned parcels currently support developed recreation; however, the unplanned parcels and parcels allocated for Reservoir Operations with existing developed recreation use are committed to that use through transfer agreement covenants or TVA licenses, leases, or easements.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use. The use of unplanned parcels and previously allocated Reservoir Operation parcels that are committed to developed recreation would not change. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas. Selection of Alternative A would not significantly affect TVA's ability to develop additional recreation facilities to address identified unmet recreation needs. Potential environmental impacts would be insignificant, because those parcels (both previously allocated and the unplanned parcels) utilized for developed recreation would not likely change. Any future development of new facilities would be limited to existing developed recreation areas. Proposed new facilities would be subject to additional environmental review under NEPA and TVA approval.

The Forecast System designation for Parcel 35 (9.8 acres) and Parcel 36 (69.1 acres) on Hiwassee is Industry (see Appendix F). With the exception of these two parcels, selection of Alternative A is not likely to result in changes in existing land use of any parcels. Therefore, potential impacts to dispersed recreation would be primarily restricted to expansion of facilities (e.g., campground expansion) within existing committed parcels. Potential impacts to dispersed recreation of this nature are expected to be insignificant. Unmet dispersed recreation needs would not be significantly impacted by selection of Alternative A.

Alternative B

Sixty-eight parcels comprising approximately 1,081 acres are allocated to Zone 6 (Developed Recreation) under Alternative B (see Table 2-5). This is 49 more parcels (i.e., 487 acres) than are allocated to Recreation under Alternative A.

Under Alternative B, all parcels that are currently committed to a developed recreation use would be allocated to Zone 6. These commitments include transfer agreement covenants and TVA licenses, leases, and easements. The vast majority of these parcels have developed recreation facilities located on them. Under this alternative, the parcels allocated to Zone 6 would include those allocated previously under Alternative A to Public Recreation as well as those parcels allocated to Reservoir Operations that have been used for developed recreation. In addition, those unplanned parcels under Alternative A that are committed to a developed recreation use would be allocated to Zone 6.

Under Alternative B, any future demand for recreational needs would necessarily be met by expansion of recreation facilities in these existing areas allocated to Zone 6. These areas are the same under Alternative B as under Alternative A. Because there would be no new parcels allocated for Developed Recreation under Alternative B, the potential environmental impacts of adopting this alternative would be the same as those for Alternative A. The potential for impacts from any new facilities within existing areas would be subject to review under NEPA. Adoption of Alternative B would not change the land use of any parcels, and therefore, potential impacts to dispersed recreation would be restricted to those resulting from the expansion of existing facilities or resource management activities. Under Alternative B, there would be more parcels allocated to zones that could support dispersed recreational activities as well as to those zones that could accommodate unmet dispersed recreation needs.

Alternative C

Under Alternative C, 72 parcels totaling approximately 1,160 acres, would be allocated to Zone 6 (Developed Recreation), an increase of five parcels (78.4 acres) over the allocations under Alternative B (see Table 2-8).

Potential impacts to recreation under Alternative C are identical to those anticipated under Alternative B with the exception of five parcels on Hiwassee and Chatuge reservoirs. Under Alternative C, two additional parcels on Hiwassee Reservoir and three additional parcels on Chatuge Reservoir (Parcels 52, 52a, and 77) would be allocated to Zone 6 (Developed Recreation). These parcels would be allocated to Zone 4 (Natural Resource Conservation) under Alternatives A and B. The total acreage for these five parcels is 78.4 acres (74.4 acres on Chatuge Reservoir and 4.0 acres on Hiwassee Reservoir). Allocation of these parcels to Zone 6 would shift the existing dispersed recreational use to recreational activities on these parcels associated with development of recreational facilities. These additional facilities would provide greater recreational opportunity on Chatuge and Hiwassee reservoirs.

Under Alternative C, a 27.2-acre parcel on Chatuge Reservoir (Parcel 10) would be allocated to Zone 5 (Industrial). Allocation of this parcel to Zone 5 would allow the eventual sale and development of the parcel for industrial use. If this were to happen, the dispersed recreation opportunities currently available on Parcel 10 would be eliminated.

Alternative D

Under Alternative D, the potential impacts on recreation would be similar to those anticipated under Alternative B. However, under Alternative D, Parcel 52 (6.1 acres) on Chatuge and Parcel 49 (1.6 acres) on Hiwassee would be allocated to Zone 6 (Developed Recreation). Under Alternative B, these two parcels are allocated to Zone

4, and dispersed recreation opportunities would be afforded on the parcels. Thus, under this alternative, an additional 7.7 acres would be available for developed recreation, but would likely not be available for dispersed recreation. Because of the minor amount of acreage in these two parcels compared to the total amount of acreage available for dispersed recreation, the overall potential effect on recreational opportunities from implementing Alternative D would be minor and insignificant.

3.1.3 Terrestrial Ecology

3.1.3.1 Plant Communities

3.1.3.1.1 Affected Environment

The nine mountain reservoirs are in two watersheds, the Little Tennessee River watershed containing Fontana Reservoir and the Hiwassee River watershed containing the other eight reservoirs. All of the reservoirs lie within the Southern Blue Ridge ecoregion (SBRE). According to Griffith et al. (1998, 2001, 2002), the SBRE is one of the richest centers of biodiversity in the eastern United States and one of the most floristically diverse. Eighty-four percent of the SBRE is forested, primarily with oak-dominated forests (Southern Appalachian Man and the Biosphere [SAMAB] 1996). Major forest types in this ecoregion are the Appalachian oak forest, oak-pine forest, northern hardwoods, cove hardwoods, and at the highest elevations in Tennessee and North Carolina, the southeastern spruce-fir forest. Shrub, grass, heath balds, and hemlock communities are also present (Griffith et al. 1998, 2001, 2002).

The SBRE within the mountain reservoirs area is subdivided into four regions based on soils and vegetation. These subdivisions are the Broad Basins ecoregion, the Southern Crystalline Ridges and Mountains ecoregion, the Southern Metasedimentary Mountains ecoregion, and the Southern Sedimentary Ridges ecoregion (ibid). The mountain reservoirs lands occur in all of these except for the Southern Sedimentary Ridges ecoregion. The Broad Basins ecoregion is drier and has lower elevations and less relief than the other more mountainous SBRE regions. The soils are mostly deep, well drained, and loamy to clayey Ultisols. This rolling foothills region is mostly forested with pastures and row crops found on terraces and floodplains. All of the Nottely, most of the Chatuge and Blue Ridge, and a small part of the Hiwassee and Ocoee 3 reservoirs lands are in the Broad Basins ecoregion.

The Southern Crystalline Ridges and Mountains ecoregion contains the highest and wettest mountains in north Georgia and western North Carolina and are underlain by pre-Cambrian-aged igneous and high-grade metamorphic rocks. The region is mostly forested with a few small areas of pastures and apple orchards. A small part of the Chatuge Reservoir lands is in this ecoregion.

According to Griffith et al. (1998, 2001, 2002), the Southern Metasedimentary Mountains ecoregion is composed of geologic materials that are mostly late pre-Cambrian. The mountains are steep, dissected, biologically diverse, and densely forested. The Appalachian oak forest and the northern hardwood forest (at high elevations) include a variety of oak and pine species as well as American beech, basswood, buckeye, hemlock, silverbell, yellow birch, and yellow poplar. Much of the region is public land managed by the USFS. All of the Apalachia and Fontana, most of the Hiwassee and Ocoee, and a small part of the Blue Ridge and Ocoee 2 reservoirs lands are in the Southern Metasedimentary Mountains ecoregion.

The vegetative classes commonly found on lands on and around the mountain reservoirs are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation. Most of the evergreen forests are pine plantations dominated by loblolly pine. The evergreen-deciduous forest is primarily mixed pine-hardwood forests. Common canopy species are shortleaf, Virginia, and white pines; black, northern red, southern red, and white oaks; mockernut and pignut hickory; tulip poplar; and sweet gum. Common understory species include American holly, buffalo nut, black gum, Carolina allspice, flowering dogwood, red maple, sassafras, serviceberry, sourwood, black cherry, and mountain laurel. American chestnut stump sprouts are present on many dry ridges. Woody vines include Japanese honeysuckle, muscadine grape, poison ivy, and Virginia creeper. The herb layer contains many fern species as well as several species of wildflowers such as pink lady's slipper and sweet Betsy.

The most common deciduous forest types are oak-hickory forest on the dryer ridges and cove hardwood forest on the moister slopes. Dominant trees in the oak-hickory forests are black, chestnut, northern red, southern red, and white oaks, and mockernut, pignut, and shagbark hickories. Black gum, musclewood, red maple, and sourwood are common understory tree species, and huckleberries and mountain laurel occur in the shrub layer. The cove hardwood forests are dominated by tulip poplar, American beech, white oak, and yellow buckeye. Other canopy trees include black locust, silverbell, sourwood, and cucumber and Frazier magnolia. They have a diverse understory with Carolina allspice, flame azalea, flowering dogwood, hazelnut, and redbud often present. Eastern hemlock and rosebay rhododendron occur along streams in the cove hardwood forest. Much of the eastern hemlock in the area has recently been infected with the nonnative hemlock wooly adelgid. Without treatment, which can be difficult and expensive, most infected trees die in three to five years. Cove hardwood forests typically have a rich herbaceous layer, which includes bloodroot, Catesby's trillium, crane fly orchid, Miami-mist, jack-in-the-pulpit, sweet Betsy, Solomon's plume, and Solomon's seal.

Forested wetlands occur along the back of some reservoir coves and grade into scrub-shrub wetlands. Because of the steep terrain surrounding most of the reservoir lands, neither of these plant communities is extensive. These areas are dominated by black willow, buttonbush, and tag alder. In addition, persimmon is common along the shoreline, along with American sycamore, river birch, and silver maple. Herbaceous species such as netted chain fern, jewelweed, poison hemlock, waterwillow, and several species of grasses, rushes, and sedges are present. Herbaceous vegetation is commonly found along transmission line and roadway rights-of-way and grassy areas on the dam reservations.

A few areas of old-growth forests occur on the mountain reservoirs lands. These areas are characterized by large old trees, natural canopy gaps, absence of invasive species, minimal past human disturbance, standing dead snags, and coarse woody debris (Davis 1996). Although old-growth forest habitat is rare in the southeastern U.S. (ibid), large areas of these forests occur in the GSMNP and in Cherokee and Nantahala national forests. These old-growth areas may represent around 0.5 percent (approximately 676,000 acres) of the total forest acreage (approximately 108,400,000 acres) in the southeastern U.S. Old-growth communities are valued as globally significant centers of biodiversity, as they are home to a vast number of plant and animal species. Standing and fallen trees and leaf litter provide shelter, nest and den

sites, and foraging opportunities for mammals, salamanders, insects, spiders, other arthropods, and birds. In addition, these habitats serve critical abiotic functions such as building rich soil, acting as natural filtration systems for water and air, and storing carbon that would otherwise contribute to global climate change (Salk 2005). Old-growth forest areas are described in more detail in the reservoir-specific sections.

Invasive plants are present on some mountain reservoir lands. EO 13112 defines an invasive species as any species that is not native to that ecosystem and whose introduction does or is likely to cause economic or environmental harm or harm to human health (NRCS 2007). Invasive plants often invade forested areas after some disturbance event and can reduce forest productivity, hinder forest use and management activities, and degrade diversity and wildlife habitat. They occur as trees, shrubs, vines, grasses, ferns, and herbs. Some of the invasive plants on the reservoir lands were intentionally planted in the area for erosion control, landscaping, or wildlife habitat enhancement purposes, while others were introduced elsewhere and have spread by various means onto reservoir lands.

The more problematic invasive plants on mountain reservoir lands include oriental bittersweet, autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese knotweed, Japanese stiltgrass, kudzu, mimosa, multiflora rose, princess tree, and tree-of-heaven (Southeastern Exotic Plant Pest Council 2006). All of these species have the potential to adversely affect the native plant communities because of their potential to spread rapidly and displace native vegetation. No plants listed on the 2006 *Federal Noxious Weed List* (NRCS 2007) are known to occur on the mountain reservoir lands. Oriental bittersweet is considered a Class C noxious weed in North Carolina, and its movement from quarantine areas is prohibited except under certificate or permit (North Carolina Department of Agriculture 2007).

3.1.3.1.2 Environmental Consequences

Alternative A

Under Alternative A, potential effects to plant communities would likely be insignificant. Under Alternative A, two parcels (Parcels 35 and 36 on Hiwassee), totaling approximately 80 acres, could potentially change existing land use. On the remainder of the parcels planned in Alternative A, potential impacts would likely occur from the development of parcels already allocated to a development-oriented use. However, no additional lands are likely to be made available for development-oriented uses. In general, invasive species would continue to proliferate, which would result in a decrease in forest productivity, forest use, and management activities, as well as contribute to the degradation of plant diversity and wildlife habitat. Development, especially residential development, on private lands adjacent to TVA shoreline properties is likely to continue. This development on private lands would create landscape disturbances that could facilitate the spread of nonnative plant species along roadsides, in recreation areas, and in remaining forested lands.

Alternative B

Under Alternative B, potential impacts to local, common plant communities would be similar to those likely under Alternative A. However, under Alternative B, the two Zone 5 parcels on Hiwassee Reservoir would be allocated to Zone 4, thus providing more protection to plant communities. Additional development of parcels with existing Project Operations and Developed Recreation land uses would affect plant communities, although most of these parcels contain common plant communities and most impacts

would likely be insignificant. The allocation of several parcels to Zone 3 (Sensitive Resource Management) could highlight the need for resource management activities on these parcels and result in long-term beneficial effects on these plant communities.

Alternative C
The potential impacts on plant communities under Alternative C would be generally similar to those under Alternative B except on the six parcels allocated to development-oriented uses (i.e., Parcels 10, 52, 52a, and 77 on Chatuge and Parcels 34 and 49 on Hiwassee). The impacts to plant communities on four of these parcels (Chatuge Parcels 52 and 52a, and Hiwassee Parcels 34 and 49) would be insignificant because on-site disturbance would not be extensive. However, the allocation of Parcel 10 on Chatuge Reservoir to Zone 5 (Industrial) could result in the eventual industrial development of the parcel, which would have a direct negative impact on the old-growth deciduous forest that occupies most of the tract. Although the clearing of old-growth forest on Parcel 10 would have adverse local impacts to plant communities, these impacts on a regional basis would likely not be significant. Allocation of Chatuge Parcel 77 to Zone 6 (Developed Recreation) would likely result in the development of a public park such as a ball field complex. Necessary site preparation for such a facility would have direct local impacts to common plant communities, particularly if extensive land clearing and grading are required. Regional impacts to common plant communities from the development of Parcel 77 would be insignificant.

Alternative D
Potential impacts to plant communities under Alternative D would be similar to those expected under Alternatives B and C. Under Alternative C, Parcel 52 on Chatuge Reservoir and Parcel 49 on Hiwassee would be allocated to Zone 6 for possible development of public recreation facilities. The potential effect on common plant communities from recreational development on these two parcels was described above. Under Alternative D, Parcels 10 and 77 on Chatuge and Parcel 34 on Hiwassee would be allocated to Zone 4 (Natural Resource Conservation), as they would be under Alternative B. Because the amount of ground and vegetation disturbance from the eventual recreational development of two parcels would be small, adoption of Alternative D would not have significant effects to common plant communities.

3.1.3.2 Wildlife Communities

3.1.3.2.1 Affected Environment

The SBRE contains the largest area of contiguous, mature forest habitat in the eastern U.S. (Franzreb and Phillips 1995). Forests in the SBRE provide globally significant habitat for many species, especially amphibians and land snails (Ricketts et al. 1996). Because of the array of microclimates and the diversity of habitats, there are many different species present, and some are found only in this region. The high elevations found in the SBRE also provide habitat for isolated populations of animals typically found at more northern latitudes.

Several forest types found within the SBRE occur on TVA lands. The diversity of forest types on these lands is somewhat limited due to the relatively low elevation of the TVA lands, and many of the more uncommon forest types and rare communities within the SBRE are found at higher elevations.

Deciduous forests provide a diversity of habitat for wildlife. Oak-hickory forest is the most abundant forest type in the eastern U.S. (Flather et al. 1999) and is prevalent on mountain reservoir lands. The numerous bird species that nest in deciduous forests include wild turkey, whip-poor-will, ruby-throated hummingbird, red-eyed vireo, blue-headed vireo, wood thrush, gray catbird, black-throated green warbler, black-and-white warbler, ovenbird, hooded warbler, and scarlet tanager. Streams within deciduous forests provide nesting habitat for Acadian flycatchers, northern parulas, and Louisiana waterthrushes. Many additional bird species migrate through and winter in the area. Common mammal species of deciduous forests include black bear, white-tailed deer, red bat, eastern chipmunk, eastern gray and southern flying squirrels, white-footed mouse, southern red-backed and woodland voles, short-tailed shrew, gray fox, least weasel, and bobcat.

Seepages, streams, and temporary ponds in deciduous forests provide habitat for numerous amphibians including American and Fowler's toads, green, northern cricket, and other frogs, spotted and other mole salamanders, red and mud salamanders, and northern dusky and other salamanders in the genus *Desmognathus*. Reptiles commonly found indeciduous forests especially near water include eastern fence lizard, ground skink, five-lined skink, eastern box turtle, eastern worm snake, black racer, and ring-necked snake.

Evergreen and evergreen-deciduous forests are also widespread around the mountain reservoirs. These habitats provide nesting for woodland birds including pine and yellow-throated warblers, great crested flycatcher, and chuck-will's-widow. Birds that winter in this forest type include red-breasted nuthatches, red crossbills, and pine siskins. Portions of this forest type have been damaged by southern pine beetles in recent years. Several stands of dead pines exist on TVA lands, and TVA has performed salvage harvests in some stands. Dead pines provide foraging sites for woodpeckers and roosting sites for little brown, long-eared, and silver-haired bats and various reptiles. Other animals that inhabit evergreen and evergreen-deciduous forests but are not restricted to them include white-tailed deer, wild turkey, black bear, eastern mole, southern bog lemming, eastern kingsnake, smooth earth snake, eastern fence lizard, six-lined racerunner, and a variety of salamanders, frogs, and toads, especially near wet areas.

Most of the TVA lands consist of narrow strips or small blocks of forest. Many of these lands are adjacent to larger contiguous forest blocks contributing habitat to area-sensitive species of wildlife that favor interior woodland habitats. Many of these adjacent lands were formerly owned by TVA and transferred to other federal agencies such as the USFS and the NPS, and to state agencies. These lands combined with the TVA lands form large blocks of forested habitat adjacent to most of the mountain reservoirs.

Nonforested community types in the SBRE are dominated by pasturelands (SAMAB 1996). Pasturelands and other early successional habitats are common around some reservoirs, notably Nottely and Chatuge reservoirs. Early successional habitats provide habitat for a variety of bird species including eastern bluebird, eastern meadowlark, American crow, American kestrel, and red-tailed hawk. Amphibians and reptiles that use these habitats include spring peeper, chorus frog, and common garter snake.

Bird and mammal diversity greatly increases at edge habitats especially those between forested areas bordered by early successional habitats. Birds commonly found at these

edge habitats include wild turkey, great crested flycatcher, white-eyed vireo, Carolina wren, blue-gray gnatcatcher, brown thrasher, blue-winged warbler, prairie warbler, common yellowthroat, yellow-breasted chat, indigo bunting, eastern towhee, field and song sparrow, and orchard oriole. Mammals typically inhabiting edges include eastern cottontail, woodchuck, eastern harvest mouse, red fox, coyote, long-tailed weasel, and striped skunk.

The reservoirs provide abundant open water habitats and associated riparian zones that are used by a variety of wildlife. Common species include great blue heron, green heron, belted kingfisher, common yellowthroat, and northern parula. Shallow embayments, especially those with emergent vegetation, provide foraging habitat for waterfowl. However, this habitat is very limited on several of the reservoirs, especially during the winter. Consequently, waterfowl numbers are relatively low. Common waterfowl include wood ducks, Canada geese, and mallards. Other waterfowl present include American black duck, gadwall, green-winged teal, ring-necked duck, lesser scaup, common goldeneye, bufflehead, hooded merganser, and common merganser.

Shorebird use of the mountain reservoirs is limited, as most reservoirs have steep, rocky banks and limited foraging areas comprised of shallow embayments and exposed mud flats. Species such as spotted sandpiper that forage along the margins of reservoirs and killdeer that are not restricted to foraging on mud flats are commonly observed on the mountain reservoirs. Most of the mud flats available on the mountain reservoirs are small (less than 10 acres) and are comprised of rocky soils, providing poor quality habitat for most species of shorebirds.

Common amphibians found in the riparian zones include green frog, eastern narrowmouth toad, and Fowler's toad. Reptiles include northern water snake, common snapping turtle, and painted turtles. Common mammals include mink, muskrat, raccoon, and American beaver.

3.1.3.2.2 Environmental Consequences

Given the proximity and abundance of forested public lands adjacent to the TVA parcels, the overall small size of the TVA parcels, and the lack of external projects resulting in large-scale land use changes in the project area, significant adverse impacts to wildlife are not expected to result from adoption of any of the alternatives.

Alternative A

Under Alternative A, two parcels (79 acres) on Hiwassee Reservoir could potentially change to a developed land use. Otherwise, potential changes in wildlife habitat would be restricted to changes in land use within undeveloped portions of existing developed parcels. These changes are expected to be minimal in a regional context; therefore, adoption of Alternative A would not result in significant loss of wildlife habitat or adverse impacts to wildlife populations.

Alternative B

Under Alternative B, all parcels would be allocated to zones that reflect their current existing use. Additionally, many parcels would be allocated to Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation), providing protection to several parcels with uncommon habitats such as wetlands, seepages, and rock outcrops. Adoption and implementation of Alternative B would potentially enhance

the management of identified sensitive wildlife habitat and would not result in adverse cumulative impacts to terrestrial animal resources or their habitat.

Alternative C
Under Alternative C, five parcels totaling 105.6 acres would be allocated to Zone 6 (Developed Recreation) and Zone 5 (Industrial) instead of Zone 4 (Natural Resource Conservation) as under Alternative B. Some of these parcels such as Parcel 52 on Chatuge Reservoir offer scant high-quality wildlife habitat. The exception is Parcel 10 on Chatuge Reservoir because of its old-growth forest. The development of recreation facilities on three of the four Zone 6 parcels would not likely adversely affect wildlife. Development of recreation facilities that require land clearing, such as the ball field proposal on Chatuge Parcel 77, would have negative local impacts to wildlife habitat. Allocation of Chatuge Parcel 10 would have localized adverse effects. Because Alternative C calls for changes of land use on only five parcels, implementation of this alternative would not result in cumulative impacts to wildlife populations in the project area.

Alternative D
Under Alternative D, the potential impacts on wildlife communities would be similar to those likely under Alternative B. Allocations under these two alternatives are the same except for two parcels containing a total of 7.7 acres. These two parcels would be allocated for developed recreation uses (i.e., to Zone 6) under Alternative C, but would be in Zone 4 (Natural Resource Conservation) under Alternative B. This loss of 7.7 acres of wildlife habitat is not a significant change.

3.1.4 Endangered and Threatened Species

3.1.4.1 Affected Environment

Plants and animals considered in this section include species listed as endangered or threatened under the *Endangered Species Act* (ESA) and candidates for such listing. They also include species listed as endangered, threatened, or other categories denoting the need for conservation by the States of Georgia, North Carolina, and Tennessee. The potential presence of these listed species, as well as suitable habitat for them, was first determined by querying databases maintained by TVA and other agencies of the occurrences of these species. Following this initial screening, TVA biologists conducted field investigations of many of the TVA lands to determine the presence of listed species and their habitats.

Species listed under the ESA (i.e., federally listed species) reported from the counties encompassing the mountain reservoirs are listed in Table 3-4. The range, status, and habitat requirements of these species are described below. These species are also typically listed as endangered or threatened by the individual states in which they occur. The state-listed species not included in Table 3-4 are described in the reservoir-specific accounts. The U.S. Fish and Wildlife Service (USFWS) has designated critical habitat for the spotfin chub in the vicinity of Fontana Reservoir, as described below. No other designated critical habitat occurs in the immediate vicinity of the mountain reservoirs.

Table 3-4. Federally Listed as Endangered, Threatened, and Candidate Species Reported From the Mountain Reservoirs Area

Common Name	Scientific Name	Listing Status	Reservoir						
			Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana
Plants									
Green pitcher plant*	*Sarracenia oreophila*	END	x						
Monkey-face orchid*	*Platanthera integrilabia*	CAND					x		
Rock gnome lichen	*Gymnoderma linear*	END							x
Ruth's golden aster*	*Pityopsis ruthii*	END					x	x	
Small whorled pogonia*	*Isotria medioloides*	THR		x	x	x		x	
Virginia spiraea*	*Spiraea virginiana*	END							x
Mammals									
Northern flying squirrel*	*Glaucomys sabrinus coloratus*	END							x
Eastern cougar*	*Puma concolor couguar*	END							x
Indiana bat*	*Myotis sodalis*	END							x
Birds									
Piping plover*	*Charadrius melodus*	THR	x			x			
Red-cockaded woodpecker*	*Picoides borealis*	END					x	x	
Reptile									
Bog turtle*	*Glyptemys muhlenbergii*	THR	x	x		x		x	x
Fish									
Spotfin chub*	*Erimonax monachus*	THR							x
Sicklefin redhorse*	*Moxostoma* sp.	CAND		x					x
Snail									
Noonday globe*	*Patera clarki Nantahala*	THR							x
Mussels									
Tan riffleshell*	*Epioblasma florentina walkeri*	END						x	
Slabside pearlymussel*	*Lexingtonia dolabelloides*	CAND						x	
Little-wing pearlymussel*	*Pegias fabula*	END							x
Cumberland bean*	*Villosa trabilis*	END						x	

* Species descriptions provided in the text
Status abbreviations: CAND = Candidate for listing, END = Endangered, THR = Threatened

The **green pitcher plant** is a carnivorous plant restricted to acidic seepage bogs and boggy stream edges in northeast Alabama, Georgia, and North Carolina. The only populations known from the mountain reservoirs area are in the vicinity of Chatuge Reservoir and are described in more detail below in Section 3.2.4.

The **monkey-face orchid** grows in swamp forests and sandy stream margins. Development, canopy closure, improper timber harvest techniques, and the encroachment of exotic invasive plants such as kudzu are major threats to this species.

Ruth's golden aster is known only from cracks or crevices of phylite or greywacke boulders along the banks of or within the Hiwassee and Ocoee rivers in Polk County (Kral 1983, USFWS 1990a, TVA 2005a, NatureServe 2007). The construction of the dams on these rivers may have reduced the range of this species, and remaining populations are threatened by habitat changes resulting from post-impoundment river flows. The Ocoee and Apalachia populations are described in more detail in Sections 3.6.4 and 3.7.4.

The **small whorled pogonia** occurs in a variety of habitats throughout its range and is typically found on acidic soils, in dry to mesic second-growth, deciduous or deciduous-coniferous forests, typically with light to moderate leaf litter, an open herb layer (occasionally dense ferns), moderate to light shrub layer, and relatively open canopy (NatureServe 2007; USFWS 1992). The main threats to this species are habitat destruction and excessive collecting. It is known from the vicinity of five of the mountain reservoirs, and its status is described in more detail in the reservoir-specific sections.

Virginia spiraea is a shrub that grows on rocky flood-scoured riverbanks and gravel bars in gorges or canyons in the central and southern Appalachian Mountains. Populations have been eliminated by impoundments, and other threats include riverbank development, habitat changes resulting from altered river flows, and the encroachment of exotic invasive species. Sexual reproduction is uncommon, and plants rely almost completely on vegetative reproduction, which could also account for the declining health of known populations. Virginia spiraea occurs in the Little Tennessee River watershed along the Cheoah River in Graham County, North Carolina, and along Abrams Creek in Blount County, Tennessee. It was not found on or in the immediate vicinity of any of the mountain reservoir lands.

Northern flying squirrels are primarily found in high elevations (greater than 5,000 feet) within spruce-fir forests and in mixed conifer-northern hardwood forests of the Blue Ridge Physiographic Region. Although they can occur in forests of varying age and understory density, most records show that this species prefers old-growth forest with widely spaced, tall trees (USFWS 1990b). Northern flying squirrels occur in the GSMNP but, because of their elevational range, do not occur on or in the immediate vicinity of any mountain reservoir lands.

Eastern cougars occupied a wide variety of habitats including swamps, riparian woodlands, and forests. This subspecies is believed to be extinct (USFWS 1990c) due to hunting by humans, habitat loss, and low prey populations during the 1800s. Two historic records from the vicinity of Fontana Reservoir were reported from the GSMNP.

Indiana bats roost in caves during the winter and typically form summer roosts under the bark of dead or dying trees (Menzel et al. 2001). Optimal summer roosts occur in forests with an open understory and usually near water (Romme et al. 1995). Indiana bats forage primarily in forested areas along streams or other corridors. Few caves occur in the mountain reservoirs area. No caves known to be occupied by Indiana bats or suitable for occupation by Indiana bats occur on or in the immediate vicinity of TVA mountain reservoir lands. Summer roosts have been reported from the GSMNP, Joyce Kilmer Memorial Forest, and Cheoah Reservoir. White Oak Blow Hole Cave, near Cades Cove on the northern slopes of the GSMNP, supports a wintering population of Indiana bats and is designated as critical habitat for this species.

Mature forests on mountain reservoir lands provide summer habitat for Indiana bats. In order to assess the suitability of forested habitat for Indiana bats, sites were sampled using a protocol based on Romme et al. (1995). Five forest variables were estimated at forested sites consisting of primarily deciduous trees. Average canopy cover, average height to bottom of canopy, and average diameter at breast height of overstory trees were used to indicate forest maturity. Subcanopy density was categorized as open (less than five percent), moderately dense (5-20 percent), dense (20 to 60 percent), and very dense (greater than 60 percent). Potential roost trees included snags, hollow trees or trees with large cavities, and trees with exfoliating bark. Although the majority of

Indiana bat summer roosts are found in dead or damaged trees (Menzel et al. 2001), we included trees with cavities and exfoliating bark to provide a conservative estimate of available roosting habitat. Percent exfoliating bark was used to categorize quality of potential roost trees. High-quality trees exhibited greater than 25 percent of the remaining exfoliating bark, moderate trees 11-25 percent, and low suitability trees had less than 11 percent. High-quality habitat plots contained a mature forest with a relatively open subcanopy and at least one moderate or high-quality potential roost tree. Low-quality habitat plots consisted of either an undeveloped forest or dense subcanopy or lacked potential roost trees. Most sample sites ranked as low-quality habitat. A site ranking as medium quality was measured on Chatuge Reservoir (Parcel 10); no high-quality sites were observed. The results of this sampling are described in more detail in the reservoir-specific sections.

Piping plovers nest on sand and gravel beaches along the Atlantic coast as far south as North Carolina and around the Great Lakes. The major threats to this bird are loss of nesting and coastal wintering habitat from shoreline development and degradation of this habitat from recreational activities. The piping plover is a rare spring and fall migrant in the Tennessee Valley, where it typically occurs on mud flats along reservoirs and other shallow-water beachlike habitats found at ash disposal areas and wildlife refuges. They tend to linger at inland stopover sites for one day or less (Pompei 2004). The only records of this species from the mountain reservoirs area are from Chatuge and Nottely reservoirs and are described in more detail in Sections 3.2.4 and 3.5.4.

Red-cockaded woodpeckers inhabit extensive old-growth pine forests with an open understory. This species formerly occurred in the western GSMNP near Chilhowee Reservoir downstream of Fontana Reservoir and in Cherokee National Forest adjacent to Ocoee 1 Reservoir. The last known occurrence of this species at the Ocoee site, and in the state of Tennessee, was in 1994 (Nicholson 1997). Red-cockaded woodpeckers have not been reported from the North Carolina or Georgia portions of the mountain reservoirs area. No suitable habitat for this species occurs on or near mountain reservoirs lands.

Bog turtles inhabit spring-fed sphagnum bogs and marshy meadows in the southern Appalachians (Herman and Pharr 1986). Clear, slow-moving rivulets or brooks with soft, highly organic substrates are required habitat features (Pitts 1978). Bog turtle habitat is largely ephemeral due to plant succession that creates drier habitats. The major threats to this species are loss of habitat due to wetland drainage and accelerated plant succession resulting from fire control and collecting for the pet trade. Habitat loss is more of a problem for bog turtles in the northeast U.S. than southern Appalachian populations, which are listed because of their similarity of appearance to northern populations. Bog turtles have been reported near five of the mountain reservoirs; these occurrences are described in the reservoir-specific accounts.

Spotfin chubs occur in clear large creeks and medium-sized rivers with moderate current in the Tennessee River drainage. Adults prefer swift current with boulder substrate, and juveniles are commonly found over small gravel substrate in moderate current. Spawning can extend from May to mid-August (Etnier and Starnes 1993). The main threats to this fish have been loss of habitat due to impoundments, siltation, and other pollutants. It occurs in the Little Tennessee River in the Fontana Reservoir headwaters and other sites farther upstream. Critical habitats for the spotfin chub, within the scope of the MRLMP, have been established in Macon and Swain Counties, North Carolina, in the Little Tennessee River main channel from the backwaters of

Fontana Reservoir upstream to the North Carolina-Georgia state line. See Section 3.8.4 for more information on this population.

The **sicklefin redhorse** is restricted to streams of the Blue Ridge Physiographic Province in the Hiwassee and Little Tennessee River systems of southwest North Carolina, and in upper Brasstown Creek (Hiwassee River system) in Towns County in north-central Georgia. In North Carolina, it occurs in the Hiwassee River system in the Hiwassee River, Hanging Dog Creek, and Valley River, all in Cherokee County, and in Brasstown Creek in Clay County. In the Little Tennessee River system, it occurs in the Little Tennessee River downstream of Franklin in Macon and Swain counties, lower Burningtown and Lotla creeks in Macon County, Tuckasegee River below Bryson City in Swain County, and lower Forney Creek, Swain County. Juveniles have been found in shallow waters of Hiwassee and Fontana reservoirs (NPS 2008).

The main threat to sicklefin redhorse is loss of habitat. Like many fish species in the southeast United States, the sickelfin redhorse has been impacted by hydroelectric dams and sedimentation. Problems caused by dams include blockage of spawning migrations, reduced water temperatures, unstable water levels, bed scouring from power-generating releases, and low oxygenation from releases of deep, poorly oxygenated water from some dams. Sedimentation has reduced the amount of available gravel substrate. Gravel substrate provides essential habitat for spawning as well as required habitat for bottom-dwelling organisms upon which the redhorse feeds. Together, dams and sedimentation have served to reduce the sicklefin redhorse range substantially (NatureServe 2007, NPS 2008).

The **noonday globe** is a land snail that inhabits damp oak-hickory forests with thick undergrowth and rich, moist soils. It prefers steep, rocky areas with northern exposure or wet ravines, and is native to Nantahala Gorge in Swain County, North Carolina (LeGrand et al. 2006). See Section 3.8.4 for more information on the occurrence of this species in the Fontana Reservoir area.

The **tan riffleshell** is the headwaters form of a species that was once widespread in the Cumberland and Tennessee River systems. Its life history is poorly known. It prefers sand and gravel substrate associated with riffles (Parmalee and Bogan 1998). The main threats to the tan riffleshell are pollution, siltation, habitat perturbation, inundation, and loss of glochidial hosts.[3] One of the few surviving populations of this species occurs in the Hiwassee River between Apalachia Dam and Apalachia Powerhouse (see Section 3.7.4).

The **slabside pearlymussel** was formerly widespread in medium and large rivers in the Tennessee and Cumberland River systems. It is presently restricted to a few rivers in the upper Tennessee River drainage, including the Hiwassee River between Apalachia Dam and Apalachia Powerhouse (see Section 3.7.4). It inhabits substrate of sand, fine gravel, and cobble in strong currents (ibid). The main threats to this species are primarily the result of habitat loss and degradation. The main causes of decline are impoundments, stream channel alterations, water pollution, and sedimentation (NatureServe 2007).

[3] The newly-hatched larvae (known as "glochidia") of most mussel species are parasitic on fish. Glochidia attach to the gills of specific host fish. After a period of maturation, the glochidia detach and inhabit bottom substrate.

The **little-wing pearlymussel** inhabits clear, cool, high-gradient streams. It usually occurs on top of or partially imbedded in sand and fine gravel at the head of riffles in 6 to 10 inches of water. Acid mine drainage, domestic pollution, and impoundments of rivers that it inhabited have eliminated most of the isolated populations. It was formerly widespread in tributaries to the Cumberland and Tennessee rivers. Occurrences have been documented in the Hiwassee and Little Tennessee River basins, but it is likely nearly extirpated there (NatureServe 2007).

The **Cumberland bean** occurs in small rivers and streams in gravel or sand substrate with fast current in riffle areas (Parmalee and Bogan 1998). It previously occurred in several river systems in the Cumberland and Tennessee River drainages but is now restricted to a few sites in the upper portions of each of these drainages. One of these sites is the Hiwassee River between Apalachia Dam and Apalachia Powerhouse (see Section 3.7.4). The main threats to this species are impoundments, siltation, channelization, and water pollution.

The **bald eagle** (*Haliaeetus leucocephalus*) was removed from the federal list of endangered species in 2007 because of its widespread recovery. It is still listed as endangered in Georgia, threatened in North Carolina, and in need of management in Tennessee, and protected by the *Bald and Golden Eagle Protection Act* and the *Migratory Bird Treaty Act.* The USFWS issued the *National Bald Eagle Management Guidelines* to encourage conservation of the species (USFWS 2007). TVA is committed to following these guidelines.

Bald eagles occur on several of the mountain reservoirs and are most numerous during the winter. Nesting has only recently been documented on Hiwassee, Ocoee 1, and Fontana reservoirs. In this region, eagles typically build large nests in solitary pines among hardwoods on steep slopes. Breeding pairs can have a primary nest and several alternate nests in a small area.

TVA biologists assessed the potential for nesting habitat on each parcel visited. The presence of large snags, hardwood and pine trees over 20-inches diameter, and large blocks of forested habitat were considered ideal nesting habitat for bald eagles. Biologists also searched for nests at each parcel and scanned for adult birds along the shoreline to try to locate additional nests in the project area. The results of these surveys are described in more detail below in the reservoir-specific sections.

3.1.4.2 Environmental Consequences

Alternative A

Under Alternative A, potential changes in wildlife habitat would be restricted to changes in land use within undeveloped portions of developed parcels. No direct impacts to federally listed species are expected from these potential changes in land use. Unrelated to TVA's land management actions, cumulative impacts could be anticipated to populations of the green pitcher plant and Ruth's golden aster. Under Alternative A, the two parcels (Parcels 35 and 36) totaling 79 acres on Hiwassee Reservoir could potentially change to a developed land use. However, neither of these parcels has federally listed species present.

Listed aquatic species occur near several Hiwassee Reservoir parcels. Under Alternative A, those parcels near known locations of listed aquatic species would remain under their current use. Hiwassee Parcels 35 and 36, which were allocated for

Industry under the Forecast System, are not located on the shoreline. Any change in land use on these two parcels would be subject to TVA approval following environmental review.

The major source of potential impacts to listed aquatic species is ground disturbance activities in riparian areas, which could affect water quality. That is, the greater the soil disturbance from an activity, the greater the potential for adverse impacts to water quality and listed aquatic species due to runoff and resulting sedimentation. Due to the small amount of TVA land, in comparison to the overall land base, the state and federal environmental regulations, and the use of any identified impact reduction methods including TVA's *General and Standard Conditions* (TVA 2005b), development opportunities on TVA lands would have no cumulative impacts to listed aquatic species.

Alternative B
Under Alternative B, those parcels known to contain listed plants and terrestrial animals would be allocated to Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation), and no adverse direct, indirect, or cumulative impacts to these species would occur.

Due to the small amount of TVA land on the mountain reservoirs in comparison to the overall land base, the state and federal environmental regulations, and the use of any identified impact reduction methods including TVA's *General and Standard Conditions* (ibid), development opportunities on TVA lands would have no cumulative impacts to listed aquatic species. In fact, some beneficial effects to listed species may result from the proposed allocations under Alternative B.

Alternative C
No endangered or threatened species occur on four of the five additional parcels allocated to more development-oriented uses under Alternative C. The fifth parcel, Parcel 10 on Chatuge Reservoir, contains suitable habitat for Indiana bats and bald eagles. Although the change in allocation would not directly affect these listed species, they could be affected by future industrial development of the tract. No adverse effects on listed plants or terrestrial animals are anticipated on any of the other lands being planned.

No federally or state-listed aquatic animal species are known to occur near any parcels proposed for development under Alternative C. Therefore, no impacts to listed aquatic species are expected to occur.

Alternative D
Potential effects to endangered or threatened species under Alternative D would be essentially the same as those anticipated under Alternative B. Under Alternative D, Parcel 10 on Chatuge Reservoir, the only subject parcel that contains suitable habitat for listed species, would be allocated to Zone 4 (Natural Resource Conservation). Thus, there would not be adverse effects to any listed terrestrial animals or plants or to any aquatic species if Alternative D were adopted.

3.1.5 Wetlands

3.1.5.1 Affected Environment

Wetlands are ecologically important because of their beneficial effect on water quality, their moderation of flow regimes by retaining and gradually releasing water and value as wildlife habitat, and as areas of botanical diversity. Wetlands are typically transitional ecosystems between terrestrial and aquatic communities.

Wetlands are defined by TVA Environmental Review Procedures (TVA 1983) as:

> [T]hose areas inundated or saturated by surface or ground water with a frequency sufficient to support, and that under normal circumstances would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as slough, potholes, wet meadows, mud flats, and natural ponds.

EO 11990 (Protection of Wetlands) directs federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In addition, activities in wetlands are regulated under the authority of the federal *Clean Water Act* and various state water quality protection regulations.

Wetlands on and near the mountain reservoirs are primarily riverine/floodplain forests located in the floodplains of rivers and streams and small areas of emergent/scrub-shrub wetlands (typically less than 0.1 acre) associated with reservoir shorelines. Isolated wetlands such as bogs, seeps, and fens are relatively rare. Emergent herbaceous wetlands as well as scrub-shrub wetlands are also uncommon on the mountain reservoirs.

For the purposes of the MRLMP, initial estimates of wetland type and extent for each reservoir were determined using USFWS National Wetlands Inventory (NWI) maps combined with data sets developed for TVA's 2004 *Reservoir Operations Study* (ROS). These data sources are based primarily on interpretation of aerial photographs. Land cover analysis conducted as part of the Southern Appalachian Assessment (SAMAB 1996) between June 1990 and September 1994 indicated wetlands comprised less than 0.01 percent of the total land area in both the Hiwassee and the Little Tennessee River watersheds.

The wetland area of each reservoir (see the reservoir-specific sections below) includes wetlands located along the entire reservoir shoreline as well as wetlands located adjacent to the reservoir shoreline that are within the groundwater influence area of the reservoir (TVA 2004). The NWI data include wetlands located on all land adjacent to each reservoir regardless of ownership.

Field surveys were conducted to determine types and locations of wetlands on plannable parcels on each reservoir. Wetland determinations were performed according to the U.S. Army Corps of Engineers (USACE) standards, which require documentation of hydrophytic (i.e., wet-site) vegetation, hydric soil, and wetland hydrology (Environmental Laboratory 1987; Reed 1997; U.S. Department of Defense and U.S. Environmental Protection Agency 2003). Broader definitions of wetlands, such as that used by the USFWS (Cowardin et al. 1979), and the TVA Environmental

Review Procedures definition (TVA 1983) were also considered in this review. Wetlands on TVA mountain reservoir lands are summarized by area and type in Table 3-5.

Table 3-5. Wetlands on TVA Mountain Reservoir Lands by Area and Type

Reservoir	Combined Aquatic Beds and Flats (acres)	Emergent (acres)	Forested (acres)	Scrub-Shrub (acres)	All Types (acres)
Chatuge	581	11	48	14	654
Hiwassee	23	15	21	106	165
Blue Ridge	2	2	1	0	5
Nottely	911	17	106	11	1,045
Ocoees 1, 2, and 3	20	115	6	103	244
Apalachia	0	0	2	4	6
Fontana	6	4	39	8	57
Totals	**1,543**	**164**	**223**	**246**	**2,176**

Using a TVA-developed modification of the Ohio Rapid Assessment Method (Mack 2001) specific to the TVA region (TVARAM), wetlands on uncommitted parcels were categorized by their functions, sensitivity to disturbance, rarity, and irreplaceability. Wetlands were classified into three categories according to their TVARAM scores. Category 1 wetlands are considered "limited quality waters" and represent degraded aquatic resources. Category 2 includes wetlands of moderate quality and wetlands that are degraded but have reasonable potential for restoration. Category 3 generally includes wetlands of very high quality or of regional/statewide concern such as wetlands that provide habitat for threatened or endangered species.

3.1.5.2 Environmental Consequences

Under any of the alternatives, wetlands present on any parcels would be protected under EO 11990. Any impacts to wetlands associated with ongoing or future project operations would be evaluated under a case-by-case NEPA review and minimized to the extent practicable. These minor impacts would have a negligible effect on wetland resources in the project area.

Alternative A

There is a potential for some minor cumulative impacts to wetlands if Alternative A is chosen. Wetlands at both ecoregion and watershed levels are very limited and uncommon, and the relatively small, linear shoreline wetlands on the mountain reservoirs comprise important habitat. Gradual, incremental loss or alteration of these shoreline wetlands due to increased development, including residential development, would contribute to the overall trend of wetland loss reported by the Natural Resources Spatial Analysis Laboratory (NARSAL) (2007a) and SAMAB Cooperative (1996).

Findings from TVA's SMI EIS (TVA 1998) indicate that the presence of wetlands on or adjacent to TVA reservoir lands appears related to the development status of the shoreline. The study found that, within 0.25 mile of the shoreline, the proportion of total wetlands acreage was greater along undeveloped shorelines than along developed shorelines. This is partially explained by the fact that many wetlands occur in low-lying or flood-prone areas where development is often restricted.

Traditionally, growth and development within the Hiwassee River watershed has occurred mostly along streams and rivers where lands are less steep (North Carolina Division of Water Quality 1997). Wetlands are typically located along streams and

rivers. Because of increasing commercial and residential development in the region, there is a potential for incremental effects to wetland habitats should development occur on the unplanned parcels for these reservoirs.

Alternative B
No direct impacts to wetlands are associated with the implementation of Alternative B, and adoption of this alternative is expected to have the least amount of adverse effects to wetlands. Under this alternative, 143.6 acres would be allocated to Zone 3 (Sensitive Resource Management) and 1,665.8 acres to Zone 4 (Natural Resource Conservation). Fourteen parcels on Hiwassee and Chatuge reservoirs would be allocated to Zone 3 specifically for wetland protection under Alternative B. Zone 4 parcels on Chatuge, Hiwassee, Blue Ridge, Nottely, and Fontana reservoirs are managed to protect and enhance habitat, which also affords protection to wetlands.

No cumulative impacts to wetlands would occur from the adoption and implementation of Alternative B, as wetlands on all TVA parcels would be protected in accordance with EO 11990.

Alternative C
Under Alternative C, TVA would allocate Parcel 10 to Zone 5 (Industrial) and Parcels 52 and 77 to Zone 6 (Developed Recreation) on Chatuge Reservoir. Neither Parcel 10 nor Parcel 77 contains any wetlands. However, some scattered forested and scrub-shrub fringe wetlands occur along the shoreline of Parcel 52. These wetland areas were categorized as Category 2 wetlands of moderate quality according to the TVARAM. Development of Parcel 52 for recreational uses is not likely to affect the shoreline or the shoreline wetlands. Following environmental review of a proposal for developed recreational use of Parcel 52, TVA would impose any necessary restrictions or conditions to ensure protection of shoreline wetlands in accordance with EO 11990. Thus, there would be no adverse effects to wetlands on Chatuge Reservoir under Alternative C.

Under Alternative C, Parcels 34 and 49 on Hiwassee Reservoir would be changed from Zone 4 (National Resource Conservation) to Zone 6 (Developed Recreation). Neither of these parcels contains wetlands, and thus, no impacts to wetlands on Hiwassee Reservoir would occur if Alternative C were implemented.

No cumulative impacts to wetlands would occur as the result of implementing Alternative C, as wetlands on TVA parcels would be protected under Zone 3 and Zone 4 allocations, and changes in allocation for specific parcels on Chatuge and Hiwassee reservoirs would have no direct impacts to wetlands.

Alternative D
Neither of the two parcels that would be subject to developed uses (i.e., Parcel 52 on Chatuge and Parcel 49 on Hiwassee) under Alternative D contains wetlands. Therefore, adoption of Alternative D is not expected to cause adverse effects to wetlands.

3.1.6 Floodplains

3.1.6.1 Affected Environment

As a federal agency, TVA is subject to the requirements of EO 11988 (Floodplain Management). The objective of EO 11988 is "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" 43 *Federal Register* 6030 (10 February 1978). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances. It applies to all federal agencies that acquire, manage, or dispose of federal lands and facilities; undertake, finance, or assist construction and improvements; and conduct activities and programs affecting land use, including planning, regulating, and licensing. The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative. The 500-year flood elevation is used to establish the "critical action floodplain." A "critical action" is defined in the *Floodplain Management Guidelines* (U.S. Water Resources Council 1978) as any activity for which even a slight chance of flooding would be too great. The 500-year flood elevation is also used to control flood-damageable development for TVA projects as well as residential and commercial development on TVA lands.

The 50-, 100-, and 500-year flood elevations, the January 1 target elevation, the June 1 target elevation, and the MSC for each reservoir are provided in Table 3-6 below. The floodplains at each reservoir are described in more detail below in the reservoir-specific sections.

Table 3-6. Dam Operating Levels and Maximum Shoreline Contour for Mountain Reservoirs

Dam	50-Year Elevation (feet)	100-Year Elevation (feet)	500-Year Elevation (feet)	January 1 Flood Guide Level (feet)	June 1 Flood Guide Level (feet)	Maximum Shoreline Contour* (feet)
Chatuge	1,928.5	1,929.0	1,931.0	1,918.0	1,926.0	1,933.0
Hiwassee	1,528.3	1,529.0	1,530.0	1,485.0	1,521.0	1,532.0
Blue Ridge	1,691.0	1,691.0	1,691.0	1,668.0	1,687.0	1,695.0
Nottely	1,781.9	1,782.5	1,785.5	1,762.0	1,777.0	1,785.0
Ocoee 1	839.5	839.5	843.4	820.0**	829.0**	842.6
Ocoee 2	Not Available	1,123.0(A)	1,124.5(A)	N/A	N/A	Not Available
Ocoee 3	1,437.5	1,438.1	1,439.7	N/A	N/A	1,440.0
Apalachia	1,281.6	1,282.0	1,283.0	N/A	N/A	1,285.0
Fontana	1,710.0	1,710.0	1,710.0	1,653.0	1,703.0	1,720.0

* From the TVA Register Deed Provisions Applicable in the Sale of Reservoir Lands
** TEPCO datum
A = Approximate Elevations
N/A = not applicable
All elevations are National Geodetic Vertical Datum (NGVD) of 1929 except as noted.
August 2007

3.1.6.2 Environmental Consequences

Alternative A
Under Alternative A, for all reservoirs, the development and/or management of properties and evaluations of proposed actions would be done individually to ensure consistency with EO 11988. Potential development would generally consist of water use facilities and other repetitive actions in the floodplain that would result in minor floodplain impacts, if any.

Alternative B
Under Alternative B, for all reservoirs, the potential adverse impacts to natural and beneficial floodplain values would be less than those expected under Alternative A because a substantial portion of the available land would be allocated for resource management and conservation activities.

Alternative C
For all of the reservoirs, the potential adverse impacts to natural and beneficial floodplain values under Alternative C would be somewhat greater than those expected under Alternatives A and B because more parcels of the available land on Chatuge and Hiwassee reservoirs would be allocated to zones allowing industrial and recreational development. Although there are impacts to floodplains of varying degrees under all alternatives, potential impacts to floodplain values would be insignificant.

Alternative D
Under Alternative D, the potential impacts on floodplains would be similar to those anticipated under Alternative B. Potential development of Parcel 52 on Chatuge and Parcel 49 on Hiwassee for public recreation use is not expected to affect floodplain values or functions on these two reservoirs significantly.

3.1.7. Cultural Resources

In accordance with the *National Historic Preservation Act* (NHPA) of 1966 and the *Archaeological Resources Protection Act* (ARPA) *of 1979*, TVA protects historic properties located on TVA land or affected by TVA undertakings. A historic property is defined in 36 CFR § 800.16(l) as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP.”

Prior to an undertaking, TVA must identify, evaluate, and assess effects on historic properties. An undertaking is defined under 36 CFR § 800.16(y) as

> [a] project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

TVA has operated large hydroelectric and/or flood control projects in the area for more than 70 years. Efforts to aid and assist in the maintenance of federally recognized Indian tribes and to support the understanding of historic properties continue to be key parts of TVA land management strategy. TVA efforts in managing and protecting historic properties are an inherent responsibility of TVA as a member of these communities.

3.1.7.1 Archaeological Resources

3.1.7.1.1 Affected Environment

The Appalachian Highland region has been inhabited for at least 12,000 years. The areas around the major waterways of the region have been the focus of prehistoric habitation, resource acquisition, and ceremonial activity for all of this time. The intensification of prehistoric occupation of the Appalachian Highlands is indicated by the frequency of archaeological sites attributable to the succeeding series of temporal and cultural traditions beginning with the Paleo-Indian Stage (circa 12000-8000 B.C.) and continuing through the Archaic (8000-1200 B.C.), the Woodland (1200 B.C.-1000 A.D.), and the Mississippian (1000-1500 A.D.) stages. Following European contact, drastic cultural changes occurred, which for explanatory purposes have been divided into the Protohistoric-Contact Stage (1500-1750 A.D.) and the subsequent Historic era, which includes the Cherokee (1700 A.D.-present) and European- and African-American (1750 A.D.-present) occupations. The sustained presence of Native American groups in the Appalachian Highlands and their continuation of traditional religious and cultural practices are of great importance to communities of the region.

In an effort to gain an understanding of the prehistory of the region, archaeological investigations in the area began in the mid-19th century. George Featherstonaugh (1847), an English-born geologist charged with exploring the mineral resources of the country by the United States government, documented prehistoric lead mining pits in the region. His work was followed in the late 19th century with the work of anthropologist James Mooney on villages and mounds, the Valentine Museum's work at Peachtree Mound (Coe 1983), and Cyrus Thomas (1894) and the Smithsonian Institution's search for the origins of mounds found throughout the United States. Following the Victorian era of American archaeology, little work was done in the region until the latter half of the 20th century (Wauchope 1966).

The results of archaeological testing on the mountain reservoirs are considered prior to undertaking site-specific activities. Previous surveys on these reservoirs documented 602 archaeological sites on or directly adjacent to TVA lands, and the results of these surveys are described in more detail below in the reservoir-specific sections. Archaeological surveys have not been conducted on all of the lands involved in this land planning process, and many of the previously reported archaeological sites have not been assessed for their NRHP eligibility. Based on the results of these surveys and various consultations with the SHPOs of Georgia, North Carolina, and Tennessee, and Tribal Historic Preservation Officers of various federally recognized Indian tribes within the region, many sites on MRLMP lands have been determined to be eligible or potentially eligible for listing in the NRHP (see Table 3-7). Few sites on the Ocoees have been assessed for their NRHP eligibility. Many archaeological sites also occur on mountain reservoir lands not managed by TVA.

Table 3-7. Archaeological Sites on Mountain Reservoirs Land Management Plan Lands Eligible for or Potentially Eligible for Listing in the National Register of Historic Places

Reservoir						
Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana
15	174	43	7	0	6	11

The area of potential effect (APE), as defined in 36 CFR § 800.16(d), is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." For the MRLMP, TVA has identified the APE in North Carolina as approximately 1,024 acres of TVA land on Chatuge Reservoir, 931 acres on Fontana Reservoir, 1,007.4 acres on Hiwassee Reservoir, and 139.1 acres on Apalachia Reservoir. In Tennessee, the APE included 706 acres of the Apalachia Dam Reservation including the penstock, powerhouse, and the Gee Creek Campground; 77.4 acres on Ocoee 1; 79.6 acres on Ocoee 2; and 218.3 acres on Ocoee 3. In Georgia, the APE included 742 acres of Chatuge Reservoir, 469.5 acres on Blue Ridge Reservoir, and 828.6 acres on Nottely Reservoir.

3.1.7.1.2 Environmental Consequences

TVA will continue the present case-by-case reviews of proposed activities in TVA-controlled areas potentially subject to ground-disturbing actions e.g., as dredging, shoreline development, or timber harvesting, through phased identification and evaluation of historic properties. Archaeological resources within these areas would be avoided and protected whenever possible. If avoidance were not possible, proper procedures would be implemented to mitigate any potential effects on the historic property. Under any alternative, the adverse effects to significant archaeological resources will be minimized by mitigation through data recovery excavations or by other means pursuant to 36 CFR Part 800.

Alternative A

Under Alternative A, for all reservoirs, site-specific activities proposed in the future would be approved, mitigated, or denied according to the significance of the resources recorded. If mitigation were required, appropriate archaeological investigation would be necessary, and potentially impacted resources would be properly recorded and removed. Resources would be protected in the course of complying with regulatory requirements of the NHPA and ARPA.

Alternative B

Under Alternative B, all proposed soil-disturbing activities that occur on parcels that contain historic properties would be reviewed by a TVA archaeologist. TVA would take necessary steps to ensure compliance with regulatory requirements of the NHPA and ARPA.

The greatest potential for development would be in Zone 7 (Shoreline Access), and identification of archaeological resources within this zone would enable development to avoid the resources effectively. If the resources could not be avoided, then further investigations would be required to determine the resources' eligibility for inclusion in the NRHP. Under Alternative B, there are commitments to management of

archaeological resources within Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation), effectively preserving resources within the planned parcels.

TVA currently has a PA and an amendment to the PA with the Tennessee SHPO for the portion of Apalachia Reservoir in Tennessee (Appendix H) for the identification, evaluation, and treatment of all historic properties in the APE. TVA anticipates executing separate PAs with the Georgia SHPO and North Carolina SHPO. TVA will provide the opportunity for federally recognized Indian tribes to comment on the PAs. Until the PAs are executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties as required by Section 106 of the NHPA.

Significant recorded archaeological resources exist within and surrounding TVA parcels allocated to zones in which some type of development or ground-disturbing activity may potentially occur. Likewise, significant archaeological resources may exist on parcels where systematic archaeological surveys have not been conducted. Development of the parcels may adversely affect archaeological resources through ground-disturbing activities. Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects cannot be avoided, mitigation through archaeological excavations or other means would be required. Treatment plans resolving adverse effects would comply with the NHPA and ARPA.

Alternative C

Alternative C is similar to Alternative B but involves the allocation of five additional parcels for development on Chatuge and Hiwassee reservoirs. Significant recorded archaeological resources exist within and surrounding these five parcels. On parcels where systematic archaeological surveys have not been conducted, archaeological resources may exist. Development of the five additional parcels may adversely affect archaeological resources through ground-disturbing activities. Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects cannot be avoided, mitigation through archaeological excavations or other means would be required. Treatment plans resolving adverse effects would comply with the NHPA and ARPA.

Alternative D

Under Alternative D, the potential impacts on archaeological resources would be similar to those under Alternatives B and C. As under the other alternatives, archaeological resources would be assessed for any proposed actions. Appropriate measures in accordance with NHPA and ARPA would be taken to mitigate adverse effects to these resources.

3.1.7.2 Historic Structures

3.1.7.2.1 Affected Environment

Many small waterpower sawmills and gristmills were built in the 19th century on the smaller branches and creeks flowing to the Hiwassee River. The first major hydroelectric development in the Hiwassee River Basin was in 1910-1912 when a power plant with an installed capacity of 18,000 kilowatts was built at Parksville on the Ocoee River. This development, Ocoee 1, was followed in 1913 by Ocoee 2 with an installed capacity of 19,900 kilowatts. To increase the amount of power, construction of

the Blue Ridge Reservoir on the Toccoa River (the upper Ocoee River in Georgia) was begun in 1925 and completed in 1931. TVA acquired these three properties in August 1939 as a part of the TEPCO purchase.

Various private interests promoted large-scale waterpower developments on the Hiwassee River. The Swann Corporation, through its subsidiary, the Hiwassee-Nolichucky Power Company, acquired the lands and interests of the Thompson Power Company in 1926 and, later, those of the George Peabody Wetmore Estate. These properties were between the Tennessee-North Carolina state line and U.S. Highway (US) 411. Although an extensive system of developments was proposed, plans were never completed, and construction was not authorized. TVA's Apalachia project now diverts the streamflow through a long tunnel paralleling the upper half of this stretch of river.

Under a special act of the North Carolina Legislature, the Carolina-Tennessee Power Company was incorporated in February 1909 to acquire lands and flowage rights along the Hiwassee River within North Carolina. In 1914, control of these power rights was acquired by W. V. N. Powelson and Bertron Griscom from New York City. The Hiwassee River Power Company was incorporated in North Carolina by the Van Deventer interests of Knoxville, Tennessee, who in July 1914 began to acquire property along the river from the state line upstream to Murphy. The Carolina-Tennessee Power Company then instituted proceedings to acquire by condemnation flowage easements on the lands of the Hiwassee River Power Company. In December 1923, the Carolina-Tennessee Power Company won on all proceedings in the Superior Court of Cherokee County, North Carolina. The case eventually reached the U.S. Supreme Court, which in June 1924 affirmed the decision of the lower court. The condemned lands were all below elevation 1,465, which was the upper limit proposed by the Carolina-Tennessee Power Company for a 150-foot dam just above the present Hiwassee Dam site. This company was reorganized in 1929 as the Southern States Power Company. Two small hydroelectric projects, which the company had acquired and operated, constituted its sole claim as an operating utility.

Prior to the creation of TVA, the USACE included five projects in its recommended development plan for navigation, flood control, and power in its March 1930 report to Congress, House Document 328, 71st Congress, 2nd Session, "Tennessee River and Tributaries, North Carolina, Tennessee, Alabama, and Kentucky" (United States and David 1930).

In 1935, Congress authorized TVA to build Hiwassee Dam and Reservoir. The Southern States Power Company insisted that it was entitled to compensation based on the alleged value of the property at the site of an assumed hydroelectric development. TVA contended that compensation should be based on the ordinary market value of the land. The lower courts sustained the position of the power company, and the case was appealed to the U.S. Supreme Court, which in May 1943 reversed the decision of the lower court and remanded the case. Further proceedings were held in the district court in June 1944. Before the hearings were completed, a compromise was reached, and the case was settled by agreement eight years after TVA began construction on Hiwassee Dam.

TVA constructed the Apalachia, Ocoee 3, Nottely, and Chatuge projects on an emergency basis during World War II and frequently referred to all of these dams and reservoirs as "The Hiwassee Projects." In fact, TVA (1948) provides detailed information about each of these dams and reservoirs. The timing of their construction

reflects the dependence of military preparedness upon aircraft, of aircraft upon aluminum, and of aluminum upon electric power. Despite this, they were integral parts of the unified development of the Tennessee River, and their construction was merely advanced in schedule by the necessities of war-born power demand.

Historic structures on or in the immediate vicinity of MRLMP lands that are listed in the NRHP include the Ocoee 1 Hydroelectric Station and the Ocoee 2 Hydroelectric Plant. Other dams and powerhouses are eligible for listing in the NRHP. These historic properties are described in more detail below in the reservoir-specific sections.

3.1.7.2.2 Environmental Consequences

Data on historic structures were derived primarily from information that has been collected for various TVA projects. For any proposal with the potential to affect properties eligible or potentially eligible for listing in the NRHP (regardless of parcel zone allocation), a field check of the current status of these historical resources would be accomplished to determine the significance of the resource, and the proposal would be subject to the stipulations set forth in the PA. Nearly all of the historic structures are located on land adjacent to, rather than on, TVA land. These resources would be evaluated because they may be indirectly affected by changes in the visual character or setting resulting from actions on TVA lands.

Regardless of the alternative, proposed site-specific activities would be assessed in accordance with the PA to determine what historic features exist on TVA land and on adjacent lands within the APE. In addition, the significance of any historic structures present and the degree of potential impact of the action on historical resources would be determined under each of the alternatives, and any necessary mitigation would be done in accordance with Section 106 of the NHPA.

Alternatives A and B

Under Alternatives A and B, the potential effects to historical structures would be restricted to potential land use changes within committed parcels for the mountain reservoirs. Any such changes could indirectly affect historic structures, depending upon the visual characteristics of the proposed development and the visibility of the development from the potentially affected structure. Because they could change the visual character of the surrounding area, activities on Developed Recreation parcels, particularly those developed for commercial recreation, have the potential to impact adjacent historic structures. Actions on parcels that are allocated to Project Operations also could visually affect adjacent historic structures. Under Alternative A, Parcels 35 and 36 on Hiwassee are assigned an industrial use allocation. Under all the other alternatives, these two parcels would be allocated to Zone 4 (Natural Resource Conservation). However, use of these parcels for industrial purposes is very unlikely due to topography. Because TVA would evaluate and avoid or mitigate adverse impacts to historic structures, impacts, including cumulative effects, are expected to be insignificant.

Under Alternative B, Parcels 21, 26, and 40 on Hiwassee Reservoir have been allocated to Zone 3 (Sensitive Resource Management) for protection of historic and archaeological resources.

Alternative C
Under Alternative C, the potential future development of three parcels on Chatuge Reservoir and two parcels on Hiwassee Reservoir could change the visual character of the surrounding area and could potentially affect historic resources. These proposals, which include possible future industrial use on Parcel 10 and developed recreation on Parcels 52 and 77 on Chatuge Reservoir and on Hiwassee Parcels 34 and 49, would be evaluated on an individual basis to determine if there would be unavoidable adverse effects and to determine the mitigation measures, if any, needed to avoid those effects.

Alternative D
Under Alternative D, Parcel 52 on Chatuge Reservoir and Parcel 49 on Hiwassee would be allocated to Zone 6 for possible future use as developed recreation. As with the other alternatives, such development could potentially affect historic structures adversely. However, as mentioned previously, requests for use of these parcels would be subject to TVA approval, and TVA would evaluate potential effects to historic properties. Appropriate mitigative measures would be taken as necessary.

3.1.8 Managed Areas and Ecologically Significant Sites

3.1.8.1 Affected Environment

Managed areas include lands held in public ownership that are managed to protect and maintain certain ecological and/or recreational features. A management plan or similar document defines what types of activities are compatible with intended use of the managed area. Examples of managed areas include the GSMNP, Nantahala National Forest, Cherokee National Forest, and TVA Rock Raven Small Wild Area. A large portion of the TVA lands on the mountain reservoirs adjoins non-TVA-managed areas. The largest of these managed areas, some of which are near more than one mountain reservoir, are listed in Table 3-8.

Table 3-8. Large Managed Areas Adjacent to or in the Vicinity of TVA Mountain Reservoirs

Name	Managing Authority	Associated Mountain Reservoirs
Chattahoochee National Forest	USFS	Blue Ridge, Chatuge, Nottely
Cherokee National Forest	USFS	Apalachia, Ocoee
Cherokee (South) State Wildlife Management Area	Tennessee	Apalachia, Ocoee
Great Smoky Mountains National Park	NPS	Fontana
Nantahala National Forest	USFS	Apalachia, Chatuge, Fontana, Hiwassee
Nantahala State Game Land	North Carolina	Apalachia, Chatuge, Fontana, Hiwassee

Ecologically significant sites are parcels of privately owned land that are identified by resource biologists as having significant environmental resources. Although no management plan is likely to be in place for such sites, there may be an active effort to acquire this land for public ownership or otherwise provide protection for the sensitive resource, e.g., a conservation easement. Examples of ecologically significant sites include Ocoee River Ruth's golden aster sites, Goforth Creek Gorge site, and Walkertown Branch bog.

Nationwide Rivers Inventory (NRI) streams are free-flowing river segments, i.e., distinct stretches of rivers that retain characteristics of a free-flowing river despite having some unregulated or man-made impoundments either upstream or downstream, recognized by the NPS as possessing remarkable natural or cultural values. Currently, more than 3,400 free-flowing river segments in the United States are listed as possessing one or more of these values. NRI streams in the plan area include portions of the Ocoee, Hiwassee, Little Tennessee, Nantahala, and Tuckasegee rivers.

3.1.8.2 Environmental Consequences

Overall, the efficient management and protection of TVA-designated natural areas and ecologically significant sites have benefited from the development and implementation of TVA RLMPs because each plan provides a systematic process for making these designations and for determining and implementing management objectives for these parcels. Additionally, because the mountain reservoirs are situated immediately adjacent to portions of three national forests and a national park, conservation of natural resources would likely remain a high priority for this region.

Alternative A

No TVA natural areas have previously been designated on or near Chatuge, Blue Ridge, Nottely, the Ocoees, Apalachia, or Fontana reservoirs. The TVA Raven Rock Small Wild Area is located on the Hiwassee Dam Reservation, which is over 5 miles from Parcels 35 and 36 (i.e., the two parcels on Hiwassee designated for industrial use under the Forecast System). All of the reservoirs are situated near areas managed by other federal entities (i.e., USFS, NPS), state, county, or municipal governments, and others, such as corporations or nonprofit organizations (e.g., The Nature Conservancy), and are adjacent to or near reservoir lands.

Thus, no adverse effects to TVA or other managed areas or ecologically significant sites would result from adoption of Alternative A.

Alternative B

No TVA natural areas are located on Chatuge, Blue Ridge, Nottely, the Ocoees, Apalachia, or Fontana reservoirs, and no new TVA natural areas are proposed under Alternative B. Allocations of parcels under Alternative B would not adversely affect natural areas in the vicinity of these reservoirs that are managed or owned by other entities.

Likewise, no new TVA natural areas are proposed on Hiwassee Reservoir. Allocations made under Alternative B would not adversely affect the TVA Raven Rock Small Wild Area or natural areas near Hiwassee Reservoir that are managed or owned by other entities. Under Alternative B, there would be no adverse effects to ecologically significant sites.

Alternatives C and D

No TVA natural areas occur on or adjacent to the five parcels that would be allocated for development-related uses on Chatuge and Hiwassee reservoirs under Alternative C. Under Alternative D, two of these same parcels would be allocated for possible use as sites for developed recreation. None of these parcels meet TVA criteria for designation as natural areas. Because of the distance (a minimum of 0.3 mile for the Zone 6 parcels and 0.7 mile for the Zone 5 parcel) between these parcels and existing non-TVA-managed areas, the selection of Alternative C or Alternative D and the subsequent

use of these parcels would not adversely affect managed areas. Under Alternative C or D, there would be no adverse effects to ecologically significant sites.

3.1.9 Visual Resources

The physical, biological, and man-made features seen in the landscape provide any selected geographic area with particular visual qualities and aesthetic character. The varied combinations of natural features and human alterations that shape landscape character also help define their scenic importance. The presence or absence of these features along with aesthetic attributes such as uniqueness, variety, pattern, vividness, contrast, and harmony make the visual resources of an area identifiable and distinct. The scenic value of these resources is based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures, and visual composition seen in each landscape.

Consistent with its objectives for environmental leadership, TVA ensures that, to the extent practicable, land use and natural resource management activities proposed for lands under its control will not significantly degrade or destroy outstanding visual resources. In those limited situations where no practicable alternatives are identified and substantial visual impacts would occur, TVA may take reasonable and prudent measures to mitigate the anticipated impacts.

A visual analysis includes evaluating the extent and magnitude of potential changes in the visual environment that could result from the proposed actions. The objectives are to identify:

- The scenic and aesthetic character of the existing landscape.
- The degree of discernible contrast between the proposed action and the existing landscape.
- The location and sensitivity levels of viewpoints available to the public.
- The visibility of the proposed action from the public viewpoints.
- Any potential cumulative changes to the visual landscape.

The visual attributes of existing scenery, along with the anticipated attributes resulting from the proposed action, were reviewed and classified in the visual analysis process. The classification criteria were adapted from a scenic management system developed by the USFS (1995) and integrated with planning methods used by TVA.

Four categories of visual attributes were evaluated individually as described below, and the results helped determine an overall scenic value.

1. Scenic attractiveness is the measure of outstanding natural features, scenic variety, seasonal change, and strategic location. It is based on the intrinsic beauty of landforms, rock outcrops, water bodies, and vegetation. Attractiveness is ranked in one of three classifications from distinctive to minimal.

2. Scenic integrity is the measure of visual unity and wholeness of the natural landscape character. It is based on the degree of disturbance in natural patterns, the presence of disruptive or discordant elements, and the relative harmony of human alterations. Integrity is ranked in one of four classifications from high to very low.

3. Human sensitivity is the expressed concern of people for the scenic qualities of the project area. Sensitivity includes considerations such as the type and number of viewers, frequency and duration of views, and viewer context of adjacent scenery. Concerns are also derived or confirmed by public input. Sensitivity is ranked in one of three classifications from high to low.

4. Viewing distance is the measure of how far an area can be seen by observers and the degree of visible detail. It is ranked in one of three classifications from foreground to background (see Figure 3-1).

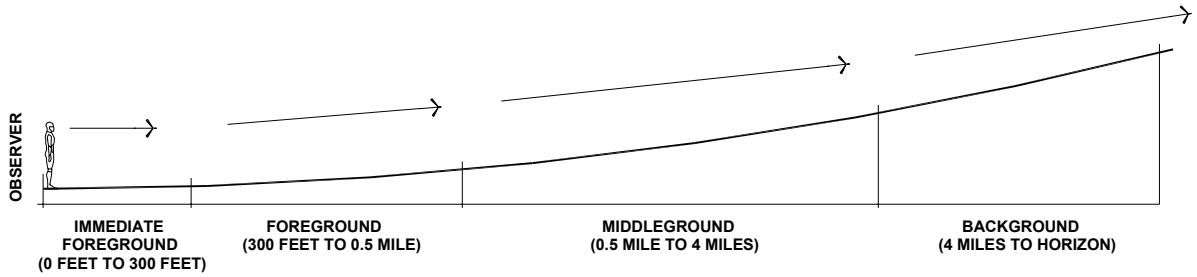

Figure 3-1. Viewing Distances

- Foreground is 0 to 0.5 mile from the observer where details of objects are clearly seen. Details are most distinct in the immediate foreground of 0 to 300 feet.

- Middleground is 0.5 to 4 miles where single objects or groups tend to merge into larger patterns with less distinguishable details. When viewed in this broader context, alterations may contrast strongly with larger natural patterns and make some middleground views more sensitive than the foreground.

- Background is from 4 miles to the horizon where objects are seen as broad outline patterns and forms. Details and colors are not normally discernible unless they are quite large, standing alone, or provide strong contrast.

The term "scenic visibility" is sometimes used in visual analyses. Scenic visibility is composed of human sensitivity and viewing distance, which are interrelated, but evaluated and classified separately.

Visual absorption capacity is also considered when determining scenic value of a landscape. Absorption capacity indicates the relative ability of a landscape to accept human alteration with the least loss of scenic quality. It is based on characteristics of the natural features seen in the project area. As an example, alterations on a steep woodland slope with dense evergreen cover would create much greater visual contrast than similar actions on a gentle slope with a cover of mixed woodlands and pastures.

Areas of greatest scenic value frequently have the least capacity to absorb visual change without substantial degradation.

Overall scenic value is determined by evaluating the combined levels of the four attributes, along with absorption capacity. It is ranked in one of four classes ranging from “excellent” to “poor” as outlined in the TVA publication *Scenic Value Criteria for Scenery Inventory and Management* (see Appendix I).

3.1.9.1 Affected Environment

All of the mountain reservoir lands have distinctive scenic attractiveness and high scenic integrity. A variety of landforms, including rock, a variety of vegetation, and other features, contrast with the reservoirs. Reservoir lands appear intact and unaltered, with minor deviations along the developed parcels. Most views from the water have high scenic visibility and are in the foreground and middleground of contrasting elements such as scenic bluffs along the shoreline and prominent peaks at greater distances.

As tributary reservoirs, the water levels of Chatuge, Hiwassee, Blue Ridge, Nottely, and Fontana reservoirs have considerable fluctuation during the year due to power generation and flood control operations. The most scenic views are generally during the late spring and summer months when reservoir levels are highest and recreational use is greatest. The normal winter drawdown exposes a “bathtub ring” of bare earth and rock around the shoreline from late summer to spring. This drawdown zone is a dominant visual element that provides strong adverse contrast with the surrounding landscape. Much of this surrounding landscape ranks high in both scenic attractiveness and scenic integrity. Recreational use of the reservoirs is reduced from late fall to early spring, so the drawdown zone is most noticeable to residents and passing traffic on nearby roads. However, in some parts of the reservoirs, islands appear that may have some visual interest for boaters, motorists, and shoreline residents.

3.1.9.2 Environmental Consequences

Potential visual consequences were examined in terms of the likely difference between the existing landscape and the landscape as it might be altered by the proposed allocation changes. The assessment of visual change considered the sensitivity of viewing points available to the general public, their viewing distances, and visibility of proposed changes. In this assessment, scenic character is described using a variety of adjectives. Scenic integrity, which relates to degree of intactness or wholeness of the landscape character, is also an important factor. These measures help identify changes in visual character based on commonly held perceptions of landscape beauty and the aesthetic sense of place. Scenic value class is determined by combining the levels of scenic attractiveness, scenic integrity, and visibility. Scenic value class and the foreground, middleground, and background viewing distances for each reservoir are described in more detail in the reservoir-specific sections.

Comparative scenic values of TVA lands were assessed during the development of the alternatives in order to identify areas for scenic protection and visual resource conservation. Those parcels having distinctive visual characteristics such as the islands; rock bluffs; steep, wooded ridges; wetlands; and flowering shallow water areas were evaluated for possible allocation to Zone 3 (Sensitive Resource Management). Land that provides valuable protective screening was also evaluated for this allocation. Parcels that possess attractive visual resources of less significance were allocated to Zone 4 (Natural Resource Conservation) under Alternatives B, C, and D. Zone 4 also

includes land that provides important protective screening. Activities that involve minor visible change such as recreational hiking, picnicking, bank fishing, and some selective forest management could take place under both zone allocations. Some resource management activities with more visible modifications could take place under the Zone 4 designation as long as the location and appearance were subordinate to maintaining the desired visual characteristics.

Future natural area and wetland management activities could preserve and enhance the exceptional natural, scenic, or aesthetic qualities of landscapes that are suitable for low-impact public use. TVA attempts to monitor and remedy, to the extent practicable, abuses found in these areas, which can enhance opportunities for viewing naturally appearing landscapes. Historically, such abuses include illegal dumping, unauthorized ATV use, and other activities not permitted in some areas.

Lands having the greatest scenic qualities are often the most desirable for public preservation. Frequently, however, they are also the most sought after for development. Regardless of the alternative selected, TVA would continue to conduct environmental reviews including evaluation for potential visual impacts prior to the approval of any proposed development on public land. These reviews may prevent the most serious scenic disruptions or loss of visual resources by requiring mitigation measures to reduce potentially significant visual impacts.

Alternative A

Under Alternative A, for all reservoirs, a slow but noticeable decline in scenic resources, aesthetic quality, and visual landscape character is expected, as demands for development are likely to continue to increase. This decline in scenic resources would likely reduce scenic class levels for some areas of the reservoirs by one level or more (e.g., from “excellent” to “good,” or from “fair” to “poor”). Areas with low scenic values are often influenced by small changes in visual character. Thus, reductions in scenic class level could be potentially significant for areas of common or minimal scenic quality or for those areas that have very little scenic importance. Parcels 35 and 36 on Hiwassee Reservoir are currently undeveloped. However, under Alternative A, they are allocated to Zone 5, and as such, they would be subject to possible industrial development at some point in the future. Such development of those parcels would have visual impacts. Under all other alternatives, these two parcels would be allocated to Zone 4 (Natural Resource Conservation).

Alternatives B and C

Under Alternative B, all of the TVA lands would be allocated to one of the seven zones. This would not result in any changes in existing land use for any of the parcels. The land use of the committed parcels would not change. Thus, visual resources are not expected to be impacted under Alternative B.

Under Alternative C, the changes in land use would be the same as under Alternative B on seven of the nine reservoirs. However, on Chatuge and Hiwassee reservoirs, an additional 27.2 acres would be allocated to Zone 5 (Industrial), and an additional 78.4 acres would be allocated to Zone 6 (Developed Recreation). Such development has the potential to reduce scenic attractiveness of the shoreline and the aesthetic sense of place.

Alternative D
The potential impacts on visual quality under Alternative D would be similar to those expected under Alternatives B and C. Under Alternative D, land use would be essentially the same as under Alternative B, with the exception of two parcels. As with Alternative C, Parcel 52 on Chatuge and Parcel 49 on Chatuge would be allocated to Zone 6 for future developed recreation. All other parcel allocations would be the same as those under Alternative B. Future recreational development of the two subject parcels would result in some changes in visual character.

3.1.10 Water Quality and Aquatic Ecology

3.1.10.1 Affected Environment

Water quality and the associated aquatic animal and plant populations in the mountain reservoirs and their tailwaters are influenced by a variety of factors. These include the size, geology, and land use conditions in the reservoirs' upstream drainage areas, point and nonpoint discharges of pollutants, activities on lands adjacent to the reservoirs, and the operation of the reservoirs.

Reservoir Ecological Health
TVA developed the Reservoir Ecological Health Monitoring Program to determine reservoir health as compared to other reservoirs in the TVA system, to provide data for comparing future water quality conditions, and to be a screening program for targeting studies that are more detailed if the need arises (TVA 2006). TVA has monitored the ecological health of the mountain reservoirs on an annual or biennial basis since the early 1990s. Because of different methods and criteria used to assess the fish and benthic macroinvertebrates prior to 1994, the ecological health ratings described below are based on monitoring from 1994 through the present. The ecological health scoring system is based on the following five indicators, which are typically measured in the reservoir forebay[4] area and one or more areas farther upstream:

1. Dissolved oxygen (DO) is necessary in respiration of most aquatic organisms. Ideally, a reservoir has enough DO throughout the water column available to fish, insects, and zooplankton for respiration. Concentrations of DO in a reservoir both control and are controlled by many physical, chemical, and biological processes (e.g., photosynthesis, respiration, oxidation-reduction reactions, bacterial decomposition, temperature) that determine the assimilative capacity of a reservoir. Assimilative capacity is a water body's ability to receive wastewaters or other materials requiring oxygen for decomposition without deleterious effects and without damage to aquatic life. If concentrations are low enough or if low levels are sustained long enough, the health and diversity of aquatic organisms can be affected adversely. DO levels are expressed in terms of milligrams per liter (mg/L).

2. Chlorophyll, a surrogate measure for the amount of algae (phytoplankton) in the water, is important because it provides insights into the level of primary productivity[5] within a water body and can provide a measure of nutrient enrichment. Although some level of phytoplankton production is essential to maintain a healthy aquatic community, high concentrations can affect water

[4] The forebay is that area of the reservoir immediately upstream of the dam.
[5] Primary productivity is a measure of the rate of production of organic matter by plants.

uses in different ways. For example, largemouth bass fisheries in southeastern reservoirs can be enhanced as phytoplankton concentrations increase to relatively high levels. However, elevated phytoplankton concentrations can cause water quality problems. These include reduced water clarity, frequent algal blooms, higher oxygen demands and lower DO concentrations, increased periods of oxygen depletion and resultant byproducts (i.e., ammonia, sulfide, and dissolved manganese), water treatment problems, and higher water treatment costs.

3. Sediment quality is a measure of the amount of contaminants, especially polychlorinated biphenyls (PCBs), pesticides, and metals, in the sediment on the bottom of the reservoir. Sediments at the bottoms of reservoirs serve as a repository for a variety of materials, especially chemicals that have a low solubility in water. If contaminated, bottom sediments can have adverse impacts on bottom fauna and can often be long-term sources of toxic substances to the aquatic environment. They may affect wildlife and humans through the consumption of contaminated food or water or through direct contact. These impacts may occur even though the water above the sediments meets water quality criteria. Thus, examination of reservoir sediments is useful to determine if toxic chemicals are present and if chemical composition is changing through time.

4. Benthic macroinvertebrates (large bottom-dwelling invertebrates such as worms, snails, mussels, and crayfish) are included in aquatic monitoring programs because of their importance to the aquatic food chain, and because they have limited capability of movement, thereby preventing them from avoiding undesirable conditions. Data analyses that are indicative of good (and poor) water quality include the number of different species present, relative abundance of organisms tolerant or intolerant of poor water quality, and proportions of samples with no organisms present.

5. Fish are included because they are important to the aquatic food chain and because they have a long life cycle that allows them to reflect water quality conditions over time. Fish are also important to the public for aesthetic, recreational, and commercial reasons. Ratings are based primarily on fish community structure and function using a metric known as the Reservoir Fish Assemblage Index. Also considered in the rating is the percentage of the sample represented by those fish that eat mainly insects, fish that consume bottom-dwelling animals, overall number of fish collected, and the occurrence of fish with anomalies such as diseases, lesions, parasites, deformities, etc. (TVA 2006).

Each indicator is evaluated separately, and the individual ratings are combined into a single, composite score for each reservoir, termed the Reservoir Ecological Health Rating. Recent trends in these five indicators, as well as the overall reservoir ecological health ratings, are described in the reservoir-specific sections.

The Reservoir Ecological Health Monitoring Program is one of five components of TVA's overall river and reservoir monitoring effort termed Reservoir Vital Signs Monitoring Program (RVSMP). The other four components of the RVSMP include: (1) examination of ecological conditions in tributary streams to the Tennessee River; (2) monitoring of toxic contaminants in fish flesh to determine their suitability for human

consumption; (3) evaluating the number and size of important game fish species to help ensure their populations remain abundant and robust; and (4) sampling of bacteriological concentrations at recreational areas to evaluate their suitability for water contact recreation.

Fish Consumption Advisories
TVA maintains a program to examine contaminants in fish fillets from TVA reservoirs and their major tributary streams. TVA coordinates these fish tissue studies with state agencies in the Tennessee Valley because they are responsible for protecting public health and determining if a fish consumption advisory is needed. TVA assists the states by collecting fish from TVA reservoirs and checking the tissue for metals, pesticides, PCBs, and other chemicals that could affect human health. Typically, two species are monitored: channel catfish and largemouth bass. Fish consumption advisories have been issued in the past for Chatuge, Hiwassee, Blue Ridge, Nottely, Apalachia, and Fontana reservoirs.

Sport Fishing Index
A Sport Fishing Index (SFI) has been developed to measure sport fishing quality for various species in Tennessee and Cumberland River reservoirs. The SFI is based on the results of fish population sampling by TVA and state resources agencies and, when available, results of angler success as measured by state resource agencies (i.e., bass tournament results and creel surveys).

Swimming Advisories
TVA performs bacteriological monitoring at selected locations for compliance with regulatory limits and reports the results to state agencies and others. The states use this information, along with the results of their own studies, in deciding whether to issue water contact advisories. The most common cause of elevated bacteria levels at TVA recreational sites is populations of Canada geese.

State(s) Impaired Waters
Section 303(d) of the *Clean Water Act* requires states to maintain a list of water bodies (streams, lakes, and reservoirs) that do not meet water quality standards or have impaired uses. Impaired waters are those that have one or more properties that violate water quality standards. They are considered impaired by pollution and not fully meeting designated uses. TVA's ecological health ratings (i.e., "good," "fair," or "poor") are not directly comparable to state water quality designations, which identify water bodies as impaired, partially impaired, or unimpaired for various use categories. Impaired waters occur in the immediate watersheds of all of the mountain reservoirs except Apalachia Reservoir. They include streams flowing into several of the reservoirs, the reservoir tailwaters, as at Blue Ridge and Nottely, and the reservoirs themselves as at the Ocoees.

Water Supply
In the mountain reservoirs area, there are 15 municipal water suppliers utilizing surface water as their primary source of raw water. The 2005 average daily surface water demand among these suppliers was 9.595 millions of gallons per day (MGD).

3.1.10.2 Environmental Consequences

Increased development and intensive land use have the potential to result in some degree of negative impact to the aquatic environment. This can come from point source pollution such as industrial or sewage treatment plants, or from nonpoint source pollution, which comes from many sources (typically defined as sources that are not required to have a National Pollutant Discharge Elimination System [NPDES] permit). Development and intensive land uses often increase the amount of impervious surface (i.e., roofs, roads, and paved areas), remove vegetation, and increase storm water runoff, thereby reducing the natural buffering/filtering effect of vegetated lands and increasing the potential for soil erosion and other nonpoint sources of pollution. The main areas of concern, in terms of impacts to the aquatic environment and consequently aquatic life, are increased turbidity and sedimentation, increased levels of nutrients, and increased levels of chemicals and bacteria from impervious surfaces, disturbed lands, managed lawns, and improper operation or failure of wastewater treatment systems.

Shoreline development may alter the physical characteristics of adjacent fish and aquatic invertebrate habitats, which can result in changes in the quality of the aquatic communities. Habitat changes could have negative impacts if valuable spawning habitat (e.g., gravel, woody cover, etc.) or protective cover (e.g., stumps, brush, logs, boulders, etc.) are reduced. Additionally, habitat could be rendered unsuitable by excessive siltation and erosion, which can occur when riparian vegetation is cleared. Conversely, construction of docks and associated pilings and structures such as rock aggregation, while having potential short-term negative impacts during construction, could enhance shoreline habitat when constructed by providing shade and cover for some fish and aquatic invertebrates.

Under any of the alternatives, the potential environmental consequences would be similar. However, the more development and/or land disturbance allowed by an alternative, the greater the potential for adverse environmental impacts would be. Prior to any individual actions taken on any parcels in the future, TVA would conduct additional site-specific environmental reviews on a case-by-case basis and require appropriate site design and management practices using TVA's *General and Standard Conditions* (TVA 2005b) to reduce or avoid negative environmental impacts and help ensure the proposals best serve the needs and interest of the public. Further, any actual development of TVA and non-TVA lands must comply with state and federal environmental regulations, and applicants must often obtain permits specifically designed to prevent adverse impacts and violation of applicable water quality criteria.

Alternative A

Adoption of Alternative A is not likely to result in parcels changing from an undeveloped land use to a developed use. Parcels 35 and 36 on Hiwassee Reservoir are currently undeveloped but could potentially be developed for industrial use under Alternative A. Potential localized water quality and aquatic ecology impacts to Martin's Creek and the nearby Hiwassee River could occur if those parcels were developed for industrial use due to the relatively steep terrain that characterizes the parcels. Under Alternatives B, C, and D, these two parcels would be allocated to Zone 4 (Natural Resource Conservation). Due to the small amount of TVA land on the mountain reservoirs, in comparison to the overall area land base, the state and federal environmental regulations, and the use of any identified impact reduction methods including TVA's

Standards and Conditions/BMPs (ibid), development opportunities on TVA lands would have insignificant cumulative impacts to water quality and aquatic ecology.

Alternative B
Under Alternative B, parcels would be allocated to zones that reflect current land use. This would not result in parcels changing from an undeveloped land use to a developed use. Under this alternative, TVA would allocate more lands to Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation). Adoption of Alternative B would have insignificant cumulative impacts to water quality and aquatic ecology.

Alternatives C and D
Allocations under Alternatives C and D are identical to those under Alternative B on seven of the nine reservoirs. Under Alternative C, on Chatuge and Hiwassee reservoirs, one parcel (27.2 acres) would be allocated to Zone 5 (Industrial) and five parcels (78.4 acres) would be allocated to Zone 6 (Developed Recreation) rather than Zone 4 (Natural Resource Conservation), as under Alternatives A and B. Similarly, under Alternative D, two parcels (Parcel 52 on Chatuge Reservoir and Parcel 49 on Hiwassee) would be allocated as under Alternative C. Because future proposed actions are subject to environmental review and a limited amount of TVA land is changing from an undeveloped land use to a developed use, cumulative impacts associated with Alternative C or Alternative D to water quality and aquatic life are anticipated to be insignificant.

3.1.11 Air Quality and Noise

3.1.11.1 Air Quality

3.1.11.1.1 Affected Environment

National Ambient Air Quality Standards (NAAQS) have been established to protect the public health and welfare with respect to six pollutants: particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, and lead. An area where any air quality standard is violated may be designated as a nonattainment area for that pollutant, and emissions of that pollutant from new or expanding sources are carefully controlled. On March 12, 2008, the USEPA significantly strengthened its NAAQS for ground-level ozone. USEPA is revising the 8-hour primary ozone standard designed to protect public health to a level of 0.075 parts per million (ppm). The previous standard set in 1997 was 0.084 ppm. In addition to tightening the primary standard, USEPA is also strengthening the secondary 8-hour standard for ozone to the level of 0.075 ppm. The secondary standard is designed specifically to protect sensitive plants from damage caused by ozone exposure throughout the growing season. States must make recommendations to USEPA no later than March 2009 for areas to be designated attainment, nonattainment, and unclassifiable. USEPA will issue final designations no later than March 2010 unless there is insufficient information to make these designation decisions, in which case USEPA will issue designations by March 2011. It is likely that, under these tightened ozone standards, some, and possibly all, of the counties in which the mountain reservoirs are located may be designated nonattainment for ozone. USEPA tightened the primary fine particle standard in December 2006. The new standard may result in some of these counties being designated nonattainment for particulate matter with a diameter less than or equal to 2.5 micrometers ($PM_{2.5}$).

Recommendations for nonattainment areas were due from the states by December 2007, and USEPA issued designations in December 2008 (USEPA 2008).

All of the counties containing the mountain reservoirs are currently in attainment of the NAAQS except for the portion of Swain County, North Carolina, that is in the GSMNP, which is in nonattainment of the 8-hour ozone NAAQS. Most adjacent counties are in attainment of the NAAQS except for Blount, Sevier, and a portion of Cocke counties in Tennessee and a portion of Haywood County, North Carolina, which are in nonattainment of the 8-hour ozone NAAQS. Blount County is also in nonattainment of the $PM_{2.5}$ NAAQS.

Prevention of significant deterioration (PSD) regulations are used to limit air pollutant emissions from new or expanding sources. Under these regulations, some national parks and wilderness areas are designated PSD Class I air quality areas and are specially protected. The Class I areas in the vicinity of the mountain reservoirs are the GSMNP immediately north and west of Fontana Reservoir, Joyce Kilmer/Slickrock Wilderness in Graham County, North Carolina, and Monroe County, Tennessee, and Cohutta Wilderness in Fannin County, Georgia. All of the mountain reservoirs are within at least 15 miles of one of these Class I areas.

3.1.11.1.2 Environmental Consequences

Because the current uses of the great majority of the TVA lands on the mountain reservoirs would not change under any of the alternatives, impacts to air quality would be minor. For Blue Ridge, Nottely, Fontana, Apalachia, and the Ocoee reservoirs, there is little to no difference in anticipated air quality impacts among the four alternatives. However, there is a somewhat greater potential for air quality impacts on Hiwassee and Chatuge reservoirs.

Alternative A

Under Alternative A, activities, either current or future associated with Project Operations, Recreation, and Natural Resource Conservation uses, as well as on unplanned lands, are not likely to cause any significant impacts to local air quality.

Currently, some of the ongoing land uses that result in air emissions include, but are not limited to, controlled-burning practices, land-clearing practices, construction/demolition projects, and lands open for motor vehicle use. These activities produce both fine particle emissions as well as nitrogen-oxide emissions, which are a precursor for ground-level ozone production.

The greatest potential for air quality effects is from industrial use, the present allocation for about 79 acres on Hiwassee Reservoir. Prior to approving any industrial development of this land, TVA would conduct an appropriate level of environmental review to document the extent of expected air quality impacts. Each such review that involved a parcel in or potentially affecting a nonattainment area for ozone and/or $PM_{2.5}$ would require a conformity applicability determination pursuant to regulations implementing Section 176(c) of the *Clean Air Act* to assure compatibility with measures in local plans for achieving attainment. Although there could be some minor decrease in air quality under Alternative A, any effects are expected to be minor and localized.

Alternative B
Under Alternative B, the existing uses or future uses associated with the proposed allocations would be comparable to those under Alternative A. Under Alternative B, however, no land would be designated for industrial use. This would decrease the potential total air pollutant emissions as compared to Alternative A.

Alternative C
Under Alternative C, the existing future uses associated with the proposed allocations would be identical to those under Alternative B for seven of the nine reservoirs. Under Alternative C, however, on Chatuge and Hiwassee reservoirs, an additional 27.2 acres would be allocated to Zone 5 (Industrial) and an additional 78.4 acres would be allocated to Zone 6 (Developed Recreation).

The greatest potential for air quality effects under Alternative C is from industrial use. Depending on the industry involved, potential impacts can range from emissions related to construction/demolition activities to increased motor vehicle emissions and possibly direct emissions from the specific industry/plant.

Developed recreational use could similarly have impacts associated with construction/ demolition activities and increased motor vehicle emissions.

Alternative D
Under Alternative D, the potential impacts on air quality would be similar to those under Alternative B in that there would be no parcels allocated for industrial use. However, two parcels (Parcel 52 on Chatuge and Parcel 49 on Hiwassee) would be allocated for developed recreation under Alternative D. Because of the limited acreage involved, any degradation in local air quality would be minor and insignificant.

3.1.11.2 Noise

3.1.11.2.1 Affected Environment

Although there are many sources of noise, the greatest potential for noise-related impacts comes from industrial development. Power generation and substations also have the potential to generate noise, but typically to a lesser degree than industrial development. Developed recreation has the potential to impact noise levels depending on the location of the facilities and the type and intensity of recreational use. For example, recreational facilities that support low-intensity uses, such as parks or open spaces, generate less noise than more intensive uses, such as ball fields or recreation complexes. Land allocated to Zone 4 (Natural Resource Conservation) and Zone 3 (Sensitive Resource Management) would have the least potential for noise-related impacts.

3.1.11.2.2 Environmental Consequences

Alternatives A and B
Under Alternatives A and B, impacts to Chatuge, Blue Ridge, Nottely, the Ocoees, Apalachia, and Fontana reservoirs from noise are expected to be insignificant because there would be only minor changes in the current land uses.

Under Alternative A, 80.5 acres on Hiwassee Reservoir (i.e., Parcels 35 and 36) would be allocated for industrial use. Potential noise impacts due to industrial development would depend largely on the type of industry that might eventually locate there.

Depending on the type of industry, the adoption of Alternative A may have more potential noise impacts than Alternative B. Under Alternative B, noise impacts to Hiwassee Reservoir would be insignificant because no allocations for industrial land uses would occur under this alternative.

Alternative C
Under Alternative C, impacts from noise would be insignificant on seven of the nine reservoirs because there would be no changes in the parcel allocations from current uses. On Chatuge Reservoir, Parcel 10 (27.2 acres) would be allocated to Zone 5 (Industrial) under Alternative C. Potential noise impacts due to industrial development would depend largely on the type of industry that might locate on Parcel 10. Depending on the type of industry, adoption of Alternative C may have more potential noise impacts on Chatuge than Alternative B. More land on Chatuge (i.e., Parcels 52 and 77) and Hiwassee (Parcels 34 and 49) reservoirs would be allocated to Zone 6 (Developed Recreation) under Alternative C than under Alternatives A or B. Because of its central location and the likelihood that proposed recreational facilities on Parcel 77 would be used frequently, recreational facilities on this parcel could generate noise locally. However, the amount of noise would depend on various factors such as use patterns, presence of loudspeakers or other noisemakers, and the timing of use. Therefore, implementation of Alternative C has a potential to result in additional noise impacts. The adoption and implementation of either Alternative A or C would have a greater potential for noise-related impacts than Alternative B.

Alternative D
The potential impacts from noise under Alternative D would be similar to those expected under Alternative B because no parcels would be allocated for industrial use under Alternative D. However, the allocation of two parcels (totaling 7.7 acres) for developed recreation under this alternative could result in the generation of noise, but the potential effects are not expected to be significant.

3.1.12 Socioeconomics

3.1.12.1 Affected Environment

Social and economic values and activities pertaining to the reservoir areas are derived primarily from the local communities and their livelihoods. The important overall socioeconomic conditions that could be affected by the MRLMP include population, size of the labor force, types of jobs, unemployment levels, and income levels. Within the general subject of socioeconomic conditions is the specific subject of environmental justice, which relates to the amount and any concentrations of the population that are in poverty or are a racial or ethnic minority and the likelihood that potential effects may be disproportionate to these groups.

Socioeconomic conditions were analyzed at the county level for the counties in which the reservoirs are located. The counties are large enough to provide aggregate socioeconomic data for a general overview adequate for a primarily policy-level plan. Many important political decisions that affect social and economic activity are made at the county level, and most of the useful data are more readily available at the county level rather than at regional or local levels.

The primary drivers of the economy and population growth in the area are the housing and tourism sectors, which are dependent on the natural scenery associated with the reservoir and adjacent lands. Other major employers are local government, particularly education. While all the counties have some manufacturing, this sector is relatively minor due to steep terrain that limits the availability of industrial sites, the lack of large water bodies for water supply and to treat large amounts of wastes, and few roads suitable for carrying large amounts of industrial traffic. Agriculture is a minor employer, but some counties have relatively large percentages of people employed in plant nurseries and production of Christmas trees and related greenery. Incomes tend to be lower and poverty rates higher than national averages because of fewer high-wage jobs such as manufacturing and professional services. Unemployment rates tend to be somewhat higher than national averages because of the decline of manufacturing jobs in recent years.

The reservoir counties are very rural, with low population densities and a few small towns. Most have high percentages of land in governmental ownership, particularly for national and state forests and the GSMNP. Populations of most of the counties have grown rapidly in recent years, especially for those counties with good roads connecting them to the Atlanta metropolitan area. On the other hand, populations have actually decreased in some of the counties with the poorest access to Atlanta or other nearby large population centers and the most land in governmental ownership and thus least available for second-home development. Minority populations are much lower than national averages except for Swain County, North Carolina, where many of the Eastern Band of Cherokee Indians live.

In the counties with large numbers of second homes, there are large influxes of vacationers, particularly in the summer. As an example, David Badger, the county manager of Cherokee County, North Carolina, noted (personal communication, November 7, 2007) that the population there can increase by as many as 10,000 people between April and October, compared to the resident population in 2006 of 26,309.

3.1.12.2 Environmental Consequences

Socioeconomic impacts under any of the alternatives are expected to be minor and insignificant. The overall TVA land base is small, and very few acres of TVA land have the potential to change use. The existing trends of increasing land development (especially for residential use) in the reservoirs area are the major factors influencing socioeconomic conditions. These trends are expected to be unaffected by either continuing the existing management or from making minor changes in management of TVA land because of the intrinsic attractiveness of the area.

Neither those in poverty nor the very small minority population in the area is likely to experience any disproportionate direct adverse effects from any development proposal under any of the alternatives. In general, economic development proposals could benefit those in poverty by providing job opportunities. These proposals would be evaluated as appropriate in an environmental review process. Significant cumulative impacts could occur if several parcels were developed even if no single development caused significant impacts. However, the extent and degree of such impacts would depend on the specific proposals. Specific land use proposals could potentially have significant adverse environmental justice impacts by reducing affordable public access to the reservoir and lands for dispersed recreation. Alternative B provides the most

zone allocations that support dispersed recreation, which provides recreation opportunities along the reservoirs for low-income populations.

Alternative A
Under Alternative A, most TVA parcels on all reservoirs would likely continue to be managed as they now are. Requests by local governments or private entities for use or transfer of TVA land would be reviewed on an individual basis. There could be requests that would result in socioeconomic impacts such as expansion of existing recreation areas or industrial development on Hiwassee Parcels 35 and 36. (These two parcels are allocated for industrial use only under Alternative A; under the other alternatives, they would be allocated to Zone 4 (Natural Resource Conservation.) Direct, indirect, and cumulative impacts on socioeconomic conditions would be assessed at that time. Development trends in the area would continue, and requests for new docks could be considered on the TVA shorelines where back-lying landowners have existing shoreline access rights.

Alternative B
Under Alternative B, the allocations for all parcels are consistent with existing land use. New development would be restricted to parcels that are already supporting the allocated use, such as expansion of an existing campground on a parcel zoned for Developed Recreation. TVA would continue considering requests for private water use facilities on TVA parcels with deeded access rights. Implementation of Alternative B would maintain the existing land use and character of the reservoirs by not proposing new uses; therefore, socioeconomic trends are not expected to be affected by adoption of this alternative.

Alternative C
Under Alternative C, the allocation of Parcel 10 on Chatuge Reservoir to Zone 5 (Industrial) would create the potential for new jobs in the area if indeed an industry decided to locate on the parcel. This development would be beneficial to the economy of the area. An additional benefit would be increased property taxes from private ownership of Parcel 10. However, depending on the type of industrial development, this could have negative socioeconomic impacts by lowering the value of nearby property and interest in residential development of available nearby property, at least relative to other properties in the area. The allocations of Parcel 52 and Parcel 77 on Chatuge Reservoir to Zone 6 (Developed Recreation) could enhance the attractiveness of the community and indirectly contribute to further population and economic growth. However, as noted above, the reservoir and scenery are the main economic drivers in the area, and high-intensity developed recreational use on Parcel 77 could be incompatible with the overall enjoyment of the reservoir and scenic quality. This could possibly lower property values and interest in residential development of available nearby property.

Under Alternative C, the allocation of two parcels totaling approximately 4 acres on Hiwassee Reservoir to recreational use would enhance the attractiveness of the area, thus possibly indirectly contributing to further population and economic growth. Under Alternative C, the change of these parcels to a walking trail and public river access would enhance the availability of parks in the area to low-income citizens. Increased public reservoir and river access sites and parks would benefit low-income residents in the area who may not have recreational opportunities available to them on private land.

Alternative D

Adoption of Alternative D would likely result in socioeconomic effects similar to those expected from Alternative B. Under Alternative D, two parcels totaling 7.7 acres would be allocated for future developed recreation use. Specifically, the 6.1-acre Parcel 52 on Chatuge would likely be used for public recreation, possibly with a boat launch area, while Parcel 49 (1.6 acres) on Hiwassee would be used to extend the Heritage Riverwalk Trail. Neither of these uses is expected to affect local property values to a significant extent. These facilities could benefit low-income citizens by providing recreational opportunities.

3.2 Chatuge Reservoir

3.2.1 Land Use

An overview of land use for the mountain reservoirs region is provided in Section 3.1.1. Land use specific to Chatuge Reservoir is described in the following section.

3.2.1.1 Affected Environment

On Chatuge Reservoir, TVA initially purchased 3,557 acres of land (see Table 1-1) and has sold about 629 acres (17 percent). Most of these sale parcels are currently developed as residential areas, and a few have been developed as recreation areas. TVA transferred 1,161 acres to state or federal agencies for public use.

The 1,765.1 acres of TVA-retained land on Chatuge Reservoir have been divided into 110 parcels. The majority of these parcels (82) are committed to existing land uses (Table 2-2). Two parcels containing the Chatuge Dam Reservation account for 347 acres (about 20 percent) of the total TVA land base. Thirty-seven parcels are committed to residential access by deeded rights or previous policy. Thirteen parcels are committed to recreational uses such as commercial marinas, public campgrounds, or boat ramps by land use agreements. Land use agreements also commit eight parcels for public infrastructure such as municipal water treatment plants, wastewater treatment plants, and state highways. Five parcels front land that TVA transferred to the USFS for operation of the National Forest System. A complete list of the committed uses for Chatuge Reservoir parcels is provided as Appendix F.

Twenty-eight parcels, totaling 717.5 acres (see Table 2-2), are considered uncommitted and are being considered for alternative uses in this plan. This is by far the largest amount of uncommitted land on any of the nine reservoirs being planned. The majority of the uncommitted parcels are currently managed for natural resource conservation and dispersed recreation.

TVA owns approximately 52 percent of the total 128 miles of shoreline on Chatuge Reservoir (see Table 1-2). Forty-eight percent of this shoreline was never owned by TVA; TVA only purchased flowage easements along this shoreline. Approximately 57 percent of the shoreline is available for residential development (Table 3-2), most of which is on private shoreline. TVA estimates that about 74 percent of the shoreline available for residential development (i.e., approximately 42 percent of the total shoreline) is currently developed with residential subdivisions.

Towns and Clay counties are distinctly rural. The principal towns on or near the reservoir are Hiawassee and Young Harris (Georgia) and Hayesville (North Carolina). About 54 percent of Towns County land is in the Chattahoochee National Forest (USFS 2007a, Quickfacts 2007). About 48 percent of Clay County land is in the Nantahala National Forest (USFS 2007b, Quickfacts 2007). In recent years, development has increased on the privately owned land in both counties. Land use data for Towns County (NARSAL 2007b) show that from 1974 to 2005, high-intensity development increased from 36 to 205 acres, and low-intensity development increased from 1,332 to 6,793 acres. About 92,000 acres (approximately 85 percent) of the county remained in forest in 2005. Much of the residential development is attributed to out-of-state retirees moving to the mountain areas of the state. In addition, improved highway access to the Atlanta area allows both

commuters and second-homeowners easier travel to and from the area. Neither Towns County nor Clay County has zoning. Regional land use data are discussed in more detail in Section 3.2.12, Socioeconomics.

Towns and Clay Counties have a joint industrial park, the Clay-Towns Regional Industrial/Technology Park, which is about 20 acres in size and located just west of Georgia State Route (SR) 515/North Carolina SR 68 and less than a mile west of Chatuge Reservoir. The Towns County part of the park has several small and medium-sized industries; however, there are still sites available for development. The Clay County portion is still under development and has no occupants.

Towns County and the cities of Hiawassee and Young Harris have developed a draft joint comprehensive growth plan (Towns County 2007) as required by Georgia law. The plan recognizes the need for special attention to the impacts of development in specific areas along the outskirts of Hiawassee and along SRs 515 and 75 and US 76 near the reservoir. It also calls for waterfront protection along the reservoir generally and redevelopment in the core of the town of Hiawassee. The plan recognizes that the reservoir waterfront is "nearing immediate capacity from development and has recently been confronted with new development types including high density and high activity land uses [and that the] county and town of Hiawassee must develop a long-range plan for the land use surrounding the reservoir and develop a means for implementing that plan." It also states that increasing development along the reservoir threatens the character of communities. Furthermore, the plan calls for additional recreation facilities and specifically notes the need for additional park space near Hiawassee. The plan is scheduled for completion in 2009.

Parcels containing prime farmland surrounding Chatuge Reservoir are presented in Table 3-9.

Table 3-9. Acres of Prime Farmland in Selected Parcels – Chatuge Reservoir

Parcel Number	Acres of Prime Farmland	Zone Allocation	Description
1	72.3	2	Dam reservation
52	6	4	Open field with agricultural lease
52a	1	4	Open field with agricultural lease
73	8.9	4	Mixed forest providing informal recreation
84	17.2	4	Fronts USFS property
86	6	7	Fronts Cypress Point Subdivision
96	8	4	Highly visible point with upland forest
104	6.2	6	Fronts Ledford Chapel Boat Ramp
107	6.5	2	Municipal wells and treatment facility, Clay County

3.2.1.2 Environmental Consequences

Alternative A

As shown in Table 2-3, under Alternative A, the allocated land uses for the 1,479 acres that are planned (out of a total of 1,765.1 acres managed by TVA) would be, in descending order, Natural Resource Conservation (41.6 percent), Recreation (21 percent), and Project Operations (21.2 percent). No land would be allocated to Sensitive Resource Management

or Industrial uses. Two small parcels previously forecast for Reservoir Operations (1 acre) that have existing permits for water use facilities would be allocated for Shoreline Access (0.1 percent).

Under Alternative A, TVA would not designate land uses for the 286 acres of TVA-managed land on Chatuge Reservoir that were not previously planned using the Forecast System. Of the 57 previously unplanned parcels, representing 286 acres, only four parcels are uncommitted. The four uncommitted parcels total less than an acre and are all used for natural resource conservation. These parcels would continue to be managed according to TVA's Land Policy, SMP, and Section 26a regulations.

Under Alternative A, there would be no changes from current land use, and therefore, no impacts to prime farmlands are expected.

Alternative B
Under this alternative, the 57 parcels (286 acres) that were not planned in the existing Forecast System would receive allocations. Thus, all of Chatuge Reservoir's 1,765 acres would have a land management plan. Fifty-two of the previously unplanned parcels are committed to existing uses, and this determined their allocation under this alternative. The four small, uncommitted parcels were allocated based on their existing land use, which would be consistent with a Zone 4 (Natural Resource Conservation) allocation. Alternative B does not include any allocations that are inconsistent with the current land use.

Under Alternative B on Chatuge Reservoir, TVA would allocate 141 additional acres to Zone 4 (Natural Resource Conservation) for a total of approximately 874.6 acres (49.5 percent), and approximately 44.2 additional acres to Zone 6 (Developed Recreation) for a total of 414.2 acres (23.4 percent). Allocations to Zone 2 (Project Operations) would increase by approximately 7.2 acres to a total of 381.2 acres (21.6 percent). Zone 7 (Shoreline Access) would receive new allocations totaling about 76 acres (4.5 percent), and Zone 3 (Sensitive Resource Management) would receive new allocations totaling 16.7 acres (0.9 percent). No land on Chatuge Reservoir would be allocated to Zone 5 (Industrial) under Alternative B.

No significant changes to land use are expected to occur on Chatuge Reservoir under Alternative B because the allocations are consistent with existing land use on all parcels.

Under Alternative B, no impacts to prime farmlands are expected.

Alternative C
Under Alternative C, all of Chatuge Reservoir's 1,765 acres would have a land management plan. Zone 4 (Natural Resource Conservation) allocations under Alternative C would be 101.6 acres less than under Alternative B, for a total of approximately 773 acres (43.8 percent). Under Alternative C, 74.4 additional acres would be allocated to Zone 6 (Developed Recreation) for a total of 488.6 acres (27.7 percent), and 27.2 acres (1.5 percent) would be allocated to Zone 5 (Industrial). The difference between Alternatives B and C, which affects four parcels (Parcel 10, 52, 52a, and 77) on Chatuge Reservoir, is shown in Table 2-8.

Parcel 10. This 27.2-acre parcel is characterized by slopes supporting old-growth deciduous forest. Under Alternative C, it would be allocated to Zone 5 (Industrial). This allocation was in response to a request from representatives of BRMEMC during the

scoping period. BRMEMC expressed an interest in acquiring access for a water intake to serve the nearby Clay-Towns County Industrial/Technology Park, which is located approximately 0.5 mile west of Parcel 10. Allocation to Zone 5 is consistent with the proposed water intake (see the description of Zone 5 in Table 2-1).

Although there were no proposals on Parcel 10 for traditional industrial uses such as a manufacturing facility, an industrial allocation would facilitate the eventual use of the property for such activities. A Zone 5 allocation would allow for the sale of the parcel for potential industrial businesses in the future. During the preparation of the DEIS, BRMEMC withdrew the request for Parcel 10 to be allocated for industrial use. Nevertheless, TVA chose to retain Alternative C in its original state and evaluate the potential environmental effects of allocating Parcel 10 to Zone 5. That analysis included the possible use of the parcel for industrial purposes despite the fact that the type of industry remained unknown.

The proposal would add to the availability of land for industrial development. Specific impacts on the site, such as development of infrastructure required for industrial use, and indirect impacts, such as traffic, would be addressed at the time development of a specific industrial project is proposed and sale of the parcel is considered. TVA's Land Policy specifies a preference for water-based industry that requires water access for either navigation or water supply.

With the exception of Parcel 10, the land use along the shoreline in Woods Creek embayment is predominantly residential; however, there is a large undeveloped private tract adjacent to the parcel to the north. The change of Parcel 10 from Zone 4 to Zone 5 would result in a loss of open space in Woods Creek embayment, thus potentially changing the character of the existing residential neighborhoods in the area. However, the loss of open space would be minor in the context of the large amount of TVA and USFS land retained on the reservoir that is currently utilized for dispersed recreation and visual character.

Parcels 52 and 52a. These two parcels were originally considered one parcel, i.e., Parcel 52. However, with the development of the Alternative D, a 1.9-acre portion of the original Parcel 52 was segregated and identified as Parcel 52a (see Figure 2-2). Collectively, these shoreline parcels are composed of an open field that is currently maintained in fescue under an agricultural license. Under Alternative C, these two parcels would be allocated to Zone 6 (Developed Recreation). Public comments received during public scoping from Towns County, Town of Hiawassee officials, and the Georgia Department of Natural Resources propose a public recreational area or city park, possibly including a year-round launching ramp, fishing piers, and trails.

The change of Parcel 52 and 52a from Zone 4 to Zone 6 would result in a loss of farmland in a mountainous county with relatively limited farmland, but the acreage is very small and contributes very little to the agricultural production in the area. Impacts to prime farmlands would be evaluated under the *Farmland Protection Policy Act* prior to conversion and are expected to be minimal due to surrounding land usage, urban buildup, and compatibility with existing agricultural use in the area. With increasing residential and other development in the vicinity, the parcel will likely become more isolated from other agricultural activity. The Towns County Joint Comprehensive Plan calls for more parks near the town of Hiawassee. The land use of the adjacent area is predominantly commercial along the US 76 corridor in that area, and residential neighborhoods are located across the reservoir. Any future proposals for recreational development on Zone 6 parcels would require TVA

approval and would be subject to additional environmental review. TVA routinely requires the implementation of appropriate BMPs to reduce the potential for on-site erosion and sedimentation from construction. Additional conditions of approval routinely involve minimizing the disturbance of the existing forested shoreline and avoidance of any sensitive resources present on the parcel.

Parcel 77. This is a highly visible parcel located near the center of the reservoir. The change of Parcel 77 from Zone 4 to Zone 6 would result in a loss of forested open space in this region of Chatuge Reservoir, thus potentially changing the character of the views from existing residential neighborhoods in the area and from across the reservoir, such as Cedar Cliff. However, the loss of open space would be minor in the context of the large amount of TVA and USFS land retained on the reservoir that is currently utilized for dispersed recreation and visual character. The land use of the surrounding area is predominantly low-density residential use with the exception of Parcel 78, which is a large island located directly to the northwest. The Georgia Mountain Fairgrounds and Towns County Park are located across the reservoir directly to the south.

Allocating Parcel 77 to Zone 6 would shift land use from a natural setting supporting dispersed recreation such as hiking, bank fishing, and informal camping to a developed setting potentially containing recreation facilities and associated infrastructure such as roads, parking lots, and lights. However, the change from Public Recreation under Alternative C to Zone 6 would still provide a type of recreation. A Zone 6 allocation would be consistent with the comprehensive plan's call for more parks near Hiawassee.

Intensive development of the parcel for the proposed multiple field sports complex could be incompatible with adjacent low-density residential use due to impacts of noise, traffic, and nighttime lighting. Loss of forest along the reservoir, noise, and nighttime lighting could also cause impacts of concern to recreational users of the reservoir and residents living across the reservoir. The degree of impact could be limited with sensitive design of the complex and restrictions on late night use.

Under Alternative C, proposed allocations for conversion to recreational and industrial development on Parcels 10 and 77 do not involve prime farmlands.

Alternative D

With the exception of two parcels (Parcel 52 on Chatuge and Hiwassee Parcel 49), the land allocations under Alternative D would be the same as those under Alternative B. These two parcels contain a total of 7.7 acres. Thus, any changes in land use would be minor and insignificant. However, adoption of Alternative D would involve the potential loss of approximately 6 acres of prime farmland (see Table 3-9). This potential loss of farmland is described previously.

3.2.2 Recreation

An overview of the recreation resource for the mountain reservoirs is provided in Section 3.1.2.

3.2.2.1 Affected Environment

Fourteen TVA parcels on Chatuge Reservoir have developed recreation facilities. TVA actively manages some of these parcels. However, the USFS and state and county

agencies manage most of the parcels, either through TVA land transfer agreements or through landrights provided by licenses, leases, or easements. In addition to the TVA and other public land that provides recreational opportunities, the private sector also provides needed amenities such as marinas and recreational vehicle (RV) campgrounds. These public and private developed recreation areas are listed in Table 3-10.

Table 3-10. Developed Recreation Facilities on Chatuge Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Chatuge Shores Golf Course	Clay, N.C.	Private	Commercial	Private	N/A								●
Ho Hum Campground	Clay, N.C.	Private	Commercial	Private	N/A	●	●		●				●
Lakeview Cottages and Marina	Clay, N.C.	Private	Commercial	Private	N/A		●	●	●				●
Penland Point Campground	Clay, N.C.	Private	Commercial	Private	N/A	●	●	●	●				●
Chatuge Cove Marina	Clay, N.C.	Private	Commercial	TVA/Private	N/A	●	●	●	●				●
Mission Dam Tailwater*	Clay, N.C.	Public	Duke Energy	Private	N/A					●			
US 64 Fishing Piers	Clay, N.C.	Public	State of N.C.	State of N.C.**	90						●	●	
Ledford Chapel Recreation Area	Clay, N.C.	Public	State of N.C.	State of N.C.**	104				●			●	
Chatuge Dam Reservation	Clay, N.C.	Public	TVA	TVA	1			●	●				●
Chatuge Tailwater Stream Access*	Clay, N.C.	Public	TVA	TVA	1			●					
Clay County Park	Clay, N.C.	Public	Clay County	TVA	5	●		●			●		●
Gibson Cove Recreation Area	Clay, N.C.	Public	Clay County	TVA	3	●			●		●		●
Shallowford Bridge Stream Access*	Clay, N.C.	Public	Clay County	TVA	FBRA-1,4			●		●			
Jackrabbit Mountain Recreation Area	Clay, N.C.	Public	USFS	USFS**	85	●		●	●			●	●
Boundary Waters Resort and Marina	Towns, Ga.	Private	Commercial	Private	N/A		●	●	●			●	
Lake Chatuge Chalets	Towns, Ga.	Private	Commercial	Private	N/A								●
Lower Bell RV Park	Towns, Ga.	Private	Commercial	Private	N/A	●	●		●				
Salale Lodge	Towns, Ga.	Private	Commercial	Private	N/A	●	●	●	●				●
Serenity Cove Cabins	Towns, Ga.	Private	Commercial	Private	N/A				●				●
The Ridges Resort and Marina	Towns, Ga.	Private	Commercial	Private/TVA	16		●	●	●		●	●	●
Chatuge Woods Campground	Towns, Ga.	Public	Towns County	TVA	13	●			●				●
US 76 Picnic Area; Park and Ride	Towns, Ga.	Public	N.C. Department of Trans-portation (NCDOT)	TVA	45			●					

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Towns County Multipurpose Center	Towns, Ga.	Public	Towns County	TVA	63								•
Towns County Park	Towns, Ga.	Public	Georgia Mountain Fair Inc.	TVA	28	•		•	•		•		•
Georgia Mountain Fair	Towns, Ga.	Public	Georgia Mountain Fair Inc.	TVA	27						•	•	•
Lake Chatuge Recreation Area	Towns, Ga.	Public	USFS	USFS**	32				•				

FBRA = Fowler Bend acquisition number (assigned for river access tracts on Hiwassee Reservoir watershed)
N/A = Not applicable
* = Stream access site
** = TVA retained below MSC

There are 10 campgrounds on Chatuge Reservoir. Five are commercial campgrounds located on private property, and the remaining campgrounds are located on TVA land or on back-lying land that TVA transferred to other public agencies. Jackrabbit Mountain Campground, located adjacent to Parcel 75, is operated by the USFS and includes a boat ramp, fishing piers, and other recreational amenities. Clay County operates Gibson Cove (Parcel 3) and the Clay County Park (Parcel 5), which includes a day use recreation area. Towns County operates Chatuge Woods Campground (Parcel 13). The Georgia Mountain Fair Inc. operates certain recreational camping and day use amenities located within Towns County Park (Parcel 28) in the town of Hiawassee.

There are 16 recreation areas that contain at least one boat ramp, nine of which are privately operated. Five of the ramps are operated by public entities, including the ramp on the Chatuge Dam Reservation (Parcel 1) that is managed by TVA.

There are four commercial marinas operating on Chatuge Reservoir. Salale Lodge Marina, Chatuge Cove Marina, and Boundary Waters Resort and Marina are located on private land. The Ridges Resort and Marina is located partially on private land and partially on TVA Parcel 16. Two marinas have been certified as a TVA Clean Marinas: Boundary Waters Resort and Marina and The Ridges Resort and Marina.

There are four public fishing piers located on Chatuge Reservoir. The piers at Ledford Chapel Boat Ramp (Parcel 104) and US 64 near Shooting Creek Bridge (Parcel 90) are managed by the North Carolina Wildlife Resources Commission. Georgia Mountain Fair manages the fishing pier adjacent to the boat ramp at Towns County Park. As previously mentioned, the USFS manages a handicap-accessible fishing pier at Jackrabbit Mountain Campground. TVA partnered with the other agencies in the construction of all of the public fishing piers.

Three stream access sites are located downstream of Chatuge Reservoir. TVA manages the access site on the Hiwassee River immediately below Chatuge Dam (Parcel 109). There is an informal access site below Mission Dam at Hiwassee River Mile (HRM) 105.7R (right bank) on Duke Energy property. Clay County manages the Shallowford Bridge

Stream Access Site (Parcel FBRA-1, 4) located at HRM 108.3L (left bank) under a memorandum of agreement with TVA.

The land used for the Georgia Mountain Fairgrounds (Parcel 27) in Towns County is made available for public recreation purposes under a permanent easement to the Georgia Mountain Fair Inc. This unique recreational area hosts the Georgia Mountain Fair each year and provides tremendous benefits for the local and regional tourism economy. The adjacent Towns County Park (Parcel 28) also provides supporting infrastructure for the fairgrounds and other facilities such as ball fields. The Towns County multipurpose building located on Parcel 63 contains a gymnasium and fitness center on land made available by TVA to Towns County under a recreation easement.

As shown in Table 3-10, many diverse developed recreation opportunities on Chatuge Reservoir enhance the quality of life and economic prosperity of the region.

Dispersed Recreation
Dispersed recreation has historically provided important recreation opportunities on Chatuge Reservoir. A listing of Chatuge Reservoir parcels with identified heavy dispersed recreational use is provided as Table 3-11.

Table 3-11. Dispersed Recreation Areas on Chatuge Reservoir

Recreation Area	Parcel Number	Number of Sites
Bell Creek	67	2
Lower Bell	70	4
Mull Road Dispersed Recreation Area	77	7

Some of the larger uncommitted parcels on Chatuge Reservoir that accommodate substantial dispersed recreation of a more passive nature such as hunting and hiking include the following: Parcel 4 with 33.6 acres, Parcel 6 with 210.7 acres, Parcel 10 with 27.2 acres, Parcel 15 with 53.2 acres, Parcel 73 with 55.2 acres, Parcel 74 with 47.0 acres, Parcel 77 with 66.4 acres, Parcel 78 with 108.3 acres, Parcel 88 with 26.4 acres, and Parcel 96 with 29.9 acres.

3.2.2.2 Environmental Consequences

Alternative A
Under Alternative A, previously planned parcels on Chatuge Reservoir allocated for recreation comprise 370 acres (20.9 percent) of the 1,765 acres managed by TVA. All of the previously allocated parcels for recreation under the Forecast System were for Public Recreation. In addition, under Alternative A, six parcels that currently support Developed Recreation are unplanned; however, all the unplanned parcels are committed to that use primarily through transfer agreements to the USFS.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use. The unplanned parcels would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas. Under Alternative A, potential environmental impacts would be insignificant, as parcels utilized for Developed Recreation

would not change. Proposals for any new facilities would be subject to environmental review to determine necessary mitigation.

Dispersed recreation could continue on both the planned and unplanned land under Alternative A. Under Alternative A, TVA does not propose changing the land use of any of these parcels. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant under Alternative A.

Alternative B

Under Alternative B, the 16 Chatuge Reservoir parcels (414.2 acres or 23.4 percent) that are committed to a Developed Recreation use would be allocated to Zone 6. Of the parcels currently committed to Developed Recreation, seven parcels (161 acres) are in Clay County, North Carolina, and nine parcels (253 acres) are in Towns County, Georgia. These commitments include transfer agreement covenants, licenses, leases, and easements. With the exception of Parcel 18, all of the parcels committed to Developed Recreation currently support recreational land use with existing facilities. The parcels allocated to Zone 6 would include those previously allocated under Alternative A to Public Recreation. In addition, the six unplanned parcels (a total of 44.2 acres) under Alternative A that are committed to Developed Recreation uses would be allocated to Zone 6.

Under Alternative B, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas allocated to Zone 6 (Developed Recreation). These areas are the same under Alternative B as under Alternative A, and because there would be no new parcels allocated for Developed Recreation, the potential environmental impacts would be the same. Proposals for any new facilities within existing areas would be subject to additional environmental review under NEPA.

Allocations for recreational uses under Alternative B align with existing land use. Under this alternative, TVA does not propose changing land use of any parcels; therefore, any potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels. Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternative C

Under Alternative C, land proposed for Zone 6 on Chatuge Reservoir would total 488.6 acres (27.7 percent), which is 74.4 acres more than is allocated to Zone 6 under Alternative B. Specifically, TVA would consider three proposals, as described below, which differentiate this alternative from Alternative B.

Parcel 10. Under Alternative C, Parcel 10 would be allocated to Zone 5 (Industrial). This undeveloped parcel currently provides dispersed recreation opportunities. Parcel 10 is the only TVA land in the Woods Creek embayment. The Zone 5 allocation could result in the eventual sale or transfer of this parcel for industrial development. If this were to occur, dispersed recreation opportunities on this 27-acre parcel would be eliminated. Industrial development on Parcel 10 could also affect recreational fishing in the area. This potential effect would depend on the condition of the shoreline, the aesthetic character of the local area, and any changes in water conditions in the Wood Creek embayment.

Parcels 52 and 52a. Parcels 52 and 52a would be allocated to Zone 6 (Developed Recreation) for public recreation purposes under Alternative C. During public scoping, Towns County, the Town of Hiawassee officials, and the Georgia Department of Natural Resources proposed a public recreational area or city park on the original Parcel 52, including possible amenities such as a year-round launching ramp, fishing piers, and trails. A Zone 6 allocation would allow future consideration of these uses by TVA. This allocation is also consistent with the Towns County, Hiawassee, Young Harris Joint Comprehensive Plan (see Section 3.2.1.1).

The suitability/capability analysis indicated that Parcel 52 ranked high for potential use as a public park and for water access, primarily due to gentle shoreline slope near deep water, central location in an area of identified need, good road access, and high level of interest by local and regional stakeholders.

Parcel 77. Under Alternative C, Parcel 77 would be allocated to Zone 6 (Developed Recreation) for public recreation purposes. During public scoping, Towns County officials requested that Parcel 77 be made available for the development of a multiple field sports complex and associated recreational facilities. A Zone 6 allocation would accommodate this proposed use.

The suitability/capability analysis indicated that Parcel 77 ranked high for consideration as a public park for some criteria due to its large land base, high degree of forestation, and shoreline slope. The criteria for location scored lower due to uncertainties regarding need for a developed park at this location. A public park can accommodate a variety of recreational uses ranging in number and type of facilities and in frequency and intensity of use. There are many developed recreational opportunities in this area of the reservoir, with 253 acres of TVA land being utilized for developed recreation in Towns County alone. Additionally, the heavy dispersed recreational use of Parcel 77 indicates it is currently meeting a recreational demand in the area.

Implementation of Alternative C would provide overall greater developed recreational opportunities and less dispersed recreation on Chatuge Reservoir than Alternative B.

Alternative D

Adoption of Alternative D would involve the allocation of Parcel 52 to Zone 6 for future recreational use as described above. Parcel 52a would be allocated to Zone 4, as its suitability for public recreation is affected by its proximity to the proposed BRMEMC substation. The degree of developed recreational opportunities available under Alternative D are less than those afforded by Alternative C, in that Parcel 77 would not be zoned for developed recreation use under Alternative D. However, under Alternative D, Parcel 77 would be allocated to Zone 4 and would remain available for dispersed recreational use. Likewise, because Parcel 10 would also be allocated to Zone 4, it would continue to provide opportunities for dispersed recreation under Alternative D.

3.2.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.2.3.1 Plant Communities

3.2.3.1.1 Affected Environment

The vegetative classes commonly found on lands within and around Chatuge Reservoir are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation.

Most of the evergreen forests around Chatuge Reservoir are pine plantations where loblolly pine is dominant, along with shortleaf and Virginia pine. Several areas, including Parcels 4, 72, 73, and 76, have numerous dead pines due to southern pine bark beetle infestation. Some of these areas, such as Parcel 4, have had recent salvage harvests and are regenerating with young pine trees.

Evergreen-deciduous forest is the most common forest type found around Chatuge Reservoir. This forest type is dominated by stands of mixed pine-hardwood trees.

Deciduous forest occurs mainly as oak-hickory forests, cove hardwood forests on slopes, and as forested wetlands near the reservoir edges, grading into scrub-shrub wetlands. During field surveys, Parcel 10 was classified as being a part of the Southern Appalachian Oak Forest System and has old-growth forest stand characteristics. Black, northern red, southern red, and white oaks were dominant species with buffalo nut, flame azalea, flowering dogwood, sweetshrub, and American chestnut sprouts in the understory. Large dead American chestnut logs were present.

On Chatuge, cove hardwood forests are found on slopes around the reservoir. Areas found on Parcels 6 and 91 are a special type of cove hardwood forest, the globally rare (G2G3) plant community known as the Southern Appalachian Cove Forest. These forests have a rich herbaceous layer with plants such as American columbo, bloodroot, Catesby's trillium, crane fly orchid, Miami-mist, Jack-in-the-pulpit, sweet Betsy, Solomon's plume, and Solomon's seal.

Forested wetlands are found along the back of the reservoir's coves and grade into scrub-shrub wetlands (shrublands). Within the shrublands vegetative class is the globally rare (G1) community, Southern Appalachian Low Mountain Seepage Bog. This rare plant community is known only from one site in Towns County, Georgia, and from two sites, one of which is probably no longer present, in Clay County, North Carolina, where it is associated with the presence of the endangered green pitcher plant. Both existing sites are located on Non-TVA Shoreland (Zone 1). Fire may have been a natural disturbance in this community type, as suggested by the presence of species more typical of fire-maintained communities of the coastal plain. It is found on shallow slopes, at about 1,500 to 1,800 feet elevation and has a wetlandlike hydrology, fed by acidic seepage. Both existing sites are heavily altered by grazing, fire, cultivation, and drainage efforts. The Southern Appalachian Low Mountain Seepage Bog community is not likely to occur on other Chatuge Reservoir lands or on other MRLMP lands.

Herbaceous vegetation is commonly found along transmission line and roadway rights-of-way as well as on grassy areas within the dam reservations and commercial recreation areas.

Under Alternative C, the allocation of Parcels 10, 52, 52a, and 77 would change, and over time, the land use on these parcels would likely change. Parcel 10 is a 27.2-acre tract with

a variety of vegetative types present. These include mixed evergreen-deciduous forest, dominated by old-growth oak-hickory-pine with scattered American chestnut in the understory. Old-growth forests are characterized by having old living and large trees for the species on site, natural canopy gaps, an absence of exotic species, minimum past human disturbance, and standing dead snags. Several of the largest trees are estimated to be over 100 years old. Deciduous forest, dominated by species such as tulip poplar, red maple, and American beech also occur on Parcel 10. The old-growth forest occupies all but about 2 acres of Parcel 10, which is surrounded by pasture and other cleared lands. Woody plants commonly found along the Parcel 10 shoreline include mountain laurel, flame azalea, river birch, and persimmon. A state-listed species, American columbo, was present in the herb layer along with pink lady's slipper, Catesby's trillium, little brown jug, and various fern species. In addition to flame azalea and mountain laurel, other flowering shrubs such as flowering dogwood and Carolina allspice occur on Parcel 10.

Parcel 52 (a 6.1-acre tract) and the 1.9-acre Parcel 52a have been highly disturbed. Predominant vegetation is composed of exotic invasive species including Japanese honeysuckle, multiflora rose, oriental bittersweet, and tree-of-heaven.

Parcel 77, a 66.4-acre tract is dominated by mixed evergreen-deciduous forest, which includes loblolly pine, shortleaf pine, Virginia pine, white oak, chinquapin, tulip poplar, and red maple. Wildflowers found in the herb layer include pink lady's slipper, cranefly orchid, Catesby's trillium, and Solomon's seal. The land shows signs of human disturbance by the evidence of off-road vehicle use and the presence of exotic invasive species. The invasive species include Chinese privet, Japanese honeysuckle, kudzu, multiflora rose, Russian olive, and sericea lespedeza. Planted eastern hemlocks also showed signs of being infected with the Hemlock wooly adelgid.

Most of the planned TVA parcels around Chatuge Reservoir have various species of invasive nonnative plants. Oriental bittersweet occurs on Parcels 52 and 82. Other invasive species on Chatuge Reservoir lands include autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese stiltgrass, kudzu, mimosa, multiflora rose, oriental bittersweet, princess tree, Russian olive, sericea lespedeza, and tree-of-heaven.

3.2.3.1.2 Environmental Consequences

Alternative A

The plant community types found on and around the majority of Chatuge Reservoir parcels are common and representative of the SBRE, and the existing land uses under Alternative A would not result in any significant changes or effects to terrestrial plant communities on these parcels.

Under Alternative A, parcels containing rare or uncommon plant communities (i.e., Parcels 6, 10, and 91) on Chatuge Reservoir could be negatively impacted if not managed to protect these botanical resources from activities, especially ground-disturbing actions, that could affect these communities. TVA would assess any proposed future action that could affect these uncommon plant communities and take appropriate measures to reduce or avoid potential impacts.

Oriental bittersweet, a Class C North Carolina invasive species, is found on Parcels 52 and 82, and other high-priority invasive species occur on several other Chatuge Reservoir

parcels. Under Alternative A, TVA's ability to manage these invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors, including the availability of resources, potential for partnerships, and threat to sensitive resources.

Alternative B
Under Alternative B, the rare and uncommon plant communities found on Parcels 6, 10, and 91 would be protected from development by allocating these parcels to Zone 4 (Natural Resource Conservation); therefore, no significant impacts to these uncommon terrestrial plant communities are expected on these parcels from the implementation of Alternative B.

Under Alternative B, TVA's ability to manage invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors, including the availability of resources, potential for partnerships, and threat to sensitive resources.

Alternative C
Under Alternative C, a Zone 5 (Industrial) allocation on Parcel 10 would facilitate the location of industrial uses on this parcel. Such development would have a direct negative impact on the old-growth deciduous forest, which occupies most of the tract. A change of allocation and the subsequent industrial development would result in the destruction of some or all of the old-growth forest. Any remaining old-growth forest would be more vulnerable to the introduction of invasive species, which would contribute to the degradation of plant diversity and wildlife habitat. Old-growth oak-hickory-pine forest occurs on about 13 percent of both the nearby Nantahala and Chattahoochee National Forests (USFS 2003, 2004b, R. Harper, USFS Southern Research Station Forest Inventory and Analysis, personal communication, May 2008). No estimate is available of its prevalence on mountain reservoirs lands. Although the loss of the Parcel 10 old-growth forest would have adverse local impacts, the impacts on a regional basis would likely not be significant.

Under Alternative C, Parcels 52, 52a, and 77 would be allocated to Zone 6 (Developed Recreation). Parcels 52 and 52a contain only common plant communities, and therefore, these communities would not be significantly impacted. Parcel 77 is described further in Section 3.2.4.1. The impacts of adopting Alternative C on the remaining 1,691 acres (96 percent) on Chatuge Reservoir would be the same as those expected under Alternative B.

TVA's ability to manage invasive species under Alternative C would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors, including the availability of resources, potential for partnerships, and threat to sensitive resources.

Alternative D
Parcels 10 and 77 would be allocated to Zone 4 (Natural Resource Conservation) under this alternative. Thus, the old-growth forest on Parcel 10 would likely remain relatively undisturbed if Alternative D were adopted. Likewise, the butternut trees and the pink lady's slipper flowers on Parcel 77 (see Section 3.2.4.1) would likely persist and would not be jeopardized to the extent they would be under Alternative C. Because Parcel 52 would be allocated to Zone 6 for recreational use and has been subjected to extensive past site disturbance, no significant effects to plant life on that parcel are anticipated under Alternative D.

3.2.3.2 Wildlife Communities

3.2.3.2.1 Affected Environment

Chatuge Reservoir lands contain a mixture of evergreen, evergreen-deciduous, deciduous, and early successional habitats. Habitats range from large tracts of mature oak-hickory forest to small areas of old-field and wetland habitats. For a description of vegetation and wetland resources, see Section 3.3.3.1 (Plants) and Section 3.2.5 (Wetlands).

Most of the wildlife species observed on Chatuge Reservoir are regionally abundant. Species observed in recent field surveys include spring peeper, northern cricket frog, bullfrog, brown thrasher, gray catbird, blue-gray gnatcatcher, indigo bunting, northern cardinal, common yellowthroat, green heron, great egret, belted kingfisher, Canada goose, mallard, beaver, opossum, and coyote.

Allocation changes on Parcels 10, 52, 52a, and 77 could occur under some of the alternatives. Parcel 10 (27.2 acres) is comprised of old-growth mixed evergreen deciduous forest. This parcel is bordered by herbaceous fields and residential area to its west and open water to the east, resulting in a largely fragmented parcel. The parcel provides scant habitat for species favoring interior woodland habitat, but it provides overall good habitat for a variety of woodland species of wildlife. Parcel 52 is a lakefront property consisting mostly of a field dominated by fescue. There is a narrow border of trees along the shoreline, which contains a small amount of linear wetlands. The landscape surrounding the parcel is relatively disturbed by roads including US 76 and residential and commercial development, which limits the quality of wildlife habitat. Parcel 77 (66.4 acres) contains a mixture of upland hardwoods and pine of varying quality. The parcel receives a moderate amount of dispersed recreation. Typical woodland species of wildlife are found on this parcel.

Approximately 650 acres of mud flat habitat become exposed when reservoir levels are lowered on Chatuge Reservoir. Mud flats on the reservoir tend to be small (less than 10 acres), have steep gradients, and are not considered favorable shorebird habitat. Larger mud flats occur at the confluence of the Hiwassee River and Hightower Creek near Parcel 47, Sutton Branch, Woodring Branch, and Bell Creek. Most of these flats are bordered by private land.

3.2.3.2.2 Environmental Consequences

Alternative A

Under Alternative A, no parcels are allocated for Sensitive Resource Management, and a smaller percentage (41.6 percent) of land is utilized for Natural Resource Conservation than under Alternatives B and C. Under Alternative A, the majority of the unplanned parcels front existing residential developments with existing access rights. Thus, land use is very unlikely to change. Under Alternative A, the existing uses of TVA parcels on Chatuge Reservoir are unlikely to change, and wildlife habitat and overall impacts to terrestrial animal resources would be insignificant.

Alternative B

Allocations under Alternative B reflect current land use, and no immediate changes in land use are expected if this alternative were adopted. Implementation of Alternative B would result in no land allocated to Zone 5 (Industrial). New allocations for parcels not previously planned under Alternative A include 16.7 acres (0.9 percent) allocated to Zone 3 (Sensitive Resource Management) and an additional 141 acres (875 acres total or 49.5 percent)

allocated to Zone 4 (Natural Resource Conservation). These changes in allocations under Alternative B would benefit wildlife and their habitat. Alternative B differs somewhat from Alternative A but would provide more habitats for wildlife than Alternative C.

Alternative C
Under Alternative C, the Zone 5 (Industrial) allocation on Parcel 10 could result in the potential loss of most of the 27.2 acres of old-growth forest habitat. Given the amount of forested habitats in the vicinity, impacts to wildlife in the region are expected to be minimal.

Under Alternative C, Parcels 52 and 52a would change from Zone 4 (Natural Resource Conservation) to Zone 6 (Developed Recreation). The proposed development of a year-round boat ramp, fishing piers, and walking trails on this parcel is expected to result in minimal impacts to wildlife or wildlife habitats, while improving river access. This access would be beneficial to wildlife-based recreation such as fishing and wildlife viewing.

Under Alternative C, the allocation of Parcel 77 would be changed to Zone 6 (Developed Recreation). The area currently receives dispersed public use including bank fishing, hiking, and informal camping. The proposed change to Developed Recreation would allow consideration of a proposed multiple field sports complex. A public recreation use of this scope would result in the loss of some forested habitat, resulting in impacts to terrestrial wildlife.

Adoption of Alternative C is expected to result in more potential impacts to wildlife and wildlife habitat than Alternatives A and B. Overall, the impacts to wildlife resources from implementing Alternative C are expected to be minimal given the amount of forested public lands in the vicinity.

Alternative D
Potential effects to terrestrial animals in the area under Alternative D are expected to be virtually the same as those expected under Alternative A or B because the allocations are essentially the same under all three alternatives. The only exception in allocation is the 6.1-acre Parcel 52, which would be allocated to Zone 6 under Alternative D. Under Alternatives A and B, this parcel would be allocated to Zone 4. However, because of the open nature of this parcel, loss of wildlife habitat from recreational use would be minor. Under Alternative D, Parcel 52a would be allocated to Zone 4 (Natural Resource Conservation), a use consistent with its current use.

3.2.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.2.4.1 Affected Environment

One federally listed as endangered plant (green pitcher plant), four Georgia state-listed plants, and one North Carolina state-listed plant are known to occur within 5 miles of Chatuge Reservoir (see Table 3-12). The two known surviving populations of the green pitcher plant are on lands protected by The Nature Conservancy (NatureServe 2007) and located on or near Non-TVA Shoreland (i.e., Zone 1 land). TVA holds a flowage easement on one of the sites. During field surveys in May 2006, no additional populations of green pitcher plants were found on unplanned parcels. However, previously undocumented populations of North Carolina and Georgia state-listed species were found. American

columbo was found on Parcels 6, 10, and 102, a small population (13 trees) of butternut was located on Parcel 77, and pink lady's slipper was observed on Parcels 6, 15, 77, and 96. The state-listed plants found on unplanned parcels and the federally listed species reported from Chatuge Reservoir lands are discussed in more detail below.

Table 3-12. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Vicinity of Chatuge Reservoir in Towns County, Georgia, and Clay County, North Carolina

Common Name	Scientific Name	Federal Status	Ga. Status (Rank)	N.C. Status (Rank)
Plants				
American columbo*	*Frasera caroliniensis*	--	--	SR-P (S2S3)
Butternut*	*Juglans cinerea*	--	SPCO (S2)	--
Green pitcher plant*	*Sarracenia oreophila*	END	END (S1)	E-SC (S1)
Large yellow lady's slipper	*Cypripedium parviflorum* var. *pubescens*	--	UNUS (S3)	--
Manhart sedge	*Carex manhartii*	--	THR (S2S3)	--
Pink lady's slipper*	*Cypripedium acaule*	--	UNUS (S4)	--
Amphibians				
Eastern hellbender*	*Cryptobranchus alleghaniensis alleghaniensis*	--	RARE (S2)	SPCO (S3)
Bird				
Piping plover*	*Charadrius melodus*	THR	THR (S1)	THR (S2)
Reptile				
Bog turtle*	*Glyptemys muhlenbergii*	THR	THR (S1)	THR

-- = Not applicable
* Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled, S2 = Imperiled, S3 = Rare or uncommon, S4 = Widespread, abundant, and apparently secure
Status abbreviations: END = Endangered, E-SC = Endangered (requires monitoring), RARE = Rare, SPCO = Special concern, SR-P = Significantly rare-peripheral, THR = Threatened, UNUS = Special concern due to commercial exploitation

Plants

American columbo is also referred to as Carolina gentian, and it is found in three localities around Chatuge Reservoir including Parcel 10. North Carolina is on the edge of the range of this species. According to Weakley (2006), habitat is usually rich forest over mafic[6] rocks, upper slopes of cove hardwood forest, and floodplain forest. Habitat loss and fragmentation may be impacting some populations, and intensive forest management could eliminate the species (NatureServe 2007).

Butternut trees may reach a height of 30 to 60 feet and a diameter of 1 to 2 feet at maturity. Butternut prefers moist, rich soils but can also grow on drier, rocky sites. Although this tree was once common throughout its range, populations have been declining due to threats from a fungal disease and excessive shading. One population was found during field surveys at an old homestead.

Three populations of the **green pitcher plant**, which is federally listed as endangered, are known from the Chatuge Reservoir area. A population in Clay County, North Carolina, and another in Towns County, Georgia, are known to exist. The third population in Clay County was recorded in the 1970s, but its existence has not been verified recently. All three populations are located on shallow slopes, at about 1,500 to 1,800 feet elevation, and have

[6] "Mafic" refers to a group of igneous rocks that contain dark-colored minerals, composed chiefly of magnesium and iron.

a wetlandlike hydrology fed by acidic seepage. All have been altered considerably by grazing, fire, cultivation, and drainage efforts. The Towns County population occurs on Zone 1 (non-TVA) land and is owned and managed by The Nature Conservancy. This population is monitored yearly. The existing North Carolina population is located adjacent to Zone 1 land and is also owned and managed by The Nature Conservancy.

Pink lady's slipper is found on dry to mesic acid forest usually under pine or other conifers (Weakley 2006). This showy pink orchid is frequently harvested by plant diggers but rarely survives being transplanted and is exceedingly difficult to nursery propagate. This species is not tracked in North Carolina but is considered "unusual" in Georgia due to its commercial exploitation. Pink lady's slipper was observed on four parcels. Three of these are in Georgia (Parcels 6, 15, and 77), and one is located in North Carolina (Parcel 99).

Animals

Two federally listed and one state-listed animal species have been reported from Chatuge Reservoir area (see Table 3-12). Neither of these species, or other listed animal species, was observed during field investigations in 2006.

Eastern hellbenders are found in large and midsized, fast-flowing, rocky rivers, typically at elevations below 2,500 feet (Petranka 1998). Hellbenders are known from Hightower Creek and Norton Branch in Georgia and Shooting Creek in North Carolina, which are all tributaries to the Hiwassee River. Historic records are known from along the Hiwassee River in areas that are now flooded by Chatuge Reservoir. Most parcels are along the reservoir and do not contain any quality eastern hellbender habitat. A riverine section of the Hiwassee River downstream of the dam flows through Parcel 1 and is adjacent to Parcels 107 and 109. Hellbenders are expected to be present in this riverine reach near these parcels.

A single historical observation of a **piping plover** (see Section 3.1.4) was reported from Chatuge Reservoir on July 29, 1983. Most of the mud flats on Chatuge Reservoir are less than 10 acres in size; however, larger flats exist at the confluence of Hiwassee River and Hightower Creek. Results of recent surveys for shorebirds on the reservoir indicate that shorebirds use the reservoir on a limited basis.

Three boglike areas, all in Zone 1, occur on Chatuge Reservoir and provide potential habitat for the **bog turtle** (see Section 3.1.4). All three have been altered considerably by grazing, fire, cultivation, and drainage efforts. Bog turtles are not known from these sites.

Although Indiana bats (*Myotis sodalis*) and bald eagles (*Haliaeetus leucocephalus*) have not been reported from areas surrounding Chatuge Reservoir, the suitability of local habitats was assessed for these two species. The suitability of Indiana bat habitat on most reservoirs was measured as low, except for Parcel 10 on Chatuge Reservoir. Most forested parcels along Chatuge Reservoir provide suitable nesting habitat for bald eagles, and they are frequently seen on Chatuge Reservoir. However, no nesting eagles have been documented on Chatuge.

No federally or state-listed aquatic species are known from the vicinity of Chatuge Reservoir lands.

3.2.4.2 Environmental Consequences

Aquatic Animals
Because there are no federally listed or state-listed aquatic species known in the vicinity of parcels on Chatuge Reservoir no impacts to these species are anticipated under any of the alternatives.

Alternative A

Plants
Under Alternative A, parcels containing state-listed as threatened and endangered plant species (i.e., Parcels 6, 10, 15, 77, and 102) would be managed for Natural Resource Conservation. This allocation does not allow residential, industrial, or recreational development; therefore, no significant impacts to sensitive botanical resources are expected from the adoption of Alternative A.

Terrestrial Animals
Under Alternative A, there would be no impacts on federally listed terrestrial animal species or their habitat, because no populations are known on most TVA parcels. Under Alternative A, parcels would be allocated to reflect their current use. Parcels 35 and 36 on Hiwassee Reservoir could ultimately be developed for industrial use. No listed species or their habitats are known from these sites.

Alternative B

Plants
Similar to Alternative A, under Alternative B, those parcels inhabited by listed plant species (i.e., Parcels 6, 10, 15, 77, and 102) would be allocated to Zone 4 (Natural Resource Conservation) to prevent residential development, industrial, or recreation development. Therefore, no significant impacts to sensitive botanical resources are expected as a result of implementing Alternative B.

Terrestrial Animals
Under Alternative B, the planned and unplanned parcels would be allocated to reflect their existing current uses; thus, no immediate changes in land use are expected. Adoption of Alternative B would result in no land allocations to Zone 5 (Industrial) but would include new allocations for parcels not previously represented under Alternative A. These include 16.7 acres (0.9 percent) allocated to Zone 3 (Sensitive Resource Management) and an additional 141 acres (875 acres total or 49.6 percent) allocated to Zone 4 (Natural Resource Conservation). These changes in allocations under Alternative B may result in fewer potential future changes in land use, which may benefit listed terrestrial animals and their habitats.

Alternative C

Plants
Under Alternative C, Parcel 10 would be changed to Zone 5 (Industrial) use. Potential clearing of the old-growth forest, should this parcel be developed, would result in habitat loss and the possible elimination of a population of American columbo, a North Carolina state-listed as rare species that was located on the parcel during a field review in May 2006. The state boundary between Georgia and North Carolina runs through this parcel and this species is listed in North Carolina, but not Georgia. Although this population could

be eliminated, there would be no significant impacts to the viability of the species across its range.

Parcels 52, 52a, and 77 would be allocated to Zone 6 (Developed Recreation) under Alternative C. The construction of a large, high-intensity developed recreation area, such as the proposed multiple field sports complex on Parcel 77, would have a negative impact on a population of butternut and pink lady's slipper found on this parcel. Because of the small size of the pink lady's slipper population, its loss would not significantly affect the species. The small population of butternut was presumably planted around an old homestead, and removal of the trees would not significantly alter the genetic diversity of this species. With the exceptions of these two species, no other known populations of listed plants are known to occur within the surrounding area of Chatuge Reservoir. The development of recreation facilities on Parcel 52 or 52a would not affect listed plants.

Terrestrial Animals
Similar to Alternative B, Alternative C calls for the allocation of several parcels with suitable habitat for protected species to Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation). However, under Alternative C, Parcel 10, a largely forested tract, would be allocated to Zone 5 (Industrial). This parcel provides suitable habitat for Indiana bats due to the presence of several snags. The parcel also contains suitable roosting habitat for bald eagles; however, no nesting activity on Parcel 10 has been documented. The allocation changes are not likely to result in impacts to these listed species; however, any future projects at this site would require surveys for Indiana bats and bald eagles. The allocation of Parcels 52 and 77 to Zone 6 (Developed Recreation) and the subsequent development of recreation facilities would not affect listed terrestrial animals.

Alternative D

Plants
Any potential effects to listed plants under Alternative D would be the same as those described for Alternative B above.

Terrestrial Animals
With the exception of Parcel 52, allocations under Alternative D and B would be the same. Parcel 52 is not inhabited by any listed species. Thus, adoption and implementation of Alternative D would not affect listed terrestrial animal species.

3.2.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.2.5.1 Affected Environment

Estimates of wetland acreage based on NWI data for Chatuge Reservoir are provided in Table 3-5. There are approximately 654 acres of wetlands on Chatuge Reservoir. Vegetated wetlands are generally uncommon due to the steep topography of the banks. NWI imagery indicated 581 acres of aquatic bed and flats features, which are both periodically flooded. These areas are mudflats, aquatic/submerged plant beds, or beaches/bars depending on season, weather patterns, and reservoir-level management. The remaining acreage is emergent, scrub-shrub, and forested wetlands.

Most wetlands are less than 0.1 acre in size. Many tracts on Chatuge Reservoir have scattered, very narrow shoreline fringe wetlands consisting primarily of river birch. Other species associated with wetlands on Chatuge Reservoir include buttonbush, black willow, sycamore, soft rush, sedges, and jewelweed.

3.2.5.2 Environmental Consequences

The impacts of adopting each of the various alternatives on wetlands would be similar, and none would be adverse. Under Alternatives A and B, parcels containing wetlands would generally continue to be managed as they have been in the past, and actions with the potential to affect wetlands would be assessed prior to their implementation.

Under Alternative C, an additional six parcels would be allocated to development-oriented uses. However, none of these parcels contain substantial wetlands. Thus, adoption of Alternative C is not expected to cause any additional effects beyond those possible under Alternative A or B. For similar reasons, no additional effects to wetlands are anticipated if Alternative D were adopted.

3.2.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.2.6.1 Affected Environment

The potentially affected area with respect to floodplains extends from the lower limit of the dam reservation at about HRM 120.0 upstream to about HRM 132.0 in Chatuge Reservoir. The 100-year flood elevations for the Hiwassee River downstream of the dam vary from elevation 1,804.5 feet above mean sea level (msl) at HRM 120.0 to elevation 1,811.8 feet msl at HRM 121.0 (downstream of Chatuge Dam). The 500-year flood elevations for the Hiwassee River downstream of the dam vary from elevation 1,809.6 feet msl at HRM 120.0 to elevation 1,816.5 feet msl at HRM 121.0. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

The main watercourse in Chatuge Reservoir is the Hiwassee River. The 100-year flood elevation for Chatuge Reservoir is 1,929.0 feet msl from the dam (HRM 121.0) to the upper end of the reservoir at about HRM 132.0. The 500-year flood elevation for Chatuge Reservoir is 1,931.0 feet msl from the dam to the upper end of the reservoir.

3.2.6.2 Environmental Consequences

The environmental consequences of each alternative are discussed in Section 3.1.6. Adverse effects on Chatuge Reservoir floodplains are not expected under any of the alternatives.

3.2.7. Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.2.7.1 Archaeological Resources

3.2.7.1.1 Affected Environment

Chatuge Reservoir has been the focus of several archaeological surveys (Joseph et al. 1997; Adams and Messick 1999; Brown and Rogers 1993; Gage and Herrmann 2006; Gunn and Lilly 1993) and one Phase III archaeological survey (Gunn 1992). These include areas both above and below Chatuge Dam. A survey of 80 linear miles and 603 acres of various shoreline tracts and public lands was conducted between November 1996 and September 1998. As a result, 215 archaeological resources were recorded or revisited. However, only 11 of these were considered potentially eligible or undetermined for listing in the NRHP. During the winter of 2005-2006, approximately 17.7 miles of reservoir shoreline were surveyed, and 25 sites were identified or revisited. Ten were considered potentially eligible for listing in the NRHP.

A survey of Chatuge Woods Public Use Area was conducted in 1993 (Gunn 1993). No archaeological sites were identified during the field investigations. To the west on Woods Creek, a site was investigated for potential adverse effects from a proposed development (Stoops 1990).

Below Chatuge Dam, a Phase III archaeological survey was conducted in the area of a proposed weir infusion dam (Gunn 1992). This site, which was determined to be eligible, was not adversely affected by the construction activities.

Parcel 77 on Chatuge Reservoir was systematically surveyed for archaeological resources in 1998. Recorded archaeological resources exist within and surrounding this parcel. Eight archaeological resources were identified during the survey, but none are considered eligible for the NRHP. Development of this tract is not expected to adversely affect archaeological resources eligible for the NRHP.

Parcels 10 and 52 have not been systematically surveyed for archaeological resources. Recorded archaeological resources exist in the vicinity of Parcels 10 and 52, and archaeological resources likely exist within these parcels.

3.2.7.1.2 Environmental Consequences

No archaeological resources eligible for the NRHP occur on Parcel 10, which would be allocated to Zone 5 (Industrial) under Alternative C. The other two parcels allocated to more development-oriented uses under Alternative C have not been surveyed. Development of these parcels may adversely affect significant archaeological resources through ground-disturbing activities. Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects could be avoided, mitigation through archaeological excavations or other means would be implemented. Treatment plans resolving adverse effects would comply with the NHPA and ARPA.

As described in Section 3.1.7.1.2, TVA proposes to implement PAs in Georgia and North Carolina for the identification, evaluation, and treatment of all historic properties on this reservoir potentially affected by this land planning effort. Until the PAs are executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties including archaeological resources as required by Section 106 of the NHPA. TVA would adhere to the terms of these PAs under all alternatives. Therefore, no adverse impacts on archaeological resources are expected.

3.2.7.2 Historic Structures

3.2.7.2.1 Affected Environment

Chatuge Dam is named for a Cherokee Indian settlement. Historic properties located on Chatuge Reservoir, all of which are located on property allocated as Zone 2 (Project Operations) or Zone 3 (Sensitive Resource Management), include the dam, powerhouse, spillway, and historic highway bridge as well as a historic brick roadhouse and beer garden. None of these are presently listed in the NRHP. Several historic properties associated with the development of the area are located adjacent to TVA lands.

3.2.7.2.2 Environmental Consequences

Under all alternatives, TVA would implement the PAs described above in Section 3.1.7.1.2. These PAs would include historic structures, and with their implementation, no adverse effects on historic structures are anticipated. Until the PAs are implemented, TVA would individually evaluate actions with the potential to affect historic structures as required by Section 106 of the NHPA.

Alternative A
Under Alternative A, potential impacts to historic structures would likely be restricted to potential land use changes on parcels committed to Project Operations and Recreation. Expansions in existing public and commercial recreation areas could change the visual character of the surrounding areas, therefore, potentially affecting adjacent historic structures. This situation would apply to future developments on Parcel 13, Chatuge Woods Campground. Possible future actions on Parcel 1 (Chatuge Dam Reservation), which is allocated for Project Operations, also could visually affect adjacent historic structures.

Thus, potential effects, especially indirect visual effects, are possible under Alternative A. However, because these potential effects would be identified along with possible mitigation measures and because TVA would reserve the option to deny land use requests that would have unavoidable adverse effects, potential effects to historic structures under Alternative A would be insignificant.

Alternative B
Under Alternative B, potential impacts to historic structures on Chatuge Reservoir lands would be the same as those anticipated under Alternative A.

Alternative C
Under Alternative C, the potential effects to historic structures would be similar to those described for Alternatives A and B. However, development of three parcels on Chatuge Reservoir could change the visual character of the surrounding area, and this could potentially affect historic structures. These proposals, which include Industrial use on Parcel 10 and Developed Recreation on Parcels 52 and 77, would be evaluated on an individual basis to determine if there would be unavoidable adverse effects and to determine the mitigation measures, if any, needed to avoid those effects; therefore, insignificant impacts would likely occur.

Alternative D
Under Alternative D, Parcel 52 on Chatuge Reservoir would be allocated to Zone 6 for potential recreational uses. Thus, potential effects to historic structures from the adoption of Alternative D would be similar to, but likely less than, those expected under Alternative C.

3.2.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.2.8.1 Affected Environment

Managed areas within 3 miles of Chatuge Reservoir are listed in Table 3-13. The areas are grouped by closest distance to the reservoir. Areas on TVA lands but managed by other entities through a letter of agreement or land use agreement with TVA are listed as "on reservoir" and those areas abutting or less than 0.1 mile from reservoir lands are listed as "adjacent."

Table 3-13. Managed Areas Within 3 Miles of Chatuge Reservoir

Name	Managing Authority	State	Closest Distance to Reservoir
Walker Point Homeowners Association Nature Area	Local (TVA letter of agreement)	N.C.	On reservoir
Clay County Park	Local (TVA land use agreement)	N.C.	On reservoir
Towns County Park/Georgia Mountain Fairgrounds	Local (TVA land use agreement)	Ga.	On reservoir
Chatuge Woods County Park and Campground	Local (TVA land use agreement)	Ga.	On reservoir
Nantahala National Forest	USFS	N.C.	Adjacent
Nantahala State Game Land	State	N.C.	Adjacent
Chattahoochee National Forest	USFS	Ga.	Adjacent
Reed Branch Wet Meadow	Nonprofit organization	Ga.	Adjacent
Eller Seepage Bog Preserve	Nonprofit organization	N.C.	Adjacent
Swallow Creek Wildlife Management Area	State	Ga.	0.1 mile east
Southern Nantahala Wilderness	USFS	Ga.	1.8 miles east

No NRI streams or ecologically significant sites are located within 3 miles of Chatuge Reservoir.

3.2.8.2 Environmental Consequences

No managed areas occur on or adjacent to the three tracts proposed for more development-oriented uses under Alternative C. Managed areas are adjacent to or near several other Chatuge Reservoir parcels. The allocations of these parcels under Alternatives A, B, C, and D are generally compatible with the managed areas, and no adverse impacts are anticipated from the implementation of any of the alternatives.

Because no ecologically significant sites occur within 3 miles of Chatuge Reservoir, no such sites would be affected under any of the alternatives.

3.2.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.2.9.1 Affected Environment

The Chatuge Reservoir and floodplain areas include islands, secluded coves, and wetlands that are framed by high wooded ridges. Because the scenic features of the landscape are not limited by land boundaries, the attractive landscape character extends across TVA public and private land alike. The natural elements together with the communities and other cultural development provide a scenic, rural countryside.

Land uses adjacent to Chatuge Reservoir are similar to other reservoirs in the mountainous areas of north Georgia and North Carolina. They include USFS lands, residential development, public parks, and sporadic industrial features. The reservoir offers abundant water-recreation opportunities along with a variety of scenery. Most creek embayments are broadly open at the mouth, and some wind over a mile to their headwaters.

Among the scenic resources of Chatuge Reservoir, the water body itself is the most distinct and outstanding aesthetic feature. The horizontal surface provides visual balance and contrast to the islands and wooded hillsides. The reservoir weaves around the ridges and bends, changing views periodically seen from the water. It also links the other landscape features together. Views across the water are satisfying and peaceful to most observers.

Islands are another distinctive visual feature. The islands provide scenic accents and visual reference points throughout the reservoir and serve as visual buffers for less desirable views. They also provide a pleasing foreground frame for the distant shoreline or background.

Other important scenic features include the secluded coves and steep, wooded ridges that occur around the reservoir. The isolated coves with wooded shoreline provide relatively private locations for dispersed recreation activities. Significant elevation changes along the shoreline provide a dramatic contrast to the surrounding reservoir and gently sloping countryside, particularly when they are viewed from background distances.

The shoreline upstream from the dam appears natural. Slopes and ridgelines seen from the reservoir are heavily vegetated during the growing season and provide positive visual contrast to the reservoir. There is little development in the foreground and middleground distances, with the exception of Gibson Cove Campground to the southwest. Views of the shoreline to the southeast from the reservoir are mainly of undisturbed USFS land.

Upstream of the dam, Clay County Park can be seen to the east from the reservoir. Shoreline views include water use facilities and a small beach area. Farther upstream, views are dominated by numerous residential developments along the shoreline, from Cedar Cliff, Amber Lane, and Heather Cove to the upper reaches of the reservoir along the Hiwassee River. Scenic attractiveness is common. Scenic integrity is moderate.

3.2.9.2 Environmental Consequences

Alternatives A and B

Under Alternatives A and B, parcels would be allocated based on existing land use. Potential impacts to scenic resources would be limited to visual changes within existing developed areas such as an expansion of a recreation area into an undeveloped portion of

a parcel. Potential effects to scenic resources of this nature are expected to be minimal, as TVA would individually consider proposed changes in these areas. Alternative B calls for a slight increase in the Zone 3 (Sensitive Resource Management) and Zone 4 (Natural Resource Conservation) total acreage (i.e., 16.7 acres and an additional 141 acres, respectively) from Alternative A. These changes would provide additional protection to the existing visual character of Chatuge Reservoir.

Adoption of Alternative B would provide the most protection to Chatuge's visual resources of the four alternatives. Scenic integrity would remain moderate or higher. Implementation of Alternative B would help preserve the scenic landscape character of Chatuge Reservoir for long-term public enjoyment.

Alternative C

Under Alternative C, lands allocated to Zone 4 (773.0 acres) would be less than under Alternative B (874.6 acres) and slightly more compared to Alternative A (733.5 acres). An additional 27.2 acres would be allocated to Zone 5 (Industrial) than under Alternatives A and B. Under Alternative C, a total of 488.6 acres would be allocated to Zone 6 (Developed Recreation), approximately 74.4 acres more than under Alternative B. The amount of Zone 7 (Shoreline Access) lands considered would be the same as the allocation under Alternative B, 78.4 acres.

Although overall impacts would be insignificant, adoption of Alternative C would result in minor adverse impacts on the visual landscape character. Under Alternative C, Parcel 10 could potentially be sold and developed for industrial use, and Parcels 52, 52a, and 77 could be allocated for developed recreational uses. For these parcels and land within their viewsheds, scenic value class and aesthetic sense of place would be reduced. However, scenic integrity would remain moderate or higher for the entire reservoir.

Generally, "light pollution" refers to the presence of unwanted artificial light, primarily exterior lights. Excessive amounts of exterior lighting over a wide expanse can obscure the stars of the night sky. The allocation of Parcel 10 to Zone 5 could lead to the eventual industrial use of this parcel. The amount of lighting present at such a facility would depend on the facility itself, the nature of its operations, and the type of exterior lighting used. Similarly, there would likely be lighting of recreational facilities that could be sited on Parcels 52, 52a, and 77. Because of the limited acreage of Parcels 52 and 52a, exterior lighting is not expected to be extensive, but lights could be visible for some distance across the water. Lighting from a recreation complex on Parcel 77 could cause some light pollution due to the prominent nature of this parcel.

Although there is potential for light pollution from such facilities, the amount of light generated and the degree of potential light pollution cannot be predicted accurately. Nevertheless, any request for an industrial facility on Parcel 10 or for recreational uses of Parcel 52, 52a, or 77 would be subject to additional environmental review prior to TVA approval. As a condition of approval, TVA could require the use of directional exterior lighting to reduce the potential for light pollution.

Alternative D

The potential effects to visual character under Alternative D would be similar to those anticipated under Alternative B. However, under Alternative D, Parcel 52 would be allocated to Zone 6 for potential recreational uses, but Parcel 52a would be allocated for Natural Resource Conservation and would likely retain much of its current visual

characteristics. As with Alternative C, use of Parcel 52 for recreation would reduce scenic value class and the aesthetic sense of place for this parcel and areas within its viewshed.

Under Alternative D, Parcel 52 would be allocated for Developed Recreation. Depending on the amount of exterior lighting, there is potential for light pollution. A request for recreational use of Parcel 52 is subject to TVA approval pending completion of an environmental review. The potential for light pollution would be determined at that time, and necessary measures to control excessive light would be implemented as terms of TVA approval.

3.2.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.2.10.1 Affected Environment

Chatuge Reservoir is a headwater reservoir with no upstream impoundments that alter flow patterns or the physical and chemical characteristics of runoff. An average annual discharge (based on data from 1990 through 2005) of 439 cubic feet per second (cfs) results in an average water retention time of about 269 days. The long retention time results in Chatuge Reservoir becoming thermally stratified in the summer. Once stratification is established, oxygen in the deeper water cannot be replenished from the air or from contact with the oxygen-rich surface water. This results in low DO concentrations in the lower layers of the water column as DO is depleted by the natural process of decaying organic material. As part of TVA's Lake Improvement Plan (LIP), an aerating weir was constructed in November 1992 to improve minimum flow and DO levels in the releases from the dam.

Chatuge Reservoir is located in the Blue Ridge Physiographic Province. Due to the geologic characteristics of the region, streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Consequently, the reservoir has low productivity (i.e., low chlorophyll concentrations). More than 37 percent of the watershed lies within two national forests, the Nantahala National Forest in North Carolina and Chattahoochee National Forest in Georgia, affording some protection to water quality (Hiwassee River Watershed Coalition Inc. 2007).

Reservoir Ecological Health

Chatuge Reservoir was monitored on a biennial cycle from 1994 through 1998. After a substantial drop in the reservoir's ecological health score in 1998, monitoring has been conducted annually. The reservoir ecological health scores for Chatuge Reservoir from 1994 through 2007 are shown as Figure 3-2.

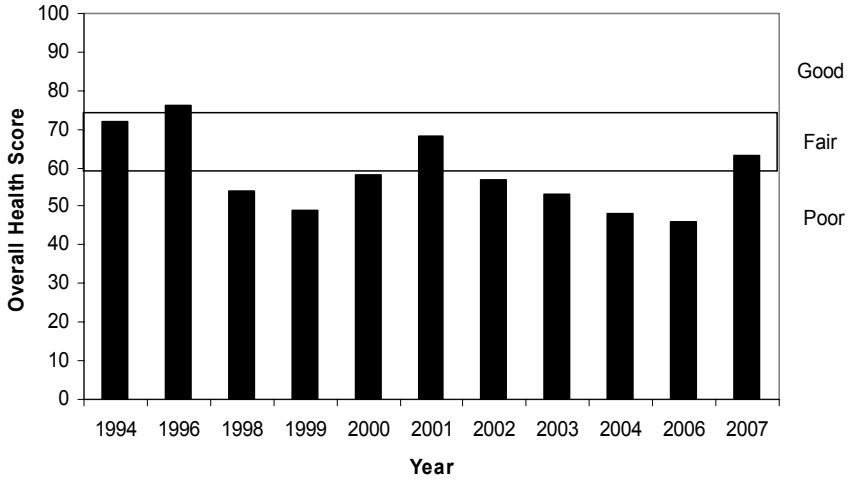

Figure 3-2. Chatuge Reservoir Ecological Health Ratings, 1994-2007

In recent years, Chatuge Reservoir has typically rated "poor" with the exception of 2001 and 2007 when it rated "fair." The 2001 improvement was primarily because of improved DO conditions and lower average chlorophyll concentrations (see Table 3-14). The lack of spring rains and near record low runoff in 2001 likely reduced the amount of nutrients and organic material brought into the reservoir. As a result, chlorophyll concentrations were lower, and oxygen levels in deeper strata were higher (due to less demand to decompose organic materials). Low flows also reduce the rate at which the colder bottom water is displaced by warmer inflows, which further reduces the rate of decomposition.

Table 3-14. Chatuge Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data, 1991-2006

Characteristic	Monitoring Year													
	1991	1992	1993	1994	1996	1998	1999	2000	2001	2002	2003	2004	2005	2006
Chatuge Forebay														
Dissolved Oxygen	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Poor
Chlorophyll	Good	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Fair	Poor	Poor	Poor
Sediment	NS	NS	Good	Fair	Good	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair
Chatuge Shooting Creek														
Dissolved Oxygen	NS	NS	Fair	Fair	Good	Poor	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor
Chlorophyll	NS	NS	Good	Good	Good	Fair	Fair	Good	Good	Fair	Poor	Poor	Poor	Fair
Sediment	NS	NS	Fair	Fair	Good	Poor	Poor	Poor	Poor	Poor	Good	Poor	Poor	Poor

NS = Not sampled

Since 1998, the ratings for four indicators, i.e., DO, sediment quality, bottom life, and chlorophyll, have fluctuated, but a shift in overall reservoir scores has resulted from more frequent and concurrent low ratings for these indicators.

A plan was completed in 2007 to address water quality in Chatuge Reservoir (Hiwassee River Watershed Coalition Inc. 2007). This plan was developed by the Hiwassee River Watershed Coalition in cooperation with TVA and other agencies. The Chatuge plan is based on modeling of the watershed and reservoir, and recommends actions necessary to improve water quality to an ecological health score of "fair."

Dissolved Oxygen
DO ratings have fluctuated between “fair” and “poor” all years monitored except in 1996 when DO rated “good” at the Shooting Creek monitoring location. The “poor/fair” ratings for DO at both monitoring locations are due to the presence of low concentrations (less than 2 mg/L) in the lower water column during late summer and autumn (August through October).

Chlorophyll
Average chlorophyll concentrations have shown a trend of increasing at both locations since TVA began monitoring Chatuge Reservoir in 1991. Chlorophyll ratings have fluctuated between “fair” and “poor” since 2003. Prior to 2003, chlorophyll rated “good” or “fair” all years.

Sediment Quality
Sediment quality ratings also have fluctuated (good, fair, and poor) due to elevated levels of one or more metals (chromium, copper, and nickel). Typically, sediment rates “fair” at the forebay due to elevated concentration of copper and “poor” at the Shooting Creek site due to elevated concentrations of chromium, copper, and nickel.

Benthic Monitoring
At HRM 122 and Shooting Creek Mile 1.5, benthic community scores ranged from “poor” to “fair” over the eight years sampled—-most recently scoring “fair” (Table 3-15).

Table 3-15. Recent (1999-2006) Benthic Community Ratings for Chatuge Reservoir

Station	1999	2000	2001	2002	2003	2004	2005	2006
Forebay	Poor	Poor	Fair	Fair	Fair	Poor	Fair	Fair
Forebay (Shooting Creek)	Poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair

Fisheries Monitoring
The RVSMP added annual fish sampling on Chatuge Reservoir in 1999. A list of fish species commonly found in Chatuge Reservoir can be found in Appendix K. The fish community in Chatuge Reservoir has consistently rated “fair” at both the forebay and midreservoir sampling stations.

In 2004, Chatuge Reservoir rated below the Valley-wide SFI average for black bass and largemouth bass, and above for spotted bass (Table 3-16).

Table 3-16. Sport Fishing Index Scores for Selected Sport Fish Species in Chatuge Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	32	36
Largemouth Bass	32	33
Spotted Bass	40	31

Swimming Advisories
There are no state advisories against swimming in Chatuge Reservoir. TVA performed *Escherichia coli* (*E. coli)* bacteria monitoring at seven locations in 2007: US 64 gravel pile informal swimming site, informal swim site off Ledford Chapel Road at Pitts Cove, Chatuge Dam Reservation-Chatuge Circle boat ramp, Clay County Park beach, Bell Creek informal swim site, Towns County Park and Georgia Mountain Fair Recreation Area beach, and Clay County Park swim site (Gibson Cove Recreation Area).

Fish Consumption Advisories
The State of Georgia has issued a fish consumption advisory for spotted bass in the Georgia portion of Chatuge Reservoir because of mercury contamination. The state advises people not to eat more than one meal a week of spotted bass between 12 and 16 inches in length. The State of North Carolina has issued a statewide fish consumption advisory for largemouth bass because of mercury contamination.

TVA collected channel catfish and largemouth bass from Chatuge Reservoir for tissue analysis in autumn 2004. The results, which were similar to those of previous years, were provided to state agencies in Georgia and North Carolina.

State(s) Impaired Waters
The North Carolina Division of Water Quality and the Georgia Environmental Protection Division assigned use support ratings to waters in the Hiwassee River Basin. Twelve miles of monitored streams are listed as impaired (North Carolina Department of Environment and Natural Resources [NCDENR] 2007a; Georgia Environmental Protection Division [GAEPD] 2006). These stream segments are listed in Table 3-17.

Table 3-17. Impaired Waters in the Immediate Watershed of Chatuge Reservoir

Stream/River Name	State	Miles	Description	Water Quality Stressor/Source
Hiwassee River	Ga.	10	Upstream of Chatuge Reservoir	Fecal coliform/ nonpoint
Bearmeat Creek	Ga.	2	Tributary to Hiwassee River	Biota impacted/ nonpoint

There are two permitted NPDES discharges in Chatuge Reservoir. These are the town of Hiawassee Wastewater Treatment Plant (WWTP) and Jackrabbit Mountain Recreation Area.

Water Supply
The town of Hiawassee, Georgia, currently withdraws water from Chatuge Reservoir. The 2005 average daily water demand was 0.96 MGD.

3.2.10.2 Environmental Consequences

Alternative A
Under Alternative A, the allocated land uses for the 1,479 acres that are planned (out of a total of 1,765.1 acres managed by TVA) would be, in descending order, Natural Resource Conservation (41.6 percent), Recreation (20.9 percent), Project Operations (21.2 percent)

and Shoreline Access (0.1 percent) (see Section 3.2.1). No land would be allocated to Sensitive Resource Management or Industrial uses. Of the 56 unplanned parcels, representing 286 acres, only four parcels totaling less than an acre are uncommitted; they would continue to be used for Natural Resource Conservation.

Any proposed use of TVA land would be subject to environmental reviews prior to TVA approval or action. Land use agreements would require the protection of water quality through either restricted development or the use of BMPs (TVA 2005b) to reduce potential impacts to water quality. Because these measures are usually effective, adoption of Alternative A is not expected to have a significant impact on water quality or the aquatic life of Chatuge Reservoir.

Alternative B
Under Alternative B, 52 of the previously unplanned parcels are committed to existing uses, which determined their allocation for this alternative. The four small, uncommitted parcels were allocated based on their existing land use, which would be consistent with a Zone 4 (Natural Resource Conservation) allocation. Alternative B does not include any allocations that are inconsistent with the actual current land use on a parcel. Therefore, no significant changes to land use are expected on Chatuge Reservoir under this alternative. Overall, resultant water quality conditions and subsequent impacts to aquatic life are not expected to differ significantly between Alternatives A and B.

Alternative C
Under Alternative C, the allocation of Parcel 10 (27.2 acres) to Zone 5 (Industrial) and Parcels 52, 52a, and 77 (74.4 acres) to Zone 6 (Developed Recreation) rather than to Zone 4 (Natural Resource Conservation) as in Alternatives A and B would increase the potential for adverse effects to water quality and aquatic life. The extent of any potential impacts would depend on the specifics of possible future development. Industrial and large-scale recreation developments would require land clearing and grading and could negatively affect much of the existing riparian vegetation, increase the amount of impervious surfaces, and increase the amount of pollutants entering the reservoir. However, all development and operation of industrial and recreational facilities would be subject to the implementation of appropriate BMPs as identified from an environmental review as a condition of TVA approval. Further, new facilities with permitted discharges would be required to meet permit limits specifically designed to prevent adverse impacts and violation of applicable water quality criteria. Therefore, potential impacts to water quality and aquatic life as a result of allocations associated with Alternative C are anticipated to be insignificant.

Alternative D
As with Alternative C, Parcel 52 would be allocated to Zone 6 (Developed Recreation) for recreational use under Alternative D. The potential effects of that allocation on water quality and local aquatic life are described above. Otherwise, any potential effects to water quality and aquatic life from implementing this alternative would be the same as those described above under Alternative B.

3.2.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Noise has previously been discussed in Section 3.1.11.2.

3.2.11.1 Affected Environment

The two counties that contain Chatuge Reservoir as well as the adjacent counties are currently in attainment of the NAAQS.

The nearest PSD Class I areas are the GSMNP, which is located about 30 miles northeast, Joyce Kilmer/Slickrock Wilderness, which is located about 15 miles northeast, and Cohutta Wilderness, which is located about 30 miles west of Chatuge Reservoir.

3.2.11.2 Environmental Consequences

The greatest potential for air quality effects is from industrial use. No parcels on Chatuge Reservoir would be available for industrial use under Alternatives A, B, or D. However, Parcel 10 would be allocated to Zone 5 (Industrial) under Alternative C. An appropriate level of environmental review would be done to document the extent of expected air quality impacts if a proposed land use request were to be received. Each such review that involved a parcel in or potentially affecting a nonattainment area for ozone and/or $PM_{2.5}$ would require a conformity applicability determination pursuant to regulations implementing Section 176(c) of the *Clean Air Act* to assure compatibility with measures in local plans for achieving attainment. Because of the small amount of acreage involved and because of regulatory controls, industrial development under Alternative C is not expected to result in any significant effects to air quality. Development of recreation facilities on Parcel 77 under Alternative C would likely lead to some increased local traffic, especially on Mull Road, which serves as the access road to Parcel 77. However, any increase in traffic load is not expected to cause any significant decrease in local or regional air quality. Thus, automobile-based air emissions are expected to be virtually the same under all the alternatives.

Industrial land use also poses a high potential for noise. The allocation of Parcel 10 for industrial use under Alternative C could result in unwanted noise. However, the extent and intensity of any noise generated would depend on the type of industry and the operating procedures of the industry. Prior to allowing an industry to use Parcel 10, TVA would conduct necessary environmental reviews and would likely require appropriate noise mitigation or attenuation measures as a condition of approval.

Developed recreation, such as that proposed on Parcels 52 and 77, also has the potential to produce noise. This noise would be generated primarily by recreational users rather than from machinery. However, depending on the type of recreational development that might occur on Parcels 52 and 77, noise could be produced by public address systems or other sources during certain events. Because of its limited size (6.1 acres) and anticipated use for public recreation, recreational use of Parcel 52 under Alternatives C and D is not expected to produce significant amounts of noise. Because of its central location and because sound tends to carry well over water, the use of Parcel 77 for a recreational complex under Alternative C has the potential to generate noise. However, the extent and degree of the noise produced depends on the type of facilities, hours of operation, and measures taken to attenuate unwanted sound.

3.2.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.2.12.1 Affected Environment

3.2.12.1.1 Population and Economy

Population: The population of the Chatuge Reservoir area is described in Tables 3-18 and 3-19. Towns County, Georgia, had a population of 9,319 in 2000, an increase of 65.3 percent since 1980. This was a higher rate than in both Georgia and the nation. Clay County, North Carolina, had a population of 8,775 in 2000, an increase of 32.6 percent since 1980. This was a higher rate than for the nation but not for North Carolina. The rate of growth in both counties, states, and the nation was higher from 1990 to 2000 than from 1980 to 1990. In both decades, the rate of growth in Towns County was higher than in Clay County, so although there were fewer residents in Towns County in 1980, by 2000 its population was greater than the population in Clay County.

Estimates for 2006 indicate that the population of Towns County has grown an additional 12.9 percent since 2000. This remains a faster rate than the nation but is not quite as fast as in Georgia. During this period, the population in Clay County is estimated to have grown 14.1 percent, a faster rate than in Towns County, North Carolina, and the nation.

Projections through 2020 indicate that both counties will continue to have faster population growth rates than either state or the nation over that time. The rate for Towns County is expected to be slower than for 1980-2000, but the rate for Clay County is expected to be greater than for 1980-2000.

Table 3-18. Population – Towns County, Georgia, and Clay County, North Carolina

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Towns County, Ga.	5,638	6,754	9,319	10,525	13,627	55.9
Clay County, N.C.	6,619	7,155	8,775	10,008	12,502	40.9
Georgia	5,462,982	6,478,216	8,186,453	9,363,941	11,463,602	141.4
North Carolina	5,880,095	6,628,637	8,049,313	8,856,505	10,885,758	165.2
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e), extrapolations from Georgia Office of Planning and Budget (2005), and North Carolina Office of State Budget and Management (2007)

Table 3-19. Recent and Projected Population Changes – Towns County, Georgia, and Clay County, North Carolina (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Towns County, Ga.	19.8	38.0	65.3	12.9	46.2	141.7
Clay County, N.C.	8.1	22.6	32.6	14.1	42.5	88.9
Georgia	18.6	26.4	49.9	14.4	40.0	109.8
North Carolina	12.7	21.4	36.9	10.0	35.2	85.1
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-18

These counties are decidedly rural in distribution of population. As noted in Table 3-18, the population densities in both counties are much lower than in either state or the nation. The largest town in the two counties is Hiawassee, Georgia (Towns County) with 808 residents

in 2000. About 85 percent of the population of Towns County is outside incorporated towns. About 97 percent of the population in Clay County is outside incorporated towns.

Economy: As presented in Table 3-20, in 2005, Towns County had 5,879 people employed on average, and Clay County had 3,618. Both counties have a considerably higher percentage of farmers than either state or the nation, a considerably lower percentage of workers employed in manufacturing, and slightly more employees in retail. Both counties have lower percentages of government employees than their states, but the percentage is higher in Clay County than in the nation. The average unemployment rate for 2006 was lower in both counties than either state or the nation. Per capita personal income in 2005 was considerably lower in Towns County and much lower in Clay County than in either the state or the nation.

Table 3-20. Employment, Unemployment, and Income – Towns County, Georgia, and Clay County, North Carolina

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Towns County, Ga.	5,879	2.7	4.0	11.2	10.2	71.8	3.4	27,085
Clay County, N.C.	3,618	5.6	5.6	13.0	14.5	61.3	3.9	23,230
Georgia	5,197,037	1.4	9.0	10.7	14.5	64.5	4.6	30,914
North Carolina	5,119,512	1.4	11.5	10.8	15.7	60.5	4.8	31,041
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated); Georgia Department of Labor (undated), North Carolina Employment Security Commission (undated)

Many local workers in the area commute outside their home county to jobs—up to 70 percent in Clay County, as noted by David Penland, Clay County Planner (personal communication, November 11, 2007). In addition, Mr. Penland and North Carolina Department of Community Affairs Planner Ginny Faust (personal communication, November 13, 2007) explained that increasing land values due to the demand for vacation homes in the region are making it difficult for local residents to find affordable housing.

3.2.12.1.2 Environmental Justice

The minority population in the Chatuge Reservoir area is very small (Table 3-21). In Towns County, Georgia, 3.5 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 41.1 percent and the national average of 33.6 percent. In Clay County, North Carolina, 3.3 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 32.1 percent and the national average of 33.6 percent. The estimated poverty rate in Towns County in 2004 was 11.9 percent, slightly lower than the state rate of 13.7 percent and the national average of 12.7 percent. The estimated poverty rate in Clay County in 2004 was 12.7 percent, slightly lower than the state rate of 13.8 percent and the same as the national average of 12.7 percent. There are no concentrations of low-income residents or minorities in the vicinities of Parcels 10 and 77, which could be developed under Alternative C.

Table 3-21. Minority Population, 2006, and Poverty, 2004 – Towns County, Georgia, and Clay County, North Carolina

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Towns County Ga.	10,525	168	197	3.5	11.9
Clay County, N.C.	10,008	211	116	3.3	12.7
Georgia	9,363.941	3,205,172	640,521	41.1	13.7
North Carolina	8,856,505	2,298,351	543,059	32.1	13.8
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated e and 2004)

3.2.12.2. Environmental Consequences

Alternatives A and B

Under Alternatives A and B, existing uses of the Chatuge Reservoir parcels would likely continue, and there would be no socioeconomic impacts and no effects on minority or low-income populations. For similar reasons, there would be no significant amounts of additional traffic generated and no additional community infrastructure would be required. Proposed actions or requests for land use on TVA-managed land would be subject to TVA approval following the completion of an environmental review.

Alternative C

Under Alternative C, industrial use of Parcel 10, should it occur, would create the potential for new jobs in the area that would be beneficial to the economy of the area. Based on TVA's experience with industrial development, the parcel could support a campus-style development with about 250,000 to 350,000 square feet of industrial space. A typical ratio of one employee per 1,000 square feet would result in about 250 to 350 jobs. Because manufacturing jobs generally pay above-average wages, this would be beneficial to the economy of the area. With unemployment rates low, it is likely that at least some of the jobs would be taken by workers living outside the two counties, so not all of the economic benefits would be experienced in the two counties. However, some of these workers might choose to move to the two counties, thus leading to additional economic growth and population growth above the current projections. If as many as 350 jobs were created, this number would still be less than 5 percent of total employment and would probably occur over a number of years. Thus, these additional jobs would not significantly affect community services. If such an industry were to locate on Parcel 10, the county would likely improve road access to the site by constructing new roads or improving existing roads. An industry would require utility infrastructure in the form of potable water supply and sewer and electric service. These would likely be supplied by the local utility services. If Alternative C were selected, TVA would likely sell Parcel 10 at public auction, and any subsequent private ownership of the parcel could result in a slight increase in property tax revenues.

As noted in Section 3.1.12.1, the primary economic drivers in the area are the housing and tourism sectors, which are very dependent on the natural scenery associated with the reservoir and adjacent lands. Allocating Parcel 10 to Zone 5 (Industrial) would potentially result in a change in land use from a natural setting to an industrial setting. Depending on the type of industrial development that might eventually locate on Parcel 10, this could have negative socioeconomic impacts by lowering the value of nearby property and interest in residential development of available nearby property, at least relative to other properties in the area. The degree of effect would depend on various factors, such as the type of

industry, landscaping, operating hours, noise, etc. Although potential socioeconomic effects from this change could be noticeable in the immediate area of Parcel 10, should it be developed for industrial use, potential socioeconomic effects are expected to be insignificant when considered in a regional context.

The change of Parcel 52 from Zone 4 (Natural Resource Conservation) to Zone 6 (Developed Recreation) as a potential deepwater boat-launching ramp, walking trails, and/or city park would enhance the attractiveness of the area by creating more parks near Hiawassee, Georgia, thus possibly indirectly contributing to further population and economic growth. However, there is a possibility that the property values of some local residences in the area could be affected, depending on the operation of the park and degree of use. Allocation of Parcel 52 for recreational use is not expected to generate a significant increase in traffic or require any significant infrastructure improvements.

The change of Parcel 77 from Zone 4 (Natural Resource Conservation) to Zone 6 (Developed Recreation) for the potential development of a sports complex would also create an additional public park, thus possibly enhancing the attractiveness of the community and indirectly contributing to further population and economic growth. A multiple field sports complex could allow the hosting of regional and national sports tournaments, thus increasing economic benefits from tourism. However, as noted above, the reservoir and scenery are the main economic drivers in the area, and as noted in Section 3.2.1, a multiple field sports complex at this location could be incompatible with enjoyment of the reservoir and scenic quality. This could have a negative socioeconomic effect by lowering property values and interest in residential development of available nearby property, at least relative to other properties in the area. Because the parcel is in an exposed location visible from much of the reservoir and surrounding land, these negative effects could be experienced over a relatively large area.

Because Parcel 77 is accessed by a single county road (Mull Road), development of a large facility would likely require the county to make improvements to Mull Road to handle the additional traffic. The costs of road improvements would likely be borne by the county. In addition, utility infrastructure such as water, sewer, and electric service to the proposed recreational facility would be required. These improvements would likely be made by the local utility providers.

In summary, the allocation of Parcel 10 to Zone 5 for industrial development under Alternative C would potentially benefit low-income populations by creating jobs. Under Alternative C, the allocation of Parcel 77 to Zone 6 for development of ball fields and a walking trail would potentially benefit low-income populations by enhancing the availability of parks near Hiawassee. As noted above, there are no nearby concentrations of low-income or minority populations to potentially suffer disproportional adverse impacts by the development of either parcel. Allocation of Parcel 52 to recreation development is not expected to have disproportional adverse impacts to minority or low-income populations due to the type of development of surrounding land and the type of development expected.

Alternative D

Under Alternative D, the 6.1-acre Parcel 52 would be allocated for Developed Recreation. The potential socioeconomic effects of this allocation under Alternative D would be essentially the same as those described above under Alternative C. Otherwise, potential effects to existing socioeconomic conditions under Alternative D are expected to be virtually the same as those expected from the adoption of Alternative B.

3.3 Hiwassee Reservoir

3.3.1 Land Use

An overview of land use for the mountain reservoirs region is provided in Section 3.1.1.

3.3.1.1 Affected Environment

TVA initially purchased 19,046 acres and nearly all of the shoreline (see Table 1-1) for Hiwassee Reservoir. Since the purchase, TVA has transferred about 17,280 acres (91 percent) of the original land base, primarily to the USFS. TVA sold about 759 acres, most of which now comprises the Bear Paw Community. TVA retained 1,007.4 acres (approximately 5.3 percent of the original holdings) in 74 parcels. The majority of these (60 parcels), totaling approximately 781 acres are considered committed to existing land uses (see Table 2-2). The Dam Reservation and other land supporting TVA Project Operations account for 300 acres (30 percent) of the total TVA land base on the reservoir. Ten parcels are committed to recreational uses such as commercial marinas and county parks by land use agreements. Land use agreements also commit 11 parcels for public infrastructure such as railroad and state highway rights-of-way. Ten parcels front land that TVA transferred to the USFS for operation of the National Forest System. Only three parcels are committed to residential access by deeded rights or previous policy. A complete list of the committed uses for Hiwassee Reservoir parcels is provided in Appendix F.

As shown in Table 2.2, 14 parcels totaling 226.7 acres are considered uncommitted and are being considered for alternative uses in this plan. This is the second-largest amount of land on any of the nine reservoirs being planned. Most of the uncommitted parcels are currently managed for natural resource conservation and dispersed recreation.

Nearly all of the 164.8 miles of shoreline on Hiwassee Reservoir is owned by TVA (see Table 1-2). Eighty-six percent of this shoreline is land TVA retained fronting land transferred to the USFS. Only about four percent of the total shoreline is available for residential development; private water-access rights are not applicable on the remaining 96 percent of the shoreline. All of the shoreline available for residential development on Hiwassee Reservoir has been developed, the vast majority of which is in Bear Paw Subdivision. Although TVA estimates that all the shoreline available for residential access has been developed, there are still individual undeveloped lots available within existing subdivisions.

Cherokee County, North Carolina, is predominantly rural. Murphy is the only town near the reservoir. About a third of the land in the county is in the Nantahala National Forest (USFS 2007b, Quickfacts 2007). In recent years, development has increased on the privately owned land in the county. Much of the development is attributed to an influx of out-of-state retirees and improved highway access to the Atlanta area, which allows commuters and second-homeowners easier access to the area. According to County Manager David Badger (personal communication, November 7, 2007), the population of Cherokee County can increase by as many as 10,000 people between April and October. There are about 37,500 parcels of property in the county, and nearly half of these parcels are owned by nonresidents. According to Mr. Badger, 4,000 acres of the county are Cherokee Indian tribal lands. Cherokee County does not have a zoning ordinance. Additional information regarding the regional land use and demographics is provided in Section 3.3.12, Socioeconomics.

Parcels containing prime farmland surrounding Hiwassee Reservoir are listed in Table 3-22.

Table 3-22. Acres of Prime Farmland on Hiwassee Reservoir

Parcel Number	Total Parcel (Acres)	Prime Farmland (Acres)	Zone Allocation
16	N/A	7.1	4
26	12.6	12.6	3
40	21.3	20	3
46	16.9	16.9	3
52	14.6	13.9	3
54	9.8	9	3
61	23.2	19.2	6
62	11.6	6.9	3

N/A = Not applicable

3.3.1.2 Environmental Consequences

Alternative A

As shown in Table 2-3, under Alternative A, the allocated land uses for the 957.4 acres that are planned (out of a total of 1,007.4 acres managed by TVA) are, in descending order, Natural Resource Conservation (47 percent), Project Operations (36.3 percent), Industrial (7.8 percent), and Recreation (3.9 percent). No land is allocated to Sensitive Resource Management or Industrial uses. One small parcel (less than 1 acre) that was previously planned as a portion of the original dam reservation and later sold (Fowler Bend) has access rights for water use facilities and is allocated for Shoreline Access.

Parcels 35 and 36 are allocated to Industrial based on the Forecast System designation and could potentially be developed for industrial use under Alternative A. However, given the steep terrain of the parcels and the requirements for industrial use of TVA land as stipulated by TVA's Land Policy, it is unlikely that industrial use would be allowed on the parcels.

Under Alternative A, TVA would not designate land uses for over 50 acres of TVA land on Hiwassee Reservoir that is not planned with the Forecast System. The exact acreage of TVA land fronting National Forest System lands is unknown and therefore not included in the Natural Resource Conservation and Recreation allocation acreage totals. Of the 20 unplanned parcels, representing over 50 acres, only one parcel is uncommitted. The uncommitted parcel is less than an acre and is allocated for Natural Resource Conservation. This parcel would continue to be managed according to TVA's Land Policy, SMP, and Section 26a regulations.

Under Alternative A, no impacts to prime farmlands are expected.

Alternative B

Under Alternative B, all of Hiwassee Reservoir's 1,007 acres would be planned, including the 20 parcels not planned under Alternative A. Nineteen of these previously unplanned parcels are committed to existing uses, which determined their allocation under this alternative. One small (less than one acre) uncommitted parcel was allocated based on existing land use, which was consistent with Zone 4 (Natural Resource Conservation). Alternative B does not include any allocations that are inconsistent with the actual current land use.

Under Alternative B, TVA would allocate 442.8 acres (43.6 percent) to Zone 4 (Natural Resource Conservation), a decrease of 28.4 acres from Alternative A. This is primarily a result of allocating land that was allocated to Zone 4 under Alternative A to Zone 3 (Sensitive Resource Management) for Alternative B. Under Alternative B, there would be increases in Zone 3 allocations from none in Alternative A to 114.7 acres on 12 parcels (11.7 percent). Land allocated to Zone 6 (Developed Recreation) would increase slightly over Alternative A to 40.6 acres (4 percent). The exact acreage of the previously unplanned acreage for the TVA land fronting the National Forest System lands is unknown. Therefore, this acreage was not included in the Zones 4 and 6 acreage totals. Zone 7 (Shoreline Access) would receive additional allocations totaling 42.9 acres (4.3 percent). Allocations to Zone 2 (Project Operations) would stay the same as Alternative A at 366 acres (36.3 percent). No land would be allocated to Zone 5 (Industrial) under Alternative B.

No significant changes to land use are expected to occur on Hiwassee Reservoir under Alternative B because the allocations are consistent with current land use on all parcels. Under Alternative B, no impacts to prime farmlands are expected.

Alternative C

Under Alternative C, all of Hiwassee Reservoir's 1,007 acres would be planned. As shown in Tables 2-7 and 2-8, land allocated to Zone 4 (Natural Resource Conservation) on Hiwassee Reservoir would decrease by 4 acres to 438.8 acres but would still be the primary use at 43.6 percent of the total. Land allocated to Zone 6 (Developed Recreation) would increase by 4 acres to 44.6 acres (4.5 percent) from lands allocated under Alternative B.

The differences in Alternatives B and C affect Parcels 34 and 49, which would be allocated to Zone 6 (Developed Recreation). These requested allocation changes are for proposals received during scoping for a water-access site along the Hiwassee River for wade fishing (Parcel 34) and an extension of the Heritage Riverwalk Trail (Parcel 49).

Parcel 34. This 2.4-acre parcel is located between Harshaw Road and the Hiwassee River in Murphy, North Carolina. The adjacent land use for Parcel 34 consists of state highway right-of-way and former agricultural fields. The Hiwassee River at this location is riverine in nature, and development of a water-access site on Parcel 34, with a narrow access corridor through Parcel 40, would provide a public access point for wade fishing in the river or for launching a canoe or other nonmotorized personal watercraft. Future development would retain or enhance existing vegetated buffers along the river, and BMPs, including storm water controls, would be implemented as conditions of TVA approval of the proposed land use. Allocating Parcel 34 to Zone 6 would allow a partnership to be formed for the development of a water-access site in the future.

Parcel 49. This linear 1.6-acre parcel parallels highway and railroad rights-of-way along most of its length. Adjacent land uses include forested river corridors and wetlands. Comments received during scoping from Town of Murphy officials, Heritage Partners, and others requested the use of Parcel 49 for the continuation of the Heritage Riverwalk Trail. Allocation of Parcel 49 to Zone 6 would allow future requests for trail development to be considered by TVA. Future development of the trail segment would feature a low-impact design and avoid sensitive resources such as wetlands.

Under Alternative C, proposed allocations for conversion to recreational development on Parcels 34 and 49 would not affect prime farmlands.

Alternative D
Under Alternative D, parcel allocations would be the same as those under Alternative B, with the exception of Parcel 49, which would be allocated to Zone 6 (its proposed allocation under Alternative C). As stated above, allocation of Parcel 49 for recreational use would facilitate the use of this parcel to extend the Heritage Riverwalk Trail.

3.3.2 Recreation

An overview of the recreation resource for the mountain reservoirs area is provided in Section 3.1.2.

3.3.2.1 Affected Environment

Thirteen TVA parcels on Hiwassee Reservoir support developed recreation facilities. TVA actively manages some of these parcels. However, the USFS and state, county, and city agencies manage most of the parcels through either TVA land transfer agreements or landrights provided by licenses, leases, or easements. In addition to the TVA and other public land that provide recreational opportunities, the private sector also provides needed amenities, such as marinas and RV campgrounds. These developed recreation areas are summarized in Table 3-23.

Table 3-23. Developed Recreation Facilities on Hiwassee Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Bear Paw Pavilion	Cherokee, N.C.	Private	Commercial	Private	7								●
Mountain View Marina	Cherokee, N.C.	Private	Commercial	Private**	6		●	●	●				●
Duke's Hide-A-Way Marina	Cherokee, N.C.	Private	Commercial	USFS**	62		●		●				
Harbor Cove Marina	Cherokee, N.C.	Private	Commercial	USFS**	8		●		●				
Shook's Marina	Cherokee, N.C.	Private	Commercial	USFS**	64		●		●				
Bealtown Ramp	Cherokee, N.C.	Public	Town of Murphy	TVA	22				●				
Hiwassee Dam Reservation	Cherokee, N.C.	Public	TVA	TVA	1, 2, 3			●	●				●
Konehete Park	Cherokee, N.C.	Public	Cherokee County	TVA/City	61			●			●	●	●
Micken Branch Ramp	Cherokee, N.C.	Public	TVA	TVA	12				●				
Hanging Dog Recreation Area	Cherokee, N.C.	Public	USFS	USFS	N/A	●		●	●		●	●	
Ramsey Bend Ramp	Cherokee, N.C.	Public	USFS	USFS	N/A				●				
Cherokee Lake Picnic Area	Cherokee, N.C.	Public	USFS	USFS**	14			●				●	
Grape Creek Boat Ramp	Cherokee, N.C.	Public	N.C.	USFS**	61				●				

** = TVA retained below MSC
N/A = Not applicable

There is one campground on Hiwassee Reservoir at Hanging Dog Recreation Area that is owned and operated by the USFS. In addition to the campground, the recreation area also includes picnic tables, a boat ramp, a paved walking trail, fishing piers, and other recreational amenities.

Ten recreation areas contain boat ramps, one of which is privately operated. The remaining nine are operated by public entities, including the ramps on the Hiwassee Dam Reservation (Parcel 3) and Micken Branch (Parcel 12) that are managed by TVA. The ramps at Micken Branch and Hanging Dog Recreation Area are both low-water ramps that serve the left bank and right bank of the reservoir, respectively. The construction of the ramp at Hanging Dog is an example of a partnership project between TVA, the USFS, the North Carolina Wildlife Resources Commission, and others that has been developed to provide a needed recreational facility.

There are four commercial marinas operating on Hiwassee Reservoir: Mountain View Marina (Parcel 6), Duke's Hide-A-Way Marina (Parcel 62), Harbor Cove Marina (Parcel 8), and Shook's Marina (Parcel 64). Mountain View Marina at Bear Paw has been certified as a TVA Clean Marina.

Four public fishing piers are located on Hiwassee Reservoir. The piers at Hanging Dog Recreation Area and Cherokee Lake Picnic Area (Parcel 14) are managed by the USFS. The two fishing piers at Konehete Park (Parcel 61) are managed by Cherokee County. There is no stream access site located near Hiwassee Reservoir.

There is one day-use area with several facilities on Hiwassee Reservoir. A large portion of Konehete Park is located on land (Parcel 61) provided by TVA to the Town of Murphy and Cherokee County through a long-term easement for public recreation. The portion on TVA land provides picnic tables, pavilions, a paved walking trail, fishing piers, children's play equipment, and ball fields.

Dispersed Recreation

Historically, dispersed recreation has provided important recreation opportunities on Hiwassee Reservoir. Table 3-24 is a summary of parcels heavily utilized for dispersed recreation that have been identified on Hiwassee Reservoir.

Table 3-24. Dispersed Recreation Areas on Hiwassee Reservoir

Recreation Area	Parcel Number	Number of Sites
Micken Branch	10, 11	3
Payne Street	65	1
McCalley Bottoms	52	1

Some of the larger uncommitted parcels on Hiwassee Reservoir that can accommodate high levels of dispersed recreation of a more passive nature, such as hunting and bank fishing, include the following: Parcel 4 with 199.2 acres, Parcel 10 with 112.8 acres, and Parcel 36 with 69.1 acres.

3.3.2.2 Environmental Consequences

Alternative A
Under Alternative A, TVA lands previously allocated to Recreation on Hiwassee Reservoir total 38.9 acres (3.9 percent). One parcel allocated for Public Recreation and five parcels allocated to Project Operations under the Forecast System have been utilized for developed recreation. These parcels include Konehete Park in Murphy. In addition, under Alternative A, five parcels that currently support developed recreation are unplanned. However, the unplanned parcels and parcels allocated for Project Operations with existing developed recreation use are all committed to that use through transfer agreement covenants or TVA licenses, leases, or easements.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use. The unplanned parcels and previously allocated Project Operation parcels that are committed to developed recreation would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas. Under Alternative A, potential environmental impacts would be insignificant because the use of those parcels (both previously allocated and the unplanned parcels) utilized for developed recreation would not change. Any future development of new facilities would be limited to existing developed recreation areas. The potential impacts from any new facilities would be determined by additional environmental review, and any necessary mitigation would be stipulated prior to approval by TVA.

Although under Alternative A Parcels 35 and 36 are designated for possible future industrial use, the steep topography of these two parcels makes this use unlikely. Thus, the implementation of Alternative A would not likely change the land use of any parcels. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternative B
Under Alternative B, parcels allocated to Zone 6 (Developed Recreation) would comprise a total of approximately 40.6 acres (i.e., about four percent) of the TVA lands on Hiwassee Reservoir. This is more acreage than would be allocated to Zone 6 under Alternative A and includes an additional 1.7-acre parcel fronting Mountain View Marina. However, it does not include uncalculated acreage of four other previously unplanned parcels that front three other marinas and a USFS recreation area. Eleven parcels on Hiwassee Reservoir are committed to developed recreation and would be allocated to Zone 6. These commitments include transfer agreement covenants and TVA licenses, leases, and easements. All of the parcels committed to developed recreation on Hiwassee Reservoir currently support recreational land use with existing facilities. The parcels allocated to Zone 6 under Alternative B would include those previously allocated under Alternative A to Public Recreation as well as the five parcels allocated to Reservoir Operations that have been utilized for developed recreation.

Under Alternative B, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas allocated to Zone 6. These areas are the same as those under Alternative A. Because there would be no new parcels allocated for Developed Recreation under Alternative B, the potential recreation-related effects would be the same as those expected under Alternative A. Proposals for any new facilities within existing areas would be subject to environmental review under NEPA prior

to TVA approval. Any necessary mitigation to offset adverse effects to recreational opportunities would be conditions of approval.

Under Alternative B, the current land use of all parcels is expected to remain the same. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels. Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternative C
Under this alternative, two parcels, 34 and 49, totaling 4.0 acres allocated to Zone 4 (Natural Resource Conservation) under Alternative B would be allocated to Zone 6 (Developed Recreation).

Parcel 34. Under Alternative C, Parcel 34 would be allocated to Zone 6 (Developed Recreation) for water-access purposes. Formerly, this area has been utilized for agriculture under a TVA agricultural license. Recent construction of the new US 64 corridor resulted in a decrease in size of the parcel and the cancellation of the agricultural license. The suitability/capability analysis for Parcel 34 indicated this parcel ranked high for water access due primarily to the gentle shoreline slope, proximity to Murphy, good road access, and high level of interest from local and state stakeholders. Development of a water-access site at this location would provide for public access to the Hiwassee River for wade fishing and nonmotorized boating such as canoeing or tubing.

Parcel 49. Parcel 49 would be allocated to Zone 6 (Developed Recreation) for public recreation purposes under Alternative C. The Town of Murphy, Heritage Partners, and others submitted comments during the public scoping period requesting the use of Parcel 49 for future phases of the Heritage Riverwalk Trail that originates in Konehete Park. The existing trail is heavily utilized by the public and is an asset to the area providing for a walking trail in a natural setting in downtown Murphy. Allocation of Parcel 49 to Zone 6 for public recreation would allow future requests for trail development to be considered by TVA. The recreational analysis of Parcel 49 indicated that it is suitable for and capable of supporting public recreation use primarily due to its high degree of forestation, its location in an area of need, and the very high level of interest by local stakeholders.

Implementation of Alternative C would provide increased recreational opportunities on Hiwassee Reservoir and would provide beneficial impacts to the recreation resource.

Alternative D
Adoption of Alternative D would provide an increase in recreational opportunities, primarily for residents of Murphy, from the allocation of Parcel 49 for recreational use. This would facilitate the extension of the Heritage Riverwalk Trail. Any other potential effects to recreational opportunities, either positive or negative, from the implementation of Alternative D would be essentially the same as those anticipated under Alternative B.

3.3.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.3.3.1 Plant Communities

3.3.3.1.1 Affected Environment

The vegetative classes commonly found on Hiwassee Reservoir lands are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation. Most of the evergreen forests are in the form of pine plantations. Mixed pine-hardwood forests dominate the region with smaller areas of deciduous forest (mainly the Appalachian oak forest, northern hardwood forest, and cove hardwood forest). Scrub-shrub wetland communities occur along the backs of coves along the reservoir. Herbaceous vegetation is commonly found along transmission line and roadway rights-of-way and grassy areas on the dam reservation.

Most of the evergreen forests are in the form of pine plantations where loblolly pine is dominant, along with shortleaf and Virginia pine. Several areas showed evidence of salvage harvests due to pine bark beetle infestation and were in the process of regenerating with young pine trees. Evergreen-deciduous forest, the most common forest type, is dominated by stands of mixed pine-hardwood trees. Deciduous forest occurs mainly as oak-hickory forests, cove hardwood forest on slopes, and forested wetlands that grade into scrub-shrub wetlands near the reservoir edges. Oak-hickory forests common on dry ridges grade into more mesic slopes.

The cove hardwood forests found on Hiwassee Parcels 4 and 10 are considered a special type of cove hardwood forest, the globally rare (G2G3) plant community known as the Southern Appalachian Cove Forest. These areas have a rich herbaceous layer, an overstory dominated by tulip poplar, American beech, white oak, and yellow buckeye, and a diverse understory of shrubs and small trees. Eastern hemlock, rosebay, mountain laurel, and horse-sugar occur along the streams on the parcels.

Forested wetlands were found along the backs of coves along the reservoir and grade into scrub-shrub wetlands (shrublands). Hillside and bluff seeps in three locations along the banks of the reservoir on Parcel 4 were classified according to NatureServe (2007) as the globally rare (G2) Montane Low-Elevation Seep plant community. Several varieties of ferns are present, including cinnamon fern, maidenhair spleenwort, marginal shield fern, New York fern, royal fern, and southern lady fern. American alumroot, foamflower, jewelweed, and turtlehead were also observed along with spicebush, southern bushy honeysuckle, and silverbell. Forested and scrub-shrub wetlands occur along the shoreline of the Hiwassee River in Murphy on Parcels 21, 26, 31, 40, 42, 44, 46, 52, 54, 55, 62, and 63. Parcels 27, 32, 34, 39, 43, and 58 are early successional bottomland hardwood forest with American sycamore and sweet gum as the dominant canopy species and diverse subcanopy, shrub, and herbaceous layers.

The old quarry site on the dam reservation (i.e., Parcel 2) contains a large wetland with several hundred plants of wax myrtle (*Myrica cerifera*), a woody shrub common to the coastal plain and not known from the SBRE. It could not be determined if this is a “natural” population or if the shrubs were planted as part of the quarry reclamation.

Herbaceous vegetation is commonly found along transmission line and roadway rights-of-way as well as grassy areas within the dam reservations and on commercial recreation areas.

The allocated uses of Parcels 34 and 49 vary among the alternatives. Parcel 34 is a 2.4-acre tract that is currently composed of an agricultural field and mixed deciduous forest.

Woody species found in the forested areas were American beech, American sycamore, black locust, honey locust, loblolly pine, red maple, river birch, and tulip poplar. The shrub layer was diverse with American holly, black willow, buttonbush, and Chinese privet. Many wildflower species were found in the herb layer. Parcel 49 is a 1.6-acre upland-forested area. Species present are common scrub-shrub wetland plants that include black willow, box elder, buttonbush, river birch, silver maple, and planted bald cypress. Japanese honeysuckle, Japanese knotweed, Japanese stiltgrass, and multiflora rose are all invasive species found on this parcel.

Most of the TVA parcels around Hiwassee Reservoir have various species of invasive plants. These include autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese knotweed, Japanese stiltgrass, kudzu, mimosa, multiflora rose, oriental bittersweet, princess tree, and tree-of-heaven.

3.3.3.1.2 Environmental Consequences

Alternative A
Under Alternative A, the previously allocated parcels containing rare plant communities (Parcels 4, 10) may be negatively impacted if they are not managed to protect sensitive resources. Under Alternative A, Parcel 4 has a committed recreation easement area, and Parcel 10 is allocated to Public Recreation but has no existing recreational facilities. Any proposed development under Alternative A would be subject to additional environmental review under NEPA to evaluate potential effects to the listed species prior to TVA approval of the requested use. Plant communities on the remaining Hiwassee Reservoir parcels are common, and therefore, no potential impacts to plant communities are anticipated on these parcels under Alternative A.

Alternative B
The potential effects to plant communities from the adoption of Alternative B would be similar to those described under Alternative A. The potential impacts of additional development on Parcels 4 and 10 would be evaluated prior to being approved. TVA's ability to manage invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors including the availability of resources, potential for partnerships, and threat to sensitive resources. No significant impacts to plant communities on Hiwassee Reservoir are expected from the adoption and implementation of Alternative B.

Alternatives C and D
The potential impacts of adopting Alternative C or D on plant communities on Hiwassee Reservoir lands would be the same as for Alternative B. Implementation of Alternative C would not have adverse impacts on plant communities. Under Alternative C, TVA's ability to manage these invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors including the availability of resources, potential for partnerships, and threat to sensitive resources.

3.3.3.2 Wildlife Communities

3.3.3.2.1 Affected Environment

Wildlife habitats on Hiwassee Reservoir lands include a mixture of evergreen, evergreen-deciduous, deciduous, and early successional habitats. Hiwassee Reservoir lands also have rock shelters and cliffs, a rock quarry, and abandoned buildings. A rock shelter on Parcel 4 on the slope overlooking the Hiwassee River contained evidence of nesting by

vultures. Rock shelters also provide habitat for a variety of small mammals, reptiles, and amphibians. Abandoned buildings on Parcel 1 also provide habitat for a variety of wildlife. Small wetlands occur on Parcels 2, 4, and 10 (see Section 3.3.5, Wetlands), providing habitat for wildlife. The seeps on Parcel 4 provide habitat for salamanders, and the small mud flat on Parcel 10 provides habitat for shorebirds. Wildlife observed during field surveys included northern water snake, dusky salamander, yellow warbler, and common yellowthroat.

Parcel 34 is comprised primarily of early successional habitat dominated by fescue. Parcel 49 is a long, linear, forested parcel between a railroad and a wetland. Approximately 620 acres of mud flat habitat become exposed when Hiwassee Reservoir levels are lowered. Mud flats on the reservoir are small (typically less than 10 acres) or are long, linear margins of streams and rivers. Larger mud flats occur at HRM 93 near the mouth of the Nottely River and Persimmon Creek. All mud flats are bordered by USFS lands.

3.3.3.2.2 Environmental Consequences

Alternative A
Under Alternative A, no TVA land is allocated for Sensitive Resource Management, and 80.5 acres are allocated for Industrial use. Uncommon terrestrial wildlife habitats found on the lands (i.e., seepages, rock outcrop) are not likely to be impacted by future activities around the reservoir. Potential effects to terrestrial animals from implementing Alternative A are expected to be minimal.

Alternative B
Under Alternative B, TVA would allocate 114.7 acres (11.4 percent) to Zone 3 (Sensitive Resource Management), approximately 442.8 acres (44 percent) to Zone 4 (Natural Resource Conservation), and no lands to Zone 5 (Industrial). These allocations would benefit terrestrial animals, and no potential adverse effects to terrestrial animals are expected under this alternative.

Alternative C
Under Alternative C, an additional 4.0 acres would be allocated to Zone 6 (Developed Recreation) than under Alternative B. The affected parcels are 34 and 49. The proposed changes would allow the development of a proposed river access area and a proposed extension of the Heritage Riverwalk Trail. Adoption of Alternative C would result in more potential effects to wildlife habitat than Alternative A or B. However, the potential effects of the proposed activities to wildlife habitat and terrestrial animal resources on Hiwassee Reservoir are expected to be minimal.

Alternative D
Under Alternative D, the 1.6-acre Hiwassee Parcel 49 would be allocated to Zone 6 for recreational use. The proposed extension of the Heritage River Walk would have a minimal effect on wildlife habitat and terrestrial animals in the area. Any other potential effects to terrestrial wildlife and their habitats under Alternative D would be virtually the same as those expected from adopting Alternative B.

3.3.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.3.4.1 Affected Environment

Several species of plants and animals listed as endangered, threatened, or of other conservation concern are known from Cherokee County and the Hiwassee Reservoir area and are listed in Table 3-25. These include two federally listed species, the small whorled pogonia and the bog turtle; one candidate for federal listing (the sicklefin redhorse); and several state-listed species. Listed species found or likely to occur on TVA lands on Hiwassee Reservoir or in their vicinity are described in more detail below.

Table 3-25. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Vicinity of Hiwassee Reservoir in Cherokee County, North Carolina

Common Name	Scientific Name	Federal Status	State Rank	State Status
Plants				
Ash-leaved bush-pea	*Thermopsis fraxinifolia*	--	S3	THR
Broad-leaved tickseed	*Coreopsis latifolia*	--	S1S2	END
Manhart sedge	*Carex manhartii*	--	S2	END
Mountain camellia*	*Stewartia ovata*	--	S2	SR-P
Porter's reedgrass	*Calamagrostis porteri*	--	S1	END
Sedge	*Carex purpurifera*	--	S1	SR-P
Sedge	*Carex ruthii*	--	S2	THR
Small white leek	*Allium tricoccum*	--	S1S2	S-CE
Small whorled pogonia	*Isotria medioloides*	THR	S1	END
Stachys	*Stachys clingmanii*	--	S1S2	THR
Tawny cotton-grass	*Eriophorum virginicum*	--	S1S2	THR
Amphibians				
Eastern hellbender*	*Cryptobranchus alleghaniensis alleghaniensis*	--	S3	SPCO
Mole salamander*	*Ambystoma talpoideum*	--	S2	SPCO
Mountain chorus frog*	*Pseudacris brachyphona*	--	SH	SPCO
Seepage salamander*	*Desmognathus aeneus*	--	S3	RARE
Birds				
Bald eagle	*Haliaeetus leucocephalus*	--	S3	THR
Blue-winged warbler*	*Vermivora pinus*	--	S2	RARE
Common raven*	*Corvus corax*	--	S3	NOST
Northern saw-whet owl*	*Aegolius acadicus*	--	S2	THR
Reptile				
Bog turtle	*Glyptemys muhlenbergii*	THR	S2	THR
Invertebrates				
Carolina scorpion*	*Vaejovis carolinianus*	--	S2?	NOST
Hiwassee crayfish*	*Cambarus hiwasseensis*	--	S3?	SPCO

Common Name	Scientific Name	Federal Status	State Rank	State Status
Fish				
Banded sculpin	*Cottus carolinae*	--	S1	THR
Sicklefin redhorse*	*Moxostoma* sp.	CAND	S?	NOST
Olive darter	*Percina squamata*	--	S2	SPCO
Snail				
A freshwater snail*	*Elimia christyi*	--	S1	END
Mussels				
Long-solid	*Fusconaia subrotunda*	--	S1	TRKD
Mountain creekshell	*Villosa vanuxemensis*	--	S1	THR
Rainbow	*Villosa iris*	--	S1	SPCO
Spike*	*Elliptio dilatata*	--	S1	SPCO
Tennessee clubshell*	*Pleurobema oviforme*	--	S1?	END
Tennessee pigtoe*	*Fusconaia barnesiana*	--	S1	END
Wavy-rayed lampmussel*	*Lampsilis fasciola*	--	S1	SPCO

-- = Not applicable
* Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled; S2 = Imperiled; S3 = Rare or uncommon; SH = State historical; ? = Inexact or uncertain
Status abbreviations: CAND = Candidate for listing; END = Endangered; NOST = No state status; RARE = Rare; S-CE = Special concern-commercially exploited; SPCO = Special concern; SR-P = Significantly rare-peripheral; THR = Threatened; TRKD = Tracked

Mountain camellia is a wide ranging but infrequently occurring shrub threatened by land use conversion, habitat fragmentation, and interspecific factors (NatureServe 2007). According to Weakley (2006), it is found in mesic forest and often found in openings of rhododendron thickets. A previously undocumented population of 30 or more individuals of mountain camellia was discovered on mesic slopes on the southwest portion of Parcel 4.

Eastern hellbenders are known from the Hiwassee River both upstream and downstream of Hiwassee Reservoir. Suitable habitat for this species (see Section 3.2.4) exists within Persimmon Creek adjacent to Parcel 15.

Mole salamanders inhabit upland hardwood forests or mixed pine-hardwood forests surrounding vernal ponds or other breeding sites (Petranka 1998). During the summer months, they spend most of their time in underground burrows. Populations of mole salamanders are known from areas near the Nottely River. Habitat for this species exists within Parcels 18, 19, 33, 65, and 54. This area is highly fragmented by roads and residential areas and is therefore not considered high-quality habitat for this species. Mole salamander habitat was not found on parcels outside of Murphy, North Carolina, but may be present on large forested tracts.

Mountain chorus frogs inhabit upland hardwood forests surrounding vernal ponds or other breeding sites. Numerous populations of this species are known from the Hiwassee Reservoir area. A historic population is known from near Murphy. Though habitat exists along the Hiwassee River in Murphy, this habitat is of low quality due to the amount of fragmentation and human disturbances in the area.

Seepage salamanders occur in and around seepages or in terrestrial habitats adjoining small streams. They frequent moist leaf litter but are occasionally found beneath logs, moss mats, and other surface objects (Petranka 1998). Habitat for this species exists on Hiwassee Parcels 1, 2, 3, 4, and 10.

In 2007, a **bald eagle** nested on Parcel 18 along the Nottely River about 2 miles from Murphy. Potential bald eagle nesting habitat exists on Parcels 1, 2, 3, 4, and 10.

Blue-winged warblers nest in early- to mid-successional habitats typically containing a mixture of woody shrubs, herbaceous vegetation, and trees. Habitat for this species exists within the transmission line rights-of-way found on Parcels 1 and 2.

Common ravens are known to nest on rock ledges within or adjacent to forested landscapes. They once had a widespread distribution in the southern Appalachians but are currently only common in the SBRE. Recent evidence suggests that ravens are expanding their range. Suitable nesting habitat occurs in the abandoned rock quarry on Parcel 2. Adult birds were observed in the area, but no nests were located.

Northern saw-whet owls nest in mixed hardwood/spruce and fir forests and high elevation hardwood forests typically above 4,500 feet msl in the southern Appalachians. There is only one known record of this species within 3 miles of Hiwassee Reservoir. Typical nesting habitat for saw-whet owls does not exist on any parcels on Hiwassee Reservoir.

No suitable habitat for **bog turtle** species exists on the TVA lands on Hiwassee Reservoir.

Carolina scorpions are found under rocks and the bark of dead pines in deciduous and mixed evergreen-deciduous forests. Abundant pine snags in the area are suitable habitat for this species. Carolina scorpions were located on Parcels 3 and 10.

The **Hiwassee crayfish** is restricted to Towns and Union counties in Georgia and Clay and Cherokee counties in North Carolina (NatureServe 2007). Habitat for crayfish is primarily separated according to each species' burrowing ability. All crayfish are able to burrow to some extent, and this ability will help determine the range of habitats in which a species can be found. The Hiwassee crayfish is in a genus that, as a group, is much more adept at burrowing than other groups. Consequently, they possess a greater habitat range than other crayfish genera and can be found in caves as well as dry water bodies (NatureServe 2008). The verified occurrence of the Hiwassee crayfish in Hiwassee Reservoir is located near Parcel 24 but not close enough to warrant inclusion in this analysis.

The **sicklefin redhorse** (see Section 3.1.4) is a candidate fish species for federal listing. A review of the TVA Natural Heritage database indicated this species has been collected in the vicinity of Parcels 5 and 18 on Hiwassee Reservoir. However, habitat consistent with that which would support this species can be found in both the Hiwassee and Valley River reaches within the vicinity of these parcels.

Elimia christyi (a freshwater snail) has only recently been differentiated from the knotty elimia (*Elimia interrupta)* and is only known from the Hiwassee River, Shuler Creek, and Valley River, Cherokee County in North Carolina, and Coker Creek and the Hiwassee River in Polk County, Tennessee (Minton et al. 2004). It has also been reported by Johnson et al. (2005) from the Hiwassee River inside and adjacent to Cherokee National Forest. *Elimia christyi* is tracked by the TVA Heritage Program because it has a global rank of G2 (very rare and imperiled within the world).

The **spike mussel** is a generalist in relation to the size of rivers it inhabits. It can be found living on firm substrate of coarse sand and gravel in moderate to strong current. The spike is a state-listed freshwater mussel species that has been collected near Parcels 22 and 24 (Parmalee and Bogan 1998).

The **Tennessee clubshell** mussel prefers substrate of coarse gravel and sand in small shallow creeks and rivers with good current (ibid). The Tennessee clubshell is a state-listed freshwater mussel species, which has been collected near Parcel 24.

The **Tennessee pigtoe** is a state-listed freshwater mussel species. Three subspecies of pigtoe have been recognized because of variations in outline, dimension, color, and pattern. These variations have been attributed to their range in habitat from headwater to big river (ibid). The form of pigtoe documented in the Hiwassee Reservoir is *Fusconaia barnesiana*, not one of the subspecies. In general, the pigtoe appears to prefer small to medium-sized rivers with moderate current, water less than 2 feet deep, and a substrate composed of coarse sand, silt, and gravel. The Tennessee pigtoe has been collected in Hiwassee Reservoir near Parcel 24.

The **wavy-rayed lampmussel** inhabits depths of 3 feet or less and is tolerant of habitat conditions unfavorable to many similar species. It prefers substrate of mud, sand, and gravel in moderate current (ibid). The wavy-rayed lampmussel is a state-listed freshwater mussel that has been collected in the Hiwassee River near Parcels 22, 24, and 25.

3.3.4.2 Environmental Consequences

Alternative A

Plants

Under Alternative A, the previously allocated parcel containing rare terrestrial plant communities (Parcel 4) may be negatively impacted if it is not managed to protect these botanical resources. Under Alternative A, Parcel 4 is committed by an informal recreation easement. Any future proposal for development on this parcel would be subject to further environmental review to determine specific potential effects to the plant resources. TVA would require appropriate mitigation as necessary as a condition of approval for future uses.

Terrestrial Animals

Under Alternative A, there would be no impacts to federally listed terrestrial animal species or their habitat because no populations are known on most TVA parcels. Under Alternative A, parcel allocations reflect current use. Parcels 35 and 36 could ultimately be developed for industrial use. No listed species or their habitats are known from these sites.

A bald eagle nest was located on Parcel 18 in 2007. Although they were recently removed from the Endangered Species List, bald eagles are protected by the *Bald and Golden Eagle Protection Act* and the *Migratory Bird Treaty Act*. TVA places an appropriate buffer zone around eagle nests as described in the *National Bald Eagle Management Guidelines* (USFWS 2007). This species would not be impacted by allocations prescribed under Alternative A. No other federally listed species are reported from TVA land on Hiwassee Reservoir.

Forested areas on Hiwassee Reservoir lands ranked low in their suitability as summer roost habitat for Indiana bats because of the lack of suitable roosting trees, the young age of most stands, and the presence of thick midstory layers. Suitable habitat for state-listed species and species considered uncommon by the North Carolina Natural Heritage Program occurs on numerous parcels. Under Alternative A, most parcels having potential habitat for state-listed or uncommon species are planned as Project Operations or Natural Resource Conservation. Consequently, no impacts to these species are expected.

Aquatic Animals

As documented in Table 3-25, several listed aquatic species are known from Hiwassee Reservoir. There is one federal candidate species (i.e., the sicklefin redhorse); the remainder are state-listed species. Several of these listed species have been documented in and around Hiwassee Reservoir near Murphy, North Carolina. The olive darter and Hiwassee crayfish are located in tributaries to the reservoir. However, these species do not inhabit areas close enough to any parcels to warrant inclusion in this analysis. Occurrence of the wavy-rayed lampmussel has been documented from the Nottely River near Parcel 16. The Nottely River is a tributary of Hiwassee Reservoir. The Nottely River record is located near unplanned land currently utilized for Natural Resource Conservation. USFS property surrounds this parcel, which affords a great deal of protection to the watershed on this reach of the Nottely River and, in turn, the lampmussel. If shoreline development were to occur at some point in the future, it could alter the physical characteristics of adjacent fish and aquatic invertebrate habitats, which could result in dramatic changes in the quality of the fish community. Prior to undertaking activities or approving land uses that could affect listed species, TVA would perform further environmental review, including appropriate surveys to ascertain the occurrence of listed species. Based on the findings of that review, necessary measures would be implemented to protect listed species.

One of the sicklefin redhorse records, near Parcel 69, is in a similar situation. Under Alternative A, the shoreline is currently unplanned but utilized for Natural Resource Conservation and is surrounded by USFS land. Therefore, the sicklefin redhorse in this area would not be affected under Alternative A. Populations of the Tennessee pigtoe, spike, Tennessee clubshell, and wavy-rayed lampmussel have all been documented more than 0.5 mile upstream of parcels in the Murphy area and therefore would not be affected by TVA land allocations.

The sicklefin redhorse, wavy-rayed lampmussel, spike, and freshwater snails occur near several Hiwassee Reservoir parcels. Under Alternative A, all those parcels in the vicinity of listed species would remain under their current use. Impoundment and sedimentation have been the primary reasons for the decline of listed aquatic species in the Tennessee River drainage. With the exception of Parcels 35 and 36, which were allocated for Industry under the Forecast System, the continued use of parcels for their current uses is not expected to alter the status of these species in Hiwassee Reservoir. Parcels 34 and 35 are not located on the shoreline. Although these two parcels were allocated for industrial use under the Forecast System, neither is likely to be developed for that purpose. Nevertheless, any future development on these two parcels would require additional environmental review, including the identification of any potentially affected sensitive resources such as listed species and the imposition of any necessary mitigative measures, prior to TVA approval.

Alternative B

Plants

The state-listed plant, mountain camellia, occurs on Hiwassee Parcel 4. Under Alternative B, Parcel 4 would be allocated to Zone 4 (Natural Resource Conservation), which is consistent with the current land use. The types of activities and actions that could occur under this allocation (see Table 2-1) are not likely to harm this species. Any future proposal on this parcel would be subject to further environmental review, which would be used to identify any necessary mitigative measures to protect the plant resources.

Terrestrial Animals
Under Alternative B, the allocation of parcels would reflect their current use. Parcel 18 and other parcels that provide suitable habitat for state-listed species would be placed in Zone 2 (Project Operations), Zone 3 (Sensitive Resource Management), and Zone 4 (Natural Resource Conservation), protecting these resources. Adoption of Alternative B would result in similar levels of protection to listed species as Alternative A. No lands would be allocated to Zone 5 (Industrial), which would benefit the species by providing additional habitat for protected species in the area.

Aquatic Animals
Under Alternative B, most parcels located near known occurrences of listed aquatic species would be allocated to Zone 3 (Sensitive Resource Management) on the Hiwassee Reservoir. A sicklefin redhorse record has been documented near Parcel 69. The back-lying property to this parcel is USFS land. The parcel would be allocated to Zone 4 (Natural Resource Conservation). Although not as potentially protective as Zone 3, the Zone 4 allocation would afford aquatic species near this parcel an extra degree of protection. With the implementation of these Zone 3 and Zone 4 allocations, along with environmental review of proposed activities on TVA lands and the use of BMPs, no impacts to listed species in Hiwassee Reservoir would occur from the adoption of Alternative B.

Alternative C

Plants
Under Alternative C, the proposed recreational development of Parcels 34 and 49 would not affect listed plants. The state-listed plants found on Parcel 4 would be in a parcel with a Zone 4 (Natural Resource Conservation) status, which is consistent with the current land use. Any future proposal for development would be subject to further environmental review and necessary mitigation to protect the plant resources prior to TVA approval for the use of these parcels.

Terrestrial Animals
The adoption of Alternative C would not result in any potential impacts to federally or state-listed terrestrial animals or their habitat. Under Alternative C, Parcel 34 and 49 would be changed from Zone 4 to Zone 6 (Developed Recreation). Parcels 34 and 49 have limited value for listed animals given the amount of disturbance in the surrounding urban landscape. No state-listed species inhabit Parcels 34 and 49. Additional parcels that have potential habitat for state-listed or uncommon species would be allocated to Zone 2 (Project Operations), Zone 3 (Sensitive Resource Management), or Zone 4 (Natural Resource Conservation). Under these allocations, no adverse impacts to these species are expected.

Aquatic Animals
Under Alternative C, Parcels 34 and 49 on Hiwassee Reservoir would be allocated to Zone 6 (Developed Recreation). The proposed facilities are designed for low-impact recreational activities (stream access for wade fishing and an extension of a river walk trail) and together only total 4.0 acres. With proper implementation of BMPs during construction, and in consideration of the extremely small amount of acreage involved in the overall total being assessed, these allocations would not affect listed aquatic species located in the vicinity.

Alternative D

Plants

Under Alternative D, Parcel 4 on Hiwassee would be allocated to Zone 4 (Natural Resource Conservation). Such an allocation would afford protection to the state-listed plant species that inhabits this parcel. Any proposed actions by TVA or other parties on this parcel would be subject to additional environmental review to determine potential environmental effects, including effects to listed species, prior to approval of such actions. Thus, adverse effects to listed plants under Alternative D are not expected.

Terrestrial Animals

The 1.6-acre Parcel 49 would be allocated to Zone 6 under Alternative D. No state-listed terrestrial animals are known to inhabit this parcel. As with Alternative C, those parcels that have potential habitat for state-listed animals or otherwise uncommon species would be allocated to Zones 2, 3, or 4. Adoption of Alternative D would not result in any potential impacts to federally or state-listed terrestrial animals or their habitats.

Aquatic Animals

For the same reasons described above in the discussions of the potential effects under Alternatives B and C, no adverse effects to listed aquatic species on Hiwassee Reservoir are anticipated under Alternative D.

3.3.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.3.5.1 Affected Environment

Estimates of wetland acreage based on NWI data for all of Hiwassee Reservoir are shown in Table 3-5. NWI imagery indicates 23 acres of aquatic beds and flats, which are both periodically flooded and unvegetated. These areas are mud flats, aquatic/submerged plant beds, or beaches/bars depending on season, weather patterns, and reservoir water levels. The remaining wetland acreage is emergent, scrub-shrub, and forested wetlands. Scrub-shrub wetlands are the most common type of wetlands found on Hiwassee Reservoir.

Due to the steep shorelines and topography on many tracts, reservoir fringe wetlands are limited on Hiwassee Reservoir. Wetlands in general are confined to the backs of coves along the reservoir and grade back into scrub-shrub wetlands. Emergent wetlands are generally less than 0.1 acre in size and are composed of species such as jewelweed, soft rush, hypericum, water willow, and smartweed. Wetland shrub and tree species common on this reservoir include black willow, buttonbush, rose mallow, and tag alder. In addition, persimmon is common along the shoreline along with American sycamore, river birch, and silver maple.

Hillside and bluff seeps were found in three locations along the banks of Hiwassee Reservoir on Parcel 4. These small, high-quality (Category 3) wetlands are classified as Montane Low-Elevation Seeps by NatureServe (2007) and are ranked as a globally rare (G2) plant community. The vegetation in these areas is described in Section 3.3.3.1. Wetlands of this type are listed as habitats of special concern in the *North Carolina Wildlife Action Plan* (North Carolina Wildlife Resources Commission 2007).

A diverse, high-quality (Category 3) emergent/scrub-shrub wetland has developed in the quarry on Parcel 2. These wetland habitats have developed in the low-lying, poorly drained areas created by quarry and excavation activities. Parcel 10 contains a high-quality emergent/scrub-shrub wetland associated with Bear Pen Creek. This parcel contains broad floodplain areas, mud flats, and an important mix of relatively uncommon wetland habitats.

There are no wetlands on Parcel 34 or on Parcel 49.

3.3.5.2 Environmental Consequences

The impacts of the adoption of the various alternatives on wetlands would be similar, and none of these effects would be adverse. Under Alternatives A and B, parcels on Hiwassee Reservoir containing wetlands would generally continue to be managed as they have been in the past, and actions with the potential to affect wetlands would be assessed prior to their implementation. Under Alternative C, two additional parcels would be allocated to development-oriented uses. Similarly, under Alternative D, one parcel (Parcel 49) would be allocated to Zone 6 for possible future recreational use. Due to the nature of the proposed developments, any impacts to wetlands would be insignificant. Additionally, these proposed developments would be subject to further environmental review and the imposition of any necessary mitigative measures prior to implementation.

3.3.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.3.6.1 Affected Environment

The affected area extends from the lower limit of the dam reservation at about HRM 75.0 upstream to about HRM 97.8 in Hiwassee Reservoir. The 100- and 500-year flood elevations for the Hiwassee River downstream of the dam have not been determined.

There are three main watercourses in Hiwassee Reservoir: the Hiwassee River, the Valley River, and the Nottely River. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

The 100-year flood elevations for the Hiwassee River vary from 1,529.0 feet msl at Hiwassee Dam (HRM 75.8) to elevation 1,535.3 feet msl at the upper end of TVA's landrights at about HRM 97.8. The 500-year flood elevations for the Hiwassee River vary from elevation 1,530.0 feet msl at Hiwassee Dam to elevation 1,536.3 feet msl at the upper end of TVA's landrights.

The 100-year flood elevations for the Valley River vary from 1,529.0 feet msl at the mouth (HRM 95.74) to elevation 1,543.9 feet msl at the upper end of TVA's landrights at about HRM 2.2. The 500-year flood elevations for the Valley River vary from elevation 1,530.0 feet msl at the mouth to elevation 1,546.0 feet msl at the upper end of TVA's landrights.

The 100-year flood elevations for the Nottely River vary from 1,529.0 feet msl at the mouth (HRM 91.81) to elevation 1,534.3 feet msl at the upper end of TVA's landrights at about HRM 6.5. The 500-year flood elevations for the Nottely River vary from 1,530.0 feet msl at the mouth to elevation 1,536.1 feet msl at the upper end of TVA's landrights.

3.3.6.2 Environmental Consequences

The potential consequences of implementing each alternative with respect to floodplains are discussed in Section 3.1.6. The boat ramp development on Parcel 34 of Hiwassee Reservoir would have minor and insignificant impacts to floodplains. Regardless of the alternative selected, there would be no adverse effects on floodplains.

3.3.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.3.7.1 Archaeological Resources

3.3.7.1.1 Affected Environment

Hiwassee Reservoir was the focus of a large-scale survey in the fall and winter of 1993 and 1994 (Riggs and Kimball 1996). This survey examined approximately 3,390 acres exposed during a maintenance drawdown and 777 acres of above-pool properties on the dam reservation and reservoir. Altogether, 255 archaeological resources were identified or revisited with 155 considered probably or potentially eligible for listing in the NRHP. Additional portions of Hiwassee Reservoir were surveyed in the winter of 2005-2006 (Gage and Herrmann 2006). Seventeen sites were recorded or revisited, and 13 of these were considered potentially eligible for listing in the NRHP.

Additional surveys have been conducted on the Hiwassee River (Abbott 1994; Thomas et al. 2006) and the Valley River in association with NCDOT and TVA projects. The survey of 14 tracts on both rivers near Murphy, North Carolina, identified nine archaeological sites, eight of which are considered potentially eligible for listing in the NRHP.

Parcel 49 was systematically surveyed for archaeological resources in 2006 (Thomas et al. 2006). Recorded archaeological resources exist within the vicinity of this parcel. Although no archaeological sites were recorded within this parcel, the survey did not include deep testing for deeply buried archaeological resources. Parcel 34 has not been systematically surveyed for archaeological resources. Recorded archaeological resources exist in the vicinity and are likely to exist within this parcel.

3.3.7.1.2 Environmental Consequences

As described in Section 3.1.7.1.2, TVA proposes to implement a PA in North Carolina for the identification, evaluation, and treatment of all historic properties potentially affected by this land planning effort. Until the PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties, including archaeological resources, as required by Section 106 of the NHPA. TVA would adhere to the terms of the PA under all alternatives; thus, no adverse impacts on archaeological resources are expected.

The development of recreation facilities on Parcels 34 and 49 under Alternative C may adversely affect significant archaeological resources through ground-disturbing activities. Under Alternative D, Parcel 49 would likely be used for recreational purposes. Adverse effects may be averted through avoidance and/or protection of archaeological resources. Where adverse effects cannot be avoided, mitigation through archaeological excavations or other means would be required. Treatment plans resolving these adverse effects would comply with the NHPA and ARPA.

3.3.7.2 Historic Structures

3.3.7.2.1 Affected Environment

Hiwassee Dam is the second tributary storage dam constructed by TVA and is similar in arrangement and appearance to Norris Dam. Historic properties located on or adjacent to Hiwassee Reservoir lands include the dam, the powerhouse, and Hunter's Ferry Crossing, a ferry used during the Trail of Tears removal. A former Louisville and Nashville Railroad (L&N) bridge is located on Parcel 49, and the L&N depot is on adjacent lands. The L&N depot is now a Trail of Tears interpretive center. Concrete remnants of historic World War II structures (Torpedo Testing Facility), part of a secret operation for testing depth charges and missiles that began in 1942 and continued through the Cold War, are eligible for listing in the NRHP.

3.3.7.2.2 Environmental Consequences

Under all alternatives, TVA would implement a PA with the North Carolina SHPO as described above in Section 3.1.7.1.2. This PA would include historic structures. With the implementation of these PAs, no adverse effects on historic structures are anticipated. Until the PAs are implemented, TVA would individually evaluate actions with the potential to affect historic structures as required by Section 106 of the NHPA.

Alternative A

Under Alternative A, activities on parcels allocated for development could potentially change the visual character of the surrounding area. Thus, these activities could have a potential to impact adjacent historic structures. Thus, potential effects, especially indirect, visual effects, are possible under Alternative A. However, because these potential effects would be identified, along with possible mitigation measures prior to implementation of any proposal, and because TVA would reserve the option to refuse any land use request that would have unavoidable adverse effects, potential effects to historic structures are expected to be insignificant if Alternative A were adopted and implemented.

Alternative B

Under Alternative B, the allocations reflect existing land use, and there are no proposed land use changes for any parcel on Hiwassee Reservoir. Parcels 21, 26, and 40 have been allocated to Zone 3 (Sensitive Resource Management) for protection of historic and archaeological resources. Therefore, no significant impacts to historic structures are anticipated under Alternative B.

Alternatives C and D

Under Alternative C or D, the potential effects to historic structures would be similar to those described for Alternative A. However, proposed actions could affect the former L&N bridge on Parcel 49 and the L&N depot on adjacent lands. For reasons stated under Alternative A, these effects are expected to be insignificant.

3.3.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.3.8.1 Affected Environment

There are six managed areas located within 3 miles of Hiwassee Reservoir as listed in Table 3-26. The areas are grouped by closest distance to the reservoir; areas on TVA

lands that are managed by TVA (i.e., Raven Rock) and those managed by other entities through a letter of agreement or land use agreement with TVA are listed as "on reservoir." Areas abutting or less than 0.1 mile from reservoir lands are listed as "adjacent."

Table 3-26. Managed Areas and Ecologically Significant Sites Within 3 Miles of Hiwassee Reservoir

Name	Managing Authority	Location County, State	Closest Distance to Reservoir
Raven Rock TVA Small Wild Area	TVA	Cherokee, N.C.	On reservoir
Nantahala National Forest	USFS	Cherokee, N.C.	Adjacent
Nantahala State Game Land	State	Cherokee, N.C.	Adjacent
Cherokee Indian Reservation (Henson Donation)	Federal	Cherokee, N.C.	Adjacent
Cherokee Indian Reservation (Tract No. 7)	Federal	Cherokee, N.C.	0.3 mile east
Cherokee Indian Reservation (Tract No. 2)	Federal	Cherokee, N.C.	0.8 mile east

No ecologically significant sites or NRI streams are within 3 miles of Hiwassee Reservoir.

3.3.8.2 Environmental Consequences

Adoption of Alternative A or B would not likely change the existing land uses of Hiwassee Reservoir lands and would not affect managed areas or ecologically significant sites. Neither of the parcels (34 and 49) proposed to be allocated to Zone 6 (Developed Recreation) under Alternative C is suitable for natural area designation, and neither is near an existing natural area or ecologically significant site. Thus, the implementation of Alternative C or Alternative D would not affect managed areas or ecologically significant sites.

3.3.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.3.9.1 Affected Environment

The visual landscape surrounding Hiwassee Reservoir has a predominantly natural, undisturbed appearance. Extensive tree-covered ridges frame the reservoir and provide a naturally appearing landscape that is scenic and relatively harmonious. Among the scenic resources of Hiwassee Reservoir, the water body itself is the most distinct and outstanding aesthetic feature. The horizontal surface provides visual balance and contrast to the islands and wooded hillsides. Middleground views across the water provide a tranquil sense of place to most observers.

Most of Hiwassee Reservoir is surrounded by relatively undisturbed USFS and Cherokee Indian land. Scenic values vary from excellent to good, and scenic integrity is high. In areas of moderate development, residences, roads, marinas, and boat-launching ramps are scattered around the shoreline. These facilities create a strong adverse contrast with the natural landscape character. Scenic attractiveness of these moderately developed areas is common, and scenic integrity is moderate to low.

3.3.9.2 Environmental Consequences

Alternative A
The environmental consequences of adopting Alternative A are discussed in Section 3.1.9.2.

Alternative B
Under Alternative B, no land would be allocated for Industrial use. This is 80.5 acres less than the industrial allocation under Alternative A. However, Alternative B calls for allocating 366.4 acres to Zone 2 (Project Operations), the same amount as under Alternative A. Depending upon proposed future use of Zone 2 land, commitments or mitigation may be recommended on a case-by-case basis to avoid or reduce potential visual impacts.

Alternative B calls for the allocation of 114.7 acres to Zone 3 (Sensitive Resource Management). There is currently no acreage allocated for sensitive resource management activities under Alternative A. Additionally, Natural Resource Conservation lands would be reduced from 471.2 acres under Alternative A to approximately 443 acres with Alternative B, resulting in a loss of 28.4 acres of lands currently managed for Natural Resource Conservation.

The allocation of approximately 41 acres to Zone 6 (Developed Recreation) land and 42.9 acres to Zone 7 (Shoreline Access) represents existing land use and would not be a change from Alternative A. However, the use could potentially have long-term minor cumulative impacts. New structures, such as covered boat slips, could potentially reduce scenic class when these structures are viewed from the water. Requests for such actions on Zone 7 lands are subject to TVA approval under Section 26a of the *TVA Act*. If and when such requests are received, TVA will adhere to the SMP and may require necessary commitments to protect visual resources. With these measures in place, any adverse effects to visual quality and character under Alternative A are expected to be minor and insignificant.

Implementation of Alternative B would result in minor adverse impacts to visual resources and potentially greater benefits than Alternative A. Scenic class level likely would not be reduced by more than one level, the threshold of significance. Implementation of Alternative B would help preserve the scenic landscape character of Hiwassee Reservoir for long-term public enjoyment.

Alternatives C and D
Under Alternative C, visual impacts would be similar to those described in Alternative B. Relative to Alternative B, allocation under Alternative C would involve the placement of two more parcels totaling 4.0 acres to Zone 6 (Developed Recreation) with a corresponding decrease in acreage allocated to Zone 4 (Natural Resource Conservation). Under Alternative D, only Parcel 49 would be allocated for recreation. The developments proposed for the two Zone 6 tracts are unlikely to cause adverse visual impacts. Thus, the overall impacts to visual resources from implementation of Alternative C or D would be minor.

3.3.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.3.10.1 Affected Environment

Hiwassee Reservoir is the largest reservoir in the upper Hiwassee River watershed. Between 1990 and 2005, the average annual discharge was 2,377 cfs, resulting in an average retention time of about 90 days. Because of the long retention time, Hiwassee Reservoir becomes thermally stratified in the summer. This causes low DO concentrations in the lower strata of the water column, as DO is depleted by the natural process of decaying organic material.

Hiwassee Reservoir is located in the Blue Ridge Physiographic Province. Due to the geologic characteristics of the region, streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Consequently, the reservoir has low productivity (i.e., low chlorophyll concentrations). Hiwassee Reservoir is fed by releases from TVA's Nottely and Chatuge dams in addition to unregulated inflows from the 565-square-mile local drainage area. Discharges from Chatuge and Nottely Dams account for about 35 percent of the total flow into the reservoir. Land use in the watershed remains largely forested, with the Nantahala National Forest in North Carolina and Chattahoochee National Forest in Georgia making up a large percent of the forested lands (NCDENR 2007a).

Reservoir Ecological Health Rating

Figure 3-3 shows the reservoir ecological health scores for Hiwassee Reservoir from 1994 through 2006. Areas sampled on Hiwassee Reservoir include the forebay at HRM 67.0 and the midreservoir at HRM 85.0.

The overall ecological health condition for Hiwassee Reservoir rated "good" for the first time in 2006, but scored only one point above the "fair" category (see Table 3-27). The reservoir rated "fair" in all previous years monitored. The most notable improvement in 2006 was the benthic macroinvertebrate indicator, which received the highest score to date at both locations, rating "fair" as compared to "poor" and "low fair" in previous years.

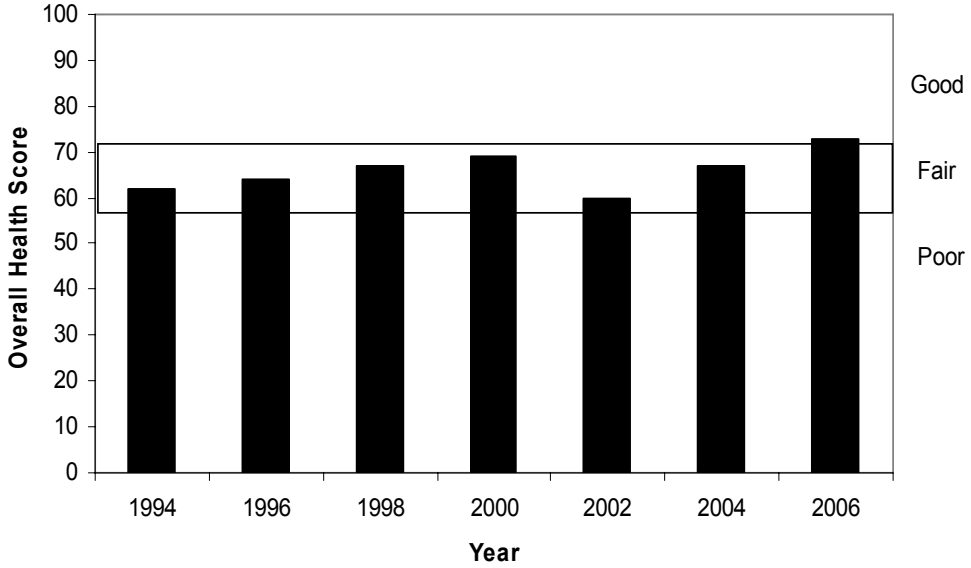

Figure 3-3. Hiwassee Reservoir Ecological HealthRatings, 1994-2006

Table 3-27. Hiwassee Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data 1991-2006

Characteristic	Monitoring Year									
	1991	1992	1993	1994	1996	1998	2000	2002	2004	2006
Hiwassee Forebay										
Dissolved Oxygen	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Fair	Poor
Chlorophyll	Good	Good	Good	Poor	Fair	Good	Fair	Poor	Poor	Fair
Sediment	NS	NS	Fair	Good	Good	Fair	Good	Good	Good	Good
Hiwassee Midreservoir										
Dissolved Oxygen	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Good	Good
Chlorophyll	Good	Good	Good	Fair	Fair	Poor	Poor	Poor	Poor	Poor
Sediment	NS	NS	Fair	Good	Good	Fair	Good	Good	Good	Good

NS = Not sampled

Dissolved Oxygen

DO in the forebay rated “poor” or “low fair” each year. Although low DO (less than two mg/L) water has encompassed a relatively small percentage of the water column each year, a large percentage of the reservoir bottom is often exposed to low concentrations, resulting in the “poor” and “low fair” ratings. The midreservoir site has experienced only limited concentrations of low DO, rating “high fair” prior to 2000 and “good” thereafter.

Often, deep tributary reservoirs, such as Hiwassee, stratify into temperature-distinct layers in the summer. As a result, water discharged from the base of the dam into the tailwater can be very cold and have low DO, impairing water quality in the tailwater. As part of the LIP, TVA mitigates this on Hiwassee Reservoir by using two methods. Perforated hoses are suspended above the reservoir bottom to inject oxygen into the water before it is pulled into the turbines. Oxygen is then introduced again into the water by the agitation of the turbine before leaving the turbine by turbine venting, resulting in improved water quality.

Chlorophyll

Average chlorophyll concentrations have exhibited a fairly consistent increase at the midreservoir site since monitoring began in 1991, rating “good” the first three years monitored, “fair” in 1994 and 1996, and “poor” since 1998. Chlorophyll has been more variable at the forebay, but there remains an overall trend of increasing concentrations. Chlorophyll at the forebay rated “good” the first three years monitored and “poor” or “fair” since 1994 with the exception of a “good” rating in 1998.

Sediment Quality

Sediment quality at both locations is usually “good.” However, very low levels of chlordane were detected in 1993 and 1998 at both reservoir locations; no other metals or contaminants have recorded concentrations above background levels.

Benthic Monitoring

As shown in Table 3-28, all benthic community scores rated “poor” to “fair” for the seven years during which benthic samples were taken. The reservoirs most recent score was “fair” in 2006.

Table 3-28. Recent (1994-2006) Biennial Benthic Community Ratings for Hiwassee Reservoir

Station	Year						
	1994	1996	1998	2000	2002	2004	2006
Forebay	Poor	Poor	Poor	Poor	Poor	Fair	Fair
Midreservoir	Poor	Poor	Poor	Poor	Poor	Poor	Fair

Fisheries Monitoring

The RVSMP has included fish sampling every other year on the Hiwassee Reservoir from 1994. A list of fish species commonly found in Hiwassee Reservoir can be found in Appendix K. The fish community in Hiwassee Reservoir has consistently rated "good" for both the forebay and midreservoir sampling sites.

Hiwassee Reservoir provides opportunities for sport anglers, particularly those interested in basses and walleye. In 2006, Hiwassee Reservoir rated below average for largemouth bass and above average for smallmouth bass, spotted bass, and walleye (Table 3-29).

Table 3-29. Sport Fishing Index Scores for Selected Sport Fish Species in Hiwassee Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	36	36
Largemouth Bass	26	33
Smallmouth Bass	40	30
Spotted Bass	36	31
Walleye	48	33

Swimming Advisories

There are no state advisories against swimming in Hiwassee Reservoir. TVA performed *E. coli* bacteria monitoring at two locations in 2007: Hanging Dog Recreation Area beach and Shallowford Bridge canoe access site/Sweetwater Park.

Fish Consumption Advisories

The State of North Carolina has issued a statewide fish consumption advisory for largemouth bass because of mercury contamination. TVA collected channel catfish and largemouth bass from the reservoir for tissue analysis in autumn 2004. The results, which were similar to those of previous years, were provided to state agencies in North Carolina.

State(s) Impaired Waters

The North Carolina Division of Water Quality and the Georgia Environmental Protection Division assigned use support ratings to waters in the Hiwassee River basin. A total of 39.4 miles of monitored streams are listed as impaired (Table 3-30) (NCDENR 2007a and GAEPD 2006).

Table 3-30. Impaired Waters in the Immediate Watershed of Hiwassee Reservoir

Stream/River Name	State	Miles	Description	Water Quality Stressor/Source
Martins Creek	N.C.	8.8	From source to Hiwassee River	Habitat degradation/ agriculture
Persimmon Creek	N.C.	5.9	From source to Lake Cherokee	Habitat degradation/ unknown
Valley River	N.C.	7.7	From Venegeance Creek near Marble to Marble Creek above Murphy	Turbidity/multiple sources
Brasstown Creek	Ga.	11	Little Bald Cove to state line	Fecal coliform/ nonpoint
Corn Creek	Ga.	2	Tributary to Brasstown Creek, Young Harris	Fecal coliform/nonpoint
Mill Creek	Ga.	2	Pheasant Branch tributary to Hiwassee River	Fecal coliform, pH/nonpoint
Yewell Branch	Ga.	2	Darr Cove to Brasstown Creek	Fecal coliform/nonpoint

There are two major permitted NPDES discharges in the immediate watershed: Andrews WWTP discharges up to 1.5 MGD to the Valley River, and the Murphy WWTP discharges up to 0.925 MGD to the Hiwassee River. Minor permitted NPDES discharges include Hayesville WWTP and Andrews WWTP.

Water Supply

No municipal water suppliers currently withdraw water from Hiwassee Reservoir. The towns of Murphy, North Carolina, and Andrews, North Carolina, currently have water intakes in Hiwassee Reservoir's supporting watershed. The 2005 average daily water demands for these intakes were 0.92 MGD (Murphy) and 0.6 MGD (Andrews), a total daily average demand of 1.52 MGD.

3.3.10.2 Environmental Consequences

Alternative A

Under Alternative A, 471.2 acres out of the 1,007.4 acres managed by TVA on Hiwassee Reservoir are allocated to Natural Resource Conservation, which affords a certain degree of protection to water quality and aquatic life through more restrictions on development and increased protection of riparian vegetation. Under Alternative A, 0.4 acre is allocated to Shoreline Access, and 38.9 acres are allocated for Recreation. No parcels are allocated to Sensitive Resource Management, the most protective land allocation designation. Twenty parcels (approximately 50 acres) would remain unplanned. However, all but one parcel are committed to their existing use, which for the most part is fronting USFS lands.

Current allocations under Alternative A include 80.5 acres on two parcels allocated for Industrial use, which have never been developed. Industrial development has a greater potential to adversely affect water quality and aquatic life than other allocations. Industrial development of Parcels 35 and 36 would require extensive land clearing and grading on the steep terrain. Industrial development would also result in the potential for extensive impervious surfaces and possible point source pollution to the Hiwassee River. New facilities with permitted discharges would be required to meet permit limits specifically designed to prevent adverse impacts and violation of applicable water quality criteria.

Potential water quality and associated aquatic life impacts, such as erosion and nutrient runoff, are expected to be higher from parcels designated for Industrial, Developed Recreation, or Shoreline Access use where more development and intensive land use might occur. However, the extent of any potential impacts would depend on the specifics of future development, and any proposed actions on TVA land would be subject to environmental review. With use of identified impact reduction methods including BMPs (TVA 2005b), future activities under Alternative A would not significantly affect water quality or aquatic life.

Alternative B
Under Alternative B, all of Hiwassee Reservoir's 1,007 acres would be allocated, including the 20 parcels not allocated under Alternative A. Nineteen of the previously unplanned parcels are committed to existing uses, which determined their allocation for this alternative. One small (less than 1 acre) uncommitted parcel was allocated based on existing land use that was consistent with Zone 4 (Natural Resource Conservation). Alternative B does not include any allocations that are inconsistent with the actual current land use, and no lands would be available for Industrial use. Overall, resultant water quality conditions and, in turn, potential impacts to aquatic life under Alternative B would be insignificant.

Alternative C
As with Alternative B, no parcels would be planned for industrial use under Alternative C on Hiwassee Reservoir. All but two parcels would be allocated the same as under Alternative B. Parcels 34 and 49, a total of 4.0 acres, would be allocated to Zone 6 (Developed Recreation) instead of Zone 4 (Natural Resource Conservation). The proposed access site for wade fishing (Parcel 34) and extension of the Heritage Riverwalk Trail (Parcel 49) are not anticipated to impact water quality and aquatic life.

Alternative D
Under Alternative D, only one parcel (Parcel 49) would be allocated for more developed uses. Use of Parcel 49 for recreational purposes would not affect water quality or aquatic life. Any other potential effects from the adoption of Alternative D would be essentially the same as those expected under Alternative B.

3.3.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Noise has previously been discussed in Section 3.1.11.2.

3.3.11.1 Affected Environment

The county that contains Hiwassee Reservoir and the adjacent counties are currently in attainment of the NAAQS.

The nearest PSD Class I areas are the GSMNP, which is located about 30 miles northeast, Joyce Kilmer/Slickrock Wilderness, which is located about 15 miles northeast, and Cohutta Wilderness, which is located about 30 miles west of Hiwassee Reservoir.

3.3.11.2 Environmental Consequences

Under Alternative C, the changes from Alternatives A and B include the allocation of two parcels totaling 4.0 acres to Zone 6 (Developed Recreation) instead of Zone 4 (Natural

Resource Conservation). The types of development proposed for these two parcels are not expected to result in any significant effects to air quality.

Among the four alternatives, adoption of Alternative B would have the least potential for affecting air quality because it involves the least amount of acreage allocated for development. Alternatives C and D call for 4.0 acres and 1.6 acres, respectively, to be allocated for recreation. Implementation of Alternative A would likely have the greatest potential to impact air quality, with 80.5 acres allocated for Industrial use.

The greatest potential for air quality effects is from industrial use. No parcels would be available for industrial use under Alternative B, C, or D. Under Alternative A, an appropriate level of environmental review would be done to document the extent of expected air quality impacts if a proposed land use request is received. Each such review that involved a parcel in or potentially affecting a nonattainment area for ozone and/or $PM_{2.5}$ would require a conformity applicability determination pursuant to regulations implementing Section 176(c) of the *Clean Air Act* to assure compatibility with measures in local plans for achieving attainment. Because of the small amount of acreage involved and because of regulatory controls, industrial development under Alternative A is not expected to result in any significant effects to air quality.

3.3.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.3.12.1 Affected Environment

3.3.12.1.1 Population and Economy

Population: Tables 3-31 and 3-32 describe the population of the area. Cherokee County had a population of 24,298 in 2000, an increase of 28.3 percent since 1980. This was a lower rate than was in the state but higher than was in the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990.

Estimates for 2006 indicate that the population of Cherokee County has grown an additional 8.3 percent since 2000. This remains a faster rate than the nation but is not quite as fast as in the state as a whole.

Projections through 2020 indicate that the county will continue to have faster population growth than the nation over that time but not as fast as population growth in the state. The rate for the county is projected to be greater than for 1980-2000.

Table 3-31. Population – Cherokee County, North Carolina

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Cherokee County	18,933	20,170	24,298	26,309	31,702	53.4
North Carolina	5,880,095	6,628,637	8,049,313	8,856,505	10,885,758	165.2
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e) and North Carolina Office of State Budget and Management (2007)

Table 3-32. Recent and Projected Population Changes – Cherokee County, North Carolina (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Cherokee County	6.5	20.5	28.3	8.3	30.5	67.4
North Carolina	12.7	21.4	36.9	10.0	35.2	85.1
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-31

The county is decidedly rural in distribution of population. As noted in Table 3-31, the population density is substantially lower than the state and much lower than the nation. The largest town in the county is Andrews, with 1,602 residents in 2000. About 87 percent of the population in the county resides outside incorporated towns.

Economy: Table 3-33 contains the most recent annual data on the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Cherokee County had 13,422 people employed on average. The county has a higher percentage of farmers, manufacturing employees, and retail employees than either the state or the nation. The county has a lower percentage of government employees and employees in the general "other" category than the state or nation. The average unemployment rate for 2006 in the county was higher than either the state or the nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

Table 3-33. Employment, Unemployment, and Income – Cherokee County, North Carolina

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Cherokee County	13,422	2.2	12.2	17.9	12.1	55.5	5.4	21,814
North Carolina	5,119,512	1.4	11.5	10.8	15.7	60.5	4.8	31,041
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated) and North Carolina Employment Security Commission (undated)

Cherokee County is geographically in the center of a bowl defined by the surrounding counties. Therefore, it has historically been a regional trade center with a more balanced economy than the surrounding counties. As with all the counties in the region, the increasing land values due to the demand for vacation homes is making it more difficult for local residents to find affordable housing (Ginny Faust, North Carolina Department of Community Affairs, personal communication, November 13, 2007; Melody Adams, Graham County, personal communication, November 9, 2007).

3.3.12.1.2 Environmental Justice

Environmental justice is concerned with the possibility of disproportionate impacts to minority and low-income populations. The minority population in the Hiwassee Reservoir area is small (see Table 3-34). In Cherokee County, 6.4 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 32.1 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 15.1 percent, higher than the state rate of 13.8 percent and the national rate of 12.7 percent.

Table 3-34. Minority Population, 2006, and Poverty, 2004 – Cherokee County, North Carolina

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Cherokee County	26,309	1,310	366	6.4	15.1
North Carolina	8,856,505	2,298,351	543,059	32.1	13.8
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

3.3.12.2 Environmental Consequences

Alternative A

Under Alternative A, there is no change in existing land use for any of the planned parcels on Hiwassee Reservoir and therefore no socioeconomic impacts. Parcels 35 and 36 (80.5 acres) are allocated under the Forecast System for Industrial use but remain undeveloped primarily because the steep terrain is unsuitable for industrial development. The eventual industrial use of these two parcels is unlikely to be feasible under Alternative A.

Alternative B

Under Alternative B, existing uses of Hiwassee Reservoir parcels would continue, and there would be no socioeconomic impacts. Under Alternative B, no TVA land on Hiwassee would be available for industrial use. This could result in some potential loss of economic development opportunities, with the associated socioeconomic impacts, although, as noted in Alternative A, such development in the future is unlikely.

Alternatives C and D

Under Alternative C, two parcels totaling 4.0 acres would be allocated for recreational use. Under Alternative D, only Parcel 49 (1.6 acres) would be so allocated. Allocation of either parcel for recreational use would enhance the attractiveness of the area, thus possibly indirectly contributing to further population and economic growth. The change of these parcels to a walking trail and stream access for wade fishing would enhance the availability of parks in the area to those with low income. As under Alternative B, land would no longer be available for industrial use under Alternative C or D. This could result in some potential loss of economic development opportunities, with the associated socioeconomic impacts. However, as noted under Alternative A, such development in the future is unlikely.

The potential negative economic effect noted above of increased land prices due to all of the alternatives is expected to be too small to have any especially pronounced impact on low-income or minority populations in the area.

3.4 Blue Ridge Reservoir

3.4.1 Land Use

An overview of land use for the mountain reservoirs region is provided in Section 3.1.1.

3.4.1.1 Affected Environment

On Blue Ridge Reservoir, TVA initially purchased 6,495 acres of land from Toccoa Electric Power Company, a subsidiary of TEPCO (see Table 1-1). Of the originally purchased acreage, TVA has sold about 106 acres (1.6 percent). Most of these sale tracts now contain residential developments, although some support recreation uses. In 1940, TVA transferred about 5,919 acres (91 percent) to the USFS. In 1994, the USFS reconveyed 18 small, narrow parcels to TVA. At the time of the reconveyance, many of these parcels were encumbered with shoreline facilities permitted under special use permits granted by the USFS. These special use permits authorized the improvements and allowed those parties whose lots adjoined the 1,700-foot contour access to and use of the public shoreland for permitted private water use facilities (i.e., docks) and other minor improvements. Although these parcels do not have deeded or implied rights for shoreline access, TVA considers permitting docks at these locations based on the historical encumbrances and has allocated these parcels for Shoreline Access under all the alternatives in the MRLMP.

The TVA-retained land on Blue Ridge Reservoir consists of 469.5 acres divided into 42 parcels. The majority of these parcels (38) are committed to existing land uses (see Table 2-2). The dam reservation and other land supporting TVA project operations account for 293 acres (62 percent of TVA Blue Ridge Reservoir lands). Fourteen parcels front land that TVA transferred to the USFS for operation of the National Forest System. Thirteen parcels are committed to residential access by deeded rights or previous policy. Two are committed to recreational uses by land use agreements including a commercial marina and a county park. Two parcels are committed due to the presence of sensitive resources. A complete list of the committed uses for Blue Ridge Reservoir parcels is provided in Appendix F.

As shown in Table 2-2, four parcels totaling 12.9 acres are considered uncommitted and are being considered for alternative uses in this plan. All of the uncommitted parcels are currently managed for natural resource conservation and dispersed recreation.

TVA owns approximately 79 percent of the total 68 miles of shoreline on Blue Ridge Reservoir (see Table 1-2). The remainder was never owned by TVA, although TVA purchased flowage easements along this private shoreline. Approximately 38 percent of the shoreline is available for residential development (see Table 3-2). TVA estimates that about 71 percent of this shoreline is currently developed with residential subdivisions.

Fannin County, Georgia, is predominantly rural. The town of Morganton lies along the eastern shore of the reservoir near its downstream end, and the town of Blue Ridge lies about 2 miles west of the reservoir, also near the downstream end. McCaysville, Georgia, is the only other incorporated town in the county. About 43 percent of the land in the county is in the Chattahoochee National Forest (USFS 2007a, Quickfacts 2007). In recent years, development has increased on the privately owned land in the county. Land use data for Fannin County (NARSAL 2007b) show that from 1974 to 2005, high-intensity development increased from 51 to 493 acres, and low-intensity development increased from 1,535 to

12,563 acres. About 221,000 acres (approximately 90 percent) of the county remained in forest in 2005. Much of the recent residential development is due to the influx of retirees from out of state. Similarly, easy highway access to the Atlanta area provides commuters and second-homeowners access to and from the area.

One parcel on Blue Ridge Reservoir contains prime farmland. Prime farmland makes up 10.7 acres of the 287.0-acre Parcel 1, which includes the dam reservation.

3.4.1.2 Environmental Consequences

Alternative A
As shown in Table 2-3, under Alternative A, the allocated land uses for the approximately 298 acres that are planned (out of a total of almost 470 acres managed by TVA) would be wholly represented by two allocations. The dam reservation, representing 287 acres (61.1 percent) is allocated to Project Operations. The remaining 10.5 acres (2.2 percent) of land planned in Alternative A are allocated to Recreation. Under Alternative A, the remaining allocation zones are not represented on any parcel of Blue Ridge Reservoir.

Under Alternative A, TVA would not designate land uses for over 172 acres of TVA land on Blue Ridge Reservoir that were not planned with the Forecast System (see Table 2-4). Further, the acreage of the unplanned parcels of TVA land fronting the USFS is unknown and therefore was not included in the Natural Resource Conservation and Recreation allocation acreage totals. Of the 40 unplanned parcels, only four parcels are uncommitted. The acreage for the uncommitted parcels totals 12.9 acres and is all allocated to Natural Resource Conservation. Under Alternative A, these parcels would continue to be managed according to TVA's Land Policy, SMP, and Section 26a regulations.

Under Alternative A, no impacts to prime farmlands are expected because the only prime farmland on any TVA parcels is on the dam reservation, which would continue to be protected.

Alternatives B, C, and D
Under Alternatives B, C, and D, all of Blue Ridge Reservoir's 42 parcels, totaling approximately 470 acres, would be planned, including the 40 parcels not previously planned under Alternative A. Thirty-six of the previously unplanned parcels are committed to existing uses, which would not change under these alternatives. The remaining four uncommitted parcels would be allocated based on existing land use, which is consistent with a Zone 4 (Natural Resource Conservation) allocation. Alternatives B and C do not include any allocations that are inconsistent with the actual current land use.

Under these three alternatives, Zone 3 (Sensitive Resource Management) and Zone 4 allocations would increase from none under Alternative A to 12.2 acres (2.6 percent) and 27.7 acres (5.9 percent), respectively. Land allocated to Zone 6 (Developed Recreation) would increase slightly more than Alternative A to 15 acres (3.2 percent). The previously unplanned acreage of the TVA land fronting the USFS land is unknown and is not included in the Zones 4 and 6 acreage totals. Zone 7 (Shoreline Access) would receive additional allocations totaling about 122 acres (26 percent) primarily due to planning the land the USFS reconveyed to TVA. Allocations to Zone 2 (Project Operations) would increase to slightly more than those under Alternative A, to 293.1 acres (62.4 percent). No land on Blue Ridge Reservoir would be allocated to Zone 5 (Industrial) under Alternative B, C, or D.

Under Alternatives B, C, or D, no impacts to prime farmlands are expected.

3.4.2 Recreation

An overview of the recreation resource for the mountain reservoirs is provided in Section 3.1.2.

3.4.2.1 Affected Environment

Eight TVA parcels on Blue Ridge Reservoir contain developed recreation facilities. TVA does not actively manage any of these parcels. The USFS manages Parcels 15, 37, and 40 in conjunction with management of the Lake Blue Ridge Recreation Area, Morganton Point Recreation Area, and Lakewood Landing Boat Ramp, respectively. Fannin County maintains the roadside picnic area along Old US 76 through a public recreation license agreement with TVA. These developed recreation areas are summarized in Table 3-35.

Table 3-35. Recreation Facilities on or Near Blue Ridge Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Lake Blue Ridge Marina	Fannin, Ga.	Private	Commercial	Private/City**	5, 6		●		●				
Morganton Dry Boat Storage	Fannin, Ga.	Private	Commercial	Private**	N/A								●
Robin's Nest Cottages and Motel	Fannin, Ga.	Private	Commercial	Private**	N/A								●
Blue Ridge Dam Reservation*	Fannin, Ga.	Public	TVA	TVA	1			●		●			
Roadside Park	Fannin, Ga.	Public	Fannin County	TVA	3			●					
Curtis Switch*	Fannin, Ga.	Public	Fannin County	TVA	TOCA-4					●			
Sandy Bottom*	Fannin, Ga.	Public	USFS	USFS	N/A	●				●			
Blue Ridge Recreation Area	Fannin, Ga.	Public	USFS	USFS**	16				●				
Lakewood Landing Ramp	Fannin, Ga.	Public	USFS	USFS**	40				●				
Morganton Point Recreation Area	Fannin, Ga.	Public	USFS	USFS**	37	●		●	●				●

* = Stream access site
** = TVA retained below MSC

There is one campground currently operating on Blue Ridge Reservoir. Morganton Point Recreation Area, located inland of Parcel 37, is operated by the USFS on land transferred to the USFS by TVA. The campground on the Lake Blue Ridge Recreation Area was recently decommissioned by the USFS.

Four recreation areas contain at least one boat ramp. The ramps are located at Morganton Point Recreation Area, Lakewood Landing, and the Lake Blue Ridge Recreation Area and

are operated by the USFS. Lake Blue Ridge Marina operates three ramps: two ramps for typical pool elevations and a deep-water ramp for use during periodic deep drawdown of the reservoir.

Lake Blue Ridge Marina is the only commercial marina on the reservoir. It is located on private property and TVA Parcels 5 and 6, and a portion is located on City of Blue Ridge property.

There are no public fishing piers located on Blue Ridge Reservoir.

Three stream access sites are located near Blue Ridge Reservoir. TVA manages the access site on the Blue Ridge Dam Reservation (Parcel 1). The Curtis Switch Toccoa River site (Parcel TOCA-4) located downstream of Blue Ridge Reservoir at Toccoa River Mile (ToRM) 7.6R is managed by Fannin County. The Shallowford Bridge site (Parcel TOCA-5) on the Upper Toccoa River at ToRM 67.7L is not developed. The USFS manages the Sandy Bottom stream access site located at ToRM 69.3L.

Dispersed Recreation
Dispersed recreation has historically been an important recreation opportunity on Blue Ridge Reservoir but takes place primarily on USFS lands. TVA does not have an inventory of these areas.

3.4.2.2 Environmental Consequences

Alternative A
Under Alternative A, only Parcel 3 (10.5 acres) is allocated for Developed Recreation on Blue Ridge Reservoir. This parcel was allocated under the Forecast System for Public Recreation. In addition, under Alternative A, four unplanned parcels that currently support developed recreation are committed to this use through transfer agreement covenants or TVA licenses, leases, or easements.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use. The unplanned parcels that are committed to developed recreation would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities on these parcels. Under Alternative A, potential environmental impacts would be insignificant since the parcels (both previously allocated and the unplanned parcels) utilized for developed recreation would not change. Any proposed new facilities would be subject to additional NEPA review, and necessary mitigation would be undertaken to compensate for potential adverse effects to recreation.

The existing or intended land use of parcels would not be changed under Alternative A. Therefore, any potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternatives B, C, and D
Under Alternatives B, C, and D, allocations to Zone 6 (Developed Recreation) would comprise a total of 14.6 acres (3.2 percent) of all of the TVA lands on Blue Ridge Reservoir, approximately 4 acres more than would be allocated for Developed Recreation under Alternative A. Five parcels on Blue Ridge Reservoir committed to a developed recreation use would be allocated to Zone 6. These commitments include transfer agreement covenants and TVA licenses, leases, and easements. All of the parcels committed to developed recreation on Blue Ridge Reservoir currently support recreational land use with existing facilities. The parcels allocated to Zone 6 under Alternatives B, C, and D include those previously allocated under Alternative A to Public Recreation, as well as the

unplanned parcels under Alternative A that are currently committed to developed recreation uses.

Under Alternatives B, C, and D, any future demand for recreational needs would have to be met by expansion of recreation facilities in areas allocated for Zone 6. These areas are the same under all alternatives. Because there would be no new parcels allocated for Developed Recreation, the potential environmental impacts would be the same. The potential for impacts from any new facilities within existing areas would be subject to review and potential mitigation under NEPA prior to approval by TVA.

Under Alternatives B, C, and D, there is no proposed change in land use of any parcels. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels. Potential impacts to dispersed recreation of this nature are expected to be insignificant.

3.4.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.4.3.1 Plant Communities

3.4.3.1.1 Affected Environment

The vegetative classes on Blue Ridge Reservoir lands are evergreen-deciduous forest, deciduous forest, and shrublands in the form of forested and emergent wetlands and herbaceous vegetation found along transmission lines, roadway rights-of-way, as well as grassy areas within the dam reservation and commercial recreation sites.

Evergreen-deciduous forest surrounds the reservoir as part of the Chattahoochee National Forest and is composed of an oak-hickory-pine association. Loblolly pine, shortleaf pine, and Virginia pine are present along with basswood, black cherry, hickories, sourwood, and various oak species.

Deciduous forest and shrublands occur mainly as oak-hickory forests and forested wetlands near the reservoir edges that grade into scrub-shrub wetlands. Oak-hickory forests common on dry ridges grade into more mesic slopes dominated by tulip poplar, American beech, white oak, and yellow buckeye.

A high-quality forested wetland located on the dam reservation (Parcel 1) and emergent wetlands on Parcel 25 were identified during field surveys in April 2006. Both areas can be classified as Southern Appalachian Seepage Wetlands and are characterized by the presence of *Sphagnum* moss (NatureServe 2007). In the forested wetland, American beech, trilobed red maple, muscle wood, flame azalea, serviceberry, and spicebush were found in the canopy and shrub layer. The herbaceous layer was rich in wildflowers with arrow arum, cinnamon fern, fly poison, foam flower, galax, Indian cucumber, kidney-leaf grass-of-parnassus, little brown jug, and mountain oxalis. The emergent-shrubland contained scattered small trees and shrubs including buttonbush, river birch, tag alder, and trilobed red maple. Small green rein orchid and southern water plantain were found growing with various rushes and sedges.

Herbaceous vegetation is found along transmission lines and roadway rights-of-way, as well as grassy areas within the dam reservation and at commercial recreation sites. Tall fescue is the dominant grass, with broomsedge and Japanese stiltgrass present.

Invasive species occur on most of the TVA parcels around Blue Ridge Reservoir. Among the species present are Chinese privet, Japanese honeysuckle, Japanese stilt grass, Johnson grass, kudzu, multiflora rose, and sericea lespedeza. All of these species have the potential to adversely affect the native plant communities.

3.4.3.1.2 Environmental Consequences

The uses of Blue Ridge Reservoir lands would be similar under all alternatives, and actions following adoption of any of the alternatives would have minor effects on plant communities. No rare or unique plant communities occur on Blue Ridge Reservoir lands. Regardless of the alternative selected, TVA's ability to manage invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors, including the availability of resources, potential for partnerships, and threat to sensitive resources.

3.4.3.2 Wildlife Communities

3.4.3.2.1 Affected Environment

Blue Ridge Reservoir properties contain evergreen, evergreen-deciduous, deciduous, and early successional habitats similar to those observed on other mountain reservoirs. Wetlands were identified on Parcels 1, 25, and 35 (see Section 3.4.5). Dusky salamander, three-lined salamander, southern two-lined salamander, spring peepers, Fowler's toads, and Cope's gray treefrogs were observed in these wetlands. Other wildlife including pine, blue-winged, and hooded warblers; scarlet tanager; downy woodpecker; blue-headed vireo; Carolina Wren; northern cardinal; and yellow-breasted chat were also observed during field surveys.

Few mud flats exist on Blue Ridge Reservoir. A small mud flat occurs at the mouth of Star Creek at Parcel 35. Portions of this wetland extend onto private land.

3.4.3.2.2 Environmental Consequences

Under all alternatives, the uses of TVA lands on Blue Ridge Reservoir would remain the same as their current uses. The Zone 3 (Sensitive Resource Management) allocations under Alternatives B, C, and D would result in greater recognition of wetland habitats on two parcels, although this would likely have little effect on the management of the wetlands. The potential impacts on wildlife that could occur under all of the alternatives would be similar and insignificant.

3.4.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.4.4.1 Affected Environment

One federally listed species, the small whorled pogonia, is known from Fannin County and seven state-listed species are known from the vicinity of Blue Ridge Reservoir (see Table 3-36). Four of the six populations of the threatened small whorled pogonia are known from Fannin County and are within 5 miles of Blue Ridge Reservoir. This species and its

suitable habitat were not found during surveys of TVA lands on Blue Ridge Reservoir. A small population of pink lady's slipper was found along an access road during a previous field survey, and the plants were relocated in January 2002 to minimize impacts to them from a TVA construction project. No other populations of pink lady's slipper were found within the project area.

Table 3-36. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Blue Ridge Reservoir Area

Common Name	Scientific Name	Federal Status	State Rank	State Status
Plants				
Pink lady's slipper	*Cypripedium acaule*	--	S4	UNUS
Small whorled pogonia	*Isotria medeoloides*	THR	S2	END
Amphibian				
Eastern hellbender	*Cryptobranchus alleghaniensis alleghaniensis*	--	S2	RARE
Fish				
River redhorse*	*Moxostoma carinatum*	--	S2	RARE
Wounded darter	*Etheostoma vulneratum*	--	S2	END
Tangerine darter*	*Percina aurantiaca*	--	S1	THR
Dusky darter*	*Percina sciera*	--	S1	RARE
Olive darter	*Percina squamata*	--	S1	THR

-- = Not applicable
*Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled; S2 = Imperiled; S4 = Widespread, abundant, and apparently secure
Status abbreviations: END = Endangered, RARE = Rare, THR = Threatened, UNUS = Special concern due to commercial exploitation

No federally or state-listed terrestrial animal species have been previously reported from the vicinity of Blue Ridge Reservoir, and none were observed during field investigations in 2006. Six state-listed aquatic species are known to occur near Blue Ridge Reservoir and tailwater (see Table 3-36). However, only three of these species, the river redhorse, tangerine darter, and dusky darter, are known or are likely to occur near TVA lands on Blue Ridge Reservoir. The eastern hellbender occurs in the Toccoa River and its tributaries and likely occurs in the numerous streams flowing into Blue Ridge Reservoir.

The **River redhorse** occurs in swift water of medium to large rivers and rarely enters smaller streams. Records of the river redhorse are found in the tailwater of Blue Ridge Reservoir downstream of Parcel 1.

Tangerine darters occur in clearer portions of large to moderate-sized headwater tributaries of the Tennessee River. This small fish is usually found in deeper riffles and runs with boulders, rubble, and bedrock most of the year but moves into deeper pools in winter (Etnier and Starnes 1993). Most records in the vicinity are found in tributaries of Blue Ridge Reservoir. However, one occurrence has been recorded from the Blue Ridge tailwater near Parcel 1.

The **Dusky darter** is found in larger creeks and rivers where it frequents areas with moderate current, debris-strewn areas, undercut banks, vegetation, and brush. Over-

wintering occurs in deeper waters (ibid). One record of the dusky darter is known near Parcel 35 in Star Creek.

3.4.4.2 Environmental Consequences

Alternative A

Plants
No known populations of listed plants occur on TVA lands on Blue Ridge Reservoir. Therefore, adoption and implementation of this alternative are not expected to adversely impact rare plant populations.

Terrestrial Animals
As mentioned above, no listed terrestrial animal species are known to occur in the area of Blue Ridge Reservoir. Under Alternative A, all planned parcels are allocated for Project Operations or Recreation. These allocations and the actions that would occur on these parcels are not expected to result in adverse impacts to listed terrestrial animals or their habitats.

Aquatic Animals
Occurrences of the river redhorse and tangerine darter, both state-listed, are known downstream of Blue Ridge Dam near Parcel 1. Activities on this parcel could potentially affect these two state-listed species. However, individual actions on Parcel 1 would be subject to environmental review to identify and assess potential impacts on aquatic species. Appropriate mitigation measures, if necessary, would be used to avoid or reduce adverse effects to the darters. Therefore, these species would not be affected by actions resulting from the adoption of Alternative A.

The state-listed dusky darter is known to occur upstream of Parcel 35. Under Alternative A, Parcel 35 would remain unplanned. Prior to taking any future actions on Parcel 35, such proposals would be subject to environmental review to assess potential effects, including impacts to aquatic species. As necessary, appropriate measures would be implemented to mitigate adverse effects. Therefore, the dusky darter would not be affected by actions under Alternative A.

Alternatives B, C, and D

Plants
No known populations of listed plants occur on TVA lands on Blue Ridge Reservoir. Therefore, adoption of any of these action alternatives is not expected to affect listed plants.

Terrestrial Animals
Under Alternatives B, C, and D, 40 previously unplanned parcels would be allocated to appropriate zones. The proposed allocations under these alternatives would result in additional protection of wetland habitats. Some parcels would be allocated to Zone 7 (Shoreline Access). None of the parcels are inhabited by listed terrestrial animals; thus, there would be no impacts on these species.

Aquatic Animals
Under Alternatives B, C, and D, Parcel 1 would remain allocated to Zone 2 (Project Operations). Potential impacts to state-listed species near Parcel 1 under these three alternatives would be the same as those anticipated under Alternative A. Under Alternatives B, C, or D, Parcel 35 would be allocated to Zone 3 (Sensitive Resource

Management). This zone allocation would have beneficial effects to the dusky darter because of its stringent restrictions on land use, which would likely improve water quality.

3.4.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.4.5.1 Affected Environment

Wetlands are very uncommon on Blue Ridge Reservoir parcels. Of the nine reservoirs surveyed for the MRLMP, Blue Ridge Reservoir has the least (only about 5 acres) amount of wetland acreage (see Table 3-5). Although NWI data indicate no scrub-shrub wetlands, very small (less than 0.1 acre) areas of scrub-shrub wetlands were observed during field surveys of Parcels 22 and 23.

Field surveys identified a high-quality forested wetland on the dam reservation (Parcel 1) and an emergent wetland on Parcel 25. Both areas were classified as Southern Appalachian Seepage Wetlands and are characterized by the presence of *Sphagnum* moss (NatureServe 2007). In the forested wetland, American beech, trilobed red maple, muscle wood, flame azalea, serviceberry, and spicebush were found in the canopy and shrub layer. The herbaceous layer included arrow arum, cinnamon fern, fly poison, foam flower, galax, Indian cucumber, kidney-leaf grass-of-parnassus, little brown jug, and mountain oxalis. The emergent/scrub-shrub wetland contained scattered areas of small trees/shrubs of buttonbush, river birch, tag alder, and trilobed red maple. Small green rein orchid and southern water plantain were found growing with various rushes and sedges.

Parcel 1 also contains a high-quality forested wetland associated with a creek immediately downstream of the dam. This wetland contains a diverse mix of wetland habitats and plant communities. Parcel 15 contains an emergent/forested wetland at the back of the cove with a diverse mix of wetland habitat and plant communities.

3.4.5.2 Environmental Consequences

Any potential wetland impacts under the various alternatives would be similar, and none would be adverse. Under all alternatives, parcels containing wetlands would generally continue to be managed as they have been in the past, and actions with the potential to affect wetlands would be subjected to environmental review prior to their implementation. The application of appropriate measures to mitigate adverse effects to wetlands would reduce potential effects to insignificant levels.

3.4.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.4.6.1 Affected Environment

The main watercourse in Blue Ridge Reservoir is the Toccoa River. The 100-year flood elevation for the Toccoa River is 1,691.0 from Blue Ridge Dam (ToRM 53.0) to the upper end of the reservoir at about ToRM 64.0. The 500-year flood elevation for the Toccoa River is also 1,691.0 from the dam to the upper end of the reservoir.

With respect to floodplains, the potentially affected area extends from the lower limit of the dam reservation at about ToRM 52.4 upstream to about ToRM 64 in Blue Ridge Reservoir. The 100-year flood elevations for the Toccoa River downstream of the dam vary from 1,552.8 feet msl at ToRM 52.4 to 1,554.2 feet msl at ToRM 53.0 (downstream of Blue Ridge Dam). The 500-year flood elevations for the Toccoa River downstream of the dam vary from 1,556.9 feet msl at ToRM 52.4 to 1,558.7 feet msl at ToRM 53.0. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

3.4.6.2 Environmental Consequences

The potential environmental consequences under each alternative are discussed in Section 3.1.6. Regardless of the alternative selected, no adverse effects to Blue Ridge Reservoir floodplains are expected.

3.4.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.4.7.1 Archaeological Resources

3.4.7.1.1 Affected Environment

Blue Ridge Reservoir was the focus of a large-scale archaeological survey in fall and winter 1993-1994 (Riggs and Kimball 2005) when the reservoir pool was lowered to 1,615 feet msl for dam maintenance work. Altogether, 85 archaeological sites were investigated during the survey of approximately 2,100 acres of exposed shoreline and lakebed. Of the 85 sites, 47 are considered potentially eligible for listing in the NRHP.

Prior to this survey, an archaeological survey of the Blue Ridge Dam access road was conducted (Ahlman 2002a). A single site was identified and determined not to meet the eligibility criteria for inclusion in the NRHP. A portion of the area surveyed for the proposed access road was also investigated in 1993 during an archaeological reconnaissance of the Blue Ridge Hydro Plant upgrade (Pace 1993). Two sites, including the one reinvestigated during the access road survey (Ahlman 2002a), were identified. Both were determined not to meet the eligibility criteria for inclusion in the NRHP.

Portions of the reservoir were also surveyed during the winter of 2005-2006. Twelve archaeological sites were identified or revisited, eight of which were considered potentially eligible for listing in the NRHP.

In 2001, TVA's Cultural Resources staff conducted a survey of 23 acres for the proposed discharge outlet built during the maintenance of the Blue Ridge Dam penstock (Pritchard 2001). The survey, which was conducted on an area west of Blue Ridge Dam as well as on an associated soil disposal area on Nottely Reservoir near Nottely River Mile (NRM) 23.5, did not identify any archaeological resources.

In 1992, a survey of a proposed river regulation structure, associated roadbed, and a buffer zone along the right bank of the Toccoa River below Blue Ridge Dam and Creaseman Branch was conducted (Pace 1993). As a result, several archaeological sites were identified, two of which are considered potentially eligible for listing in the NRHP.

3.4.7.1.2 Environmental Consequences

Because no changes to existing land use allocations on Blue Ridge are proposed under any of the alternatives, the potential for impacts to archaeological resources is low. As described in Section 3.1.7.1.2, TVA proposes to implement a PA in Georgia for the identification, evaluation, and treatment of all historic properties potentially affected by this lands planning effort. Until the PA is executed, during any undertaking, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties, including archaeological resources, as required by Section 106 of the NHPA. TVA would adhere to the terms of this PA under all alternatives, and no adverse impacts on archaeological resources are expected.

3.4.7.2 Historic Structures

3.4.7.2.1 Affected Environment

The Toccoa Electric Power Company, a subsidiary of TEPCO, built the Blue Ridge Hydroelectric Plant on the Toccoa River near the town of Blue Ridge, Georgia. Initial operation of the plant began on July 1, 1931, with one 25,000-kilovolt-ampere Westinghouse generator, driven by an S. Morgan Smith waterwheel of 30,000 horsepower. This facility was the most modern plant of the TEPCO system.

The design of the Blue Ridge Plant had a number of rather unusual features. The spillway was built in a conveniently located saddle between two hills adjacent to the dam so that the spillway is entirely separate from the dam itself. A reinforced concrete intake tower was provided that is 26 feet in diameter and 192 feet high. Water from this tower is conveyed to the turbine through a steel penstock that is 1,050 feet long and 14 feet in diameter. This penstock is enclosed in reinforced concrete.

The intake tower is equipped with caterpillar-type broom gates that measure 7 feet by 14 feet. These gates are motor driven and may be operated from the switchboard or from the intake tower.

A surge tank was built adjacent to the powerhouse to relieve pressure surges that might result from closing the wicket gates[7] rapidly. This surge tank is made of steel and is of the nonoverflow differential type. It is 30 feet in diameter and 180 feet high.

The generator and electrical equipment in the powerhouse were made largely automatic in operation to require a minimum number of attendants. TEPCO used six employees to operate the plant—a superintendent, a chief operator, and four operators. The original Woodward Type A actuator was replaced with a Woodward cabinet-type actuator by TVA about 1965. Currently, the plant is operated remotely.

Besides Blue Ridge Dam and Powerhouse, there are four brick houses near the dam that are considered historic properties. These four structures are potentially eligible for listing in the NRHP.

3.4.7.2.2 Environmental Consequences

Because no changes to existing land uses are proposed under any of the alternatives, the potential for impacts to historic structures is low. Under all alternatives, TVA would implement the PAs described above in Section 3.1.7.1.2. These PAs would include historic structures, and with their implementation, no adverse effects on historic structures are

[7] The wicket gates are baffles that control the flow of water to the hydroelectric turbine unit.

anticipated. Until the PAs are implemented, TVA would individually evaluate any proposed actions with the potential to affect historic structures as required by Section 106 of the NHPA.

3.4.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.4.8.1 Affected Environment

The two managed areas within 3 miles of Blue Ridge Reservoir are listed in Table 3-37. The areas are grouped by closest distance to the reservoir; the area abutting or less than 0.1 mile from reservoir lands is listed as "adjacent."

Table 3-37. Managed Areas and Ecologically Significant Sites Within 3 Miles of Blue Ridge Reservoir

Name	Managing Authority	Location County, State	Closest Distance to Reservoir
Chattahoochee National Forest	USFS	Fannin, Ga.	Adjacent
Rich Mountain State Wildlife Management Area	State	Gilmer, Ga.	2.1 miles south

No ecologically sensitive sites or NRI streams are within 3 miles of Blue Ridge Reservoir.

3.4.8.2 Environmental Consequences

None of the alternatives for Blue Ridge Reservoir call for changing existing land uses on Blue Ridge Reservoir lands. Therefore, no impacts to managed areas or ecologically significant sites are anticipated under any of the alternatives.

3.4.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.4.9.1 Affected Environment

The landscape character of the Blue Ridge Reservoir is naturally appearing, as seen from the shoreline in middleground and background distances, interspersed with a variety of development along the shoreline, as seen in the foreground from the reservoir. Much of the shoreline has been protected through natural resource conservation. Many of the back-lying properties along these shorelines are managed by the USFS and have excellent scenic class. Development along the reservoir includes Blue Ridge Marina and the USFS Morganton Point Recreation Area.

The appearance of the reservoir immediately upstream of the dam remains visually intact when viewed in the middleground. The wide expanse of water body absorbs man-made alterations along the shoreline such as water use facilities when viewed from these distances. In the foreground, when viewed out of context with the reservoir as an intact unit, these facilities tend to dominate the character of the shoreline. There are numerous

undeveloped coves farther upstream from the dam. These coves have natural settings available to boaters and anglers.

Along the Toccoa River and Wilscott Creek, the river channel narrows, and views are mainly in the foreground distances as the river undulates with natural topography. There are fewer residential developments and water use facilities along this section of the reservoir. Scenic attractiveness is common. Scenic integrity is moderate.

3.4.9.2 Environmental Consequences

Existing land uses on Blue Ridge Reservoir lands would not change under any of the alternatives. Therefore, no adverse impacts to visual resources are anticipated. Scenic integrity would remain moderate or higher. Implementation of the alternatives would help preserve the scenic landscape character of Blue Ridge Reservoir for long-term public enjoyment.

3.4.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.4.10.1 Affected Environment

The rate of water discharge from Blue Ridge Reservoir averages about 615 cfs, which results in an average retention time of 158 days. Because of the long retention time, Blue Ridge Reservoir becomes thermally stratified in the summer. This results in low DO concentrations in the lower strata of the water column as DO is depleted by the natural process of decaying organic material. Thus, water discharged into the tailwater can be very cold and have low DO, impairing water quality. As part of the LIP, a small hydroturbine unit was installed to operate whenever the main unit is off to maintain minimum flows. Additionally, DO in the releases is improved by turbine venting and an oxygen-injection system.

Water quality in Blue Ridge Reservoir can be affected by many factors, both from TVA public land along the reservoir and from land use practices throughout the local watershed. The watershed is mountainous and forested, with a significant portion of the basin lying within the Chattahoochee National Forest. Because the reservoir is located in the Blue Ridge Physiographic Province, the streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Consequently, the reservoir has low productivity (low chlorophyll concentrations).

Reservoir Ecological Health

Figure 3-4 shows the reservoir ecological health scores for Blue Ridge Reservoir from 1994 through 2007. Blue Ridge Reservoir was sampled in the forebay at ToRM 54.1. The ecological health score for the reservoir is consistently among the highest of all reservoirs monitored (see Table 3-38) with scores ranging from 80 to 96. The 2005 score (81) was at the low end of the historic range due primarily to the “poor” rating for chlorophyll. The 2005 chlorophyll rating was the highest summer average to date and the first “poor” rating for chlorophyll.

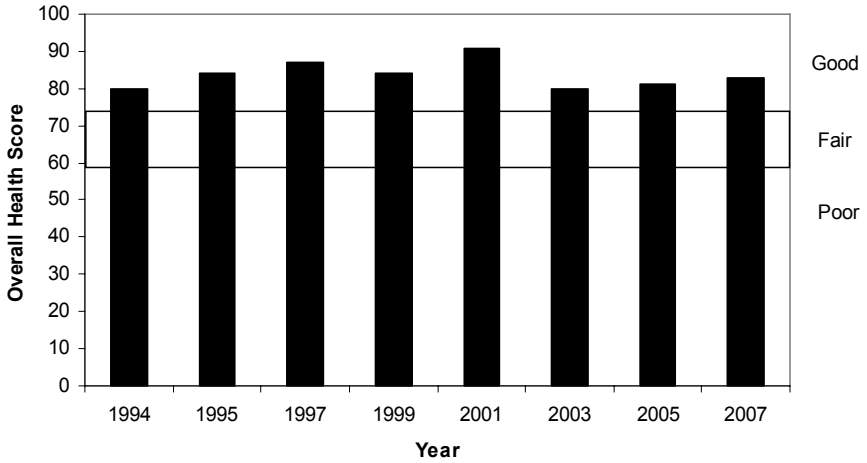

Figure 3-4. Blue Ridge Reservoir Ecological Health Ratings, 1994-2007

Table 3-38. Blue Ridge Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Program (Monitoring Data 1991-2005)

Characteristic	Monitoring Year									
	1991	1992	1993	1994	1995	1997	1999	2001	2003	2005
Blue Ridge Forebay										
Dissolved Oxygen	Good	Good	Good	Good	Fair	Fair	Good	Good	Good	Good
Chlorophyll	Good	Good	Good	Good	Good	Good	Good	Good	Good	Poor
Sediment	NS	NS	Good	Good	Fair	Good	Good	Good	Good	Good

NS = Not sampled

Dissolved Oxygen

DO rated “good” eight out of 10 years. DO rated a “high-fair” in 1995 and 1997 due to a small area of low DO (less than 2 mg/L) near the bottom.

Chlorophyll

Average chlorophyll concentrations were within the expected range all years and rated “good,” with the exception of 2005, which rated “poor.”

Sediment Quality

Sediment quality has rated “good” all years except in 1995 when low levels of dichlorodiphenlydichloroethylene (DDE) were detected.

Benthic Monitoring

As shown in Table 3-39, benthic community scores rated “good” four of the seven years sampled, “poor” two of the seven years, and “fair” one of the seven years.

Table 3-39. Recent (1994-2005) Biennial Benthic Community Ratings for Blue Ridge Reservoir

Station	River Mile	Year						
		1994	1995	1997	1999	2001	2003	2005
Forebay	54.1	Poor	Good	Good	Fair	Good	Poor	Good

Fisheries Monitoring

The RVSMP began biennial fish sampling on Blue Ridge Reservoir in 1994. A list of fish species commonly found in Blue Ridge Reservoir is presented in Appendix K. The fish community in Blue Ridge Reservoir rated "good" five of the seven years monitored and "fair" in 1997 and 2001 (see Table 3-40).

Table 3-40. Recent (1994-2005) Biennial Reservoir Fish Assemblage Index Ratings for Blue Ridge Reservoir

Station	Year						
	1994	1995	1997	1999	2001	2003	2005
Forebay	Good	Good	Fair	Good	Fair	Good	Good

As shown in Table 3-41, Blue Ridge Reservoir rated below the SFI Valleywide average in 2006.

Table 3-41. Sport Fishing Index Scores for Selected Sport Fish Species in Blue Ridge Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	28	36
Largemouth Bass	30	33
Smallmouth Bass	22	30

Swimming Advisories

There are no state advisories against swimming in Blue Ridge Reservoir. TVA performed *E. coli* bacteria monitoring at two USFS locations in 2007: Lake Blue Ridge Recreation Area boat ramp and Morganton Point Recreation Area swim site.

Fish Consumption Advisories

A fish consumption advisory is in effect for Blue Ridge Reservoir because of mercury contamination. The State of Georgia advises against eating more than one meal per week of channel catfish greater than 16 inches in length or white bass or largemouth bass between 12 and 16 inches in length from Blue Ridge Reservoir.

TVA collected channel catfish and largemouth bass from the reservoir for tissue analysis in autumn 2005. The results, which were similar to those of previous years, were provided to state agencies in Georgia. TVA will analyze fish from Blue Ridge Reservoir again in autumn 2009.

State(s) Impaired Waters
The Georgia Environmental Protection Division assigned use support ratings to waters in the Blue Ridge Reservoir watershed based on available biological, chemical, and/or physical data. A total of 22 miles of monitored streams are listed as impaired (see Table 3-42) (GAEPD 2006).

Table 3-42. Impaired Waters in the Watershed of Blue Ridge Reservoir

Stream/River Name	State	Miles	Description	Water Quality Stressor/Source
Cooper Creek	Ga.	3	Tributary to Toccoa River/Fannin County	Fecal coliform/ nonpoint
Toccoa River	Ga.	7	Downstream of Blue Ridge Reservoir	Fecal coliform/ nonpoint
Toccoa River	Ga.	10	Big Creek to Blue Ridge Reservoir	Fecal coliform/ nonpoint
Weaver Creek	Ga.	2	Fannin County	Biota impacted/ nonpoint

Water Supply
No municipal water suppliers currently withdraw water from Blue Ridge Reservoir or its supporting watershed. However, the City of Blue Ridge has a municipal water intake directly below Blue Ridge Dam on Parcel 1.

3.4.10.2 Environmental Consequences

Alternative A
Under Alternative A, all but two of the 42 parcels (half of the land area) are unplanned with the exception of the 287-acre Blue Ridge Dam Reservation (Parcel 1) and a 10.5-acre roadside picnic area (Parcel 3). Most unplanned parcels have a committed use because they front USFS lands or existing residential developments. The four uncommitted parcels total 12.9 acres and are allocated to Natural Resource Conservation. The extent to which a proposed land use might affect water quality and aquatic life depends on the nature and extent of development. Any proposed actions on TVA land would be assessed for compliance with TVA's Land Policy, SMP, and Section 26a regulations. Individual environmental reviews would identify potential adverse impacts and mitigation to protect the aquatic environment. TVA would then take appropriate measures to address these impacts. Therefore, use of TVA lands under Alternative A should not significantly affect water quality or aquatic life.

Alternatives B, C, and D
Allocations under Alternatives B, C, and D on Blue Ridge Reservoir are identical (see Section 3.4.1). No significant changes to land use are expected to occur on Blue Ridge Reservoir under any of the three action alternative because the allocations are consistent with existing land use on all parcels. Therefore, no significant impacts to water quality and aquatic life are expected in association with these alternatives.

3.4.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11. Under all of the alternatives, the existing uses of Blue Ridge Reservoir lands would not

change, and there would be no adverse impacts to air quality. Noise has been discussed previously in Section 3.1.11.2.

3.4.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.4.12.1 Affected Environment

3.4.12.1.1 Population and Economy

Population: Tables 3-43 and 3-44 contain data regarding the population of the area. Fannin County, Georgia, had a population of 19,798 in 2000, an increase of 34.2 percent since 1980. This was a much lower rate than in the state but a higher rate than in the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990.

Estimates for 2006 indicate that the population of Fannin County has grown an additional 12.7 percent since 2000. This remains a slower rate than the state but much faster than the nation.

Projections through 2020 indicate that the county will have a slightly greater population growth rate than the state and a much greater rate than the nation over that time. The county's growth rate from 2000 through 2020 is projected to be faster than for 1980 through 2000, but the state and national rates are projected to be less than for 1980 through 2000.

Table 3-43. Population – Fannin County, Georgia

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Fannin County	14,748	15,992	19,798	22,319	28,139	51.3
Georgia	5,462,982	6,478,216	8,186,453	9,363,941	11,463,602	141.4
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e) and extrapolations from Georgia Office of Planning and Budget (2005)

Table 3-44. Recent and Projected Population Changes – Fannin County, Georgia (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Fannin County	8.4	23.8	34.2	12.7	42.1	90.8
Georgia	18.6	26.4	49.8	14.4	40.0	109.8
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-43

The county is decidedly rural in distribution of population. As noted in Table 3-43, the population density is substantially lower than the state and much lower than the nation. The largest of the three incorporated towns in the county is Blue Ridge, Georgia, with 1,210 residents in 2000. About 87 percent of the county's population lives outside of the incorporated towns.

Economy: Table 3-45 contains the most recent annual data regarding the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Fannin County had 10,069 people employed on average. The county has a higher percentage of farmers and retail employees than either the state or the nation. The county has a much lower percentage of manufacturing employees and a lower percentage of government employees than the state or nation. The average unemployment rate for 2006 in the county was lower than either the state or the nation. Per capita personal income in 2005 was considerably lower in the county than in the state and much lower than in the nation.

Table 3-45. Employment, Unemployment, and Income – Fannin County, Georgia

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Fannin County	10,069	2.5	4.1	13.9	9.8	69.7	4.0	23,846
Georgia	5,197,037	1.4	9.0	10.7	14.5	64.5	4.6	30,914
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated) and Georgia Department of Labor (undated)

3.4.12.1.2 Environmental Justice

Environmental justice is concerned with the possibility of disproportionate impacts to minority and low-income populations in the area. The minority population in the Blue Ridge Reservoir area is small (Table 3-46). In Fannin County, 3.6 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 41.1 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 13.2 percent, lower than the state rate of 13.7 percent but higher than the national rate of 12.7 percent.

Table 3-46. Minority Population, 2006, and Poverty, 2004 – Fannin County, Georgia

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Fannin County	22,319	547	252	3.6	13.2
Georgia	9,363,941	3,205,172	640,521	41.1	13.7
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

3.4.12.2 Environmental Consequences

The current land uses at Blue Ridge Reservoir would continue under all of the alternatives. Other than the possible expansion of existing recreation facilities, there would be little development that would affect socioeconomic conditions. None of the alternatives would result in disproportionate impacts on minority or disadvantaged populations.

3.5 Nottely Reservoir

3.5.1 Land Use

An overview of land use for the mountain reservoirs region is provided in Section 3.1.1.

3.5.1.1 Affected Environment

On Nottely Reservoir, TVA initially purchased 3,136 acres of land (see Table 1-1) and has sold about 276 acres (approximately 9 percent). Most of these sale parcels now contain residential developments, although some currently support recreation uses. TVA transferred about 2,031 acres (65 percent) to the USFS.

TVA presently manages 828.6 acres of land divided into 42 parcels on Nottely Reservoir. Thirty nine of these parcels are committed to existing land uses (see Table 2-2). The dam reservation is considered a committed land use and accounts for 51 percent (422.6 acres) of the total TVA land on Nottely Reservoir. Six parcels are committed to residential access by deeded rights or previous policy. One parcel (Poteete Creek Recreation Area) is committed to recreational use by land use agreement for public recreation. Land use agreements also commit one parcel for public infrastructure (Notla Water Authority Treatment Plant). Twenty-eight parcels front land that TVA transferred to the USFS for operation of the National Forest System. A complete list of the committed uses for Nottely Reservoir parcels is provided in Appendix F.

Three parcels totaling approximately 121 acres (see Table 2-2) are considered uncommitted and are being considered for alternative uses in this plan. All of the uncommitted parcels are currently managed for natural resource conservation, dispersed recreation, and/or as vegetative buffers.

As shown in Table 1-2, TVA owns approximately 47 percent of the total 102 miles of shoreline on Nottely Reservoir. Fifty-three percent of the shoreline has never been owned by TVA, and TVA only purchased flowage easements along this private shoreline. Approximately 41 percent of the shoreline is available for residential development (see Table 3-2); the vast majority of this is privately owned. TVA estimates that about 44 percent of the shoreline available for residential development is currently developed.

Union County, Georgia, is predominantly rural. Blairsville is the only town near Nottely Reservoir and lies at its upstream end of the reservoir. About 47 percent of the land in the county is in the Chattahoochee National Forest (USFS 2007a, Quickfacts 2007). In recent years, development has increased on the privately owned land in the county. Land use data for Union County (NARSAL 2007b) show that from 1974 to 2005, high-intensity development increased from 71 to 445 acres, and low-intensity development increased from 1,845 to 14,110 acres. An influx of out-of-state retirees has contributed to much of the recent residential development. Improved highway access to the greater Atlanta area has also contributed to development by allowing both commuters and second-homeowners easier travel to and from the area.

Blairsville has a 153-acre industrial park just west of the city near the upper end of the reservoir. The park has several small and medium-sized industries. Several tracts remain available for development. There is other industrial and commercial development, as well as an airport west of the industrial park.

No prime farmlands occur on the TVA lands on Nottely Reservoir.

3.5.1.2 Environmental Consequences

Alternative A
As shown in Table 2-3, under Alternative A, the land uses of the approximately 658 acres that are planned (out of a total of 829 acres managed by TVA) are represented by three land use allocations. The Dam Reservation and a parcel committed to use by the Notla Water Authority Facility encompass 443.3 acres (53.5 percent) and are allocated to Project Operations. The remaining acreage of land planned under Alternative A consists of two parcels (Parcels 2 and 4) that are allocated to Natural Resource Conservation (123 acres or 14.8 percent) and one 92-acre parcel (Parcel 4) committed to Recreation (11.1 percent).

Under Alternative A, TVA would not designate land use allocations for over 170 acres of TVA land, consisting of 37 parcels, on Nottely Reservoir that are not planned with the Forecast System (see Table 2-4). Of the 37 unplanned parcels, only two parcels are uncommitted. The acreage of the two unplanned, uncommitted parcels totals 0.3 acre, and they are both used for natural resource conservation. These parcels would continue to be managed according to TVA's Land Policy, SMP, and Section 26a regulations.

Under Alternative A, there would be no impacts to prime farmlands because no prime farmlands exist on the TVA parcels on Nottely Reservoir.

Alternatives B, C, and D
Under Alternatives B and C, all of Nottely Reservoir's 42 parcels totaling 828.6 acres would be planned (see Table 2-5). Thirty-five of the 37 previously unplanned parcels are committed to existing uses that determine their allocation under this alternative. The three uncommitted parcels would be allocated based on existing land use, which is consistent with a Zone 4 (Natural Resource Conservation) allocation. Alternatives B, C, and D do not include any land allocations that differ from the current land use.

Under these three alternatives, TVA would allocate 270.3 acres (32.6 percent) to Zone 4 (Natural Resource Conservation), an increase of approximately 147 acres over Alternative A. This is primarily a result of allocating the previously unplanned land fronting the USFS land to Zone 4. Land allocated to Zone 6 (Developed Recreation) would increase by about three acres to a total of 94.5 acres (11.5 percent). A new Zone 7 (Shoreline Access) allocation would total about 21 acres (2.5 percent). Zone 2 (Project Operations) allocations would remain the same (53.4 percent). No land would be allocated to Zone 3 (Sensitive Resource Management) or Zone 5 (Industrial) under these action alternatives.

No significant changes to land use are expected to occur on Nottely Reservoir under Alternative B, C, or D because the allocations are consistent with existing land use on all parcels.

No impacts to prime farmlands along Nottely Reservoir are expected under Alternative B, C, or D.

3.5.2 Recreation

An overview of the recreation resources for the mountain reservoirs is provided in Section 3.1.2.

3.5.2.1 Affected Environment

Three TVA parcels on Nottely Reservoir support developed recreation facilities. Poteete Creek Campground and Recreation Area is located on Parcel 4 and is managed by Union County under a public recreation license agreement. Facilities located at Poteete Creek include long- and short-term campsites, a swim beach, a boat ramp, fishing piers, and pavilions. Parcel 13 fronts Jack's Creek Boat Ramp, which is managed by the USFS. Parcel 37 adjoins Deaverton Boat Ramp on land owned by TVA and the USFS and is managed by Union County by Special Use Permit from the USFS. These developed recreation areas are summarized in Table 3-47.

Table 3-47. Developed Recreation Facilities on Nottely Reservoir

Facility Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Canal Lake Campground	Union, Ga.	Private	Commercial	Private	N/A	●							
Cozy Cove Marina	Union, Ga.	Private	Commercial	Private	N/A		●		●				●
Lake Nottely RV Park	Union, Ga.	Private	Commercial	Private	N/A	●			●			●	
Nottely Marina	Union, Ga.	Private	Commercial	Private	N/A		●		●				
Nottely Dam Reservation	Union, Ga.	Public	TVA	TVA	1			●	●				●
Poteete Creek Recreation Area	Union, Ga.	Public	Union County	TVA	4	●		●	●			●	●
Canal Lake Ramp	Union, Ga.	Public	Union County	USFS**	22				●				
Davenport Mountain ATV Trails	Union, Ga.	Public	USFS	USFS**	10								●
Jack's Creek Ramp	Union, Ga.	Public	Union County	USFS**	13				●				
Deaverton Ramp	Union, Ga.	Public	Union County	TVA/ USFS**	37				●				
Meeks Park	Union, Ga.	Public	Union County	County	N/A			●			●		●

N/A = Not applicable
**- TVA retained below MSC

There are three campgrounds on Nottely Reservoir. In addition to Poteete Creek Campground, which is located on TVA land, there are two commercial campgrounds on private property.

Eight recreation areas contain at least one boat ramp, three of which are privately operated. Five of the ramps are operated by public entities including the ramp on the Nottely Dam Reservation (Parcel 1) that is managed by TVA. There are two ramps at Deaverton, one for typical pool elevation and one for low water conditions.

There are two commercial marinas operating on Nottely Reservoir. These are Cozy Cove Marina and Nottely Marina, and both are privately operated.

Two public fishing piers are located on Nottely Reservoir. The piers at Lake Nottely RV Park are managed by a commercial operator. The fishing pier at Poteete Creek (Parcel 4) is managed by Union County. There is no stream access site located near Nottely Reservoir.

As shown in Table 3-47, Union County manages recreation facilities on Nottely Reservoir on TVA and USFS lands, in addition to land owned by Union County. Meeks Park is a county-owned park in the extreme upper end of the reservoir that has several ball fields, picnic pavilions, and an extensive trail system. Revenue generated by the operation of the TVA-owned Poteete Creek Campground allows the Union County Recreation Department to provide recreational services for the county.

Dispersed Recreation

Nottely Reservoir lands have historically provided important recreational opportunities. Table 3-48 is a summary of areas identified by TVA as being heavily used for dispersed recreation areas on Nottely Reservoir.

Table 3-48. Dispersed Recreation Areas on Nottely Reservoir

Recreation Area	Parcel Number	Number of Sites
Nottely Dam Reservation, including Nottely Cliffs	1 and 2	8

Parcel 2 (120.6 acres) also accommodates a high level of dispersed recreation of a more passive nature, such as hiking and bank fishing.

3.5.2.2 Environmental Consequences

Alternative A

Under Alternative A, one 91.9-acre parcel of previously planned land on Nottely Reservoir is used for developed recreation. Parcel 4 was allocated previously under the Forecast System for Public Recreation for Poteete Creek Campground. In addition, two unplanned parcels with boat ramps currently support developed recreation and are committed to this use through a transfer agreement with the USFS.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use. The unplanned parcels that are committed to developed recreation would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas. Under Alternative A, potential effects to recreational resources would be insignificant because parcels (i.e., both previously allocated and the unplanned parcels) utilized for developed recreation would not change. Any proposed new facilities would be subject to additional environmental review to determine the need for mitigation to offset potential adverse effects to recreation opportunities.

Alternative A does not involve changing the land use of any parcels; therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternatives B, C, and D
Under Alternatives B, C, and D, parcels allocated to Zone 6 (Developed Recreation) would comprise a total of 11.5 percent (about 95 acres) of TVA lands on Nottely Reservoir, approximately 3 acres more than are used under Alternative A for developed recreation. Three parcels committed to a developed recreation use would be allocated to Zone 6. These commitments include the transfer agreement with the USFS and the license to Union County for Poteete Creek Recreation Area. All of the parcels committed to developed recreation on Nottely Reservoir currently support recreation with existing facilities. The parcels allocated to Zone 6 under the three action alternatives include the one previously allocated under Alternative A to Public Recreation, as well as the two unplanned parcels under Alternative A that are committed to developed recreation uses.

Under Alternatives B, C, and D, any future demand for recreational needs would have to be met by expansion of recreation facilities in the areas allocated to Zone 6. These areas are the same under Alternatives B, C, and D as under Alternative A. Because there would be no new parcels allocated for Developed Recreation, the potential environmental impacts from adopting one of the action alternatives would be the same as those anticipated under Alternative A. The potential for impacts from any new facilities within existing areas would be subject to review and potential mitigation under NEPA and therefore should be insignificant.

Alternatives B, C, and D do not involve changing land use of any parcels on Nottely Reservoir; therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels. Potential impacts to dispersed recreation of this nature are expected to be insignificant.

3.5.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.5.3.1 Plant Communities

3.5.3.1.1 Affected Environment

The vegetative classes commonly found on and around Nottely Reservoir lands are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation. A small percentage of the forests are evergreen forests, and these are loblolly pine plantations. Evergreen-deciduous forest, the most common forest type, is dominated by stands of mixed pine-hardwood trees. Deciduous forest occurs mainly as oak-hickory forests, hardwood forests on slopes, and forested wetlands near the reservoir edges. These forested wetlands tend to grade into scrub-shrub wetlands. Oak-hickory forests common on dry ridges grade into more mesic slopes.

Forested wetlands occur in bottom areas near the dam and along the backs of coves along the reservoirs and grade into scrub-shrub wetlands (shrublands). A population of small green wood orchid was found along with spike moss and white turtlehead.

Herbaceous vegetation is commonly found along transmission line and roadway rights-of-way as well as grassy areas on the dam reservation and commercial recreation areas. Purple sprangletop, bahia grass, and tall fescue were common grasses observed during field surveys.

Most of the TVA parcels around Nottely Reservoir are inhabited by various species of invasive plants, including autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese knotweed, Japanese stiltgrass, kudzu, multiflora rose, princess tree, and tree-of-heaven.

3.5.3.1.2 Environmental Consequences

Alternative A
Because there are no uncommon terrestrial plant communities known to occur around Nottely Reservoir, no impacts to these botanical resources are expected if Alternative A were adopted and implemented.

Alternatives B, C, and D
Under Alternatives B, C, and D, there would be a 147.1-acre (54.4 percent) increase in allocations to Zone 4 (Natural Resource Conservation) compared to Alternative A. The plant communities on the Nottely Reservoir lands are common and representative of the region; thus, no significant impacts to the plant communities on Nottely Reservoir lands are expected from the adoption of Alternative B, C, or D.

Under all alternatives, TVA's ability to manage invasive species would not change from the present situation. TVA currently prioritizes invasive species management efforts based on several factors including the availability of resources, potential for partnerships, and threat to sensitive resources.

3.5.3.2 Wildlife Communities

3.5.3.2.1 Affected Environment

Wildlife habitats on Nottely Reservoir lands are similar to those observed on other mountain reservoirs and include a mixture of evergreen, evergreen-deciduous, deciduous, and early successional habitats. Parcel 1 is the largest TVA parcel on Nottely Reservoir and contains a mixture of hardwood forest interspersed with old-field habitats. Small seepages were also identified on this parcel. Wildlife observed during field surveys include mallard, ovenbird, Kentucky and black and white warblers, yellow-billed cuckoo, American redstart, eastern kingbird, and barn swallows.

Approximately 1,000 acres of mud flat habitat become exposed when reservoir levels are lowered on Nottely Reservoir. Larger mud flats occur along the Nottely River at NRM 37, Poteete Branch, Youngcane Creek, and Ivylog Creek. Most mud flats are bordered by private land.

3.5.3.2.2 Environmental Consequences

Alternative A
Most parcels on Nottely Reservoir, i.e., 28 of the unplanned parcels, front USFS lands, and their existing use is consistent with Zone 4 (Natural Resource Conservation). Six of the parcels front residential subdivisions. Under Alternative A, no adverse impacts to wildlife on Nottely Reservoir would be expected.

Alternatives B, C, and D
Under Alternative B, C, or D, a total of 270.3 acres, or about a third of Nottely Reservoir lands, would be allocated to Zone 4 (Natural Resource Conservation). No additional lands would be allocated to development-oriented uses that have the potential to adversely affect

wildlife. The potential effects to wildlife or their habitats from implementing Alternative B, C, or D would be similar to those of Alternative A. Adoption of any of these alternatives would not adversely affect local wildlife or their habitat.

3.5.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.5.4.1 Affected Environment

Federally and state-listed as endangered, threatened, and other species of conservation concern known from the vicinity of Nottely Reservoir are listed in Table 3-49. Three populations of the federally listed small whorled pogonia are reported from Union County. No populations were found during field surveys of Nottely Reservoir lands. Pink lady's slipper was observed on three parcels (Parcels 1, 4, and 6).

Table 3-49. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Nottely Reservoir Area

Common Name	Scientific Name	Federal Status	Ga. Rank (Status)	N.C. Rank (Status)
Plants				
Pink lady's slipper	*Cypripedium acaule*	--	UNUS (S4)	--
Small whorled pogonia	*Isotria medeoloides*	THR	THR (S2)	--
Amphibian				
Eastern hellbender*	*Cryptobranchus alleganiensis alleganiensis*	--	RARE (S2)	--
Bird				
Piping plover*	*Charadrius melodus*	THR	THR (S1)	THR (S2)
Mammal				
Least weasel*	*Mustela nivalis*	--	NOST (S1)	--
Reptile				
Bog turtle	*Glyptemys muhlenbergii*	THR	THR (S1)	--

-- = Not applicable
* Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled; S2 = Imperiled; S4 = Widespread, abundant, and apparently secure
Status abbreviations: NOST = No state status; RARE = Rare, THR = Threatened; UNUS = Special concern due to commercial exploitation

Two federally listed animals have been reported from Union County and an additional two state-listed terrestrial animal species have been reported from the vicinity of Nottely Reservoir (see Table 3-49). No suitable habitat for the bog turtle (see Section 3.1.4) occurs on Nottely Reservoir lands. The blotched chub is known to occur upstream of Nottely Reservoir lands but would not be affected under any of the alternatives.

Eastern hellbenders are known from the Nottely River and its tributaries. Hellbenders likely occur in the tailwater near Parcel 1. Hellbenders are unlikely to occur in the vicinity of other Nottely Reservoir lands.

Piping plovers were reported from Nottely Reservoir on August 2-3, 1991. Mud flats potentially used by this species exist at Poteete Branch and Youngcane and Ivylog creeks. Most of the exposed shoreline lacks the silty mud that is preferred by shorebirds. Results of recent shorebird surveys on the reservoir indicate that shorebirds use the reservoir on a

limited basis. Piping plovers have not been observed during shorebird surveys on the reservoir, and no recent observations have been reported.

Least weasels inhabit a variety of sites, including old fields, hedgerows, and forested areas (Linzey 1998). Habitat for this species occurs within the Nottely Reservoir project area.

3.5.4.2 Environmental Consequences

Alternative A

Plants

The three known populations of state-listed plants on Nottely Reservoir lands occur on parcels used for Project Operations, Natural Resource Conservation, and Developed Recreation. These uses would continue under Alternative A, and TVA would assess the potential impacts to these species that could result from any proposed actions on these parcels. Consequently, appropriate mitigative measures, if necessary, would be implemented to reduce or limit potential effects to insignificant levels. Thus, adoption of Alternative A is unlikely to result in adverse impacts to listed plants.

Terrestrial Animals

No federally listed terrestrial animal species are reported from TVA planning parcels on Nottely Reservoir. Forested areas on lands ranked low in their suitability as summer roost habitat for Indiana bats. This was due to the lack of suitable roosting trees, the young age of most stands, and the presence of thick midstory layers.

Under Alternative A, planned parcels would be allocated according to their current use. The vast majority of unplanned parcels are also committed to their existing land use. Adoption of Alternative A would not result in impacts to listed terrestrial animals because there would no change from the current conditions on these properties.

Aquatic Animals

The blotched chub is known to occur in tributary streams at the upper end of Nottely Reservoir. However, these occurrences are not located near any TVA parcels. Thus, adoption of Alternative A would not affect this listed fish.

Alternatives B, C, and D

Plants

Under Alternatives B, C, and D, Parcel 6, which is inhabited by the Georgia state-listed pink lady's slipper, would be managed for Zone 4 (Natural Resource Conservation). Thus, no significant impacts to this population are expected. However, small populations of pink lady's slippers found on Parcel 1 (Zone 2, Project Operations) and Parcel 4 (Zone 6, Developed Recreation) could be impacted by dam operations or human disturbance within the recreational area. Populations of pink lady's slipper consisting of less than 100 plants are considered by Georgia Heritage botanists not worthy of protection, and therefore, no significant impacts to this species are expected. No other known populations of listed plant species occur within the surrounding area of Nottely Reservoir; therefore, no significant impacts are expected under these three alternatives.

Terrestrial Animals

Under Alternatives B, C, and D, the proposed allocations of planned parcels would reflect their current uses. These alternatives involve the allocation of approximately 270 acres (32.6 percent) to Zone 4 (Natural Resource Conservation) but no acres to Zone 3 (Sensitive

Resource Management) or Zone 5 (Industrial). Under these alternatives, an additional 147 acres would be allocated to Zone 4 than under Alternative A, which should benefit animal species in the project area.

Aquatic Animals
Potential impacts to the blotched chub under Alternative B, C, or D would be the same as those described under Alternative A.

3.5.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.5.5.1 Affected Environment

Vegetated wetlands are generally uncommon on Nottely Reservoir due to the steep topography of the banks. NWI imagery for the entire reservoir indicated the presence of more than 900 acres of aquatic beds and flats features that are both periodically flooded and unvegetated (see Table 3-5). These include mud flats, areas of submerged/aquatic plants, or beaches/bars depending on season, weather patterns, and reservoir-level management. Forested wetlands (approximately 106 acres) are the second most common wetland type on Nottely Reservoir and are associated with the backs of coves where tributary streams enter the reservoir. Emergent wetlands and scrub-shrub wetland areas comprise 17 and 11 acres, respectively.

3.5.5.2 Environmental Consequences

The potential impacts of implementing the various alternatives on wetlands would be similar, and none would be adverse. Under all alternatives, parcels on Nottely Reservoir containing wetlands would generally continue to be managed as they have been in the past. Any actions having the potential to affect wetlands would be assessed under NEPA prior to their implementation. Appropriate mitigation would be employed to compensate for adverse effects to wetlands or their functions.

3.5.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.5.6.1 Affected Environment

The affected area extends from the lower limit of the dam reservation at about NRM 20.2 upstream to about NRM 40.0 in Nottely Reservoir. The 100-year flood elevations for the Nottely River downstream of the dam vary from elevation 1,606.2 feet msl at NRM 20.2 to elevation 1,614.1 feet msl at NRM 21.0 (downstream of Nottely Dam). The 500-year flood elevations for the Nottely River downstream of the dam vary from elevation 1,612.1 feet msl at NRM 20.2 to elevation 1,618.7 feet msl at NRM 21.0. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

The main watercourse in Nottely Reservoir is the Nottely River. The 100-year flood elevation for the Nottely River is 1,782.5 feet msl from Nottely Dam (NRM 21.0) to the upper end of Nottely Reservoir at about NRM 40.0. The 500-year flood elevation for the Nottely River is 1,785.5 feet msl from the dam to the upper end of Nottely Reservoir.

3.5.6.2 Environmental Consequences

The environmental consequences likely under each alternative are discussed in Section 3.1.6. Parcel allocations under any of the alternatives are not likely to have adverse effects on Nottely Reservoir floodplains.

3.5.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.5.7.1 Archaeological Resources

3.5.7.1.1 Affected Environment

Nottely Reservoir was the subject of a large archaeological survey conducted on 59 miles of noncontiguous shoreline (Adams and Messick 1997). Altogether, 157 archaeological sites were identified or revisited. Of these, only 10 were considered potentially eligible for listing in the NRHP. During the winter of 2005-2006, 16.4 miles of the reservoir shoreline were surveyed, and 17 sites were recorded or revisited (Gage and Herrmann 2006). Five of these were considered potentially eligible for listing in the NRHP.

Several surveys were also undertaken for the reconveyance of former TVA land back to TVA from the USFS (Seckinger 1977; Wynn 1986, 1988). A survey was undertaken for the Poteete Creek Campground (Hubbert 1981) during which two archaeological sites were identified. Both sites were heavily eroded, and both were considered ineligible for listing in the NRHP.

3.5.7.1.2 Environmental Consequences

Because no changes to existing land uses are proposed under any of the alternatives for Nottely Reservoir, the potential for impacts to archaeological resources is low. As described in Section 3.1.7, TVA proposes to implement a PA in Georgia for the identification, evaluation, and treatment of all historic properties potentially affected by this lands planning effort. Until the PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties, including archaeological resources, as required by Section 106 of the NHPA. TVA would adhere to the terms of this PA under all alternatives, and no adverse impacts on archaeological resources are expected.

3.5.7.2 Historic Structures

3.5.7.2.1 Affected Environment

Nottely Dam was closed on January 24, 1942, and its contribution to the war effort consisted of the storage and release of water as required to regulate flow at Hiwassee Dam and other downstream plants. A single hydropower-generating unit was added in 1956. Nottely Dam and Powerhouse are considered historic properties, as they are potentially eligible for listing in the NRHP.

3.5.7.2.2 Environmental Consequences

Because no changes to existing land uses are proposed under any of the alternatives for Nottely Reservoir, the potential for impacts to historic structures is low. Under all alternatives, TVA would implement the PA described above in Section 3.1.7.1.2. This PA

would include historic structures, and with its implementation, no adverse effects on historic structures are anticipated. Until the PA is implemented, TVA would individually evaluate actions with the potential to affect historic structures as required by Section 106 of the NHPA.

3.5.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.5.8.1 Affected Environment

Table 3-50 lists the three managed areas within 3 miles of Nottely Reservoir. The areas are grouped by closest distance to the reservoir; the area abutting or less than 0.1 mile from reservoir lands is listed as "adjacent."

Table 3-50. Managed Areas and Ecologically Significant Sites Within 3 Miles of Nottely Reservoir

Name	Managing Authority	Location County, State	Closest Distance to Reservoir
Chattahoochee National Forest	USFS	Union, Ga.	Adjacent
Nantahala National Forest	USFS	Cherokee, N.C.	1.8 miles north
Georgia Mountain Branch Experiment Station	Federal	Union, Ga.	2.0 miles southeast

No ecologically significant sites or NRI streams are within 3 miles of Nottely Reservoir.

3.5.8.2 Environmental Consequences

None of the alternatives for Nottely Reservoir involve changing existing land uses, and therefore, no impacts to managed areas or ecologically significant sites are anticipated under any of the alternatives.

3.5.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.5.9.1 Affected Environment

Nottely Reservoir shoreline has been moderately to heavily developed for residential use with the exception of recreational areas and shoreline that is managed by the USFS. The reservoir is wide immediately upstream of the dam, and views from the water are mainly restricted to the middleground distances. Islands obscure longer views of the reservoir but enhance the scenic quality of the reservoir by providing a naturally appearing landscape that contrasts with shoreline development.

There are numerous undeveloped coves on Nottely Reservoir. Most of these coves are broad at the mouth and can extend several miles to their headwaters. Wooded shoreline and steep slopes adjacent to the water provide relatively private locations for fishing and overnight boat anchorage. Steep ridgelines adjacent to the reservoir provide a dramatic contrast to the surrounding reservoir and gently sloping countryside, particularly when they are viewed from background distances.

A large recreation area (Poteete Creek Campground) and USFS land comprise large contiguous lands, which help preserve substantial stretches of undeveloped shoreline. Scenic values vary from excellent to good, and scenic integrity is high in this area. On other areas of the reservoir, numerous residences can be seen scattered around the shoreline along with a variety of water use facilities. The scenic value is moderately good, but scenic integrity is low. Concentrations of dwellings and related water use facilities are visually dominant on some parts of Nottely Reservoir where they create a strong adverse contrast with the natural landscape. Scenic value is fair, and scenic integrity is very low.

3.5.9.2 Environmental Consequences

Under all alternatives, the existing uses of TVA Nottely Reservoir lands would continue, and there would be no additional lands allocated to more development-oriented uses with the potential to affect scenery adversely. Future development along Zones 6 (Developed Recreation) and 7 (Shoreline Access) shorelines could affect visual resources. New structures, such as covered boat slips, could potentially reduce scenic class when viewing these structures from the water. As individual permits are reviewed for these lands, adherence to the SMP and any necessary commitments to protect visual resources would likely minimize these impacts. Under all alternatives, scenic integrity would remain moderate or higher, and much of the scenic landscape character of Nottely Reservoir would be maintained for long-term public enjoyment.

3.5.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.5.10.1 Affected Environment

Long-term (1990-2005) flows from Nottely Dam average about 389 cfs, which results in an average retention time of 220 days. Because of the long retention time, Nottely Reservoir becomes thermally stratified in the summer. Once stratification is established, oxygen in the deeper water cannot be replenished from the air or from contact with the oxygen-rich surface water. This causes low DO concentrations in the lower strata of the water column, as DO is depleted by the decomposition of organic material. As a result, water discharged into the tailwater can be very cold and have low DO, impairing water quality. TVA mitigates this on Nottely Reservoir by forcing air into the water as it passes through the turbine. If additional aeration is needed, oxygen is injected into the reservoir above the dam.

Nottely Reservoir is located in the Blue Ridge Physiographic Province. Due to the geologic characteristics of the region, streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Consequently, the reservoir is expected to have low productivity (low chlorophyll concentrations). Nottely is a headwater reservoir with no upstream impoundments that alter flow patterns and physical and chemical characteristics of runoff. Most of the watershed lies within the boundaries of the Chattahoochee National Forest.

Reservoir Ecological Health

The reservoir ecological health scores for Nottely from 1994 through 2007 are shown in Figure 3-5. The monitoring to derive these scores has been conducted at a forebay site at NRM 23.5 and a midreservoir station at NRM 31.0.

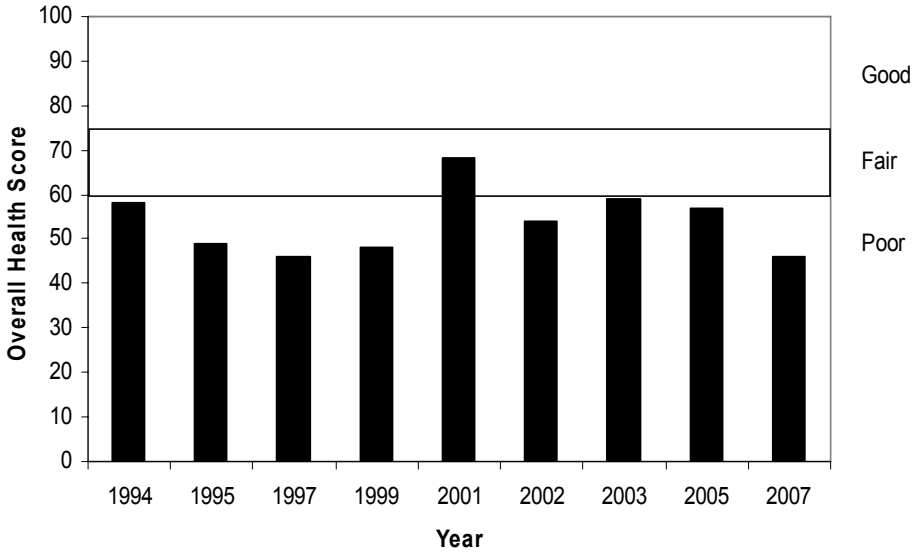

Figure 3-5. Nottely Reservoir Ecological Health Ratings, 1994-2007

Since 1994, the ecological health of Nottely Reservoir rated "poor" in seven of the nine years monitored. In 2001, Nottely rated "fair" with the highest score (68) to date. Because of the substantially higher score in 2001, Nottely Reservoir was sampled again in 2002 when it rated "poor." In 2003 and 2005, Nottely Reservoir's ecological health rating again was low with a "low fair" (only one point above the "poor" category) and "poor" rating, respectively, indicating the higher rating in 2001 was only temporary. Year 2001 had near-record low runoff during the first half of the year (January through May). The higher ecological health score was likely the result of the unusually dry conditions, which led to substantially improved DO conditions (the only "good" rating for DO) in the forebay and lower chlorophyll concentrations.

Dissolved Oxygen

DO has rated "poor" except for a "good" rating at the forebay in 2001 and a "fair" rating at the midreservoir in 2005 (see Table 3-51). In the forebay, a large proportion of the water column typically contains low DO levels (less than 2 mg/L) during mid- to late summer. Year 2001 was an exception, as oxygen concentrations were significantly higher and rated "good." DO typically rates "poor" at the midreservoir, but significant rain events in late summer 2005 helped replenish oxygen in the upper reaches of the reservoir.

Table 3-51. Nottely Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data 1991-2005

Characteristic	Monitoring Year										
	1991	1992	1993	1994	1995	1997	1999	2001	2002	2003	2005
Nottely Forebay											
Dissolved Oxygen	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Poor	Poor
Sediment	NS	NS	Good	Good	Good	Good	Good	Good	Good	Good	Good
Chlorophyll	Good	Good	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor	Poor
Nottely Midreservoir											
Dissolved Oxygen	NS	NS	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Fair
Sediment	NS	NS	Good	Good	Fair	Good	Good	Good	Good	Good	Good
Chlorophyll	NS	NS	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor

NS = Not sampled

Sediment Quality

Sediment quality has been "good" at both locations with the exception of a "fair" rating at the midreservoir in 1995, the result of low concentration of DDE being detected. A "good" rating means no pesticides or PCBs were detected and concentrations of metals were within expected background levels.

Chlorophyll

Average chlorophyll concentrations at both locations indicate a general trend of increasing since the early 1990s. Ratings at the forebay have shifted from "good" and "fair" ratings to "fair" and "poor," while concentrations have been high enough to rate "poor" most years at the midreservoir.

Benthic Monitoring

At the forebay, benthic community scores rated "poor" with the exception of 1994 and 2001, when it rated "fair." The midreservoir sampling station scored "good" five of the eight years monitored, "fair" two of the years, and "poor" one year (Table 3-52).

Table 3-52. Recent (1994-2005) Benthic Community Ratings for Nottely Reservoir

Station	River Mile	Year							
		1994	1995	1997	1999	2001	2002	2003	2005
Forebay	23.5	Fair	Poor	Poor	Poor	Fair	Poor	Poor	Poor
Midreservoir	31	Good	Poor	Fair	Fair	Good	Good	Good	Good

Fisheries Monitoring

The RVSMP began annual fish sampling on Nottely Reservoir in 1994. A list of fish species commonly found in Nottely Reservoir can be found in Appendix K. The fish community in Nottely Reservoir has consistently rated "fair" at both the forebay and midreservoir sampling stations.

In 2004, the SFI rated above the Valleywide average for black bass and spotted bass and below average for largemouth bass (see Table 3-53).

Table 3-53. Sport Fishing Index Scores for Selected Sport Fish Species in Nottely Reservoir, 2004

Fish Species	2004 Score	2004 Valley-wide Average
Black Basses	36	32
Largemouth Bass	28	31
Spotted Bass	32	28

Swimming Advisories

There are no state advisories against swimming in Nottely Reservoir. TVA performed *E. coli* bacteria monitoring at five locations in 2007: Poteete Creek Recreation Area Beach, Nottely Dam Reservation Boat Ramp, Jack's Creek Boat Ramp, Union County Recreation Complex at Butternut Creek Mile 1.0, and Nottely Dam Reservation "Bluff" informal swim area.

Fish Consumption Advisories

There are two fish consumption advisories in effect at Nottely Reservoir. The State of Georgia advises against eating more than one meal per week of largemouth bass greater than 12 inches or striped bass greater than 16 inches because of mercury contamination.

TVA collected channel catfish and largemouth bass from Nottely Reservoir for tissue analysis in autumn 2005. The results, which were similar to those of previous years, were provided to state agencies in Georgia. TVA will analyze fish from Nottely Reservoir again in autumn 2009.

State(s) Impaired Waters

The Georgia Environmental Protection Division assigned use support ratings to waters in the Nottely Reservoir watershed based on available biological, chemical, and/or physical data. A total of 24 miles of monitored stream are listed as impaired (Table 3-54).

Table 3-54. Impaired Waters in the Watershed of Nottely Reservoir

Stream/River Name	State	Miles	Description	Water Quality Stressor/Source
Butternut Creek	Ga.	2	Blairsville	Biota impacted, fecal coliform/ nonpoint
Lower Youngcane Creek	Ga.	2	Headwaters to Youngcane Creek	Biota impacted/ nonpoint
Nottely River	Ga.	8	US 19 to Nottely Reservoir	Fecal coliform/ nonpoint
Nottely River	Ga.	6	Right/left forks to US 19	Fecal coliform/ nonpoint
Nottely River	Ga.	2	Downstream of Nottely Reservoir	Biota impacted/ dam releases
Youngcane Creek	Ga.	4	Little Youngcane Creek to Nottely Reservoir	Fecal coliform/ nonpoint

Source: GAEPD (2006)

Water Supply
Notla Water Authority currently withdraws water from Nottely Reservoir, and the city of Blairsville, Georgia, currently has an intake in Nottely Reservoir's supporting watershed. The 2005 average daily water demand for these intakes were 0.61 MGD (Notla) and 0.314 MGD (Blairsville), a total daily average demand of 0.924 MGD.

3.5.10.2 Environmental Consequences

Alternative A
Under Alternative A, the allocated land uses for the approximately 658 acres that are planned are represented by three land use allocations: Project Operations (443.3 acres), Natural Resource Conservation (123.2 acres), and Recreation (approximately 92 acres). TVA would not designate land use allocations for more than 170 acres of TVA land on Nottely Reservoir that are not planned with the Forecast System (see Table 2-4). Of the 37 unplanned parcels, only two parcels are uncommitted. The acreage for the unplanned, uncommitted parcels total less than an acre, and both parcels are used for natural resource conservation.

Under Alternative A, any proposed use of TVA public land on Nottely Reservoir would be assessed for compliance with TVA's Land Policy, SMP, and Section 26a regulations. Proposals would be subject to environmental reviews, which would require the protection of water quality through either restricted development or the commitment to use BMPs to minimize impacts. Therefore, proposed activities under Alternative A would not significantly impact water quality and aquatic life.

Alternatives B, C, and D
Allocations under Alternatives B, C, and D are identical on Nottely Reservoir. No significant changes to land use are expected to occur on Nottely Reservoir under any one of these alternatives because the allocations are consistent with existing land use on all parcels. Therefore, no significant impacts to water quality and aquatic life are expected in association with these alternatives.

3.5.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Under all of the alternatives, the existing uses of Nottely Reservoir lands would not change, and there would be no adverse impacts to air quality. Noise has previously been discussed in Section 3.1.11.2.

3.5.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.5.12.1 Affected Environment

3.5.12.1.1 Population and Economy

Population: Tables 3-55 and 3-56 contain data regarding the population of the area. Union County, Georgia, had a population of 17,289 in 2000, an increase of 84.1 percent since 1980. This was a much higher rate than in the state or the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990.

Estimates for 2006 indicate that the population of Union County has grown an additional 19.5 percent since 2000. This remains a faster rate than the state and much faster than the nation.

Projections through 2020 indicate that the county will continue to have much faster population growth than the state and the nation over that time. All of those rates are projected to be less than for 1980-2000.

Table 3-55. Population – Union County, Georgia

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Union County	9,390	11,993	17,289	20,652	28,345	53.4
Georgia	5,462,982	6,478,216	8,186,453	9,363,941	11,463,602	141.4
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e) and extrapolations from Georgia Office of Planning and Budget (2005)

Table 3-56. Recent and Projected Population Changes – Union County, Georgia (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Union County	27.7	44.2	84.1	19.5	63.9	201.9
Georgia	18.6	26.4	49.9	14.4	40.0	109.8
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-55

The county is decidedly rural in distribution of population. As noted in Table 3-55, the population density is substantially lower than the state and much lower than the nation. The only incorporated town in the county is Blairsville, Georgia, with 659 residents in 2000. About 96 percent of the population in the county resides outside of the city.

Economy: Table 3-57 contains the most recent annual data regarding the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Union County had 9,850 people employed on average. The county has a higher percentage of farmers, retail employees, and government employees than either the state or the nation. The county has a much lower percentage of manufacturing employees than the state or nation. The average unemployment rate for 2006 in the county was lower than either the state or the nation. Per capita personal income in 2005 was lower in the county than in the state and much lower than in the nation.

Table 3-57. Employment, Unemployment, and Income – Union County, Georgia

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Union County	9,850	4.3	3.1	14.7	15.8	62.1	3.7	25,135
Georgia	5,197,037	1.4	9.0	10.7	14.5	64.5	4.6	30,914
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated) and Georgia Department of Labor (undated)

3.5.12.1.2 Environmental Justice

The minority population in the Nottely Reservoir area is small (Table 3-58). In Union County, Georgia, 3.2 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 41.1 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 12.7 percent, lower than the state rate of 13.7 percent and equal to the national rate of 12.7 percent.

Table 3-58. Minority Population, 2006, and Poverty, 2004 – Union County, Georgia

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Union County	20652	452	210	3.2	12.7
Georgia	9,363,941	3,205,172	640,521	41.1	13.7
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

3.5.12.2 Environmental Consequences

The current land uses at Nottely Reservoir would continue under all of the alternatives. Other than the possible expansion of existing recreation facilities and construction of private water use facilities by adjacent residential landowners, there would be little development that would affect socioeconomic conditions. Because of the allocations, land-based actions under any alternatives are not expected to result in disproportionate impacts on minority or disadvantaged populations.

3.6 Ocoees (1, 2, and 3) Reservoirs

3.6.1 Land Use

An overview of the land use for the mountain reservoirs is provided in Section 3.1.1.

3.6.1.1 Affected Environment

Because of the complex design of the Ocoee dams, reservoirs, water diversion systems, and powerhouses, TVA's land ownership is also complex. The TVA properties consist of approximately 375 acres on 39 parcels including reservations at each dam and powerhouse, land overlying the Ocoee 3 tunnel, and a narrow strip along Ocoee 1 Reservoir fronting National Forest System land. All of these parcels are considered committed, and TVA is not proposing changes in use or management. As shown in Table 1-1, TVA initially purchased 7,785 acres of land (4,135 acres for Ocoee 1; 389 acres for Ocoee 2; and 3,261 acres for Ocoee 3) for the reservoirs. Ninety three percent (7,277 acres) of the lands were later transferred to the USFS, and 133 acres (1.7 percent) were sold.

TVA retained 375.3 acres of land divided into 39 parcels on the Ocoee projects. All of the parcels are committed to existing land uses. The dam reservation, powerhouse reservation, and other land supporting TVA project operations account for 100 percent of the calculated acreage. As previously mentioned, the acreage of the narrow strip of TVA-retained land fronting the land TVA transferred to the USFS has not been calculated. Therefore, the committed uses associated with those parcels are not represented in the committed acreage total. However, there are 27 such parcels on Ocoee 1 that are committed through the transfer agreement with the USFS. Most of this land is used for natural resource conservation and dispersed recreation, and some of the land is managed for developed recreation where it fronts recreational facilities managed or leased by the USFS. The Ocoee 2 and 3 projects are completely committed to project operations, although a significant amount of recreation also occurs on the parcels.

TVA owns 100 percent of the approximately 110 miles of shoreline on the Ocoee projects (see Table 1-2). This shoreline either fronts land TVA retained for project operations or is adjacent to land TVA retained fronting the land transferred to the USFS. The USFS manages most of the land along all three reservoirs, and there is no shoreline along the reservoir available for residential access.

Parcels containing prime farmland surrounding Ocoee 1 Reservoir are presented in Table 3-59. Little, if any, prime farmland soils are found in the areas surrounding Ocoee 2 and 3 reservoirs.

Table 3-59. Acres of Prime Farmland in Selected Parcels – Ocoee 1 Reservoir

Parcel Number	Total Parcel Acreage	Acres of Prime Farmland	Zone Allocation	Description
1	60.1	9.8	2	Dam Reservation (Overlook)
2	17.3	9.6	2	Dam Reservation (Sugarloaf Mountain Recreation Area)

3.6.1.2 Environmental Consequences

Alternative A
As shown in Table 2-3, TVA allocated all of its 375.3 acres on the Ocoee reservoirs for Project Operations. Under the Forecast System, no acreage was allocated to any other use. The Forecast System does not provide a land use plan for the TVA-retained land fronting the land TVA transferred to the USFS. This land is considered committed to the back-lying use and will continue to be managed by the USFS according to the conditions of the transfer agreement and subsequent USFS permits. The acreage of these parcels is unknown.

There would be no potential for change in land use under Alternative A because all of the parcels on the Ocoees are committed to their existing uses as shown in Table 2-2.

No impacts to prime farmlands are expected under Alternative A.

Alternatives B, C, and D
Under Alternative B, C, or D, no changes would be made to the previously allocated uses under Alternative A. All parcels allocated for Project Operations under Alternative A would be allocated to Zone 2 (Project Operations) under Alternatives B, C, and D. The previously unplanned narrow strip of TVA land fronting the National Forest System property would be allocated to a zone compatible with its current use, either to Zone 4 (Natural Resource Conservation) or to Zone 6 (Developed Recreation) where the lands front USFS developed recreation areas. The acreage for these narrow strips of TVA-retained land fronting USFS land is unknown and is not included in the Zones 4 and 6 acreage totals. These narrow strip parcels would continue to be managed as they now are, and their individual land uses would not change. Adoption of Alternative B, C, or D would not affect prime farmland.

3.6.2 Recreation

An overview of the recreation resource for the mountain reservoirs is provided in Section 3.1.2.

3.6.2.1 Affected Environment

Whitewater Rafting Recreation
In 1984, TVA entered into a 35-year agreement with the State of Tennessee to provide 116 days of controlled water releases for recreation purposes between Ocoee 2 Dam and an area at Caney Creek below Ocoee 2 Powerhouse. In addition, TVA granted an easement to the state over certain lands owned by TVA (Ocoee 2 Parcels 1 and 3) for access and take-out areas for the operation, management, and maintenance of a whitewater recreation area. The agreement also provided for $1 million to be placed in an interest-bearing trust fund for the state's operation and management of the area.

Ocoee 2 Dam Reservation (Parcel 3) functions doubly as a put-in location for Ocoee River whitewater rafting. The heavily used public recreation area includes parking and drop-off areas for local outfitters, restroom facilities, a pedestrian access ramp to the river, and a picnic area. This point is a staging area for over 200,000 rafters and kayakers that visit the river each year. The put-in location and the river course below are heavily used from late March through early November.

Most of the recreation facilities on Ocoee parcels are allocated for Project Operations due to the presence of dams and powerhouses.

Ocoee 1 (Parksville)
There are 10 TVA parcels on Ocoee 1 (Parksville) Reservoir that support developed recreation facilities. These developed recreation areas are summarized in Table 3-60.

Table 3-60. Recreation Facilities on Ocoee 1 (Parksville) Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Lake Ocoee Inn and Marina	Polk, Tenn.	Private	Commercial	USFS**	4		●		●				●
Parksville Dam Reservation*	Polk, Tenn.	Public	TVA/State of Tenn.	TVA	1, 2			●		●			●
East Parksville Boat Ramp	Polk, Tenn.	Public	USFS	USFS**	13				●				
Kings Slough Ramp	Polk, Tenn.	Public	USFS	USFS**	23				●				
Mac Point Beach	Polk, Tenn.	Public	USFS	USFS**	15			●					●
Parksville Beach	Polk, Tenn.	Public	USFS	USFS**	7			●					●
Parksville Boat Ramp	Polk, Tenn.	Public	USFS	USFS**	13				●				
Parksville Campground	Polk, Tenn.	Public	USFS	USFS**	17	●							●
Big Creek Private Paddler Take-Out *	Polk, Tenn.	Public	State of Tenn.	USFS**	19					●			●
Camp Ocoee	Polk, Tenn.	Quasi-Public	YMCA	USFS**	23								●
Camp Cherokee	Polk, Tenn.	Quasi-Public	First Baptist Church of Cleveland	USFS**	21								●

* = Stream access site
** = TVA retained below MSC

Seven parcels front the USFS cabin sites (area of the reservoir with rustic private cabin sites allowed by the USFS under a 20-year recreation residence special use permits), two parcels front private camps on USFS lands, and five parcels front USFS day use areas and campgrounds.

The one public campground on Ocoee 1 (Parksville) Reservoir, Parksville Campground (Parcel 17), is owned and operated by the USFS.

There is one commercial marina operating on Ocoee 1 (Parksville) Reservoir. Lake Ocoee Inn and Marina (Parcel 4) is privately operated, and this marina was certified as a TVA Clean Marina in October 2005.

Four recreation areas contain at least one boat ramp. One is located at the Lake Ocoee Inn and Marina, and three are operated by the USFS.

There are two stream access sites located near Ocoee 1 (Parksville) Reservoir. TVA manages the access site on the Parksville Dam Reservation (Parcel 1). The State of Tennessee manages the Big Creek Private Paddler Take-Out (Parcel 19).

There is one day use area with significant facilities on Ocoee 1 (Parksville). Sugarloaf Mountain Park is owned by TVA and is operated by the State of Tennessee on Parcel 2 of the dam reservation. It provides restrooms, picnic tables, grills, interpretive signs, and a 1:10 scale model of the 1996 Olympic whitewater section of the Ocoee River.

Ocoee 2

Two TVA parcels on Ocoee 2 Reservoir and associated river reaches support developed recreation facilities. Facilities on Parcels 1 and 3 include stream access areas for commercial and private boaters, restroom facilities, and picnic tables (see Table 3-61).

Table 3-61. Recreation Facilities on Ocoee 2 Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenitites Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Caney Creek (Middle Take-Out) *	Polk, Tenn.	Public	State of Tenn.	TVA	3					•			•
Rogers Creek (Upper Take-Out and Middle Put-In) *	Polk, Tenn.	Public	State of Tenn.	TVA/ USFS	1			•		•			•

* = Stream access site

Ocoee 3

Two TVA parcels on Ocoee 3 Reservoir support developed recreation facilities (Table 3-62). The only campground on Ocoee 3 Reservoir lands is Thunder Rock Campground, located immediately downstream of the Ocoee 3 Powerhouse on Parcel 5. It is managed by the USFS under a public recreation license agreement with TVA.

One stream access site is located in the Ocoee 3 watershed. The State of Tennessee manages the access site on the Upper Ocoee Put-In (Parcel 1).

Table 3-62. Recreation Facilities on Ocoee 3 Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campground	Marina	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Upper Ocoee Put-In *	Polk, Tenn.	Public	State of Tenn.	TVA	1					●			●
Thunder Rock Campground	Polk, Tenn.	Public	USFS	TVA	5	●		●					●
USFS Whitewater Center	Polk, Tenn.	Public	USFS	USFS	N/A			●					●

N/A = Not applicable
* = Stream access site

Dispersed Recreation
Inventory data were collected only for on-reservoir recreation areas. Due to the riverine nature of Ocoee 2 and 3 reservoirs, a large majority of the recreation areas are not in the table provided. Many recreation areas, which are dispersed in nature, are on surrounding lands that are managed by the USFS.

3.6.2.2 Environmental Consequences

Alternative A
Under Alternative A, no land is allocated to Zone 6 (Developed Recreation) on the three Ocoee reservoirs. However, under Alternative A, 16 unplanned parcels currently support developed recreation. The unplanned parcels are all committed to a developed recreation use through a transfer agreement with the USFS.

Under Alternative A, TVA would not allocate any additional parcels for Public or Commercial Recreation use on any of the Ocoee reservoirs. However, the unplanned parcels that are committed to developed recreation would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas. Many of the Project Operations parcels also support recreational use, such as Thunder Rock Campground. Under Alternative A, potential impacts to recreation would be insignificant because parcels utilized for developed recreation (both unplanned and planned parcels) would not change. Any proposed recreational facilities would be subject to additional environmental review, and appropriate mitigation would be used as necessary to compensate for potential adverse effects to recreation.

Under Alternative A, no land use changes are proposed of any parcels, and therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansions). Potential effects to dispersed recreation of this nature are expected to be insignificant.

Alternatives B, C, and D
Under Alternatives B, C, and D, 16 narrow strip parcels would be allocated to Zone 6 (Developed Recreation) on the Ocoee reservoirs lands. All of these parcels are committed to a developed recreation use and would be allocated to that use as Zone 6. All of the

parcels currently support recreational use with existing facilities. The parcels allocated to Zone 6 under the action alternatives include those unplanned parcels under Alternative A that are committed to developed recreation uses.

Under Alternatives B, C, and D, any future demand for recreational needs would have to be met by expansion of recreation facilities in these existing areas allocated to Zone 6. These areas are the same under all alternatives. Because there would be no new parcels allocated to Developed Recreation, the potential effects to recreational opportunities would be the same under these three alternatives. Any new facilities proposed within existing areas would be subject to additional environmental review, and any necessary mitigation would be used to offset adverse effects to recreational opportunities or facilities.

3.6.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.6.3.1 Plant Communities

3.6.3.1.1 Affected Environment

The vegetative classes commonly found on lands within and around the Ocoee reservoirs are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation. Most of the evergreen forests are in the form of pine plantations. Mixed pine-hardwood forests dominate the region with smaller areas of deciduous forest (mainly oak-hickory dry forest on the ridges and more mesic hardwood forest with beech on the slopes). Scrub-shrub wetland communities occur along the banks of the river, and herbaceous vegetation is commonly found along transmission line and roadway rights-of-way and grassy areas within the dam and powerhouse reservations.

A small percentage of the forests are considered to be evergreen forests and consist of small stands of Virginia pine and white pine. Evergreen-deciduous forest, the most common forest type, is dominated by stands of mixed pine-hardwood trees. Several species of dry-site ferns (hairy lip fern and cliffbrake fern) occur on rocky bluffs along US 64 along with invasive nonnative plants such as Japanese knotweed, princess tree, and tree-of-heaven.

Deciduous forest occurs mainly as oak-hickory forest (mesic to xeric) and mesic hardwood forest on slopes. Oak-hickory forests common on dry ridges grade into more mesic slopes.

The globally rare (G2) community known as the Hiwassee/Ocoee River Boulder Scour Vegetation occurs in a 3.2-mile stretch of the Ocoee River between Ocoee 2 Powerhouse and Ocoee 2 Dam. This community is restricted in distribution, being limited to phyllite or graywacke boulders in unimpounded sections of rivers with a narrowed flow and a higher gradient regime. The habitat of this association has been affected and limited by the effects of impoundments and resulting changes in flooding regimes. It is threatened by recreational use, vegetational succession, and alterations in the flow regime. In this temporarily flooded river scour community, the herbaceous species are limited to the cracks and crevices of the boulders, with Ruth's golden aster dominating in many places. The scouring of the river controls the encroachment of woody vegetation, but small saplings of American sycamore, river birch, and Virginia pine can be found. Virginia willow, tag alder, and silky dogwood are shrubs found along the river.

Invasive plants occur on most of the planned TVA parcels around the Ocoee reservoirs. The species present include Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese knotweed, Japanese stilt grass, Johnson grass, kudzu, mimosa, multiflora rose, princess tree, and tree-of-heaven.

3.6.3.1.2 Environmental Consequences

Alternative A
Under Alternative A, the potential impacts to the Hiwassee/Ocoee River Boulder Scour Vegetation G2 community would be as previously described in the ROS EIS (TVA 2004). The portion of the river containing the globally rare (G2) plant community is presently being managed by the USFS. To reduce impacts, the USFS, in cooperation with TVA, is displaying signs on the rocks to warn rafters not to disturb the area of the rare plant community. With the exception of the Hiwassee/Ocoee River Boulder Scour Vegetation G2 community, most plant communities encountered on the Ocoee reservoirs are common and representative of the Blue Ridge Mountains. No additional impacts are expected to the terrestrial ecology of the Ocoee reservoirs.

Alternatives B and C
Potential effects on plant communities under Alternatives B, C, and D would be the same as those anticipated under Alternative A.

3.6.3.2 Wildlife Communities

3.6.3.2.1 Affected Environment

TVA parcels around the Ocoee reservoirs are allocated for Project Operations. Properties on the Ocoee reservoirs contain evergreen, evergreen-deciduous, deciduous, southern Appalachian cove forests, and limited early successional habitats. Much of the landscape is extremely rugged with steep hillsides, dry ridge tops, and deeply incised stream corridors. Most of the terrestrial animal species observed here are typical of the region.

Bat surveys performed in the vicinity indicate that red, big brown, and silver-haired bats as well as northern *Myotis* and eastern pipistrelle are common in the area. Belted kingfisher, great blue heron, green heron, gray squirrel, white-tailed deer, and wild turkey are common wildlife frequently observed in the area. American crow, broad-winged hawk, and green frog were also observed in the area.

3.6.3.2.2 Environmental Consequences

Alternative A
Under Alternative A, all planned parcels on the Ocoee reservoirs are allocated for Project Operations. Several properties on Ocoee 1 Reservoir are unplanned. These areas front recreation areas and USFS lands. The existing uses of all these parcels would continue and would not result in adverse impacts to wildlife.

Alternatives B, C, and D
Under Alternatives B, C, and D, allocated uses for Ocoee 2 and 3 reservoirs would remain the same as under Alternative A. The new allocations to Zone 4 (Natural Resource Conservation) and Zone 6 (Developed Recreation) on narrow strip parcels on Ocoee reservoirs would be based on their current use. Adoption of Alternative B, C, or D is not expected to result in adverse impacts to wildlife.

3.6.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.6.4.1 Affected Environment

As shown in Table 3-63, one federally listed plant, Ruth's golden aster, and 21 state-listed plants are known from within 5 miles of the Ocoee reservoirs. In addition, the monkey-face orchid, a federal candidate for listing, is known from Polk County. Other than horsesugar, which was found on Parcels 1 and 2 on Ocoee 3 Dam Reservation, no other listed plants were found on 375.3 planned acres for the Ocoee reservoirs.

Table 3-63. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Vicinity of the Ocoee Reservoirs in Polk County, Tennessee

Common Name	Scientific Name	Federal Status	State Rank	State Status
Plants				
American ginseng	*Panax quinquefolius*	--	S3S4	S-CE
Ash-leaf bush pea*	*Thermopsis fraxinifolia*	--	S3	THR
Broad-leaved tickseed	*Coreopsis latifolia*	--	S1S2	END
Chalk maple	*Acer saccharum* ssp. *leucoderme*	--	S3	SPCO
Cow parsnip	*Heracleum maximum*	--	S2	SPCO
Eastern turkeybeard	*Xerophyllum asphodeloides*	--	S3	THR
Fraser's loosestrife*	*Lysimachia fraseri*	--	S2	END
Giant hyssop	*Agastache scrophulariifolia*	--	S1S2	THR
Horsesugar*	*Symplocos tinctoria*	--	S2	SPCO
Large cranberry	*Vaccinium macrocarpon*	--	S2	THR
Monkey-face orchid	*Platanthera integrilabia*	CAND	S2S3	END
Mountain bush-honeysuckle	*Diervilla rivularis*	--	S2	THR
Mountain honeysuckle	*Lonicera dioica*	--	S2	SPCO
Naked-fruited rush	*Juncus gymnocarpus*	--	S3	SPCO
Nestronia	*Nestronia umbellula*	--	S1	END
Nevius' stonecrop*	*Sedum nevii*	--	S1	END
Northern bush-honeysuckle	*Diervilla lonicera*	--	S2	THR
Pink lady's slipper	*Cypripedium acaule*	--	S4	E-CE
Ruth's golden aster*	*Pityopsis ruthii*	END	S1	END
Sedge	*Carex purpurifera*	--	S2	THR
Southern lobelia	*Lobelia amoena*	--	S1S2	THR
Sweet pinesap	*Monotropsis odorata*	--	S2	THR
Tawny cotton-grass	*Eriophorum virginicum*	--	S1S2	THR
Fish				
Tennessee dace*	*Phoxinus tennesseensis*	--	S3	NMGT
Amphibian				
Seepage salamander*	*Desmognathus aeneus*	--	S1	NMGT
Birds				
Bald eagle*	*Haliaeetus leucocephalus*	--	S3	NMGT
Red-cockaded woodpecker	*Picoides borealis*	END	SH	EXTI
Swainson's warbler*	*Limnothlypis swainsonii*	--	S3	NMGT

Common Name	Scientific Name	Federal Status	State Rank	State Status
Mammals				
Masked shrew*	*Sorex cinereus*	--	S4	NMGT
Smoky shrew*	*Sorex fumeus*	--	S4	NMGT
Woodland jumping mouse*	*Napaeozapus insignis*	--	S4	NMGT
Reptile				
Northern pine snake*	*Pituophis melanoleucus melanoleucus*	--	S2	THR
Snails				
Blue-gray glyph*	*Glyphyalinia ocoae*	--	S2	NOST
Ocoee covert*	*Fulmonelix archeri*	--	S1	NOST

-- = Not applicable
*Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled; S2 = Imperiled; S3 = Rare or uncommon; S4 = Widespread; abundant, and apparently secure; **Status abbreviations:** CAND = Candidate for listing; E-CE = Endangered-commercial exploited; END = Endangered; EXTI = Extirpated; NMGT = In need of management; NOST = No state status; S-CE = Special concern-commercially exploited; SPCO = Special concern; THR = Threatened

Ash-leaf bush pea is a southern Appalachian plant that occurs from North Carolina and Tennessee, into northern portions of Georgia and South Carolina. Habitat includes openings in dry woodlands and ridges (Weakley 2006). There are currently eight known sites for this species in Polk County with one known from the Gee Creek wilderness area. No suitable habitat was found on the TVA lands.

Fraser's loosestrife occurs in eastern Tennessee, the Carolinas, Alabama, and Georgia with disjunct populations in southern Illinois and northwestern Tennessee. Fraser's loosestrife is generally found in wet areas such as alluvial meadows, moist stream and riverbanks, flats along streams, moist pastures, and roadside ditches, yet it is also known from rocky upland and hardwood forests (ibid). There are currently 10 populations reported from Polk County with two considered historic records. Habitat for Fraser's loosestrife occurs along the bluffs above US 64, which runs parallel to the Ocoee River. Plants are known to occur on USFS land on the bluffs adjacent to Parcel 1 of Ocoee 2.

The range of **horsesugar**, a common subcanopy woody species on the coastal plain, extends into the southeastern Tennessee and western Carolina mountains (ibid). Eight populations of horsesugar have been reported from areas surrounding the Ocoee reservoirs. During field reviews on Parcels 1 and 2 at Ocoee 3 Dam, plants were found growing in the understory of evergreen-deciduous forests. Common trees found in the canopy were hickory, oak, and pine species. Other common trees observed were tulip poplar and sweetgum. In addition to the horsesugar, other associated understory species were American holly, buffalo nut, Carolina allspice, flowering dogwood, serviceberry, and sourwood and vine hydrangea.

Nevius' stonecrop is a succulent herb that is native to Polk and Marion counties in Tennessee, north central and east central Alabama, and west central Georgia. It occurs on gneiss rock outcrops on river bluffs (ibid). There are currently nine records known in the Cherokee National Forest. These occurrences are all located on rocky outcrops in the Ocoee River Gorge above US 64, which runs parallel to the Ocoee River. Plants are known to occur on the bluffs near Parcel 3 of Ocoee 2.

Ruth's golden aster (see Section 3.1.4) is known from a 3.2-mile reach of the Ocoee River, between Ocoee 2 Dam and Ocoee 2 Powerhouse. Approximately 600 plants occur

in this area (TVA 2005a). Since 1987, there has been a gradual increase in numbers of Ruth's golden aster on the Ocoee River. However, in 2007, five out of the six populations of Ruth's golden aster declined in numbers, possibly related to widespread drought conditions. Presently, the USFS, in cooperation with TVA, is displaying signs on the rocks where the rare plant populations occur to warn rafters not to disturb the plants. River flows are managed as described in the ROS EIS (TVA 2004).

The **Tennessee dace**, a state-listed species, occurs in tributaries to Ocoee 1 Reservoir. It inhabits low-gradient woodland tributaries of the Tennessee River. This fish prefers shallow pools with associated debris and undercut banks (Etnier and Starnes 1993).

Seepage salamanders frequent seepages with moist leaf litter but are occasionally found beneath logs, moss mats, and other surface objects (Petranka 1998). This species is expected to occur scattered throughout the Ocoee Reservoir project area and is known from Parcel 16.

Bald eagles nest on Parcel 20 along the Caney Creek embayment of Ocoee 1 Reservoir. Eagles have successfully raised young at this location annually since 2005.

As previously described in Section 3.1.4, the **red-cockaded woodpecker** is no longer known to occur in the mountain reservoirs area. Other listed animals previously reported in the area and likely or known to occur on the Ocoee reservoirs lands are described below.

Swainson's warblers nest in wooded bottomlands and ravines with a thick, shrubby understory. Habitat for this species exists along most of the tributaries to the Ocoee River near the Ocoee reservoirs.

Masked shrews are found in a variety of habitats but are most commonly found living among rocks and logs in moist woods as well as in marshy meadows and sphagnum bogs (Linzey 1998). This species likely occurs along stream corridors in the area.

Smoky shrews inhabit cool, damp hemlock and spruce forests as well as deciduous forests (ibid). They have been collected in swamps and bogs. This species is reported from several localities in the Cherokee National Forest. Suitable habitat for smoky shrews exists within the Ocoee Reservoir land parcels.

Woodland jumping mice inhabit areas of dense herbaceous growth in moist or mesic habitats (ibid). This species has been found inhabiting bogs and swamps. This mouse species is reported from several localities in the Cherokee National Forest. Suitable habitat for woodland jumping mice exists on the Ocoee reservoirs land.

Although **Indiana bats** have not been reported from areas surrounding the Ocoee reservoirs, forested habitats were assessed for their suitability for this endangered species. Forested areas on TVA lands ranked low in their suitability as summer roost habitat for Indiana bats because of the lack of suitable roosting trees, young age of most stands, and the presence of thick midstory layers. Mist net surveys for bats were performed at four sites near the Ocoee 2 Powerhouse during the late 1990s. No Indiana bats were captured during these surveys. No parcels were found that warrant a Zone 3 (Sensitive Resource Management) allocation to protect other federally listed species.

Northern pine snakes inhabit well-drained sandy or loamy soils with dense vegetation. They have been found in pine barrens, mixed scrub pine and oak woods, dry rocky mountain ridges, sand hills, and old fields (Ernst and Ernst 2003). This species is reported from several localities in the Cherokee National Forest. Suitable habitat for northern pine snake exists on ridge tops on the Ocoee reservoirs land.

Blue-gray glyph and **Ocoee covert** are both terrestrial snails found in deciduous forests. Both species are known from tributaries of the Ocoee River in Polk County, Tennessee. A population of Ocoee coverts exists on Parcel 4 off the road behind the powerhouse. A population of blue-gray glyphs exists approximately a mile from Parcel 3.

3.6.4.2 Environmental Consequences

Alternative A

Plants

Under Alternative A, the impacts to Ruth's golden aster would be as previously described in the ROS EIS (TVA 2004). The region where the plants occur is managed by the USFS and would not be affected by the proposed MRLMP. To minimize impacts, the USFS, in cooperation with TVA, is displaying signs on the rocks to warn rafters not to disturb the areas where the rare plants grow. Because horsesugar occurs on parcels designated for dam operations, no adverse impacts are expected to this species.

Terrestrial Animals

No federally listed terrestrial animals are known to occur on TVA parcels on the Ocoee reservoirs, although the formerly listed bald eagle nests on Parcel 20 on Ocoee 1 Reservoir. TVA has established a protective buffer zone around this locality as recommended by the *National Bald Eagle Management Guidelines* (USFWS 2007). The parcel borders USFS lands.

Forested areas on TVA lands ranked low in their suitability as summer roost habitat for Indiana bats because of the lack of suitable roosting trees, young age of most stands, and the presence of thick midstory layers. Mist net surveys for bats were performed at four sites near the Ocoee 2 Powerhouse during the late 1990s. No Indiana bats were captured during these surveys. No parcels were found that warrant a Zone 3 (Sensitive Resource Management) allocation to protect other federally listed species.

Under Alternative A, all previously planned parcels are allocated for Project Operations, and several narrow TVA parcels on Ocoee 1 Reservoir have not been planned. These narrow strips front USFS recreation areas and lands. Under Alternative A, continued committed use of the narrow strip lands fronting USFS lands and the planned allocations utilized on the three Ocoee reservoirs are not expected to result in impacts to protected terrestrial animal resources.

Aquatic Animals

The Tennessee dace is known to occur in tributaries near the vicinity of unplanned Parcels 17, 18, and 22 on Ocoee 1 Reservoir, which front USFS lands. Parcel 17 fronts the USFS Parksville Lake Campground. Any future proposed activities on Parcel 17 would be subject to environmental review to assess potential impacts on aquatic species. TVA would take necessary measures, including not undertaking the proposed action, to protect the Tennessee dace. No known listed aquatic species occur in Ocoee 2 or 3 reservoirs.

Therefore, any activities anticipated on these reservoirs would have no impacts to listed species.

Alternatives B, C, and D

Plants

Anticipated effects to listed plants under Alternatives B, C, and D, would be the same as those expected to occur under Alternative A.

Terrestrial Animals

Under Alternatives B, C, and D, allocations for parcels under Alternative A for the Ocoee reservoirs would remain the same. The new allocations of Zone 4 (Natural Resource Conservation) and Zone 6 (Developed Recreation) for the narrow strip parcels on Ocoee 1 Reservoir are not expected to result in impacts to protected terrestrial animal resources or their habitats. As with Alternative A, the bald eagle nest would be protected by guidelines established by the *National Bald Eagle Management Guidelines* (USFWS 2007).

Aquatic Animals

Under Alternatives B, C, and D, Parcel 17 would be allocated to Zone 6 (Developed Recreation) and Parcels 18 and 22 would be allocated as Zone 4 (Natural Resource Conservation), which represents their existing uses. Therefore, there would be no change from Alternative A. No known listed aquatic species occur in Ocoee 2 or 3 reservoirs, and therefore, there would be no impacts to listed aquatic species under the three action alternatives.

3.6.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.6.5.1 Affected Environment

Wetland areas on the Ocoee reservoirs are primarily scrub-shrub and emergent wetlands associated with the river channels and islands. NWI data (see Table 3-5) support this, and indicate the presence of 115 acres of emergent wetlands and 103 acres of scrub-shrub wetlands on the three Ocoee reservoirs. Typical plant species associated with these habitats include river birch, sycamore, tag alder, and silky dogwood. No wetlands were present on any of the TVA parcels associated with Ocoee 1 Reservoir. Parcels 1, 2, 4, and 5 on Ocoee 2 Reservoir contain scrub-shrub wetlands immediately downstream of the dam and downstream of the powerhouse. Parcels 1 and 4 on Ocoee 3 Reservoir also have scrub-shrub wetlands associated with the riverine portions of the parcel.

3.6.5.2 Environmental Consequences

The potential effects of implementing the various alternatives on wetlands would be similar, and none of these potential effects are likely to be adverse. Under all alternatives, parcels containing wetlands would generally continue to be managed as they have been in the past. Any proposed actions with the potential to affect wetlands would be subjected to additional environmental review. As necessary, appropriate mitigation would be employed to offset potential adverse effects to wetlands prior to the implementation of such projects.

3.6.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6. The main watercourse in the Ocoee 1, 2, and 3 reservoirs is the Ocoee River.

3.6.6.1 Affected Environment

Ocoee 1 Reservoir

With respect to floodplains, the potentially affected area extends from the lower limit of the Ocoee Dam Reservation at about ORM 11.5 upstream to about ORM 17.0 in Ocoee 1 Reservoir. The 100-year flood elevations for the Ocoee River downstream of the dam vary from 739.4 feet msl at ORM 11.5 to 742.0 feet msl at ORM 11.9 (downstream of Ocoee 1 Dam). The 500-year flood elevations for the Ocoee River downstream of the dam vary from 744.2 feet msl at ORM 11.5 to 747.9 feet msl at ORM 11.9. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

The 100-year flood elevation for the Ocoee River is 839.5 feet msl from Ocoee 1 Dam (ORM 11.9) to the upper end of Ocoee 1 Reservoir at about ORM 17.0. The 500-year flood elevation for the Ocoee River is 843.4 feet msl from the dam to the upper end of the reservoir.

Ocoee 2 Reservoir

The potentially affected area extends from the Ocoee 2 Powerhouse at about ORM 19.8 upstream to about ORM 24.5 in Ocoee 2 Reservoir. The 100- and 500-year flood elevations for the Ocoee River at the powerhouse and downstream of the dam have not been determined.

The approximate 100-year flood elevation for the Ocoee River is estimated to be 1,123.0 feet msl from Ocoee 2 Dam (ORM 24.2) to the upper end of TVA's landrights at about ORM 24.5. The approximate 500-year flood elevation for the Ocoee River is estimated to be 1,124.5 feet msl from the dam to ORM 24.5.

Ocoee 3 Reservoir

The potentially affected area extends from the Ocoee 3 Powerhouse at about ORM 25.1 upstream to about ORM 35.5 in Ocoee 3 Reservoir. The 100- and 500-year flood elevations for the Ocoee River at the powerhouse and downstream of the dam have not been determined.

The 100-year flood elevations for the Ocoee River vary from 1,438.1 feet msl at Ocoee 3 Dam (ORM 29.2) to elevation 1,455.6 feet msl at the upper end of TVA's landrights at about ORM 35.5. The 500-year flood elevations for the Ocoee River vary from elevation 1,439.7 feet msl at the dam to elevation 1,458.8 feet msl at the upper end of TVA's landrights. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

3.6.6.2 Environmental Consequences

The environmental consequences of each alternative are discussed in Section 3.1.6. Adverse effects on the Ocoee reservoirs floodplains are not anticipated under any of the alternatives.

3.6.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.6.7.1 Archaeological Resources

3.6.7.1.1 Affected Environment

Ocoee 1 Reservoir was subject to a shoreline survey in January and February of 2002 during the winter drawdown period (Ahlman 2002b). Approximately 54.7 miles of shoreline were investigated, and 20 archaeological sites either identified or revisited. Of these, 10 sites are considered potentially eligible for listing in the NRHP. Below the Ocoee 1 Reservoir Dam, a site was investigated for potential impacts resulting from the construction of the 1996 Olympic whitewater venues model site (Dicks 2002).

Archaeological surveys have not been conducted along the shorelines of Ocoee 2 and 3 reservoirs. However, archaeological sites occur near Ocoee 2 Dam, Ocoee 3 Powerhouse, and Ocoee 3 Dam. These were recorded by the USFS transmission line surveys and Tennessee Department of Transportation during studies of the US 64 corridor. The three archaeological sites on TVA Ocoee 2 Reservoir lands and the four sites on TVA Ocoee 3 Reservoir lands are all on lands used for project operations.

3.6.7.1.2 Environmental Consequences

Because none of the alternatives would involve changes of existing land uses, the adoption of any alternative would not directly affect archaeological resources. As described in Section 3.1.7.1.2, TVA anticipates executing a PA in Tennessee for the identification, evaluation, and treatment of all historic properties in the Ocoee reservoirs area. Until the PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties as required by Section 106 of the NHPA. TVA would adhere to the terms of this PA under all alternatives, and no adverse impacts on archaeological resources are expected.

3.6.7.2 Historic Structures

3.6.7.2.1 Affected Environment

Ocoee 1 (Parksville) Reservoir

Henry Crumbliss, an employee of the Chattanooga Railway and Light Company, is credited with the idea of locating a hydro plant at this location. He was a professional engineer and was supposedly riding through the area on horseback when he conceived the idea of the project. Crumbliss later became chief engineer of TEPCO.

Some idea of the magnitude of the undertaking may be gathered from the fact that 1,500 men were employed. To ensure the welfare of these workers and their families, a town was built having practically all of the features of a city, including labor camps, boarding houses, waterworks, stores, an ice plant, a hospital, and fire and police protection.

The first hydroelectric power supplied to Chattanooga came from this plant located at Parksville, Tennessee, on the Ocoee River. This dam may hold the distinction of being the first to supply hydroelectric power in the TVA territory.

Ocoee 1 Dam and Powerhouse are listed in the NRHP.

Ocoee 2 Reservoir
The Ocoee 2 Powerhouse is located on the Ocoee River at its junction with Caney Creek, slightly above the headwaters of Ocoee 1 Reservoir. Construction of the project was started in 1911, and the plant was placed in operation October 24, 1913. Because of the manner in which the hydraulic head was obtained, many people considered Ocoee 2 to be an engineering marvel of the time. In its natural bed, the river drops about 270 feet in a distance of 5 miles. A diversion dam was built 5 miles upstream from the powerhouse location to divert water into a wooden flume that was set upon a shelf carved along the side of the mountain. The drop in the flume for its entire length was 17 feet and 6 inches, providing an operating head for the plant of some 250 feet.

The Diversion Dam
The diversion dam is a rock-filled crib structure, 385 feet long at its crest. At the maximum section, it is 27.5 feet high and 40 feet wide at the base. The dam rests throughout on a rock foundation. The crib was constructed of 10-inch-square sawed pine timbers, fastened at the intersections with drift bolts.

The Flume
The flume on the mountainside is a wooden structure designed for a waterway 14 feet and 2 inches wide by 9 feet and 9 inches deep when carrying the maximum required capacity of 1,200 second-feet. The flume is 24,800 feet long, and the drop in the flume for its entire length is 17 feet and 6 inches. Almost 9 million board feet of Georgia pine lumber was used in its construction.

At certain points, trestles support the flume. These vary in height from 70 to 150 feet and in length from 200 to 500 feet. Construction of the taller trestles used steel; the other trestles are wooden construction. Concrete structures replaced the wooden trestles later.

A narrow gauge railway was constructed on top of the flume. The railway was used to patrol the flume and to carry construction and maintenance materials. A handcar was initially used. This was superseded by a battery-operated car, and it, in turn, was superseded by a car powered with a gasoline motor.

The village of Caney Creek was built in 1918 by TEPCO to house plant employees and their families. Located across the river, it was home to 15 families. Both *Life* magazine and Ripley's *Believe It or Not* featured Caney Creek as one of the few "carless" towns in America. TVA removed the village in 1941.

Ocoee 2 Dam, Powerhouse, and Flume are listed in the NRHP.

Ocoee 3 Reservoir
Ocoee 3 Reservoir is named for the river it sits on and for its position among the three dams on the lower Ocoee. Ocoee 3 Dam, like Apalachia Dam, is a straight gravity-type diversion structure. Construction began on the dam on July 17, 1941, the day the dam was authorized by the TVA Board of Directors. The dam closed in August 1942, and its single hydropower-generating unit went into service on April 30, 1943. The Ocoee 3 Powerhouse is located more than 2 miles downstream from the dam. At the dam, water from the river is diverted into a tunnel and carried to the powerhouse downstream.

Both the Ocoee 3 Dam and Powerhouse are considered historic properties.

3.6.7.2.2 Environmental Consequences

Under all alternatives, there would be no changes to existing land uses, and there would be no associated impact to historic structures. As described in Section 3.1.7.1.2, TVA proposes to execute a PA in Tennessee for the identification, evaluation, and treatment of all historic properties in the Ocoee reservoirs area. Until the PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties as required by Section 106 of the NHPA.

3.6.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.6.8.1 Affected Environment

Managed areas and ecologically significant sites within 3 miles of the Ocoee reservoirs are listed in Table 3-64. The areas are grouped by closest distance to the reservoir; areas abutting or less than 0.1 mile from reservoir lands and NRI streams underlying reservoir waters are listed as “adjacent.”

Table 3-64. Managed Areas, Ecologically Significant Sites, and Nationwide Rivers Inventory Streams Within 3 Miles of Ocoee Reservoirs

Name	Type of Area	Managing Authority	County, State	Closest Distance to Reservoir
Ocoee River	NRI	Federal	Polk, Tenn.	Adjacent
Ocoee River Ruth’s Golden Aster Sites	Ecologically significant site (ESS)	None for sites; federal for species protection	Polk, Tenn.	Adjacent
Cherokee National Forest	Managed area (MA)	USFS	Polk, Tenn.	Adjacent
Cherokee (South) State Wildlife Management Area	MA	State	Polk, Tenn.	Adjacent
Goforth Creek Gorge Site	ESS	None	Polk, Tenn.	Adjacent
Ocoee State Bear Reserve	MA	Federal	Polk, Tenn.	Adjacent
Little Frog Mountain Wilderness Study Area	MA	Federal	Polk, Tenn.	Adjacent
Sugarloaf Mountain Park	MA	State	Polk, Tenn.	0.2 mile west
Little Frog Mountain Roadless Area	MA	Federal	Polk, Tenn.	0.3 mile east
Walkertown Branch Bog	ESS	None	Polk, Tenn.	0.3 mile northeast
Big Frog Wilderness Area	MA	Federal	Polk, Tenn.	0.6 mile west
William Davenport Refuge Designated State Natural Area	MA	State	Polk, Tenn.	2.0 miles northeast

3.6.8.2 Environmental Consequences

Under all alternatives, there would be no change in existing land uses. Regardless of the alternative implemented, there would be no effects to managed areas or ecologically significant sites.

3.6.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.6.9.1 Affected Environment

The Ocoee River Gorge, surrounded by wooded peaks of the Cherokee National Forest, provides visitors with vistas of scenic mountain beauty. US 64 follows the river's course throughout most of the area. Ocoee 1 creates a scenic reservoir that offers a variety of water-based recreation opportunities.

The Ocoee 1 Reservoir shoreline is the most developed of the three Ocoees. This development is mainly through the efforts of the USFS and supports recreation on the Ocoees. This development includes cabins, camping sites, a beach, and a recreation area. Much of the reservoir remains relatively pristine, as development is sparsely located along the shoreline with some development located in coves off the main water body.

The water surface of Ocoee 1 Reservoir contrasts greatly with the rugged mountains of the surrounding Cherokee National Forest. The highest peaks are hundreds of feet higher than the reservoir and provide dramatic views in the middleground and background distances from the water. Scenic attractiveness is distinctive. Scenic integrity is high.

Ocoee 2 Dam lies immediately downstream of the confluence of the Ocoee River and Gassaway Creek. Ocoee 2 Dam functions doubly as a put-in location for Ocoee River whitewater rafting. Views of the river below from this location vary from those of shallow trickling pools to a river that runs into Class IV rapids, which diversifies the viewing constituency, operation, and management of the area.

TVA land at Ocoee 3 Reservoir includes only the dam reservation land at the dam. Land along the headwaters of the reservoir is managed by the USFS.

3.6.9.2 Environmental Consequences

Under all alternatives, the existing land uses would continue, with the majority of TVA lands continuing to be used for project operations. Under Alternatives B, C, and D, narrow strips of lands fronting USFS lands would be allocated to either Zone 4 (Natural Resource Conservation) or Zone 6 (Developed Recreation). Regardless of the alternative adopted, adverse effects to visual resources are not expected.

3.6.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.6.10.1 Affected Environment

The Ocoee reservoirs are located in the Blue Ridge Physiographic Province. Due to the geologic characteristics of the region, streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Consequently, these reservoirs exhibit low productivity (low chlorophyll concentrations). The copper industry that once existed in the Copper Basin has resulted in extremely degraded water quality and aquatic habitat in the Ocoee River. The Ocoee reservoirs are located downstream from the Copper Basin, and decades of erosion have caused significant filling of the reservoirs. Ocoee 1 Reservoir has lost about 25 percent of its original volume.

Ocoee 1 Reservoir has an average annual discharge of about 1,426 cfs and a theoretical reservoir retention time of approximately 30 days. Retention is much shorter for Ocoee 1

Reservoir than for most tributary reservoirs. However, because of the shallow depth of the turbine intakes, water in the lower third of the water column can reside in the reservoir much longer. Both Ocoee 1 and Ocoee 3 reservoirs are “run-of-river” reservoirs operated on an inflow-equals-outflow basis. Because of this, they do not have the same water quality problems associated with stratification as other mountain reservoirs.

Ocoee 2 Reservoir is formed by Ocoee 2 Dam at ORM 24.2 and has no storage capacity. Ocoee 3 Reservoir is impounded by Ocoee 3 Dam, about 5 river miles upstream from Ocoee 2 Dam. Between its closure in 1942 and a sediment survey in 1976, Ocoee 3 Reservoir had lost approximately 80 percent of its storage volume due to heavy siltation from the upstream Copper Basin area. The copper industry that once existed in the basin has resulted in extremely degraded water quality and aquatic habitat in the Ocoee River.

There is no development around Ocoee 3 Reservoir. During recreation season, Ocoee 2 and 3 reservoirs are operated to accommodate an extensive whitewater rafting industry downstream of the Ocoee 2 Diversion Dam and the Ocoee 3 Powerhouse. To a lesser extent, Ocoee 3 releases are modified to provide whitewater recreation opportunities between the dam and the powerhouse, which requires water to be spilled at the dam rather than being diverted to the powerhouse.

Reservoir Ecological Health

TVA does not routinely sample the reservoir ecological health of Ocoee 2 or Ocoee 3 reservoirs. The reservoir ecological health scores for Ocoee 1 Reservoir from 1994 through 2007 are shown as Figure 3-6. Areas sampled on Ocoee 1 Reservoir included the forebay at ORM 12.5 (area of the reservoir nearest the dam). The overall ecological health condition for Ocoee 1 Reservoir rated “good” for the first time in 2006. Ocoee 1 Reservoir rated in the “fair” category all past years except in 1999 when it rated “poor”; the score was just below the breakpoint between “fair” and “poor.” Bottom life exhibited a noticeable change between the 1994-2003 and 2005-2006 time periods. Although the variety of organisms remained low, there was a substantial increase in the number of individuals collected in 2005 and 2006. This led to highest score for benthic community in 2006 and contributed to the higher overall reservoir score. The lower reservoir score in 1999 was due to concurrent low scores for benthos and fish as the fish assemblage received its lowest score, primarily due to the collection of only a few fish.

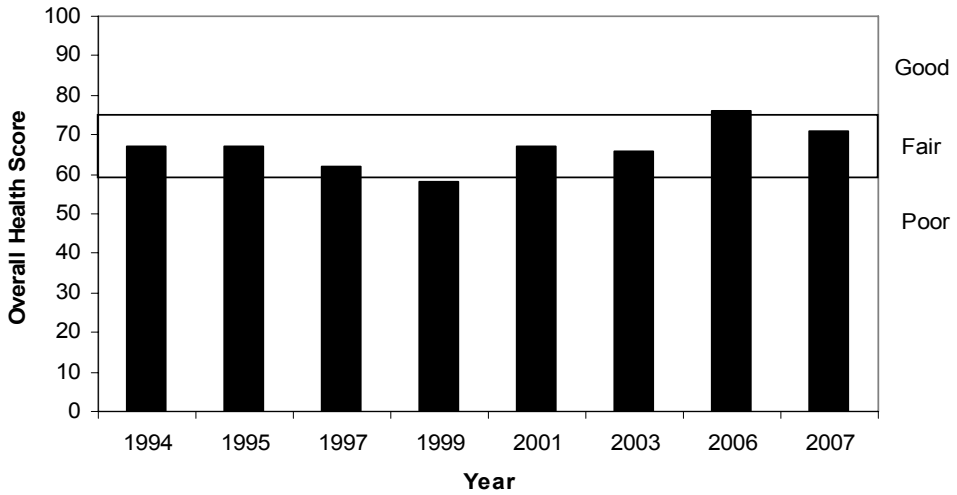

Figure 3-6. Ocoee 1 Reservoir Ecological Health Ratings, 1994-2007

Dissolved Oxygen

Prior to 2005, Ocoee 1 Reservoir had consistently rated "good" for DO (see Table 3-65). In 2005 and 2006, DO rated "high fair." DO rated lower those years because a small area of water with low DO was present near the reservoir bottom in late autumn that was not present in previous years.

Chlorophyll

Although chlorophyll has continued to rate "good" each year, summer average concentrations have been slightly higher the past four years than in previous years.

Sediment Quality

Sediment quality remains the most notable issue on Ocoee 1 Reservoir. Past mining practices in the Copper Basin left a legacy of very high concentrations of several metals, including arsenic, copper, iron, lead, and zinc. In addition, elevated amounts of PCBs have been found historically in the sediment. PCBs, arsenic, and lead concentrations indicate a decreasing trend, although concentrations remain above normal levels.

Table 3-65. Ocoee 1 Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data 1991-2006

Characteristic	Monitoring Year										
	1991	1992	1993	1994	1995	1997	1999	2001	2003	2005	2006
Ocoee 1 Forebay											
Dissolved Oxygen	Good	Good	Good	Good	Good	Good	Good	Good	Good	Fair	Fair
Chlorophyll	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Sediment	NS	NS	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor

NS = Not sampled

Benthic Monitoring
At Ocoee 1 Reservoir, only the forebay at ORM 12.5 has been sampled beginning in 1994. As shown in Table 3-66, the forebay scored "poor" all years with the exception of 1997, 2005, and 2006 when it scored "fair."

Table 3-66. Recent (1994-2006) Benthic Community Ratings for Ocoee 1 Reservoir

Station	River Mile	Year							
		1994	1995	1997	1999	2001	2003	2005	2006
Forebay	12.5	Poor	Poor	Fair	Poor	Poor	Poor	Fair	Fair

Fisheries Monitoring
The RVSMP included annual fish sampling on Ocoee 1 Reservoir in 1994. A list of fish species commonly found in Ocoee 1 Reservoir can be found in Appendix K. The fish community in Ocoee 1 Reservoir rated "fair" six of the eight years sampled, "poor" in 1999, and "good" in 2001 (see Table 3-67).

Table 3-67. Recent (1994-2006) Reservoir Fish Assemblage Index Ratings for Ocoee 1 Reservoir

Station	Year							
	1994	1995	1997	1999	2001	2003	2005	2006
Forebay	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair

In 2006, Ocoee 1 Reservoir SFI rated above the Valleywide average for black bass and spotted bass, and below for largemouth bass (see Table 3-68). No SFI surveys have been conducted on Ocoee 3 Reservoir.

Table 3-68. Sport Fishing Index Scores for Selected Sport Fish Species in Ocoee 1 Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	38	36
Largemouth Bass	30	33
Spotted Bass	36	31

Swimming Advisories
There are no state advisories against swimming in Ocoee 1 Reservoir or the Ocoee River. TVA performed *E. coli* bacteria monitoring at five locations in 2007: Ocoee River at Ocoee 2 Powerhouse bridge, Greasy Creek Campground beach, Floatway take-out site at ORM 19.7, Floatway take-out site at Caney Creek, and Floatway access site below Ocoee 2 Dam at ORM 24.2.

Fish Consumption Advisories
There are no fish consumption advisories for the Ocoee reservoirs. TVA collected channel catfish and largemouth bass from Ocoee 1 Reservoir for tissue analysis in autumn 2005.

The results, which were similar to those of previous years, were provided to state agencies in Tennessee. TVA will analyze fish from the reservoir again in autumn 2009.

State(s) Impaired Waters
The Tennessee Department of Environment and Conservation (TDEC) assigned use support ratings to waters in the Ocoee River basin based on available biological, chemical, and/or physical data. As shown in Table 3-69, a total of 46.5 miles of monitored stream and 2,254 reservoir surface acres are listed as impaired (TDEC 2006).

Table 3-69. Impaired Waters in the Watershed of Ocoee River Basin in Tennessee

Stream/River Name	State	Miles/ Acres	Description	Water Quality Stressor/Source
Ocoee River	Tenn.	26.6/ 2,254	Ocoee Reservoir No. 1 through Ocoee Reservoir No. 3	Iron, copper, zinc, pH, loss of biological integrity due to siltation, habitat loss due to streamflow alteration/past mining activities, Copper Basin area
North Potato Creek	Tenn.	6.3		Copper, iron, zinc, pH, physical substrate habitat alterations, loss of biological integrity due to siltation/past mining activities, Copper Basin area
Burra Burra Creek	Tenn.	2.2		Copper, iron, zinc, pH, loss of biological integrity due to siltation
Ellis Branch	Tenn.	2.8		Copper, zinc, iron
Davis Creek	Tenn.	3.8		Copper, iron, zinc, pH, loss of biological integrity due to siltation
Fourmile Creek	Tenn.	4.8		*E. coli*

Water Supply
No municipal water suppliers currently withdraw water from Ocoee 1, Ocoee 2, or Ocoee 3 reservoirs. Copper Basin Utility District and the towns of McCaysville, Georgia, and Blue Ridge, Georgia, currently have intakes in Ocoee 3 Reservoir's supporting watershed. The 2005 average daily water demand for these intakes were 0.25 MGD (Copper Basin Utility District), 0.76 MGD (McCaysville), and 0.84 MGD (Blue Ridge), resulting in a total daily average demand of 1.85 MGD.

3.6.10.2 Environmental Consequences

No change in the existing land use would occur on the Ocoee reservoirs because all parcels are committed to their existing uses, which would continue under all alternatives.

Any proposed actions on TVA land would be assessed for compliance with TVA's Land Policy, SMP, and Section 26a regulations. Individual environmental reviews would identify potential adverse impacts and necessary mitigation to protect the aquatic environment. TVA would then respond appropriately to address these impacts. Therefore, no significant impacts to water quality and aquatic life are expected in association with these alternatives.

3.6.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Under all of the alternatives, the existing uses of Ocoee Reservoir lands would

not change, and there would be no adverse impacts to air quality. Noise has previously been discussed in Section 3.1.11.2.

3.6.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.6.12.1 Affected Environment

3.6.12.1.1 Population and Economy

Population: Tables 3-70 and 3-71 contain data regarding the population of the area. Polk County, Tennessee, had a population of 16,050 in 2000, an increase of 18.0 percent since 1980. This was a lower rate than in either the state or the nation. The rate of growth in the county, state, and nation was greater, much greater for the county from 1990 to 2000 than from 1980 to 1990. Estimates for 2006 indicate that the population of Polk County has declined 0.7 percent since 2000 compared to growth of more than 6 percent in both the state and nation during that time. Projections through 2020 indicate that the county will rebound to have faster population growth than the state and nation over that time. The rates for the county and state are projected to be greater than for 1980-2000, but the rate for the nation is projected to be lower.

Table 3-70. Population – Polk County, Tennessee

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Polk County	13,602	13,643	16,050	15,939	22,086	36.9
Tennessee	4,591,023	4,877,185	5,689,283	6,038,803	7,195,375	138.0
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e) and Tennessee Advisory Council on Intergovernmental Relations and University of Tennessee Center for Business and Economic Development (2003)

Table 3-71. Recent and Projected Population Changes – Polk County, Tennessee (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Polk County	0.3	17.6	18.0	-0.7	37.6	62.4
Tennessee	6.2	16.7	23.9	6.1	26.5	56.7
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-70

Polk County is decidedly rural in distribution of population. As noted in Table 3-70, the population density of the county is substantially lower than the state and much lower than the nation. The largest town in Polk County is Benton with 1,138 residents in 2000. About 87 percent of the population in Polk County resides outside incorporated towns.

Economy: Table 3-72 contains the most recent annual data regarding the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Polk County had 4,404 people employed on average. The county had a much higher percentage of farmers and government employees than the state or nation, a lower

percentage of manufacturing employees, and a lower percentage of employees in the general "other" category than the state or nation. The average unemployment rate for 2006 in the county was higher than the state or nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

Table 3-72. Employment, Unemployment, and Income – Polk County, Tennessee

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Polk County	4,404	7.9	7.2	12.6	20.9	51.4	5.6	24,245
Tennessee	3,630,959	2.7	11.7	11.4	12.1	62.2	5.2	30,969
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated) and Tennessee Department of Labor (undated)

3.6.12.1.2 Environmental Justice

The minority population in the Ocoee reservoirs area is small (Table 3-73). In Polk County, 3.1 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 22.5 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 15.1 percent, slightly higher than the state rate of 15.0 percent and higher than the national rate of 12.7 percent.

Table 3-73. Minority Population, 2006, and Poverty, 2004 – Polk County, Tennessee

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Polk County	15,939	325	164	3.1	15.1
Tennessee	6,038,803	1,182,866	174,747	22.5	15.0
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

3.6.12.2 Environmental Consequences

The current land uses at the Ocoee reservoirs would continue under all of the alternatives. Other than the possible expansion of existing recreation facilities, there would be little development that would affect socioeconomic conditions. None of the alternatives would result in disproportionate impacts on minority or disadvantaged populations.

3.7 Apalachia Reservoir

3.7.1 Land Use

An overview of land use for the mountain reservoirs is provided in Section 3.1.1.

3.7.1.1 Affected Environment

On Apalachia Reservoir, TVA initially purchased 7,506 acres of land (see Table 1-1). TVA transferred 6,661 acres (89 percent) to the USFS and sold 2 acres. Because the pipeline and tunnel system carries water from the reservoir 8.3 miles downriver to the powerhouse to generate electric power, much of TVA's retained land is actually downstream of the dam and is not adjacent to the reservoir.

TVA retained 843.3 acres of land divided into seven parcels on Apalachia Reservoir. All of the parcels are committed to existing land uses. Dam reservation, powerhouse reservation, and other land supporting TVA Project Operations account for 90 percent of the calculated acreage. As previously mentioned, the acreage of the narrow strip of TVA-retained land fronting the land TVA transferred to the USFS has not been calculated. Therefore, the committed uses associated with those parcels are not represented in the committed acreage total. However, there are two parcels that are committed through the transfer agreement with the USFS. This land is used for natural resource conservation and dispersed recreation and is managed by the USFS. The remaining 10 percent of the committed acreage is Parcel 7, which is under a term easement for Public Recreation to the State of Tennessee. A complete list of the committed uses for Apalachia Reservoir parcels is provided in Appendix F.

TVA owns 100 percent of the approximately 32 miles of shoreline on Apalachia Reservoir. This shoreline either fronts land TVA retained for Project Operations or fronts the land TVA retained fronting the land transferred to the USFS. With the exception of TVA dam reservation land, the USFS manages the land along the reservoir, and there is no shoreline along the reservoir available for residential access.

Cherokee County, North Carolina, and Polk County, Tennessee, are predominantly rural. There are no towns near the reservoir. About a third of the land in Cherokee County is in the Nantahala National Forest (USFS 2007b, Quickfacts 2007) and a similar amount of Polk County lies in the Cherokee National Forest (Southeast Tennessee Development District 2007). In recent years, development has increased on the privately owned land in these counties, particularly in Cherokee County. Within the past several years, development has been initiated on several large private tracts behind the USFS lands on Apalachia Reservoir. According to Cherokee County Manager David Badger (personal communication, November 7, 2007), there are about 37,500 parcels of property in the county, and nearly half of these parcels are owned by nonresidents. According to Mr. Badger, about 4,000 acres of Cherokee County are Cherokee Indian tribal lands.

Two TVA parcels on Apalachia Reservoir contain prime farmland (Table 3-74).

Table 3-74. Acres of Prime Farmland in Selected Parcel – Apalachia Reservoir

Parcel Number	Total Parcel Acres	Acres of Prime Farmland	Zone Allocation	Description
1	139.1	30.7	2	Dam Reservation
7	82.8	76.6	6	Gee Creek Campground

3.7.1.2 Environmental Consequences

Alternative A

As shown in Table 2-3, under Alternative A the allocated land uses for the 843.3 acres that are planned are wholly represented by two allocations. The dam and powerhouse reservations representing 760 acres (90 percent) are allocated to Project Operations. The remaining 83 acres (10 percent) are allocated to Recreation. The five planned parcels are committed to the existing land use.

Under Alternative A, TVA would not designate land use allocations for two parcels of TVA land on Apalachia that front USFS land (Table 2-4). The acreage for these unplanned parcels has not been calculated. Both unplanned parcels are committed to the existing land use (see Table 2-2) through the transfer agreement with the USFS.

There would be no change in land use under Alternative A because all of the parcels on Apalachia Reservoir are committed to their existing use as shown in Table 2-2.

Alternatives B, C, and D

Under the three action alternatives, almost all the TVA lands would continue to be managed for Zone 2 (Project Operations) and Zone 6 (Developed Recreation). The very small amount of previously unplanned narrow strip land (less than 0.1 percent) surrounding most of Apalachia Reservoir would be allocated to Zone 4 (Natural Resource Conservation) based on the commitments of the transfer agreement between TVA and the USFS. Prime farmlands would not be affected.

3.7.2 Recreation

An overview of the recreation resource for the mountain reservoirs is provided in Section 3.1.2.

3.7.2.1 Affected Environment

Apalachia Reservoir, the associated river reaches, and Gee Creek Campground have a number of recreation facilities that provide recreation opportunities. There are two TVA parcels on Apalachia Reservoir lands that support developed recreation facilities. These areas are described below and summarized in Table 3-75.

There is one campground on Apalachia Reservoir lands. TDEC operates the Gee Creek Campground (Parcel 7) recreation area as a component of the Tennessee State Park System (Hiwassee/Ocoee Scenic River State Park) under a public recreation term easement agreement with TVA. Facilities at Gee Creek include campsites, picnic areas, an amphitheatre, a stream access site, play courts, and walking trails. TDEC administrative offices and maintenance bases supporting the state park are also located on this parcel.

There is one formal boat ramp on Apalachia Reservoir. The North Carolina Wildlife Resources Commission manages the boat ramp on the Hiwassee Reservoir Dam Reservation (Hiwassee Parcel 3).

Table 3-75. Recreation Facilities on Apalachia Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Available							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Powerhouse Put-In*	Polk, Tenn.	Public	USFS	USFS	N/A					●			
Gee Creek*	Polk, Tenn.	Public	State of Tenn.	TVA	7	●		●		●	●		●
N.C. Wildlife Resources Commission Ramp	Cherokee, N.C.	Public	State of N.C.	TVA	3**				●				

* = Stream access site
** = Hiwassee Reservoir Parcel 3

Dispersed Recreation
Dispersed recreation has historically been an important use of Apalachia Reservoir lands but takes place primarily on USFS property. TVA does not have an inventory of heavily used dispersed recreation areas.

3.7.2.2 Environmental Consequences

Under all alternatives for Apalachia Reservoir lands, one parcel is allocated to Developed Recreation. Parcel 7 (82.8 acres) is committed to use as a component of the Tennessee State Park System by an operating agreement with TDEC.

TVA would not allocate any additional parcels on Apalachia Reservoir for Developed Recreation under any alternative. Therefore, any future demand for developed recreational needs accommodated on TVA lands would necessarily be met by the expansion of the state park by TDEC. Potential environmental impacts would likely be insignificant, as parcels utilized for developed recreation would not change. The potential impacts from any new facilities would be assessed in an environmental review. Necessary mitigative measures would be used to offset adverse effects to recreation potential.

None of the alternatives involve changing land use of any parcels. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant.

3.7.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.7.3.1 Plant Communities

3.7.3.1.1 Affected Environment

Vegetative classes commonly found on and near Apalachia Reservoir lands are evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation.

The small percentages of the forests considered evergreen forest consist of small stands of Virginia pine and small stands of white pine. The most common forest type is evergreen-deciduous forest. Rocky bluffs found along the railroad right-of-way adjacent to the powerhouse are inhabited by several species of dry-site ferns (hairy lip fern and cliftbrake fern) and princess tree, along with poison ivy and Virginia creeper. Deciduous forest occurs mainly as oak-hickory forest (mesic to dry) and mesic hardwood forest on slopes. Oak-hickory forests common on dry ridges grade into more mesic slopes.

Scrub-shrub wetlands (shrublands) are associated with the rocky cobble areas of the river near the Apalachia Powerhouse and have a high percentage of rare plants. The portion of the river between the powerhouse and the dam is a globally rare (G2) community known as the Hiwassee/Ocoee River Boulder Scour Vegetation, as described in Section 3.6.3.1.1. The encroachment of trees and woody vines is a threat to this area, which is managed by the USFS and not included in the MRLMP parcels.

Herbaceous vegetation is common along transmission line and railway and roadway rights-of-way as well as grassy areas within the dam reservations and commercial recreation areas. Purple sprangletop, bahia grass, and tall fescue were common grasses observed during field surveys, as were a number of invasive species.

Invasive plants occur on most of the TVA parcels around Apalachia Reservoir. The species present include autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese knotweed, Japanese stiltgrass, kudzu, marsh dayflower, mimosa, multiflora rose, princess tree, shrubby lespedeza, and tree-of-heaven. These invasive plants are most prevalent along the railroad right-of-way that runs adjacent to the Hiwassee River between the powerhouse and the dam.

3.7.3.1.2 Environmental Consequences

Alternative A
Under Alternative A, no significant impacts are expected to the plant communities of Apalachia Reservoir because there would be no changes under the current Forecast System plan. The globally rare (G2) plant community, the Hiwassee/Ocoee River Boulder Scour Vegetation that occurs within the Apalachia Bypass reach is presently being managed by the USFS and would not be affected by the adoption of Alternative A.

Alternatives B, C, and D
The potential effects of adopting and implementing Alternative B, C, or D would be the same as those expected under Alternative A.

3.7.3.2 Wildlife Communities

3.7.3.2.1 Affected Environment

The Apalachia Reservoir properties contain primarily evergreen, evergreen-deciduous, and deciduous forest habitats, and smaller areas of early successional habitats, similar to those

observed on the other mountain reservoirs. Apalachia Reservoir lands adjoin USFS lands and contribute to large contiguous tracts of forest supporting a variety of area-sensitive species. A wetland was identified on Parcel 3, near USFS lands. A cave is known from the project area, approximately 0.5 mile from Parcel 7. No uncommon animals are known from the cave. Wildlife communities on Apalachia Reservoir are typical for the region.

3.7.3.2.2 Environmental Consequences

Under all alternatives, there would be no change in current land uses, and therefore, no impacts to wildlife and wildlife habitats would result.

3.7.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.7.4.1 Affected Environment

Federally and state-listed as endangered, threatened, and other species of conservation concern reported from the vicinity of Apalachia Reservoir are listed in Table 3-76.

Table 3-76. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Known From the Vicinity of Apalachia Reservoir in Polk County, Tennessee, and Cherokee County, North Carolina

Common Name	Scientific Name	Federal Status	N.C. Status (Rank)	Tenn. Status (Rank)
Plants				
American ginseng	*Panax quinquefolius*	--	--	S-CE (S3S4)
Ash-leaf bush pea*	*Thermopsis fraxinifolia*	--	--	THR (S3)
Bitter cress	*Cardamine flagellifera*	--	--	THR (S2)
Branching whitlow-wort*	*Draba ramosissima*	--	--	SPCO (S2)
Butternut	*Juglans cinerea*	--	--	THR (S3)
Creekgrass	*Potamogeton epihydrus*	--	--	SPCO (S1S2)
Dwarf filmy-fern	*Trichomanes petersii*	--	--	THR (S2)
Gibbose panic grass*	*Sacciolepis striata*	--	--	SPCO (S1)
Hairy umbrella-sedge*	*Fuirena squarrosa*	--	--	SPCO (S1)
Horsesugar*	*Symplocos tinctoria*	--	--	SPCO (S2)
Obovate marshallia	*Marshallia obovata*	--	--	THR (S1)
Pink lady's slipper	*Cypripedium acaule*	--	--	E-CE (S4)
Ruth's golden aster*	*Pityopsis ruthii*	END	--	END (S1)
Small purple fringe orchid	*Platanthera psycodes*	--	--	SPCO (S2)
Small whorled pogonia	*Isotria medioloides*	THR	END (S1)	--
Southern lobelia	*Lobelia amoena*	--	--	THR (S1S2)
Sweet pinesap	*Monotropsis odorata*	--	--	THR (S2)
Tennessee pondweed*	*Potamogeton tennesseensis*	--	--	THR (S2)
Hiwassee quillwort*	*Isoetes tennessensis*	--	--	SPCO (S1)
Toothed sedge	*Cyperus dentatus*	--	--	SPCO (S1)
Yellow jessamine	*Gelsemium sempervirens*	--	--	SPCO (S1S2)
Amphibians				
Eastern hellbender*	*Cryptobranchus alleganiensis alleganiensis*	--	SPCO (S3)	NMGT (S3)
Seepage salamander*	*Desmognathus aeneus*	--	RARE (S3)	NMGT (S1)
Birds				
Bald eagle*	*Haliaeetus leucocephalus*	--	THR (S3)	NMGT (S3)
Red-cockaded woodpecker	*Picoides borealis*	END	END (S2)	EXTI (SX)
Swainson's warbler*	*Limnothlypis swainsonii*	--		NMGT (S3)

Common Name	Scientific Name	Federal Status	N.C. Status (Rank)	Tenn. Status (Rank)
Mammal				
Smoky shrew*	*Sorex fumeus*	--	--	NMGT (S4)
Reptiles				
Bog turtle*	*Glyptemys muhlenbergii*	THR	THR (S2)	--
Northern pine snake*	*Pituophis melanoleucus melanoleucus*	--	SPCO (S3)	THR (S3)
Stripeneck musk turtle*	*Sternotherus minor*	--	SPCO (S1)	--
Fish				
Blotchside logperch*	*Percina burtoni*	--	END (S1)	NMGT (S2)
Tangerine darter*	*Percina aurantiaca*	--	--	NMGT (S3)
Tennessee dace*	*Phoxinus tennesseensis*	--	--	NMGT (S3)
Snails				
Cohutta slitmouth*	*Stenotrema cohuttense*	--	--	NOST (S2)
A freshwater snail*	*Elimia christyi*	--	END (S1)	--
A freshwater snail*	*Somatogyrus* sp.	--	--	NOST (S1)
Smooth mudalia*	*Leptoxis virgata*	--	NOST (SU)	NOST (S1)
Mussels				
Spike*	*Elliptio dilatata*	--	SPCO (S1)	--
Tan riffleshell*	*Epioblasma florentina walkeri*	END	--	END (S1)
Slabside pearlymussel*	*Lexingtonia dolabelloides*	CAND	--	NOST (S2)
Tennessee clubshell*	*Pleurobema oviforme*	--	END (S1?)	NOST (S2S3)
Rainbow*	*Villosa iris*	--	SPCO (S1)	--
Cumberland bean*	*Villosa trabalis*	END	NOST (S1)	END (S1)

-- = Not applicable
*Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled, S2 = Imperiled, S3 = Rare or uncommon, S4 = Widespread, abundant, and apparently secure, SU = Status unrankable, SX = Presumed extirpated, ? = Inexact or uncertain
Status abbreviations: CAND = Candidate for listing; END = Endangered, E-CE = Endangered-commercially exploited, EXTI = Extirpated, NMGT = In need of management, NOST = No state status, RARE = Rare, S-CE = Special concern-commercially exploited, SPCO = Special concern, THR = Threatened

Ash-leaf bush pea (see Section 3.6.4) is known from eight sites in Polk County with one known from the Gee Creek wilderness area near Parcel 7.

Branching whitlow-wort grows in crevices and rock outcrops or on dry talus slopes on a variety of rock types (Weakley 2006). It is known from two populations on rocky bluffs overlooking the Ocoee River above Parcels 5 and 6.

Gibbose panic grass inhabits freshwater marshes along streams and on shores of ponds and lakes, as well as swamps, ditches, and drainage canals (Godfrey and Wooten 1979). It is commonly found on the coastal plain and known on the edge of its range in Tennessee with less than 10 reported populations. Two existing populations and another previously recorded population that may no longer exist have been recorded within 5 miles of the river. Gibbose panic grass was found growing on cobble bars in the Apalachia Bypass reach near the powerhouse on Parcel 5.

Hairy umbrella-sedge inhabits moist, open, and often sandy soils of marshes, ditches, and savannas. This is a coastal plain species with disjunct populations in the Hiwassee River area. One current and one extirpated population are known from the region, and plants were found growing on cobble bars in the Apalachia Bypass reach near the powerhouse on Parcel 5.

Horsesugar (see Section 3.6.4) was found growing in forested areas on Parcels 4, 5, and 6.

A large population of over 10,000 individuals of **Ruth's golden aster** occurs within a 3-mile stretch of the Hiwassee River between Apalachia Powerhouse and Dam (TVA 2005a). None of this population occurs on lands subject to the MRLMP. Since 1987, there has been a gradual decrease in the size of this population. The decrease could be due to the encroachment of competing woody vegetation. The USFS is considering more active management of this population, including the removal of woody vegetation.

Tennessee pondweed inhabits slow to fast-moving streams and rivers (Haynes and Hellquist 2000). It is known from two populations in the Hiwassee River watershed and was found growing in the water of the Apalachia Bypass reach near the powerhouse on Parcel 5.

Hiwassee quillwort is known only to occur in the Hiwassee River between Quinn Springs and the Apalachia Powerhouse. Before its rediscovery at Reliance, Tennessee, in 2000, this population was thought to be a different species, lake quillwort, and extirpated from the Little Tennessee River in Monroe County and the Hiwassee River in Polk County (Luebke and Budke 2003). Hiwassee quillwort occurs in the river at Parcel 6.

Eastern hellbenders are known from the Hiwassee River and its tributaries and may occur throughout the project area.

Seepage salamanders (see Section 3.3.4) have been found on Parcel 1 north of Appalachia Dam and less than 0.5 mile from Parcel 7. Habitat exists throughout the undisturbed forests within the project area.

No active **bald eagle** nests are reported from Apalachia Reservoir, and bald eagles were not observed during field surveys. However, forested parcels around the reservoir are suitable nesting habitat.

Suitable habitat for **Swainson's warblers** (see Section 3.6.4) exists on Parcels 1, 3, 4, and 7, and this species has been reported from the vicinity of Quinn Springs.

Smoky shrews (see Section 3.6.4) have been collected in swamps and bogs in the region. A section of rich cove forest on Parcel 1 contains suitable habitat for this species.

The two known populations of **bog turtles** in the area are both over 6 miles from Apalachia Reservoir. Three boglike areas occur on Zone 1 lands. All three have been altered considerably by grazing, fire, cultivation, and drainage efforts. None of these sites are known to contain bog turtles and only represent marginal habitat for the species.

Suitable habitat for **northern pine snakes** (see Section 3.6.4) occurs in dry, forested habitats near the Apalachia Dam Reservation.

Stripeneck musk turtles inhabit rivers, creeks, spring runs, lakes and lake margins, ponds, and swamps, especially those with mud bottoms (Ernst et al. 1994). This species has been recorded from the Hiwassee River just below Apalachia Dam and likely occurs near Parcels 1 and 4.

Blotchside logperch prefers large creeks to small or medium rivers with low turbidity over areas of large gravel and small cobble in medium current. Spawning occurs in April and May (Etnier and Starnes 1993). The blotchside logperch has been collected in the Hiwassee River between the Apalachia Powerhouse and the confluence with Gee Creek.

Tangerine darters inhabit deep riffles and runs with a mixture of boulders, large rubble, and bedrock substrate. This fish utilizes deep pool habitat during the winter and spawns in gravel riffles from May to June (ibid). The tangerine darter has been collected in the Hiwassee River at various locations between the Apalachia Dam and its confluence with Gee Creek.

The **Tennessee dace** inhabits low-gradient woodland tributaries of the Tennessee River. The Tennessee dace prefers shallow pools with associated debris and undercut banks (ibid). The Tennessee dace has been collected in the Hiwassee River between the Apalachia Powerhouse and its confluence with Gee Creek.

Cohutta slitmouths are terrestrial snails found only in the Hiwassee River watershed. A population of this species is known from the woodland next to Gee Creek within 3 miles of Parcel 7.

The snail ***Elimia christyi*** has only recently been differentiated from the knotty elimia (*Elimia interrupta)* and is known only from the Hiwassee River, Shuler Creek, and Valley River; Cherokee County in North Carolina; and Coker Creek and Hiwassee River (half dozen sites) in Polk County, Tennessee (Minton et al. 2004). It has been reported by Johnson et al. (2005) as well from the Hiwassee River inside and adjacent to Cherokee National Forest. *Elimia christyi* has a global rank of G2 (very rare and imperiled within the world).

An unnamed species of the genus ***Somatogyrus*** has been observed in one location on the Hiwassee River in East Tennessee (NatureServe 2007). This snail is tracked by the TVA Heritage Program because it has a global rank of G1 (extremely rare and critically imperiled in the world). It has been collected in the Hiwassee River upstream of the Apalachia Powerhouse.

Smooth mudalia is native to the Tennessee River drainage with most of its original habitat being polluted or inundated by reservoirs (ibid). This snail is tracked by the TVA Heritage Program because it has a global rank of G2 (very rare and imperiled within the world). It has been collected in the Hiwassee River upstream of the Apalachia Powerhouse.

Spike mussel can be found living on firm substrate of coarse sand and gravel in moderate to strong current (Parmalee and Bogan 1998). This species has been collected in the Hiwassee River below Apalachia Dam.

Tan riffleshell (see Section 3.1.4) has been collected in the Hiwassee River between Apalachia Dam and Apalachia Powerhouse. Only a few surviving populations of this species exist.

Slabside pearlymussel (see Section 3.1.4) inhabits substrate of sand, fine gravel, and cobble in strong currents (ibid). It has been collected at various locations in the Hiwassee River between Apalachia Dam and its confluence with Gee Creek.

Tennessee clubshell prefers substrate of coarse gravel and sand in small shallow creeks and rivers with good current (ibid). This mussel has been collected in the Hiwassee River between the Apalachia Dam and the Apalachia Powerhouse.

Rainbow mussel can be found living in the edge of emerging vegetation in riffles with sand and gravel substrate and a moderate current (ibid). The rainbow mussel has been collected in the Hiwassee River downstream of the Apalachia Dam.

One of the few remaining viable populations of the **Cumberland bean** (see Section 3.1.4) is in the Hiwassee River in Polk County. The Cumberland bean has been collected in the Hiwassee River, between the Apalachia Dam and its confluence with Gee Creek.

3.7.4.2 Environmental Consequences

Plants
Under all alternatives, there would be no changes to the current land uses of Apalachia Reservoir lands and no resulting adverse impacts on listed plants. The federally listed plant Ruth's golden aster, which occurs in the Apalachia Bypass reach, is presently being managed by the USFS and would not be affected by the proposed alternatives. Any proposed activities on the TVA lands would be carefully evaluated for their potential to affect the several state-listed plants present on or near these lands.

Terrestrial Animals
No federally listed terrestrial animals are known from TVA parcels on Apalachia Reservoir. Therefore, adoption of any of the alternatives would not result in impacts to any federally llisted terrestrial animals or their habitats. Forested areas on TVA lands ranked low in their suitability as summer roost habitat for Indiana bats because of the lack of suitable roosting trees. Suitable habitat for state-listed species and species tracked by Natural Heritage Programs occurs on numerous parcels but would not be affected by the continuation of the existing land uses under all of the alternatives.

Aquatic Animals
All of the listed aquatic species are known to occur in the Apalachia tailwater downstream of Apalachia Dam. Any future action taken on these parcels under any of the alternatives would be subject to further environmental review to assess the potential impacts of that specific action to aquatic life, including listed aquatic species. Based on these findings, appropriate measures would be taken to avoid adverse impacts to listed species. These listed species are more directly affected by the operation of Apalachia Dam, which would not change under any of the alternatives.

3.7.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.7.5.1 Affected Environment

Wetlands are very rare on Apalachia Reservoir; NWI data indicate a total of 6 acres of forested and scrub-shrub wetlands (see Table 3-5). Although NWI data did not indicate the presence of any emergent wetlands, very small areas of emergent and scrub-shrub wetlands were found during field surveys of the river channel downstream of the

powerhouse (Parcel 3). Small areas were also found in the flats upstream of the dam (Parcel 1). Species associated with wetlands on Apalachia Reservoir include swamp milkweed, jewelweed, smartweed, bulrush, St. John's wort, cattail, cardinal flower, softrush, river birch, black willow, red maple, tag alder, buttonbush, and sycamore.

3.7.5.2 Environmental Consequences

The potential impacts of the various alternatives on wetlands would be similar, and none of these effects would be adverse. Under all alternatives, parcels containing wetlands would generally continue to be managed as they have been in the past, and any actions with the potential to affect wetlands would be assessed prior to their implementation.

3.7.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.7.6.1 Affected Environment

A potentially affected floodplain area extends from the land at the powerhouse at about HRM 53.3 upstream to about HRM 75.8 in Apalachia Reservoir at the tailwater of Hiwassee Dam. In addition, one small tract of land occupied by the Gee Creek Campground is located between HRM 43.2 and 43.8 that is managed by TDEC. The 100-year flood elevations for the Hiwassee River downstream of the dam vary from 848.1 feet msl at the powerhouse (HRM 53.3) to 1,182.3 feet msl at HRM 66.0 (downstream of Apalachia Dam). The 500-year flood elevations for the Hiwassee River downstream of the dam vary from elevation 853.1 feet msl at HRM 53.3 to 1,187.8 feet msl at HRM 66.0. At the Gee Creek Campground, the 100-year flood elevations vary from 732.7 feet above msl at HRM 43.2 to 734.5 feet msl at HRM 43.8. The 500-year flood elevations vary from 738.7 feet msl at HRM 43.2 to 740.0 feet msl at HRM 43.8. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

The main watercourse in Apalachia Reservoir is the Hiwassee River. The 100-year flood elevation for the Hiwassee River is 1,282.0 feet msl from Apalachia Dam (HRM 66.0) to the upper end of the reservoir at HRM 75.8 (tailwater of Hiwassee Dam). The 500-year flood elevation for the Hiwassee River is 1,283.0 feet msl from the dam to the upper end of the reservoir.

3.7.6.2 Environmental Consequences

The environmental consequences of each alternative are discussed in Section 3.1.6. Consequences of adopting any of the alternatives are not expected to have adverse effects on Apalachia Reservoir floodplains.

3.7.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.7.7.1 Archaeological Resources

3.7.7.1.1 Affected Environment

Apalachia Reservoir was the subject of a single archaeological survey conducted in 1995, when the reservoir was lowered to 1,254 feet msl for maintenance, exposing about 200 acres (Riggs et al. 1996). Altogether, 16 archaeological sites were identified. Five of the 16 sites are considered potentially eligible for listing in the NRHP. A number of archaeological resources in the area are considered potentially eligible for listing in the NRHP.

3.7.7.1.2 Environmental Consequences

Under all alternatives, the existing uses of Apalachia Reservoir lands would not change, and archaeological resources would not be directly affected. Any activities on these lands with the potential to affect archaeological resources would be reviewed according to the terms of the PA with the Tennessee SHPO for the portion of Apalachia Reservoir in Tennessee (see Appendix H). TVA anticipates executing a similar PA in North Carolina for the identification, evaluation, and treatment of all historic properties in the mountain reservoirs area. Until this PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties as required by Section 106 of the NHPA. TVA would adhere to the terms of this PA under all alternatives, and no adverse impacts on archaeological resources are expected.

3.7.7.2 Historic Structures

3.7.7.2.1 Affected Environment

TVA chose the name “Apalachia” after a nearby crossroads settlement, Old Apalachia, north of the river in North Carolina and from a flag stop, Apalachia, on the L&N Railroad on the south bank in Tennessee.

Apalachia Dam and Powerhouse are considered historic properties, as they are potentially eligible for listing in the NRHP. Therefore, prior to any undertaking that could affect the dam and powerhouse, TVA would evaluate the effects of the action in accordance with Section 106 of the NHPA.

3.7.7.2.2 Environmental Consequences

Under all alternatives, the existing uses of Apalachia Reservoir lands would not change, and historic structures would not be directly affected. Any activities on these lands with the potential to affect the dam, powerhouse, or other historic structures would be reviewed according to the terms of the existing PA with the Tennessee SHPO for the portion of Apalachia Reservoir in Tennessee, and the PA to be developed in North Carolina, as described in Section 3.1.7.1.2.

3.7.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.7.8.1 Affected Environment

The tailwaters of Apalachia Reservoir-Hiwassee River from Apalachia Dam to Gee Creek Campground are included in the study area. Gee Creek Campground, managed by TDEC, is an outlying Apalachia Reservoir parcel, and the Apalachia Bypass tunnel, which runs

west from Apalachia Dam to the Apalachia Powerhouse, is approximately parallel to the Hiwassee River for some distance.

Managed areas, ecologically significant sites, and NRI streams within 3 miles of Apalachia Reservoir and its tailwaters (Hiwassee River) are listed in Table 3-77. The areas are grouped by closest distance to the reservoir and/or the Hiwassee River; areas on the Hiwassee River and those abutting or less than 0.1 mile from the reservoir and tailwaters are listed as "adjacent."

Table 3-77. Managed Areas, Ecologically Significant Sites, and Nationwide Rivers Inventory Streams Within 3 Miles of Apalachia Reservoir and its Tailwaters (Hiwassee River) to Gee Creek Campground

Name	Type of Area	Managing Authority	Location County, State	Closest Distance to Reservoir and/or Tailwaters
Hiwassee River	NRI	Federal	Polk, Tenn.	Adjacent
Hiwassee State Scenic River	Managed area (MA)	TDEC	Polk, Tenn.	Adjacent
Hiwassee River State Mussel Sanctuary	MA	State	Polk, Tenn.	Adjacent
Hiwassee River Ruth's Golden Aster Sites	Ecologically significant site	None for sites; federal for species protection	Polk, Tenn.	Adjacent
Nantahala National Forest	MA	USFS	Cherokee, N.C.	Adjacent
Nantahala State Game Land	MA	State	Cherokee, N.C.	Adjacent
John Muir National Recreation Trail/John Muir State Scenic Trail	MA	Federal/State	Polk, Tenn.	Adjacent
Cherokee National Forest	MA	USFS	Polk, Tenn.	Adjacent
Cherokee (South) State Wildlife Management Area	MA	TWRA	Polk, Tenn.	Adjacent
Coker Creek Scenic Area	MA	Federal	Polk, Tenn.	0.2 mile north

3.7.8.2 Environmental Consequences

None of the alternatives for Apalachia Reservoir would involve changing existing land uses, and therefore, no impacts to managed areas or ecologically significant sites are anticipated under any of the alternatives.

3.7.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.7.9.1 Affected Environment

Apalachia Reservoir has a narrow pool characterized by steep, wooded ridgelines adjacent to the shoreline. Some parcels are within the Hiwassee River Scenic River Corridor. There are several distinct coves that offer quiet, scenic destinations for anglers and recreation boaters. There is a minor amount of development along the shoreline, resulting in a naturally appearing expanse of reservoir unaltered by human development.

Most shoreline adjacent to Apalachia Reservoir has been preserved, resulting in pristine views from the reservoir of old-growth forest. The only parcels actively managed by TVA are the reservation land for the dam and powerhouse. Gee Creek Campground, located several miles below the powerhouse, is managed by TDEC as a component of the state park system.

3.7.9.2 Environmental Consequences

Under all alternatives, TVA would continue to manage its lands on Apalachia Reservoir according to the existing uses. Visual resources would not be impacted, and the high scenic integrity of the area would be maintained under all the alternatives.

3.7.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.7.10.1 Affected Environment

Apalachia Reservoir is located in the Blue Ridge Physiographic Province. The streams in the watershed have naturally low concentrations of nutrients and dissolved minerals. Land use in the watershed remains largely forested, with the Nantahala National Forest making up a large percent of the forested lands (NCDENR 2007a). Most of the water entering Apalachia Reservoir comes from Hiwassee Dam with minor local inflow, so water quality in Apalachia is strongly affected by waters outside its own immediate drainage area. Long-term (1990-2005) flows from Apalachia Dam average about 2,164 cfs, which results in an average retention time of about 14 days.

Deep tributary reservoirs such as Apalachia Reservoir often stratify into distinct temperature layers in the summer. Consequently, water discharged from the base of the dam into the tailwater can be very cold and have low DO, which impairs water quality in the tailwater. TVA mitigates potential downstream impacts by introducing oxygen into the water leaving the turbine.

There are three minor NPDES discharges located in the upper reach of the reservoir. These include Bear Paw WWTP, Hiwassee Dam School, and Hiwassee Hydro Plant.

Reservoir Ecological Health

Apalachia Reservoir is monitored at a forebay site at HRM 67.0. Apalachia Reservoir received a “good” ecological health rating in 2006 with the highest score (82) to date (see Figure 3-7). This was the result of three indicators (chlorophyll, benthic macroinvertebrates, and sediment) concurrently scoring at the upper end of their historical range rather than of a substantial change in any single indicator. The reservoir’s score has fluctuated between “fair” and “good” since monitoring began, but the higher reservoir scores since 2000 are largely the result of improvements in the benthic community, which rated in the “poor” to “low fair” range until 2000 when the community received a “good” rating. The benthic community has continued to rate “good” in subsequent years.

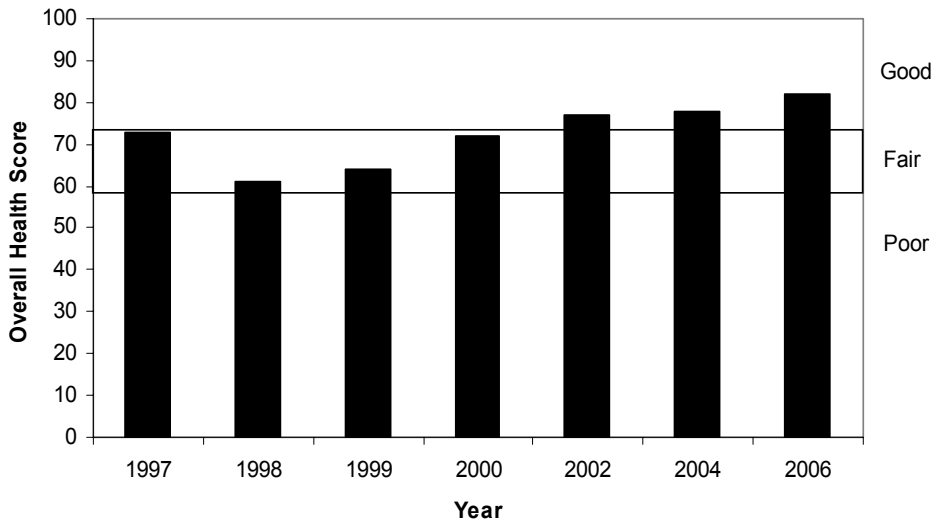

Figure 3-7. Apalachia Reservoir Ecological Health Ratings, 1997-2006

Dissolved Oxygen

As shown in Table 3-78, DO has rated "fair" each year due to a small zone of low DO water along the bottom of the reservoir in late summer. Although low DO (less than 2 mg/L) water has encompassed only a small percentage of the water column each year, a large percentage of the reservoir bottom is often exposed to low concentrations.

Table 3-78. Apalachia Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data 1997-2006

Characteristic	Monitoring Year						
	1997	1998	1999	2000	2002	2004	2006
Apalachia Forebay							
Dissolved Oxygen	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Chlorophyll	Good	Good	Fair	Poor	Poor	Poor	Good
Sediment	Good	Fair	Good	Fair	Good	Good	Good

Chlorophyll

Chlorophyll ratings have fluctuated between "poor," "fair," and "good," with no specific trend through time.

Sediment Quality

Sediment quality rated "good" most years because no PCBs or pesticides were detected and no metals had elevated concentrations. Sediment quality rated "fair" in 2000 due to slightly elevated concentrations of copper—probably related to the area's geology— and "fair" in 1998 because low levels of chlordane were detected. Chlordane was a pesticide previously used to control termites and crop pests.

Benthic Community

The benthic community rated in the "poor" to "low fair" range until 2000 when the community received a "good" rating. The improvement resulted primarily from an increase

in the number of *Corbicula*, fingernail clams, and more notably the number of chironomids[8] collected. The benthic community has continued to rate "good" in subsequent years.

Benthic Monitoring

Areas sampled on Apalachia Reservoir included the forebay at HRM 67.0 (area of the reservoir nearest the dam). All benthic community scores rated "fair" to "good" for the eight years during which benthic samples were taken with the exception of 1998, which scored "poor" (Table 3-79).

Table 3-79. Recent (1996-2006) Benthic Community Ratings for Apalachia Reservoir

Station	River Mile	Year							
		1996	1997	1998	1999	2000	2002	2004	2006
Forebay	67.0	Fair	Fair	Poor	Fair	Good	Good	Good	Good

Fisheries Monitoring

The RVSMP began including annual fish sampling on Apalachia Reservoir in 1996. A list of fish species commonly found in Apalachia Reservoir can be found in Appendix K. The fish community in Apalachia Reservoir has consistently rated "fair" at the forebay sampling stations.

Apalachia Reservoir provides some opportunities for sport anglers, particularly those interested in black bass. Because of its isolation, relatively few anglers use the reservoir compared to other regional reservoirs. In 2006, Apalachia Reservoir SFI rated below the average for black bass, largemouth bass, smallmouth bass, and spotted bass (see Table 3-80).

Table 3-80. Sport Fishing Index Scores for Selected Sport Fish Species in Apalachia Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	30	36
Largemouth Bass	30	33
Smallmouth Bass	26	30
Spotted Bass	22	31

Swimming Advisories

There are no state advisories against swimming in Apalachia Reservoir. TVA performed *E. coli* bacteria monitoring at one location (i.e., the Hiwassee Dam tailwater boat ramp) in 2007.

[8] Chironomids are mosquito-like flies that are members of the family Chironomidae. These insects are common and abundant in many areas.

Fish Consumption Advisories
The State of North Carolina has issued a statewide fish consumption advisory for largemouth bass because of mercury concentrations. TVA collected channel catfish and largemouth bass from the reservoir for tissue analysis in autumn 2006. The results, which were similar to those of previous years, were provided to state agencies in North Carolina.

State(s) Impaired Waters
The North Carolina Division of Water Quality assigned use support ratings to waters in the Hiwassee River basin based on biological, chemical, and physical data collected between September 1999 and August 2004 (NCDENR 2007a). All waters evaluated in the immediate watershed of Apalachia Reservoir are "supporting" in the aquatic life, recreation, and water supply categories. TDEC has listed 11.4 miles of the Hiwassee River below Apalachia Dam as impaired due to habitat loss from flow alteration (TDEC 2006). Since 2004, TVA has provided minimum flows in this reach of the Hiwassee River between Apalachia Dam and Apalachia Powerhouse from June 1 through November 1 to enhance the diversity of aquatic species in that water body (TVA 2004).

Water Supply
No municipal water suppliers currently withdraw water from Apalachia Reservoir or its supporting watershed.

3.7.10.2 Environmental Consequences

Regardless of the alternative selected, no changes in the existing land uses would occur on Apalachia Reservoir. Any proposed actions on TVA land would be assessed for compliance with TVA's Land Policy, SMP, and Section 26a regulations. Individual environmental reviews would identify potential adverse impacts and mitigation to protect the aquatic environment; TVA would then take appropriate measures to address these impacts. Therefore, no significant impacts to water quality and aquatic life are expected in association with these alternatives.

3.7.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Under all of the alternatives, the existing uses of Apalachia Reservoir lands would not change, and there would be no adverse impacts to air quality. Noise has previously been discussed in Section 3.1.11.2.

3.7.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.7.12.1 Affected Environment

3.7.12.1.1 <u>Population and Economy</u>

<u>Population</u>: Cherokee County, North Carolina, had a population of 24,298 in 2000, an increase of 28.3 percent since 1980 (Tables 3-81 and 3-82). This was a lower rate than was in the state but higher than was in the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990. Estimates for 2006

indicate that the population of Cherokee County has grown an additional 8.3 percent since 2000. This remains a faster rate than the nation but is not quite as fast as in the state as a whole. Projections through 2020 indicate that the county will continue to have faster population growth than the nation over that time, but not as fast as population growth in the state. The rate for the county is projected to be greater than for 1980-2000, but the rates for the state and nation are projected to be lower than for 1980-2000.

Table 3-81. Population – Cherokee County, North Carolina, and Polk County, Tennessee

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Cherokee County, N.C.	18,933	20,170	24,298	26,309	31,702	53.4
Polk County, Tenn.	13,602	13,643	16,050	15,939	22,086	36.9
North Carolina	5,880,095	6,628,637	8,049,313	8,856,505	10,885,758	165.2
Tennessee	4,591,023	4,877,185	5,689,283	6,038,803	7,195,375	138.0
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e), North Carolina Office of State Budget and Management (2007), and Tennessee Advisory Council on Intergovernmental Relations and University of Tennessee Center for Business and Economic Development (2003)

Polk County, Tennessee, had a population of 16,050 in 2000, an increase of 18.0 percent since 1980 (Table 3-81 and 3-82). This was a lower rate than in either the state or the nation. The rate of growth in the county, state, and nation was much greater for the county from 1990 to 2000 than from 1980 to 1990. Estimates for 2006 indicate that the population of Polk County has declined 0.7 percent since 2000. This compares to growth of more than 6 percent in both the state and nation during that time. Projections through 2020 indicate that the county will rebound to have faster population growth than the state and nation over that time. The rates for the county and state are projected to be greater than for 1980-2000, but the rate for the nation is projected to be lower.

Table 3-82. Recent and Projected Population Changes – Cherokee County, North Carolina, and Polk County, Tennessee (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Cherokee County, N.C.	6.5	20.5	28.3	8.3	30.5	67.4
Polk County, Tenn.	0.3	17.6	18.0	-0.7	37.6	62.4
North Carolina	12.7	21.4	36.9	10.0	35.2	85.1
Tennessee	6.2	16.7	23.9	6.1	26.5	56.7
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-81

The counties are decidedly rural in distribution of population. As noted in Table 3-81, the population densities of both counties, particularly Polk County, are substantially lower than their states and much lower than the nation. The largest town in Cherokee County is Andrews, with 1,602 residents in 2000. The largest town in Polk County is Benton, with 1,138 residents in 2000. About 87 percent of the population in both counties is outside incorporated towns.

Economy: Table 3-83 contains the most recent annual data regarding the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Cherokee County had 13,422 people employed on average. The county had a higher percentage of farmers, manufacturing employees, and retail employees than either the state or the nation. The county had a lower percentage of government employees and employees in the general "other" category than the state or nation. The average unemployment rate for 2006 in the county was higher than either the state or the nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

Table 3-83. Employment, Unemployment, and Income – Cherokee County, North Carolina, and Polk County, Tennessee

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Cherokee County, N.C.	13,422	2.2	12.2	17.9	12.1	55.5	5.4	21,814
Polk County, Tenn.	7,020	7.9	7.2	12.6	20.9	51.4	5.6	24,245
North Carolina	5,119,512	1.4	11.5	10.8	15.7	60.5	4.8	31,041
Tennessee	3,630,959	2.7	11.7	11.4	12.1	62.2	5.2	30,969
United States	174,249,600	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated), North Carolina Employment Security Commission (undated), and Tennessee Department of Labor (undated)

In 2005, Polk County had 7,020 people employed on average. The county had a much higher percentage of farmers and government employees than the state or nation, a lower percentage of manufacturing employees, and a lower percentage of employees in the general "other" category than the state or nation. The average unemployment rate for 2006 in the county was higher than the state or nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

Cherokee County is geographically in the center of a bowl defined by the surrounding counties. Therefore, it has historically been a regional trade center with a more balanced economy than the surrounding counties. As with all the counties in the region, the increasing land values due to the demand for vacation homes is making it more difficult for local residents to find affordable housing (Ginny Faust, North Carolina Department of Community Affairs, personal communication, November 13, 2007; Melody Adams, Graham County, November 9, 2007).

3.7.12.1.2 Environmental Justice

The minority population in the Apalachia Reservoir area is small (Table 3-84). In Cherokee County, 6.4 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 32.1 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 15.1 percent, higher than the state rate of 13.8 percent and the national rate of 12.7 percent.

Table 3-84. Minority Population, 2006, and Poverty, 2004 – Cherokee County, North Carolina, and Polk County, Tennessee

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Cherokee County, N.C.	26309	1310	366	6.4	15.1
Polk County, Tenn.	15,939	325	164	3.1	15.1
North Carolina	8,856,505	2,298,351	543,059	32.1	13.8
Tennessee	6,038,803	1,182,866	174,747	22.5	15.0
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

In Polk County, 3.1 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 22.5 percent and the national average of 33.6 percent (Table 3-84). The estimated poverty rate in the county in 2004 was 15.1 percent, slightly higher than the state rate of 15.0 percent and higher than the national rate of 12.7 percent.

3.7.12.2 Environmental Consequences

The current uses of Apalachia Reservoir lands would continue under all of the alternatives. Other than the possible expansion of existing recreation facilities, there would be little development that would affect socioeconomic conditions. None of the alternatives would result in disproportionate impacts on minority or disadvantaged populations.

3.8 Fontana Reservoir

3.8.1 Land Use

An overview of land use for the mountain reservoirs region is provided in Section 3.1.1.

3.8.1.1 Affected Environment

TVA initially purchased 57,312 acres of land for Fontana Reservoir (see Table 1-1). TVA transferred 55,153 acres (96 percent) to other agencies for public use. Approximately 44,000 acres were transferred to the USFS and 10,400 acres were transferred to the NPS for inclusion in the GSMNP. Of the originally purchased acreage, TVA sold about 1,228 acres (2 percent). Several hundred acres along the reservoir were involved in a USFS land exchange, which provided land for residential development. This area is known as Fontana Lake Estates.

TVA retained 931 acres of land, which is divided into 46 parcels on Fontana Reservoir. All of the parcels are committed to existing land uses. The dam reservation accounts for 43 percent (403 acres) of the calculated acreage. As mentioned previously, the acreage of the narrow strip of TVA-retained land fronting the land TVA transferred to the USFS has not been calculated. Therefore, the committed uses associated with those parcels are not represented in the committed acreage total. However, there are 23 such parcels that are committed through the transfer agreement with the USFS. Most of this land is used for natural resource conservation and dispersed recreation. Some of the land is managed for developed recreation where it fronts recreational facilities such as where marinas are present. Additionally, there are several parcels committed to recreational use through land use agreements, the two largest of which include Fontana Village Resort near the dam (351.7 acres) and the Old SR 288 boat ramp and day use area near Bryson City (70.3 acres). Finally, there are two parcels committed to residential access by deeded rights or prior policy. A complete list of the committed uses on Fontana Reservoir parcels is provided in Appendix F.

As shown in Table 1-2, TVA owns 92 percent of the approximately 238 miles of shoreline on Fontana Reservoir. This shoreline either borders land TVA retained for project operations or abuts the land TVA retained fronting the land transferred to the USFS. Nineteen percent of the shoreline was never owned by TVA. TVA purchased only flowage easements along this private shoreline. Approximately 11 percent of the shoreline, all privately owned, is available for residential development (see Table 3-2). TVA estimates that about 64 percent of the shoreline available for residential development is currently developed.

Graham and Swain counties, North Carolina, are predominantly rural. Bryson City in Swain County is the town nearest to the reservoir. About 60 percent of the land in Graham County is in the Nantahala National Forest (USFS 2007b, Quickfacts 2007). About 7 percent of Swain County is in the national forest (ibid). According to Swain County Economic Development Director Ken Mills (personal communication, November 14, 2007), when the acreage in the GSMNP and the Cherokee Indian Reservation is added, total federal and tribal ownership is about 88 percent of the county. Mr. Mills noted that development has increased on the privately owned land in the county in recent years. Graham County Economic Development Director Melody Adams (personal communication, November 9, 2007) said this was also occurring in Graham County.

No prime farmlands occur on the TVA-managed lands on Fontana Reservoir.

3.8.1.2 Environmental Consequences

Alternative A
As shown in Table 2-4, TVA did not utilize the Forecast System designations to plan Fontana Reservoir and has no other formal plan for the management of its Fontana Reservoir lands. Under Alternative A, TVA would continue to manage this land for its current uses with no parcel allocations or RLMP. There would be no potential for change in land use under Alternative A because all of the parcels on Fontana Reservoir are committed to their existing use as shown in Table 2-2.

Under Alternative A, there would be no potential impacts to prime farmlands.

Alternatives B, C, and D
Under Alternatives B, C, and D, TVA would allocate the previously unplanned 931 acres on Fontana Reservoir to four of the seven current land use planning zones. The largest amount of land, comprising 16 parcels and approximately 435 acres (46.7 percent), would be allocated to Zone 6 (Developed Recreation). Almost as large an amount, three parcels totaling approximately 405 acres (43.5 percent) would be allocated to Zone 2 (Project Operations). Twenty-five parcels comprising about 50 acres (5.4 percent) would be allocated to Zone 4 (Natural Resource Conservation). However, the previously unplanned acreage for the TVA-retained land fronting USFS land is unknown and is not included in the Zone 4 and 6 acreage totals. Zone 7 (Shoreline Access) would have 41.2 acres (4.4 percent) allocated to it. No land would be allocated to Zone 3 (Sensitive Resource Management) or to Zone 5 (Industrial).

No significant changes to land use are expected to occur on Fontana Reservoir under any of the action alternatives because the allocations would be consistent with existing committed land use on all parcels.

Under Alternative B, C, or D, there would be no impacts to prime farmlands.

3.8.2 Recreation

An overview of the recreation resource for the mountain reservoirs is provided in Section 3.1.2.

3.8.2.1 Affected Environment

There are 19 TVA parcels on Fontana Reservoir that support developed recreation facilities. TVA actively manages a few of these parcels. However, most are managed by the USFS and state and county agencies, either through TVA land transfer agreements or landrights provided by licenses, leases, or easements. In addition to the TVA and other public land that provides recreational opportunities, the private sector also provides needed amenities such as marinas. These developed recreation areas are summarized in Table 3-85.

Table 3-85. Developed Recreation Facilities on Fontana Reservoir

Area Name	County, State	Sector	Operator	Land Ownership	Parcel Number	Amenities Availble							
						Campgrounds	Marinas	Picnic Tables	Boat Ramps	Stream Access	Paved Trails	Fishing Piers	Other
Crisp Boat Dock	Graham, N.C.	Private	Commercial	Private***	13				●				
Prince Boat Dock	Graham, N.C.	Private	Commercial	Private***	11		●		●				
Peppertree Fontana Village	Graham, N.C.	Private	Commercial	TVA	4	●	●		●				●
Fontana Dam Reservation	Graham, N.C.	Public	TVA	TVA	2, 3, 4			●					●
Cable Cove Recreation Area	Graham, N.C.	Public	USFS/ State of N.C.	USFS**	7	●			●				
Tsali Recreation Area	Graham/ Swain, N.C.	Public	USFS/ State of N.C.	USFS**	15	●		●	●				
Cullowhee Dam*	Jackson, N.C.	Public	Western Carolina University	TVA	TSGA-3					●			
East LaPorte*	Jackson, N.C.	Public	Jackson County	TVA	TSGA-4			●		●			
Phillips Bridge*	Macon, N.C.	Public	Macon County	TVA	LTRA-3					●			
Prentiss Bridge*	Macon, N.C.	Public	Macon County	TVA	LTRA-4					●			
Alarka Dock	Swain, N.C.	Private	Commercial	Private***	16		●		●				
Greasy Branch Boat Dock	Swain, N.C.	Private	Commercial	Private***	35		●		●				●
Almond Boat and RV Park	Swain, N.C.	Private	Commercial	USFS**	25	●	●		●				●
Bryson City Park*	Swain, N.C.	Public	Bryson City	TVA	42					●			●
Ela*	Swain, N.C.	Public	Swain County	TVA	TSGA-1			●		●			●
SR 288 Recreation Park	Swain, N.C.	Public	Swain County	TVA	44			●	●			●	
Lemmon's Branch Ramp	Graham, N.C.	Public	USFS/ State of N.C.	USFS**	19				●				
Wilderness Boat Ramp	Swain, N.C.	Public	State of N.C.	USFS**	38				●				

* = Stream access site
** = TVA retained below MSC
*** = Marina below USFS and TVA Land below the 1,710-foot msl

There are four campgrounds on Fontana Reservoir. There are two commercial campgrounds located on TVA land and on USFS land. Cable Cove Recreation Area (Parcel 7) is operated by the USFS and the State of North Carolina and also includes a boat ramp. Tsali Recreation Area (Parcel 15) is operated by the USFS and the State of North Carolina and includes picnic tables and a boat ramp.

There are 11 recreation areas that contain at least one boat ramp, six of which are privately operated. Five of the ramps are operated by public entities.

There are five commercial marinas operating on Fontana Reservoir, all of which are privately operated. Marinas include Prince Boat Dock (Parcel 11), Peppertree Fontana Village (Parcel 4), Alarka Dock (Parcel 16), Greasy Branch Boat Dock (Parcel 35), and Almond Boat and RV Park (Parcel 25).

The single public fishing pier on Fontana Reservoir is at the SR 288 Recreation Park (Parcel 44). This facility is managed by Swain County.

There are six stream access sites located near Fontana Reservoir. All of these are located on TVA land and managed by other public agencies. Cullowhee Dam (Parcel TSGA-3) is managed by Western Carolina University; East LaPorte (Parcel TSGA-4) is managed by Jackson County; Phillips Bridge (Parcel LTRA-3) and Prentiss Bridge (Parcel LTRA-4) are managed by Macon County; Bryson City Park (Parcel 42) is managed by Bryson City; and Ela (Parcel TSGA-1) is managed by Swain County.

Dispersed Recreation

Dispersed recreation has historically been an important use of Fontana Reservoir. Table 3-86 provides a summary of parcels utilized for dispersed recreation areas that have been identified to date on Fontana Reservoir.

Table 3-86. Dispersed Recreation Areas on Fontana Reservoir

Recreation Area	Parcel Number	Number of Sites
Fontana Lake Estates	28	1
National Park Service 1	45	3
National Park Service 2	46	3

3.8.2.2 Environmental Consequences

Alternative A

Under Alternative A, no land on Fontana Reservoir is allocated for developed recreation. However, under Alternative A, 16 unplanned parcels currently support developed recreation. The unplanned parcels are all committed to a developed recreation use through transfer agreement covenants and TVA license, leases, and easements.

Under Alternative A, TVA would not allocate any parcels for Public or Commercial Recreation use on Fontana Reservoir. The unplanned parcels that are committed to developed recreation would continue to be used for that purpose. Therefore, any future demand for recreational needs would have to be met by the expansion of recreation facilities in these existing areas. Under Alternative A, potential impacts to recreational resources would be insignificant because parcels utilized for developed recreation would not change. Any proposed facilities would be subject to environmental review, including the imposition of necessary mitigation prior to TVA approval.

There are no proposed changes in land use of any parcels under Alternative A. Therefore, potential impacts to dispersed recreation would be restricted to expansions within existing committed parcels (e.g., campground expansion). Potential impacts to dispersed recreation of this nature are expected to be insignificant.

Alternatives B, C, and D
Under any of the three action alternatives, 16 parcels on Fontana Reservoir would be allocated to Zone 6 (Developed Recreation). All of these parcels are committed to a developed recreation use, and all of the parcels currently support recreational use with existing facilities. The parcels allocated to Zone 6 under Alternatives B, C, and D include those unplanned parcels under Alternative A that are committed to a developed recreation use.

Under these alternatives, any future demand for recreational needs accommodated on TVA land would have to be met by expanding recreation facilities in these existing areas allocated to Zone 6. These areas would be the same as those under Alternative A. Because there would be no new parcels allocated for Developed Recreation, the potential recreation-related effects would be the same as those expected under Alternative A. The potential for impacts from any proposed facilities within existing areas would be assessed in an environmental review. Adverse effects would be subject to any necessary mitigation prior to TVA approval and implementation.

Under Alternative B, C, or D, there are no proposed changes in land use of any parcels, and therefore, potential impacts to dispersed recreation would be limited to expansions within existing committed parcels. Potential effects to dispersed recreation of this nature are expected to be insignificant.

3.8.3 Terrestrial Ecology

An overview of terrestrial ecology (plant and wildlife communities) is provided in Section 3.1.3.

3.8.3.1 Plant Communities

3.8.3.1.1 Affected Environment

The typical vegetative classes on Fontana Reservoir lands include evergreen forest, evergreen-deciduous forest, deciduous forest, shrublands, and herbaceous vegetation. Evergreen forests make up a small percentage of the forests and consist of large stands of Virginia pine and small stands of white pine. Evergreen-deciduous forests, the most common forest type, are dominated by stands of mixed pine-hardwood trees. On dry ridges, pitch, short-leaf, and Virginia pines and oaks are found in the canopy with the understory dominated by blueberry/huckleberry species along with stump sprouts of American chestnut. Horsesugar, a small tree thought to no longer occur in the GSMNP, was found growing within an evergreen-deciduous forest on Parcel 46 (an island adjacent to National Park Service lands). More mesic sites are also dominated by oaks interspersed with pines, often including white pine.

Deciduous forests occur mainly as oak-hickory forests (mesic to xeric) and mesic hardwood forests on slopes. Oak-hickory forests common on dry ridges grade into more mesic slopes. Cove hardwood forests are dominated by tulip poplar with American beech, Fraser's magnolia, striped maple, sweet birch, white oak, and yellow buckeye. The cove hardwood forest on Parcel 23 has an unusually diverse assembly of flora, with American basswood, northern red oak, tulip poplar, and white oak in the canopy and American plum, buffalo nut, dog hobble, flowering dogwood, highbush blueberry, mountain laurel, red maple, rosebay, sweet birch, sweetshrub, and wild hydrangea in the subcanopy. Numerous ferns are present, which include Christmas fern, cinnamon fern, marginal shield

fern, New York fern, rock cap fern, southern lady fern, and royal fern. Other herbaceous species found include American alumroot, bellwort, flowering spurge, New England aster, Solomon's seal, thimbleberry, and touch-me-not.

Forested wetlands occur in bottom areas along the backs of coves along the reservoirs and grade into scrub-shrub wetlands (shrublands). A seepage area associated with a rocky bluff was observed on Parcel 28 opposite of Parcel 27 on the Little Tennessee River. Wooly lip fern and rock cap fern grow on the rocky bluff.

Herbaceous vegetation is commonly found along transmission line and railway and roadway rights-of-way as well as grassy areas within the dam reservations and commercial recreation areas. Kudzu and oriental bittersweet were commonly encountered along with boneset, bracken fern, common ragweed, small-headed sunflower, and several grass species such as broomsedge, Johnson grass, love grass, and sugar cane plume grass. Tall fescue and bahia grass were common grasses seen on the dam reservation.

A number of invasive species were observed during field surveys, especially on the dam reservation and along the railroad and road rights-of-way. The species present included oriental bittersweet, autumn olive, Chinese lespedeza, Chinese privet, Japanese honeysuckle, Japanese stiltgrass, kudzu, mimosa, multiflora rose, princess tree, and tree-of-heaven. Large stands of kudzu occur along the railroad right-of-way on Fontana Lake Estates and near the US 19 bridge at Parcel 27. TVA, along with the NPS, has attempted to control oriental bittersweet on the dam reservation and other areas near Fontana Reservoir for several years by physically uprooting the plants.

3.8.3.1.2 Environmental Consequences

Regardless of the alternative implemented, there would be no changes to existing land uses. Thus no associated impacts on plant communities are anticipated under any of the alternatives. TVA's ability to manage invasive species would not change from the current situation. TVA prioritizes invasive species management efforts based on several factors including the availability of resources, potential for partnerships, and threat to sensitive resources.

3.8.3.2 Wildlife Communities

3.8.3.2.1 Affected Environment

The TVA lands on Fontana Reservoir contain a mixture of deciduous, evergreen, evergreen-deciduous, and early successional habitats. Wildlife communities are considered common in the region. A variety of salamanders, including dusky and slimy salamanders, was noted near streams along Parcels 31 and 28. Additionally, a series of ponds with associated emergent wetlands on Parcels 31 and 28 provide habitat for various amphibians, wading birds, ducks, and songbirds such as yellow warbler, common yellowthroat, and other typical wetland species. River otters are observed regularly on Fontana Reservoir and its tailwater. Few mud flats exist on Fontana Reservoir.

3.8.3.2.2 Environmental Consequences

Because there would be no changes to existing land uses under any of the alternatives, no associated impacts to wildlife communities are anticipated.

3.8.4 Endangered and Threatened Species

A regional overview of endangered and threatened species is provided in Section 3.1.4.

3.8.4.1 Affected Environment

As shown in Table 3-87, seven state-listed plant species are known to occur within 5 miles of Fontana Reservoir. The rock gnome lichen, is both state and federally listed. In addition, the federally listed Virginia spiraea occurs in Graham County. No threatened or endangered plants or terrestrial animals were found during field surveys conducted as part of this planning process. As described below, suitable habitat for some listed animals does occur on Fontana Reservoir lands.

Table 3-87. Federally and State-Listed as Endangered, Threatened, and Other Species of Conservation Concern Reported From the Vicinity of Fontana Reservoir

Common Name	Scientific Name	Federal Status	State Rank	State Status
Plants				
Dwarf filmy-fern	*Trichomanes petersii*	--	S2	THR
Glade spurge	*Euphorbia purpurea*	--	S2	SR-T
Liverwort	*Aneura sharpii*	--	S1	SR-T
Rock gnome lichen	*Gymnoderma linear*	END	S2	THR
Saxifrage	*Saxifraga caroliniana*	--	S3	SR-T
Sedge	*Carex purpurifera*	--	S1	SR-P
Virginia spiraea	*Spiraea virginiana*	END	S2	END
Amphibian				
Eastern hellbender*	*Cryptobranchus alleghaniensis alleghaniensis*	--	S2	RARE
Birds				
Bald eagle*	*Haliaeetus leucocephalus*	--	S3	THR
Blue-winged warbler*	*Vermivora pinus*	--	S2	RARE
Cerulean warbler*	*Dendroica cerulea*	--	S2	RARE
Mammals				
Northern flying squirrel	*Glaucomys sabrinus coloratus*	END	S2	END
Eastern cougar	*Puma concolor couguar*	END	SH	S2
Indiana bat*	*Myotis sodalis*	END	S1?	END
Rafinesque's big-eared bat*	*Corynorhinus rafinesquii rafinesquii*	--	S2	THR
Southeastern fox squirrel*	*Sciurus niger niger*	--	S3	NOST
Southern Appalachian woodrat*	*Neotoma floridana haematoreia*	--	S3	SPCO
Reptiles				
Bog turtle*	*Glyptemys muhlenbergii muhlenbergii*	THR	S2	THR
Northern pine snake	*Pituophis melanoleucus melanoleucus*	--	S3	SPCO
Fish				
Spotfin chub*	*Erimonax monachus*	THR	S1	THR
Smokey dace*	*Clinostomus funduloides* ssp.	--	S2	SPCO
Sicklefin redhorse*	*Moxostoma* sp.	CAND	S?	NOST
Wounded darter*	*Etheostoma vulneratum*	--	S2	SPCO
Olive darter*	*Percina squamata*	--	S2	SPCO

Common Name	Scientific Name	Federal Status	State Rank	State Status
Insects				
Appalachian crescent*	*Phycoides batesii maconensis*	--	S2	RARE
Dusky azure*	*Celastrina ebenina*	--	S2?	RARE
Snails				
Noonday globe*	*Patera clarki nantahala*	THR	S1	THR
Open supercoil*	*Paravitrea umbilicaris*	--	S2	SPCO
Mussels				
Slippershell mussel*	*Alasmidonta viridis*	--	S1	END
Little-wing pearlymussel*	*Pegias fabula*	END	S1	END

-- = Not applicable
*Species descriptions in the text
Rank abbreviations: S1 = Critically imperiled, S2 = Imperiled, S3 = Rare or uncommon, SH = State historical, ? = Inexact or uncertain
Status abbreviations: CAND = Candidate for listing, END = Endangered, NOST = No state status, RARE = Rare, SPCO = Special Concern, SR-P = Significantly Rare-Peripheral; SR-T = Significantly rare-throughout, THR = Threatened

Eastern hellbenders are known from the Tuckasegee River and its tributaries. They are expected to occur in the numerous streams flowing into Fontana Reservoir.

Bald eagles (see Section 3.1.4) nest near the mouth of the Tuckasegee River, adjacent to Parcel 37. Recent bald eagle sightings suggest that additional nests may exist near Eagle Creek. Adult bald eagles were observed on Fontana Reservoir during field investigations in 2006.

Blue-winged warblers live within early to midsuccessional habitats typically containing a mixture of woody shrubs, herbaceous vegetation, and trees. A blue-winged warbler was observed within a transmission line corridor near Fontana Village in 1964. Habitat for this species still exists in the area but is relatively uncommon throughout the Fontana Reservoir project area.

Cerulean warblers occur largely in mature deciduous forests. Numerous records of this species exist within the Fontana Reservoir area, including on the dam reservation. Suitable habitat occurs on many of the parcels surrounding Fontana Reservoir.

A total of 20 points were sampled on Fontana Reservoir lands to determine their quality as **Indiana bat** summer roost habitat. Overall, most forested habitat ranked as unsuitable for Indiana bats, as sample points exhibited low-quality habitat due to lack of suitable roost trees and thick midstory. Due to the abundance of habitat in the area and presence of Indiana bats in the region, Indiana bat surveys would be performed during future projects in the vicinity of Fontana Reservoir that have the potential to affect summer roost habitat.

Rafinesque's big-eared bats often roost in caves, mines, and hollow trees, under loose bark of trees, and in abandoned buildings and other man-made structures especially in or near wooded areas. They forage in mature forests in both uplands and lowlands. One site within the boundaries of the GSMNP houses a population of Rafinesque's big-eared bats during winter months. This site is approximately 2.5 miles from the Fontana Dam Reservation. Foraging habitat for this species exists on several TVA parcels.

Southeastern fox squirrels often occur in evergreen-deciduous forests and long-leaf pine forests but can be found in disturbed areas, hedgerows, and city parks. A historic record of southeastern fox squirrel was reported near Parcel 38.

Southern Appalachian woodrats occupy woodland and brushy habitats. They are usually associated with rocky outcrops but also occur in areas with dense vegetation. A single record is known for this species within 3 miles of the project area. This species likely occurs on TVA parcels dominated by forested habitat.

The only known **bog turtle** population in Graham or Swain counties is more than 6 miles from the Fontana Reservoir project area. No bog turtle habitat exists in the project area.

Spotfin chub (see Section 3.1.4) has been collected in the Tuckasegee River and Little Tennessee River forks of Fontana Reservoir.

Smokey dace populations are spotty and uncommon in the Tennessee side of the Little Tennessee River but are common in the North Carolina side (NatureServe 2007). This fish has been collected in the Tuckasegee River fork of Fontana Reservoir.

The **sicklefin redhorse** (see Section 3.1.4) has been recognized as a distinct species by the USFWS and has been designated as a candidate for federal listing. This species has not yet been assigned a formal scientific name. However, it is currently in the process of being formally described as a species by the scientific community. This fish has been collected in the Tuckasegee River fork of Fontana Reservoir near NPS parcels of land, as well near Parcels 11 and 12 on the Little Tennessee River fork of Fontana Reservoir.

The **wounded darter** can be found in moderate to large rivers and prefers depths of 0.5 meter or more in gentle to moderate current with boulder to coarse rubble substrate. Spawning occurs in late May to late July with water temperatures of 16 to 20 degrees Celsius (Etnier and Starnes 1993). This fish has been collected in the Little Tennessee River fork of Fontana Reservoir upstream of Parcel 11.

Olive darters inhabit higher gradient upland rivers in boulder and bedrock chutes with moderate to torrential current (ibid). This fish has been collected on the upper end of Fontana Reservoir near Parcels 16, 17, 18, and 19.

Appalachian crescent habitat includes damp meadows to dry ridges. The host plants include many species of aster. All records of this butterfly are south of the Fontana Reservoir project area. However, suitable habitat exists around Fontana Reservoir.

Dusky azure butterflies inhabit moist, rich deciduous forests. The host plant of the larvae is goatsbeard (*Aruncus dioicus*), which is relatively common throughout the Fontana Reservoir project area.

Suitable habitat for a snail, the **noonday globe**, (see Section 3.1.4) occurs on Parcels 22, 23, and 24 within the Nantahala Gorge. No intensive surveys have been performed at these sites. A population is known from approximately 2.3 miles south of Parcel 24.

Open supercoil snails are known from cove forests with rocky slopes. Parcel 1 cove forest may contain this species.

The **Slippershell mussel** is found in small creeks and shallow streams. It prefers substrate of sand and fine gravel but can thrive in mud and sand bottoms among vegetation roots in stretches of continuous current (Parmalee and Bogan 1998). This mussel has been collected in the Little Tennessee River fork of Fontana Reservoir, upstream of Parcel 11.

The **little-wing pearlymussel** (see Section 3.1.4) has been collected in the Little Tennessee River fork of Fontana Reservoir, upstream of Parcel 11.

3.8.4.2 Environmental Consequences

Plants
No known populations of endangered or threatened plants occur on the 931 acres of TVA land on Fontana Reservoir. Therefore, no impacts to listed plants are expected under any of the four alternatives.

Terrestrial Animals
No federally listed as endangered or threatened terrestrial animals are known to occur on TVA Fontana Reservoir lands. These lands also ranked low in their suitability as Indiana bat habitat due to the lack of suitable roosting trees and the presence of thick midstory layers on the forested parcels. A few state-listed species, including the bald eagle, which was formerly federally listed, occur on or are likely to occur on Fontana Reservoir lands. Under all alternatives, TVA would incorporate protective buffers as suggested by the *Bald and Golden Eagle Protection Act* around all known bald eagle nests in the project area. TVA would also review any proposed activities on Fontana Reservoir lands for their potential to affect listed terrestrial animals. Under all alternatives, there would be no impacts to federally listed terrestrial animals and no adverse impacts to state-listed terrestrial animals.

Aquatic Animals
There would be no changes to existing land uses under any of the alternatives. Future actions on Fontana Reservoir parcels would be subject to further environmental review to assess their impacts, and with implementation of proper BMPs, there would be no effect on any listed aquatic species.

Under Alternatives B, C, and D, Parcel 41 would be allocated to Zone 2 (Project Operations) for an existing wastewater treatment plant, and Parcel 42 would be allocated to Zone 6 (Developed Recreation) for Bryson City Park. The olive darter occurs in this reach, and activities on Parcels 41 and 42 could potentially affect the species. However, with the implementation of appropriate environmental controls, no impacts would occur to this species. Parcel 43, a riverine island, would be allocated to Zone 4 (Natural Resource Conservation). This allocation would provide habitat protection for the olive darter.

The sicklefin redhorse is known to occur near virtually all of the TVA land parcels on Fontana Reservoir. Activities on any of these land parcels, which are primarily utilized for Zone 4 (Natural Resource Conservation) or Zone 6 (Developed Recreation) and front an existing boat ramp and boat docks, have the potential to negatively affect water quality in the reservoir. However, as long as proper controls are implemented during any future development, no impacts would occur to this candidate species.

Occurrences of the smokey dace and spotfin chub are known within the vicinity of Parcel 39. Under Alternatives B, C, and D, Parcel 39, which fronts USFS lands, would be allocated to Zone 4 (Natural Resource Conservation). With this allocation in place, these species would not be affected.

Parcels 18, 19, 20, 21, 25, 26, 27, 28, and 29 are adjacent to designated critical habitat for the spotfin chub. Parcels 18, 20, 26, and 28 front undeveloped USFS lands and would be allocated to Zone 4 (Natural Resource Conservation) under Alternatives B, C, and D. This allocation would have beneficial effects to spotfin chub habitat because the riparian habitat would be maintained. Parcels 19 and 25 contain an existing boat ramp and boat dock area (Lemons Branch Boat Ramp and Almond Boat Park) and would be allocated to Zone 6 (Developed Recreation). Although recreational activities can have the potential to affect water quality, proper operation of recreational facilities would reduce possible impacts to the spotfin chub to insignificant levels. Parcel 21 would be allocated to Zone 2 (Project Operations) to support the existing land use adjacent to the Great Smoky Mountain Railway, and ongoing activities on that parcel are not expected to adversely affect aquatic life.

Under any of the action alternatives, Parcels 27 and 29 would be allocated to Zone 7 (Shoreline Access) to support the existing use by residents of the Fontana Lake Estates Subdivision and other areas with water access. Those lands allocated to Zone 7 have the potential for additional nutrient enrichment that can occur from the loss of the riparian buffer on residential shoreline along the reservoir. TVA requires BMPs to minimize impacts to natural resources associated with any new proposed development fronting residential access areas. With the implementation of TVA Standards and Conditions and BMPs, these proposed allocations would not affect spotfin chub critical habitat.

The wounded darter and little-wing pearlymussel are known to occur within the vicinity of Parcels 27 and 28. The presence of critical habitat in this reach would be evaluated and taken into consideration for any future requests for Section 26a approval on these parcels. The Zone 4 (Natural Resource Conservation) allocation for Parcel 28 would have beneficial effects to the wounded darter because it would preclude residential development along the shoreline.

3.8.5 Wetlands

A regional overview of the wetlands resource for the mountain reservoirs is provided in Section 3.1.5.

3.8.5.1 Affected Environment

Wetlands are a relatively uncommon habitat type on Fontana Reservoir. As discussed in Section 3.1.5, wetlands comprise less than 0.1 percent of the total land cover types in the Little Tennessee River watershed. As shown in Table 3-5, there are approximately 57 acres of wetlands on Fontana, and most (about 39 acres) are forested wetlands. The balance of Fontana's wetlands are aquatic beds and exposed flats (6 acres), emergent wetlands (4 acres) and scrub-shrub wetlands (8 acres).

Wetland resources on Fontana Reservoir are primarily associated with the reservoir shoreline in very narrow fringes. Common species include persimmon, cutgrass, jewelweed, buttonbush, river birch, sycamore, alder, red maple, sedges, and soft rush. The

majority of TVA parcels contain steeply sloped shorelines. Thus, wetlands are associated with only a few parcels. These areas are typically linear and small (less than 0.1 acre). Parcels 3, 11, 14, and 20 contain small areas of scrub-shrub and emergent wetlands. A series of ponds with associated emergent wetlands on Parcels 31 and 28 provide valuable habitat for amphibians, wading birds, ducks, and songbirds. There are also small seeps within Parcels 23 and 24 that are relatively uncommon habitat types.

3.8.5.2 Environmental Consequences

The potential effects to wetlands resulting from the adoption of the various alternatives would be similar, and none would be adverse. Regardless of the alternative selected, those parcels containing wetlands would generally continue to be managed as they have been in the past. Any proposed actions with the potential to affect wetlands would be assessed prior to their implementation, and appropriate mitigative measures would be taken.

3.8.6 Floodplains

An overview of floodplains in the mountain reservoirs area is provided in Section 3.1.6.

3.8.6.1 Affected Environment

The potentially affected area extends from the lower limit of the Fontana Dam Reservation at about Little Tennessee River Mile (LTRM) 59.1 upstream to about LTRM 87.0 in Fontana Reservoir. The approximate 100-year flood elevations for the Little Tennessee River downstream of the dam vary from 1,280.0 feet msl at LTRM 59.1 to 1,286.0 feet msl at LTRM 61.0 (downstream of Fontana Dam). The approximate 500-year flood elevations for the Little Tennessee River downstream of the dam vary from 1,283.5 feet msl at LTRM 59.1 to 1,291.0 feet msl at LTRM 61.0. Tabulations of the 100- and 500-year flood elevations are included in Appendix J.

There are two main watercourses in Fontana Reservoir, i.e., the Little Tennessee River and the Tuckasegee River. The 100-year flood elevation for the Little Tennessee River is 1,710.0 feet msl from Fontana Dam (LTRM 61.0) to the upper end of the reservoir at about LTRM 87.0. The 500-year flood elevation is also 1,710.0 feet msl from the dam to the upper end of the reservoir. The 500-year flood elevation is used to control flood damageable development for TVA projects and on TVA lands.

The 100-year flood elevations for the Tuckasegee River vary from 1,710.0 feet msl at the mouth (LTRM 76.15) to elevation 1,735.4 feet msl at the upper end of TVA's landrights at about LTRM 12.7. The 500-year flood elevations for the Tuckasegee River vary from elevation 1,710.0 feet msl at the mouth to elevation 1,739.5 feet msl at the upper end of TVA's landrights.

3.8.6.2 Environmental Consequences

The potential environmental consequences of the implementation of each alternative are discussed in Section 3.1.6. Adverse effects on Fontana Reservoir floodplains are not anticipated under any of the alternatives.

3.8.7 Cultural Resources

An overview of cultural resources in the mountain reservoirs area is provided in Section 3.1.7.

3.8.7.1 Archaeological Resources

3.8.7.1.1 Affected Environment

Fontana Reservoir was the subject of archaeological surveys of the proposed North Shore Road corridor in 2004 (Webb 2004) and of large tracts of shoreline in late fall 1995 (Shumate et al. 1996), the winter of 2005-2006 (Gage and Herrmann 2006), and the winter of 2006-2007 (Gage and Herrmann 2007). The 1995 survey focused on the area from LTRM 82.5 of the Little Tennessee River upstream to approximately LTRM 90.1 and portions of Alarka Creek. Eight of the 21 sites recorded during the 1995 survey were considered potentially eligible for listing in the NRHP. The 2005-2006 and 2006-2007 surveys were conducted as part of the ROS project. Twenty-three sites, 14 of which were considered eligible, were identified during the first season, while 88 sites, 37 of which were considered eligible, were identified during the second.

During the survey of the proposed USFS Lemmons Branch Boat Ramp, a historic farmstead was identified (Shumate and Shumate 2000). Modifications to the proposed ramp resulted in a joint USFS-TVA project that involved the mitigation of the mid-19th century farmstead (Riggs and Shumate 2002).

3.8.7.1.2 Environmental Consequences

Because no changes to existing land uses on Fontana Reservoir are proposed under any of the alternatives, the potential for impacts to archaeological resources is low. As described in Section 3.1.7.1.2, TVA proposes to implement a PA in North Carolina for the identification, evaluation, and treatment of all historic properties potentially affected by this lands planning effort. Until the PA is executed, TVA will incorporate the phased identification, evaluation, and treatment procedure to effectively preserve historic properties, including archaeological resources, as required by Section 106 of the NHPA. TVA would adhere to the terms of this PA under all alternatives, and no adverse impacts on archaeological resources are expected.

3.8.7.2 Historic Structures

3.8.7.2.1 Affected Environment

Fontana Dam, named for the nearby town, is a straight gravity concrete structure with a maximum height above foundation rock of 480 feet. At the time of construction, it was the highest dam east of the Rocky Mountains and the fourth highest in the world. Alcoa (formerly known as the Aluminum Company of America) started developing the Little Tennessee River as early as 1917. At the time of the formation of TVA in 1933, Alcoa had constructed three hydroelectric projects on the Little Tennessee and its tributaries—Cheoah, Calderwood, and Santeetlah. Alcoa had also explored the Fontana Dam site. Its early plans contemplated developing the reach between Bryson City, North Carolina, and Fontana with two dams, each about 225 feet high, as a 450-foot dam was at that time beyond all precedent. Later plans called for the one dam located at the Fontana site and of a height approximately the same as that of the structure built by TVA.

TVA started negotiations with Alcoa over the construction of a multipurpose dam at the Fontana site in 1935. The problems involved in attempting to arrive at an agreement in the

matter were not simple, as the method of operations of the Fontana plant would necessarily control the operation of Alcoa's downstream Calderwood Dam. Finally, in 1941, an agreement was reached whereby the storage and release of water at Alcoa's hydroelectric plants would be directed by TVA and Alcoa would receive certain allotments of power from the TVA system. In the meantime, two additional projects, Nantahala and Glenville, had been built upstream from Fontana, so a total of five plants were involved in the agreement.

Because of the influx of construction workers, a new town, Fontana Village, housing some 5,000 people who worked around the clock in three shifts, sprang up in the forest. What was once the construction village is now a resort, and offers recreational activities such as boating, horseback riding, and making crafts. The village retains a number of the community facilities and houses built by TVA in the early 1940s (Bisher et al. 1999). These structures are important in the history of manufactured housing and include a variety of "temporary," "demountable," and trailer houses. The village also includes the Gunter house, a two-room log house of half-dovetailed construction.

Historic properties on Fontana Reservoir include the dam and powerhouse as well as the structures remaining from the original construction village. There are two segments of the Appalachian National Scenic Trail near Fontana Dam, an approximate 6-mile section extending 3.25 miles north and another segment 2.75 miles south of the dam. Most of the trail dates to 1946 or later. There are no potentially significant Appalachian National Scenic Trail shelters along these sections of trail (NPS 2007).

3.8.7.2.2 Environmental Consequences

Because no changes to existing land uses are proposed under any of the alternatives for Fontana Reservoir, the potential for impacts to historic structures is low. Under all alternatives, TVA would implement the PA described above in Section 3.1.7.1.2. This PA would include historic structures, and with its implementation, no adverse effects on historic structures are anticipated. Until the PA is implemented, TVA would individually evaluate actions with the potential to affect historic structures as required by Section 106 of the NHPA.

3.8.8 Managed Areas and Ecologically Significant Sites

Managed areas, ecologically significant sites, and NRI streams are defined in Section 3.1.8.

3.8.8.1 Affected Environment

Managed areas and NRI streams within 3 miles of Fontana Reservoir are listed in Table 3-88. The areas are grouped by closest distance to the reservoir; areas on TVA lands but managed by other entities through a letter of agreement or land use agreement with TVA are listed as "on reservoir." Those areas abutting or less than 0.1 mile from reservoir lands and NRI streams underlying reservoir waters are listed as "adjacent."

Table 3-88. Managed Areas, Ecologically Significant Sites, and Nationwide Rivers Inventory Streams Within 3 Miles of Fontana Reservoir

Name	Type of Area	Managing Authority	Location County, State	Closest Distance to Reservoir
Little Tennessee River	NRI	NPS	Swain, N.C.	Adjacent
Nantahala River	NRI	NPS	Swain, N.C.	Adjacent
Tuckasegee River	NRI	NPS	Swain, N.C.	Adjacent
Appalachian National Scenic Trail	Managed area (MA)	Nonprofit organization (TVA land use agreement)	Swain, N.C.	On reservoir (crosses Fontana Dam)
Bryson City Park	MA	Local (TVA land use agreement)	Swain, N.C.	On reservoir
Nantahala National Forest	MA	USFS	Swain, N.C.	Adjacent
Nantahala State Game Land	MA	State	Swain, N.C.	Adjacent
Great Smoky Mountains National Park/Registered State Natural Area	MA	NPS/State	Swain, N.C.	Adjacent
Needmore Tract	MA	State	Swain, N.C.	Adjacent
Swain County Park	MA	Local	Swain, N.C.	Adjacent
Cherokee Indian Reservation (3,200-acre tract)	MA	Federal	Swain, N.C.	1.7 miles southeast

No ecologically significant sites are located within 3 miles of Fontana Reservoir.

3.8.8.2 Environmental Consequences

None of the alternatives for Nottely Reservoir involve changing existing land uses. Therefore, no impacts to managed areas or ecologically significant sites are anticipated under any of the alternatives.

3.8.9 Visual Resources

The general visual environment of the mountain reservoirs is described in Section 3.1.9.

3.8.9.1 Affected Environment

The landscape character of Fontana Reservoir is mainly naturally appearing between the dam and Bryson City, North Carolina. At the dam, views are of an intact reservoir surrounded by rugged mountains. With the exception of the dam and roadway, the landscape is unaltered by human development. There are large contiguous land holdings to the north (NPS) and to the south (USFS) that help preserve substantial stretches of shoreline. Scenic attractiveness is distinctive, and scenic integrity is high.

From the dam to approximately Sawyer Creek, there are numerous undeveloped coves. These coves have natural settings available to boaters and anglers. Steep slopes along the shoreline provide a dramatic contrast to the reservoir, particularly when viewed from background distances. There are few islands along this section of the reservoir that

obscure views from the water, providing visitors on the reservoir dramatic panoramas of natural landscapes. Scenic value is excellent.

Farther upstream, east of Chambers Creek, there is a variety of developments along the reservoir. These include numerous residential developments, boat docks, marinas, a city park, and a municipal wastewater treatment plant. Much of the development lies along Panther Creek and north of the confluence of the Little Tennessee River and Nantahala River. Concentrations of dwellings and related water use facilities are dominant along some sections of this portion of Fontana Reservoir, where they create a strong adverse contrast with the natural landscape character. In this area, scenic value is fair, and scenic integrity is low.

3.8.9.2 Environmental Consequences

Under all alternatives, the existing land uses of TVA Fontana Reservoir lands would not change. With the exception of the dam itself and associated operational support area for the dam, as well as the existing developed recreation areas, the remainder of TVA lands would remain undisturbed. The dam provides visual contrast to the reservoir along the headwaters and to the riverine setting downstream. Any future actions on TVA lands would be assessed for their potential to affect the scenic value and scenic integrity of the Fontana Reservoir area.

3.8.10 Water Quality and Aquatic Ecology

An overview of water quality and aquatic ecology for the mountain reservoirs area is provided in Section 3.1.10.

3.8.10.1 Affected Environment

Fontana Reservoir is the deepest reservoir in the TVA Tennessee River system. Average annual discharge is 3,950 cfs, which provides an average hydraulic retention time in the reservoir of 181 days. Water entering the reservoir is low in nutrients and dissolved minerals. Water in Fontana Reservoir is quite clear due to limited photosynthetic activity and a mostly forested watershed.

Reservoir Ecological Health

TVA samples Fontana Reservoir at the forebay at LTRM 62.0 and at two midreservoir sites (LTRM 81.5 and Tuckasegee River Mile 3.0). The reservoir ecological health scores for Fontana Reservoir from 1994 through 2006 are shown as Figure 3-8.

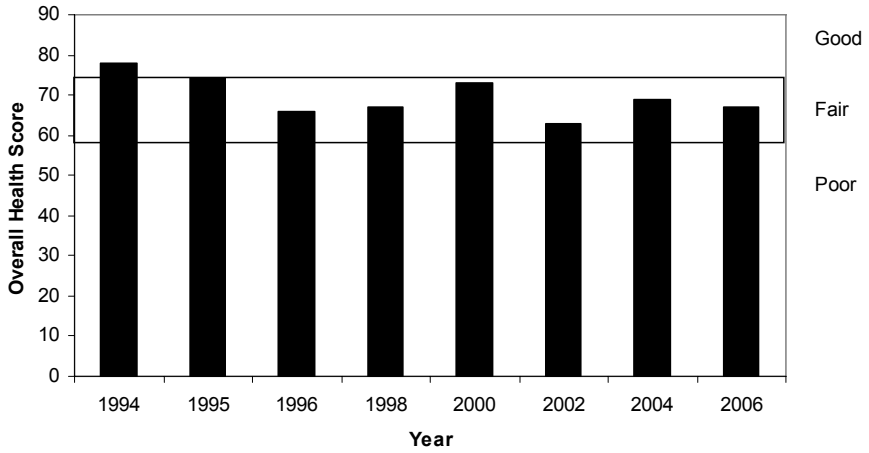

Figure 3-8. Fontana Reservoir Ecological Health Ratings, 1994-2006

Fontana Reservoir rated "fair" in 2006, a similar rating to previous years in which the full complement of indicators was measured. In 1994, 1995, and 2000, the overall health score was slightly higher. This was partly because bottom life was not sampled at all locations in these years due to the extensive reservoir drawdown for the scheduled five-year safety check and maintenance at Fontana Dam. This indicator, which usually rates in the "fair-poor" category, probably would have reduced the overall score by several points.

Dissolved Oxygen

As shown in Table 3-89, DO rated "good" or "fair" at the forebay and Little Tennessee River locations and "fair" or "poor" at the Tuckasegee site. However, the area of low DO was substantially smaller at the Tuckasegee site in 2004 than in previous years, resulting in the first "good" rating for DO at this location.

Table 3-89. Fontana Reservoir Water Quality and Sediment Ratings, Reservoir Vital Signs Monitoring Data 1993-2006

Characteristic	Monitoring Year								
	1993	1994	1995	1996	1998	2000	2002	2004	2006
Fontana Forebay									
Dissolved Oxygen	Fair	Good	Good	Fair	Fair	Fair	Fair	Fair	Fair
Chlorophyll	Good	Good	Good	Good	Good	Good	Good	Good	Good
Sediment	Fair	Fair	Good	Good	Fair	Good	Good	Good	Good
Fontana Midreservoir Little Tennessee River									
Dissolved Oxygen	Good	Good	Fair	Good	Fair	Good	Fair	Good	Fair
Chlorophyll	Good	Good	Fair	Good	Good	Poor	Poor	Poor	Fair
Sediment	Good	Fair	Fair	Fair	Fair	Good	Good	Good	Good
Fontana Midreservoir Tuckasegee River									
Dissolved Oxygen	Poor	Fair	Fair	Fair	Poor	Fair	Poor	Good	Fair
Chlorophyll	Good	Good	Fair	Fair	Fair	Fair	Poor	Fair	Fair
Sediment	Fair	Fair	Good	Fair	Fair	Fair	Fair	Good	Good

Often deep tributary reservoirs such as Fontana Reservoir stratify into temperature distinct layers in the summer. As a result, water discharged from the base of the dam into the

tailwater can be very cold and have low DO, which impairs water quality in the tailwater. TVA mitigates this on Fontana by introducing oxygen into the water leaving the turbine. As part of the LIP, turbine venting is used to improve the DO content of the releases.

Chlorophyll

Chlorophyll has rated "good" at the forebay all years monitored. A slight increase in chlorophyll levels at the two midreservoir monitoring locations has been observed in Fontana Reservoir for several years. These increases have caused chlorophyll ratings to drop from "good" at the midreservoir locations in the early 1990s to "fair or poor" in recent years.

Sediment Quality

Sediment quality ratings have fluctuated between "good" and "fair" dependent on whether chlordane was detected. Chlordane was last detected in the reservoir sediments in 2002 and only at the Tuckasegee midreservoir site. Chlordane has not been detected at the forebay or Little Tennessee midreservoir site since 1998.

Benthic Monitoring

Areas sampled on Fontana Reservoir included the forebay at LTRM 62.0 and midreservoir at LTRM 81.5. As shown in Table 3-90, all of the benthic community scores rated "poor" for the seven years during which benthic samples were taken, with the exception of the midreservoir in 1994.

Table 3-90. Recent (1994-2006) Benthic Community Ratings for Fontana Reservoir

Station	Year						
	1994	1996	1998	2000	2002	2004	2006
Forebay	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Midreservoir	Fair	Poor	Poor	Poor	Poor	Poor	Poor

Fish Monitoring

The RVSMP included fish sampling on Fontana Reservoir in 1994. A list of fish species commonly found in Fontana Reservoir can be found in Appendix K. The fish community in Fontana Reservoir has consistently rated in the "fair" to "good" range at both the forebay and at both midreservoir sites (see Table 3-91).

Table 3-91. Recent (1994-2006) Reservoir Fish Assemblage Index Ratings for Fontana Reservoir

Station	Year							
	1994	1995	1996	1998	2000	2002	2004	2006
Forebay	Good	NS	Fair	Fair	Fair	Fair	Fair	Good
Midreservoir-Little Tennessee	Good	Fair	Good	Good	Good	Good	Fair	Fair
Midreservoir-Tuckasegee	Fair	Fair	Fair	NS	Fair	Good	Fair	Good

NS = Not sampled

Fontana Reservoir provides opportunities for sport anglers, particularly those interested in bass and walleye. In 2006, Fontana Reservoir SFI rated above average for black bass, smallmouth bass, and walleye (see Table 3-92).

Table 3-92. Sport Fishing Index Scores for Selected Sport Fish Species in Fontana Reservoir, 2006

Fish Species	2006 Score	2006 Valley-wide Average
Black Basses	40	36
Largemouth Bass	30	33
Smallmouth Bass	42	30
Walleye	36	33

Swimming Advisories

There are no state advisories against swimming in Fontana Reservoir. In 2007, TVA performed *E. coli* bacteria monitoring at the Tsali Campground boat ramp and at a Nantahala River canoe access site at Nantahala River Mile 0.8 on an unnamed tributary.

Fish Consumption Advisories

The State of North Carolina has issued a statewide fish consumption advisory because of mercury concentrations. TVA collected channel catfish and largemouth bass from Fontana Reservoir for tissue analysis in autumn 2006. The results, which were similar to those of previous years, were provided to state agencies in North Carolina.

State Impaired Waters

The North Carolina Division of Water Quality assigned use support ratings to waters in the Little Tennessee River basin based on biological, chemical, and physical monitoring data collected between September 1999 and August 2004 (NCDENR 2007b). A shown in Table 3-93, a total of 30.8 miles of stream and 170.6 reservoir acres are impaired in the immediate watershed of Fontana Reservoir (ibid).

Table 3-93. Impaired Waters in the Immediate Watershed of Fontana Reservoir

Stream/River Name	State	Miles or Acres	Description	Water Quality Stressor/Source
Savannah Creek	N.C.	13.4 miles	Headwaters to Tuckasegee River	Fecal coliform, turbidity and habitat degradation/unknown and associated with agriculture
Scott Creek	N.C.	15.3 miles	Headwaters to Tuckasegee River	Fecal coliform, turbidity and habitat degradation/multiple sources
Tuckasegee River	N.C.	1.4 miles	Savannah Creek to Unnamed Tributary 0.3 mile upstream of Yellow Creek	Fecal coliform/ unknown

Stream/River Name	State	Miles or Acres	Description	Water Quality Stressor/Source
Tuckasegee River	N.C.	0.7 miles	Dillsboro Dam to Mack Town Branch	Fecal coliform/ unknown
Tuckasegee River arm of Fontana Lake	N.C.	170.6 acres	Lemmons Creek to Peachtree Creek	Fecal coliform and sediment

Water Supply

No municipal water suppliers currently withdraw water from Fontana Reservoir. Western Carolina University, Nantahala Village, and Tuckasegee Water and Sewer, as well as the towns of Bryson City, Franklin, Sky Valley, and Cherokee currently have intakes in Fontana Reservoir's supporting watershed. The 2005 average daily water demand for these intakes were 0.375 MGD (Western Carolina University), 0.002 MGD (Nantahala Village), 0.914 MGD (Tuckasegee Water and Sewer), 0.7 MGD (Bryson City), 1.12 MGD (Franklin), 0.03 MGD (Sky Valley), and 1.2 MGD (Cherokee). The total average daily municipal water demand from Fontana Reservoir and its supporting watershed was 4.341 MGD.

3.8.10.2 Environmental Consequences

Under all four alternatives, TVA would continue to manage its Fontana Reservoir lands according to their current uses. All of the parcels on Fontana Reservoir are committed to their existing uses, which would not change. Any proposed actions would be assessed for their potential to affect water quality and aquatic life, as well as compliance with TVA's Land Policy, SMP, and Section 26a regulations. Individual environmental reviews would identify potential adverse impacts and appropriate mitigation to protect the aquatic environment. TVA would then take appropriate measures to address these impacts. Therefore, significant effects to water quality or aquatic life are not expected under any of the alternatives.

3.8.11 Air Quality and Noise

An overview of the air quality of the mountain reservoirs area is provided in Section 3.1.11.1. Under all of the alternatives, the existing uses of Fontana Reservoir lands would not change, and there would be no adverse impacts to air quality. Noise has previously been discussed in Section 3.1.11.2.

3.8.12 Socioeconomics

The socioeconomic conditions of the mountain reservoirs area are described in Section 3.1.12.

3.8.12.1 Affected Environment

3.8.12.1.1 Population and Economy

Population: Graham County, North Carolina, had a population of 7,993 in 2000, an increase of 10.8 percent since 1980 (Tables 3-94 and 3-95). This was a lower rate than in the state and the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990. The population of Graham County has declined during the years from 1980 to 1990. Estimates for 2006 indicate that the population of

Graham County has remained approximately the same since 2000, as compared to growth in both the state and nation. Projections through 2020 indicate that the county will continue to have a much lower rate of population growth than the state or nation over that time. The rate for the county is projected to be greater than for 1980-2000.

Table 3-94. Population – Graham and Swain Counties, North Carolina

Area	1980	1990	2000	2006 (Estimate)	2020 (Projection)	Density (persons per square mile) 2000
Graham County	7,217	7,196	7,993	7,996	8,538	27.4
Swain County	10,283	11,268	12,968	13,445	16,411	24.6
North Carolina	5,880,095	6,628,637	8,049,313	8,856,505	10,885,758	165.2
United States	226,545,805	248,709,873	281,421,906	299,398,484	335,804,546	79.6

Source: U.S. Census Bureau (undated a-e) and North Carolina Office of State Budget and Management (2007)

Table 3-95. Recent and Projected Population Changes – Graham and Swain Counties, North Carolina (Percentage Growth)

Area	1980-1990	1990-2000	1980-2000	2000-2006	2000-2020	1980-2020
Graham County	-0.3	11.1	10.8	0.0	6.8	18.3
Swain County	9.6	15.1	26.1	3.7	26.5	59.6
North Carolina	12.7	21.4	36.9	10.0	35.2	85.1
United States	9.8	13.2	24.2	6.4	19.3	48.2

Source: Calculated from data in Table 3-94

Swain County, North Carolina, had a population of 12,968 in 2000, an increase of 26.1 percent since 1980 (see Tables 3-94 and 3-95). This was a lower rate than the state but higher than the nation. The rate of growth in the county, state, and nation was higher from 1990 to 2000 than from 1980 to 1990. Estimates for 2006 indicate that the growth rate of population in Swain County has dropped substantially and was much less than growth in both the state and nation. Projections through 2020 indicate that the county will continue to have a lower rate of population growth than the state but greater than the nation over that time. The rate for the county is projected to be slightly greater than for 1980-2000.

The counties are decidedly rural in distribution of population. As noted in Table 3-94, the population densities of the counties are substantially lower than the state and much lower than the nation. The largest town in Graham County is Robbinsville, with 747 residents in 2000. About 91 percent of the population in the county is outside incorporated towns. The largest town in Swain County is Bryson City, with 1,411 residents in 2000. About 89 percent of the population in the county is outside incorporated towns. This enumeration does not include the population in the town of Cherokee because it is part of the Cherokee tribal lands.

Economy: Table 3-96 contains the most recent annual data regarding the amounts and types of employment, amounts of unemployment, and incomes in the area. In 2005, Graham County had 4,031 people employed on average. The county had a higher percentage of farmers and manufacturing employees than either the state or the nation. According to Graham County's Director of Planning and Economic Development, the county's largest manufacturer recently laid off a large number of employees, so the current

manufacturing employment would probably be a much lower percentage (Graham County Economic Development Director Melody Adams, personal communications, November 9, 2007). The percentage of employees in retail and government was lower than either the state or the nation. The average unemployment rate for 2006 in the county was higher than either the state or the nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

Table 3-96. Employment, Unemployment, and Income – Graham and Swain Counties, North Carolina

Area	Employment 2005	Employment (percent of total)					Unemploy-ment Rate 2006 (%)	Per Capita Personal Income 2005
		Farm	Manufac-turing	Retail Trade	Govern-ment	Other		
Graham County, N.C.	4,031	2.9	17.4	7.6	12.9	59.3	6.4	23,763
Swain County, N.C.	7,446	1.2	6.3	10.3	32.2	49.9	5.8	22,594
North Carolina	5,119,512	1.4	11.5	10.8	15.7	60.5	4.8	31,041
United States	174,249.6	1.7	8.5	10.9	13.7	65.2	4.6	34,471

Source: U.S. Bureau of Economic Analysis (undated) and North Carolina Employment Security Commission (undated)

In 2005, Swain County had 7,446 people employed on average. The county had a lower percentage of farmers, manufacturing employees, and retail employees than either the state or the nation. The percentage of employees in government was much higher than either the state or the nation. (This may be due to a different way of reporting the Cherokee Tribe in the county, or possibly staff of the GSMNP.) The average unemployment rate for 2006 in the county was higher than either the state or the nation. Per capita personal income in 2005 was much lower in the county than in the state or nation.

3.8.12.1.2 Environmental Justice

Information on the minority and low-income population in the Fontana Reservoir area is shown in Table 3-97. In Graham County, 10.6 percent of the total population was estimated to be minorities in 2006, which was far below the state average of 32.1 percent and the national average of 33.6 percent. The estimated poverty rate in the county in 2004 was 16.7 percent, higher than the state rate of 13.8 percent and the national rate of 12.7 percent.

In Swain County, 32.8 percent of the total population was estimated to be minorities in 2006, which was slightly above the state average of 32.1 percent and slightly below the national average of 33.6 percent. This is due to the presence of the Cherokee Indian Tribe. The estimated poverty rate in the county in 2004 was 15.4 percent, higher than the state and national rates.

Table 3-97. Minority Population, 2006, and Poverty, 2004 – Graham and Swain Counties, North Carolina

Area	Minority Population, 2006				Percent Below Poverty Level 2004
	Total	Nonwhite	White Hispanic	Percent Minority	
Graham County	7,995	783	64	10.6	16.7
Swain County	13,445	4,280	163	32.8	15.4
North Carolina	8,856,505	2,298,351	543,059	32.1	13.8
United States	299,398,484	59,652,230	41,001,760	33.6	12.7

Source: U.S. Census Bureau (undated d and 2004)

3.8.12.2 Environmental Consequences

The current land uses at Fontana Reservoir would continue under all of the alternatives. Other than the possible expansion of existing recreation facilities and construction of private water use facilities by adjacent residential landowners, there would likely be minor development that would affect socioeconomic conditions.

The Cherokee tribal lands are some distance from Fontana Reservoir, and the tribal jobs, incomes, and revenues are largely involved with the gaming and tourism activity near the town of Cherokee, North Carolina. The Cherokee housing situation on the tribal lands is also disconnected from market forces affecting nontribal land on the reservoir. Therefore, management of TVA lands is not expected to have disproportional impacts on the Cherokee tribe.

3.9 Unavoidable Adverse Effects

The land uses of the majority of the mountain reservoirs lands would not change under any of the alternatives, and there would be no unavoidable adverse effects associated with planning these lands. The increased industrial development that could potentially occur under Alternatives A and C and recreational developments under Alternatives C and D on the five Chatuge Reservoir and Hiwassee Reservoir parcels do have a potential for unavoidable adverse effects. However, TVA would carefully review the potential impacts of any proposed developments on these parcels and implement practicable measures to reduce any adverse effects.

Over the long term, the region around the mountain reservoirs is expected to experience continued residential and commercial development. Such regional development trends and future residential shoreline development in existing areas will likely continue to cause some losses of aquatic and terrestrial habitats regardless of the alternative selected for implementation. Additional residential development, especially on Chatuge Reservoir, has the potential to have cumulative effects on the reservoir's water quality.

3.10 Relationship Between Short-Term Uses and Long-Term Productivity

Commitments of the shoreline for industrial use, as well as for some types of recreational development are essentially long-term decisions that would decrease the productivity of land for agriculture, forestry, wildlife, and other natural resources management. Long-term decreases in productivity would likely be somewhat greater under Alternatives A, C, and D than under Alternative B. As described in earlier sections, the types of changes that occur with development would result in a decline in habitat quality for some terrestrial species and increase in habitat suitability for others. Many of the water-related impacts of such development could be reduced by the use of appropriate measures to control erosion.

In addition to shoreline development, increased residential and commercial development at the regional level will likely occur independently of any of the alternatives. This will result in a population increase and an increase in the number of people recreating on the reservoirs and on adjacent public lands. New jobs and income would be generated by their spending activities leading to enhanced long-term socioeconomic productivity.

3.11 Irreversible and Irretrievable Commitments of Resources

Irretrievable use of nonrenewable resources (i.e., fuel, energy, and some construction materials) could occur under all of the alternatives due to future residential shoreline development in existing areas as well as potential industrial and recreational development under Alternatives A, C, or D. The trend in development around the mountain reservoirs and the surrounding area is primarily dependent on the regional and national economy. Therefore, use of most (if not all) of these resources could occur somewhere else in the region to provide the same development services regardless of the alternative chosen.

3.12 Energy Resources and Conservation Potential

Energy is used by machines for fuel to maintain grassy areas on the TVA Project Operations lands such as the dam reservation and for operation of the TVA dams. There

are no additional short-term energy uses required for these TVA project lands under any of the alternatives, as they are already established.

Energy is also used by machines to maintain areas set aside for Natural Resource Conservation. Although these activities also are not likely to have much influence on regional energy use demands, there would be some short-term energy use of fuel to conduct prescribed natural resource conservation activities such as mowing, timber management, access road maintenance, etc. Implementation of Alternative B would result in a slightly greater requirement for this type of energy use because it involves the most acreage allocated to Natural Resource Conservation.

TVA is encouraging campers who utilize developed recreation areas to reduce energy consumption and to conserve water resources. TVA has posted resource conservation tips at many campgrounds located on TVA land as part of its campground conservation program. These practices could potentially reduce energy usage under all alternatives.

Under Alternatives C and D, additional land would be allocated for developed recreation areas, some of which may include infrastructure such as bathhouses, pavilions, and lighting that may increase energy consumption. TVA would encourage energy conservation measures to be utilized at recreation areas that may be developed in the future.

Greater energy usage would occur if industrial facilities are developed on Hiwassee or Chatuge reservoirs (under Alternatives A and C, respectively) TVA actively promotes public education and outreach to encourage energy efficiency and green-energy offerings and promotes the integration of energy efficiency and water conservation into community planning and building construction. TVA would work with potential users of TVA lands to achieve the greatest energy savings and to implement conservation practices.

CHAPTER 4

4.0 LIST OF PREPARERS

4.1 NEPA Project Management

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Jan K. Thomas

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Edward W. Wells III

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Cassandra L. Wylie

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Experience:	20 years in Atmospheric Modeling and Effects of Air Pollution on Forests; 8 years in Noise Analysis
Involvement:	Noise Impacts

CHAPTER 5

5.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES ARE SENT

Federal Agencies

Appalachian National Scenic Trail, Park Manager
Chattahoochee-Oconee National Forest, Forest Supervisor
Cherokee National Forest, Forest Supervisor
Great Smoky Mountains National Park, Superintendent
National Forests in North Carolina, Forest Supervisor
Natural Resources Conservation Service-Blairsville, Ga., District Conservationist
Natural Resources Conservation Service-Bryson City, N.C.
Natural Resources Conservation Service-Murphy, N.C.
Natural Resources Conservation Service, Resource Conservationist
Natural Resources Conservation Service-Sylva, N.C.
U.S. Army Corps of Engineers, Asheville Regulatory Field Office
U.S. Army Corps of Engineers, Regulatory Branch
U.S. Fish and Wildlife Service, Field Supervisor
U.S. Fish and Wildlife Service, State Supervisor
U.S. Fish and Wildlife Service, Supervisory Biologist
U.S. Forest Service, Blue Ridge District
U.S. Forest Service, Deputy District Ranger
U.S. Forest Service, Ocoee/Hiwassee Ranger District
U.S. Forest Service, Tusquitee Ranger District

State Agencies

Georgia

Georgia Department of Economic Development
Georgia Department of Economic Development, Commissioner
Georgia Department of Natural Resources, Commissioner
Georgia Department of Natural Resources, Directors
Georgia Department of Natural Resources, Environmental Protection Division
Georgia Department of Natural Resources, Historic Preservation Division
Georgia Department of Natural Resources, State Parks and Historic Sites Division
Georgia Department of Natural Resources, Wildlife Resources Division
Georgia Department of Transportation
Georgia Department of Transportation, Commissioner
Georgia Forestry Commission
Georgia Mountains Regional Development Center
Georgia Soil and Water Conservation Commission, Region 1
Georgia State Clearinghouse
North Georgia Regional Development Center

North Carolina

North Carolina Department of Environment & Natural Resources, Director
North Carolina Department of Environment & Natural Resources, Division of Conservation and Community Affairs
North Carolina Department of Environment & Natural Resources, Division of Forest Resources
North Carolina Department of Environment & Natural Resources, Division of Water Quality
North Carolina Department of Environment & Natural Resources, Division of Water Resources

North Carolina Department of Environment & Natural Resources-Ecosystem Enhancement Program
North Carolina Department of Environment & Natural Resources, Secretary
North Carolina Department of Transportation
North Carolina Division of Parks and Recreation
North Carolina Division of Tourism
North Carolina Wildlife Resources Commission
North Carolina Wildlife Resources Commission, Communications
North Carolina State Clearinghouse
North Carolina Department of Cultural Resources, Deputy Secretary of Archives and History
Southwestern North Carolina Planning and Economic Development

Tennessee
Southeast Tennessee Development District, Executive Director
Tennessee Department of Agriculture
Tennessee Department of Economic and Community Development, Director of Special Projects
Tennessee Department of Tourism Development
Tennessee Department of Transportation
Tennessee Department of Transportation, Department of Environment and Planning
Tennessee Division of Environment and Conservation, Commissioner
Tennessee Division of Environment and Conservation, Division of Natural Areas
Tennessee Division of Environment and Conservation, Hiwassee/Ocoee Scenic River State Park
Tennessee Division of Environment and Conservation, Water Pollution Control
Tennessee Historical Commission
Tennessee State Parks and Conservation
Tennessee Wildlife Resources Agency, Executive Director
Tennessee Wildlife Resources Agency, East Tennessee-Region 3 Office
Tennessee Wildlife Resources Agency, East Tennessee-Region 4 Office

Local Agencies and Private Organizations
Alarka Dock
Almond Boat and RV Park
Bearmeat Creek Village Association
Bear Paw Service District, Bear Paw Pavilion
Birdsong Villas Owners Association
Blue Ridge Mountain Electric Membership Corporation
Boundary Waters Resort and Marina
Canal Lake Campground
Chatuge Cove Marina
Chatuge Shores Golf Course
Chatuge Village Community Association
Chatuge Woods Campground
Cherokee County Economic Development Commission
Clay County Recreation Association
Cozy Cove Marina
Crisp Boat Dock
Dukes Hide-A-Way Marina
The Eastern Band of Cherokee Indians
Enchantment Homeowners Association
Extension Service-Fannin County
Extension Service-Towns County
Extension Service-Union County
Fannin County Development Authority
Fontana Lake Estates Homeowners Association
Fontana Realty
Fontana Village Marina

Georgia Mountain Fair Inc.
Georgia Mountains Research & Education Center
Georgia Regional Realtor Board
Georgia River Network
Georgia Wildlife Federation
Greasy Branch Boat Dock
Harbor Cove Marina
Hawks Harbour Marina Inc.
Hidden Field's Homeowners Association
Hideaway Townhouse Association
Hiwassee-Bear Paw
Town of Hiawassee, Commission
Hiwassee River Watershed Coalition Inc.
Ho-Hum Campground
Lake Blue Ridge Marina
Lake Chatuge Chalets
Lake Nottely Improvement Association
Lake Nottely RV Park Inc.
Lake Ocoee Inn and Marina
Lakeview Cottages and Marina
Lakewood Hills Homeowners Association Inc.
Limestone Valley Resource Conservation & Development Council
Lower Bell RV Park
Mountain Lake Vista Homeowners Association
Mountain View Marina
Murphy Electric Power Board
Nantahala Outdoor Center
National Audubon Society
National Wild Turkey Federation
The Nature Conservancy, Atlanta
The Nature Conservancy, North Georgia Conservation Director
The Nature Conservancy of Georgia
North Carolina Wildlife Federation
North Georgia Sportsman's Club
Nottely Marina
Penland Point Campground
Peppertree Fontana Village
Prince Boat Dock
Robin's Nest Cottages and Motel
Salale Lodge
Serenity Cove Cabins
Shook's Marina
Southeast Watershed Forum
SR 288 Recreation Park
Swain County Chamber of Commerce
Swain Soil and Water Conservation District
Tennessee Wildlife Federation
Thomas Boat Dock
Towns County Development Authority Board
Towns County Homeowners Association
Trout Unlimited Georgia Chapter
Union County Development Authority
Union County Parks and Recreation Director

Individuals Who Were Sent Notification of FEIS Availability

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Norcross, Ga.

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Avondale Estates, Ga.

Jay Aiken
Roswell, Ga.

Edward Alber
Stone Mountain, Ga.

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Smyrna, Ga.

Ruandy Albisurez
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Lynne Bever
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Bill Rowe
Lake Mary, Fla.

Joe Royal
Chattanooga, Tenn.

Joseph & Elizabeth Ruf
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Greg Ruff
Hermitage, Tenn.

Charleen Russell
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CHAPTER 6

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Appendix A – TVA Land Policy

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Policy Governing the Tennessee Valley Authority's Retention, Disposal and Planning of Interests in Real Property

The Tennessee Valley Authority (TVA) has been charged by Congress with improving navigation, controlling floods, providing for the proper use of marginal lands, providing for industrial development and providing power at rates as low as feasible, all for the general purpose of fostering the physical, economic, and social development of the Tennessee Valley region. The lands which TVA stewards in the name of the United States are some of the most important resources of the region. They have provided the foundation for the great dams and reservoirs that protect the region from flooding and secure for its residents the benefits of a navigable waterway and low-cost hydro-electricity. TVA's lands are the sites for its power generating system and the arteries for delivering power to those that need it. Many of the region's parks, recreation areas, and wildlife refuges that are so important for the region's quality of life grew up from lands that TVA made available. And TVA's lands often have been the catalyst for public and private economic development activities that support all of these activities.

TVA originally acquired approximately 1.3 million acres of land in the Tennessee Valley. The construction and operation of the reservoir system inundates approximately 470,000 acres with water. TVA has already transferred or sold approximately 508,000 acres, the majority of which was transferred to other federal and state agencies for public uses. TVA currently owns approximately 293,000 acres which continue to be managed pursuant to the TVA Act.

As stewards of this critically important resource, TVA has a duty to manage its lands wisely for present and future generations. Accordingly, it is TVA's policy to manage its lands to protect the integrated operation of the TVA reservoir and power systems, to provide for appropriate public use and enjoyment of the reservoir system, and to provide for continuing economic growth in the Valley. Recognizing that historical land transfers have contributed substantially to meeting multipurpose objectives, it further is TVA's policy to preserve reservoir lands remaining under its control in public ownership except in those rare instances where the benefits to the public will be so significant that transferring lands from TVA control to private ownership or another public entity is justified. This policy is explicated below.

Reservoir Properties

Land Planning- TVA shall continue to develop reservoir land management plans for its reservoir properties with substantial public input and with approval of the TVA Board of Directors. The land use allocations will be determined with consideration of the social, economic and environmental conditions around the reservoir. TVA shall consider changing a land use designation outside of the normal planning process only for water-access purposes for industrial or commercial recreation operations on privately owned backlying land or to implement TVA's Shoreline Management Policy. Reservoir properties that have become fragmented from the reservoir will be evaluated to determine their public benefit. If it is determined by TVA's Chief Executive Officer that these fragmented properties have little or no public benefit they shall be declared surplus and sold at public auction to the highest bidder in the same manner as surplus power or commercial properties.

Residential Use- TVA shall not allocate lands or landrights for residential use or dispose of reservoir properties for residential use.

Economic Development- TVA shall consider disposing of reservoir lands or land rights for industrial purposes or other businesses if the TVA property is located in an existing industrial park, or is designated for such purposes in a current reservoir land management plan and verified as suitable for such use by RSO&E and ED staff in a property survey. The TVA Board directs staff to complete this survey within six months of the approval of this policy. The TVA Board recognizes that property with water access, for either navigation or water supply, is a limited resource in the Valley and has preference for businesses that require water access. Future reservoir land management plans will consider industrial development opportunities as land allocations are made. TVA shall consider disposing of non-waterfront reservoir properties in industrial parks for any purpose permitted by the industrial park covenants. TVA shall not allocate lands or landrights for retail use or dispose of reservoir land or landrights for such use.

Recreation- TVA shall consider leasing or granting limited easements over lands for the development of commercial recreation facilities or public recreation purposes if the property is so designated in a reservoir land management plan and a survey conducted by RSO&E determines that the site remains suitable for recreational uses and a continued need exists for such use. The TVA Board directs staff to complete this survey within six months of the approval of this policy. Commercial recreation is defined as recreation with facilities that are provided for a fee to the public intending to produce a profit for the owner/operator. Public recreation is defined as recreation on publicly owned land with facilities developed by a public agency (or their concessionaire) and provides amenities open to the general public. -

Commercial Recreation- TVA leases or easements for commercial recreation purposes shall limit the use primarily to water-based recreation designed to enhance the recreation potential of the natural resources of the river and be a stimulus for regional economic development. TVA leases or easements for commercial recreation purposes will contain restrictions against residential use, and no long term accommodations or individually owned units will be permitted.

Public Recreation- TVA leases or easements for public recreation purposes will contain restrictions against residential use, cabins, or other overnight accommodations (other than campgrounds) except if a recreation area is owned by a State or State agency and operated as a component of a State Park system in which case cabins and other overnight accommodations will be permitted.

Deed Restrictions over Private Lands- The TVA Board recognizes that much of TVA's lands were transferred upon specific agreement among the parties to conduct activities that would enhance recreation opportunities in the Valley. TVA will continue to consider the release or modification of flowage rights no longer necessary to TVA to operate the river system. TVA will consider the removal or modification of deed provisions to facilitate industrial development. TVA will also consider the removal or modification of deed restrictions that result in the public having recreational access to the tract, or if the tract is already open to the public, maintains that access. TVA will not remove or modify other deed restrictions for the purpose of facilitating residential development. To the extent permitted by the language of deed or other transfer or contractual instrument, TVA will administer its interest in former TVA land to achieve the goals of this policy.

Operational Uses of TVA Properties- TVA shall continue to utilize reservoir properties to meet the operational needs of the agency and its distributors as well as provide for public infrastructure needs such as roads, water and sewer lines, and other utilities, but will only consider requests for private infrastructure where TVA determines no other practicable alternative exists. Nothing in this policy is intended to prevent the disposal of tracts of land upon the recommendation of the General Counsel to settle claims or litigation or to address issues of

contamination or potential contamination. In addition, TVA will continue to work with development agencies (and other partners) throughout the Valley to implement previously executed agreements.

Power & Commercial Properties

TVA's nonreservoir property—primarily power and commercial properties and mineral holdings--shall continue to be managed as power assets. The TVA Board directs staff to undertake a review of TVA mineral holdings for later policy consideration. Retention and disposal decisions will be primarily based on business considerations consistent with the TVA Act and other applicable requirements. TVA may enter into special arrangements with the distributors of TVA power. In addition, TVA may relinquish transmission line rights, if they are determined to be unnecessary for present or future operations and the current owner agrees to pay the enhanced fair market value of the property. In all other instances, TVA shall emphasize sales that generate the maximum competition among bidders at public auction and where possible shall not include use restrictions other than those designed to protect TVA's program interests or to meet legal or environmental requirements.

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Appendix B – Scoping Document

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Document Type: EIS-Administrative Record
Index Field: Environmental Document Transmittal
Project Name: Mtn. Reservoirs Land Mgmt. Plan
Project Number: 2006-1

MOUNTAIN RESERVOIRS LAND MANAGEMENT PLAN ENVIRONMENTAL IMPACT STATEMENT SCOPING DOCUMENT March 2008

INTRODUCTION

The Tennessee Valley Authority (TVA) proposes to develop the Mountain Reservoirs Land Management Plan (MRLMP). This plan, like other TVA reservoir land management plans, will allocate TVA lands to specific uses and guide land-use approvals, private water use facility permitting, and resource management decisions. TVA manages its land to protect and enhance natural resources, generate prosperity, and improve the quality of life in the Tennessee Valley. Reservoir land management plans are submitted to the TVA Board of Directors for approval and adopted as policy to provide for long-term land stewardship and accomplishment of TVA responsibilities under the TVA Act of 1933.

Pursuant to the requirements of the National Environmental Policy Act (NEPA), TVA is preparing an Environmental Impact Statement (EIS) that will evaluate the potential environmental impacts of the alternative ways of managing its mountain reservoir lands. NEPA regulations require an early and open process for deciding what should be discussed in an EIS, i.e., the scope of the document. The scoping process involves requesting and using comments from the public and interested agencies to help identify the issues and alternatives that should be addressed in the EIS. This document summarizes the input that TVA received during the scoping process and defines the scope of the EIS. In addition to agency and public input, the EIS will also address specific requirements associated with a number of federal laws such as the Clean Water Act, the Endangered Species Act, and the National Historic Preservation Act.

THE PLAN AREA

The MRLMP will address TVA lands on the following nine reservoirs which are also shown in Figure 1:

Apalachia	Blue Ridge	Chatuge
Fontana	Hiwassee	Nottely
Ocoee 1	Ocoee 2	Ocoee 3

TVA originally acquired a total of 104,837 acres on these nine mountain reservoirs. About 92 percent of this land has subsequently been transferred (primarily to other federal agencies) or sold. The remaining 6,222 acres owned by TVA above the summer operating pool elevations are the subject of the current planning effort. About 83 percent (5,146-acres) of this land is presently committed to specific uses through transfers, leases, licenses, contracts, outstanding land rights, or the presence of utility lines or TVA-developed recreation areas. These committed uses are not anticipated to change as a result of the planning process unless a compelling need for change is identified.

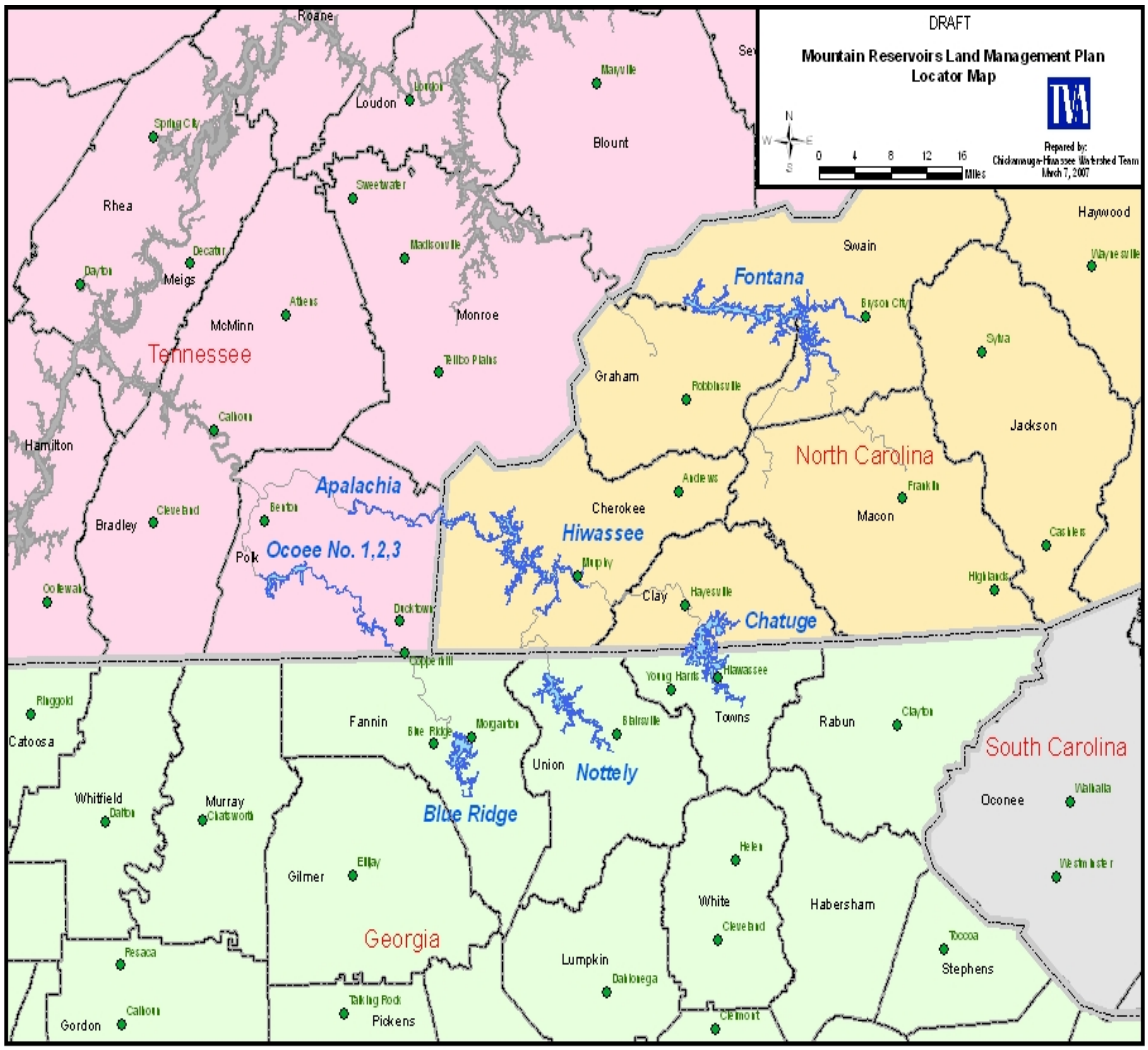

Figure 1. Reservoirs included in the Mountain Reservoir Land Management Plan

The operating objectives of the nine mountain reservoirs include flood control, power production, water supply, water quality, recreation, navigation, and other objectives. Because of differences in the original purpose and construction of these reservoirs, the emphasis on these different objectives differs among the reservoirs. The MRLMP is intended to be consistent with the purposes and operational objectives of each reservoir.

PREVIOUS PLANNING EFFORTS

Eight of the nine mountain reservoirs involved in this current land planning effort were previously planned utilizing a Forecast System developed in 1965. The Forecast System allocated land into 13 categories. Six of the 13 categories were assigned to mountain reservoir lands: dam reservations, public recreation, reservoir operations (islands), reservoir operations (mainland), power transmission and power needs, and industrial. TVA lands on Fontana Reservoir have not been planned using the Forecast System or any other system.

ALTERNATIVES

The MRLMP EIS will analyze three alternatives:

1. Alternative A – No Action/Forecast System Alternative

Under this alternative, TVA would continue to use the Forecast System designations established in 1965 to manage 4,592-acres (approximately 73.8 percent) of the total of approximately 6,222-acres on eight of the nine mountain reservoirs that were previously forecast in the 1970s. TVA has revised these designations to reflect changes in land use that have occurred since then. Approximately 1,630 acres of TVA lands not planned under the Forecast System, including all TVA-owned Fontana Reservoir lands, would continue to be managed according to existing land use agreements, TVA's Shoreline Management Policy, and TVA's Land Policy.

To facilitate the comparison of alternatives in this EIS, the Forecast System designations for all parcels previously planned have been converted to the equivalent seven currently used land use zone designations. For example, a parcel with a Forecast System designation of Dam Reservation would be converted to Project Operations, a Zone 2 allocation. In situations where a Forecast Designation could be converted to more than one zone allocation, existing land use determined which zone allocation was selected. In some cases, a parcel with multiple land uses was split in order to allocate the varying uses to the compatible zone. Additionally, some adjacent parcels with similar land uses were combined and allocated to the compatible zone. The conversions are identified for individual parcels on each reservoir in Appendix E and the converted designations are used in many of the discussions below.

Under Alternative A, only five of the currently used seven land use zone allocations are utilized for the 4,592 acres previously planned: Project Operations, Natural Resource Conservation, Industrial, Recreation and Shoreline Access (see Table 2-3 below). Under Alternative A, no TVA parcels were planned for Sensitive Resource Management because the Forecast System did not have an equivalent designation for these zones. Only 0.4 acres were allocated to Shoreline Access because with the exception of one parcel, parcels with access rights were not planned using the Forecast System. The Zone 1–Non TVA Shoreland is not represented in the following tables because the parcels are private land (in which TVA owns certain rights) and will not change as a result of the land planning process.

Table 1. Alternative A - Area by Equivalent Current Land Use Designations by Reservoir

Equivalent Current Designation	Area in Acres by Reservoir						
	Chatuge	Hiwassee	Blue Ridge	Nottely	Apalachia	Ocoees	Fontana
Project Operations	374	366	287	423	760	375	0
Natural Resource Conservation	737	472	0	123	0	0	0
Industrial	0	79	0	0	0	0	0
Recreation	370	39	11	92	83	0	0
Shoreline Access	0	<1	0	0	0	0	0
TOTAL	1481	956	298	638	843	375	0

2. Alternative B – The Proposed Land Use Plan Alternative

Under this alternative, TVA would adopt a new land management plan allocating lands to one of seven zones. These zones, also used in other recent TVA reservoir land management plans are listed and briefly defined in Table 2. The proposed Alternative B

zone allocations are listed in Table 3. These proposed allocations are based on evaluations of the parcels' current uses, results of field surveys, TVA technical staff input, and public input.

Table 2. TVA Reservoir Land Planning Zones

Zone	Definition
1. Non-TVA Shoreland/Flowage Easement	Shoreland located above summer pool elevation that TVA does not own in fee or land never purchased by TVA.
2. Project Operations	TVA reservoir land currently used for TVA operations and public works projects.
3. Sensitive Resource Management	Land managed for protection and enhancement of sensitive resources.
4. Natural Resource Management	Land managed for the enhancement of natural resources for human use and appreciation.
5. Industrial	Land managed for economic development including businesses in distribution/processing/ assembly and light manufacturing. Preference will be given for industries requiring water access.
6. Developed Recreation	Land managed for public and/or commercial recreation.
7. Shoreline Access	TVA-owned land where Section 26a applications and other land use approvals for residential shoreline alterations are considered.

Table 3. Alternative B Zone Allocations by Reservoir

Current Allocation Designation	Area in Acres by Reservoir							
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana	Total
Zone 2	381	366	293	443	375	760	405	**3024**
Zone 3	17	118	12	0	0	0	0	**147**
Zone 4	876	439 **	28 **	270	**	**	50 **	**1663**
Zone 5	0	0	0	0	0	0	0	**0**
Zone 6	414	41 **	15 **	95	**	83	435 **	**1083**
Zone 7	79	43	122	21	0	0	41	**305**
TOTAL	**1767**	**1007****	**470****	**829**	**375****	**843****	**931****	**6222**

** Includes narrow strip of TVA Retained Land along shoreline; acreage not calculated

3. Alternative C – The Modified Land Use Plan Alternative

This alternative differs from Alternative B by allocating one parcel on Chatuge Reservoir to Zone 5 - Industrial instead of to Zone 4 - Natural Resource Management, and by allocating two additional parcels each on both Chatuge and Hiwassee Reservoirs to Zone 6 – Developed Recreation instead of to Zone 4. The proposed Alternative C allocations are summarized in Table 4.

Table 4. Alternative C Zone Allocations by Reservoir

Allocation Zone	Area in Acres by Reservoir							
	Chatuge	Hiwassee	Blue Ridge	Nottely	Ocoees	Apalachia	Fontana	Total
Zone 2	381	366	293	443	375	760	405	**3024**
Zone 3	17	118.	12	0	0	0	0	**147**
Zone 4	775	433.	28	270	**	**	50	**1556**
Zone 5	27	0	0	0	0	0	0	**27**
Zone 6	488	47	15	95	**	83	435	**1163**
Zone 7	78	43	122	21	0	0	41	**305**
TOTAL	**1767**	**1007**	**470**	**829**	**375**	**843**	**931**	**6222**

** Includes narrow strip of TVA Retained Land along shoreline; acreage not calculated

PUBLIC INVOLVEMENT

TVA has conducted an extensive public involvement effort to determine the scope of the EIS and to determine alternative parcel allocations under a range of alternatives. The major public involvement steps are listed below.

June 1, 2007 — Published in the *Federal Register* the Notice of Intent (NOI) to prepare an EIS.

May/June 2007 — Met with stakeholder groups and individuals in the reservoirs area to brief them on the planning effort.

June 21, 2007 — Held public scoping meeting at The North Georgia Technical College in Blairsville, Georgia.

June 30, 2007 — Closed the public scoping period. The scoping comment period concluded with over 473 comments on the proposal.

In addition to the NOI in the *Federal Register*, TVA published public notices in regional and local newspapers in June 2007. Several local newspapers also published articles on the planning effort. TVA also mailed over 3,000 information postcards to area residents announcing the planning effort and directing them to the TVA web site for more information.

A total of 83 participants attended the public scoping meeting. Attendees were asked to complete a questionnaire on the planning effort. They were also given the opportunity to have a stenographer record their comments and to submit other written comments. The description of the planning effort on the TVA web site also included the questionnaire, which readers were asked to complete. TVA received about 473 completed questionnaires and other comments on the planning effort.

TVA sent notices of the planning effort and copies of the NOI to a variety of Federal and state agencies, tribes, and other stakeholder groups and requested their comments. The following agencies and groups submitted comments to TVA:

- Georgia Department of Natural Resources
- Georgia Historic Preservation Division
- Georgia Mountains Regional Development Center, Historic Preservation Office
- Blue Ridge Mountain Electric Membership Corporation
- North Carolina Department of Administration

- North Carolina Department of Environment and Natural Resources
- North Carolina Division of Environmental Health
- North Carolina Division of Forest Resources
- North Carolina Division of Parks and Recreation
- North Carolina Division of Water Quality
- North Carolina Wildlife Resources Commission
- Tennessee Historical Commission
- The Eastern Band of Cherokee Indians
- U.S. Fish and Wildlife Service, Asheville Office

The answers on the questionnaires and other public comments received during the public scoping are summarized in the attached *Summary of Public Participation Report* issued in September 2007. The results of the public scoping provided suggestions on land use allocations for individual reservoirs, environmental issues to be addressed in the EIS, and a characterization of respondents' use of the nine reservoirs.

ISSUES TO BE ADDRESSED

Issues to be addressed in the EIS were initially identified through an internal scoping process and listed in the NOI. This list of issues was refined based on comments received during the public scoping. The issues to be addressed in the EIS include the following:

Land Use Existing land use patterns along the shoreline and back-lying land have been largely determined by TVA land acquisition, disposals, and land use agreements. Many of the parcels are committed to existing land uses with little to no potential for change in the 10 year planning horizon. Proposed allocations of the remaining uncommitted parcels will be evaluated using the goals of the MRLMP and TVA policies and regulations.

Recreation comprises a broad range of activities on the nine mountain reservoirs. Recreation opportunities are an important resource for public use of the mountain reservoirs lands and waters.

Terrestrial Ecology includes the plants and animals comprising the terrestrial ecosystems and natural community types found adjacent to the nine mountain reservoirs. Issues include the identification and protection of significant natural features, rare species habitat, important wildlife habitat, or locally uncommon natural community types. TVA will comply with Executive Orders (EOs) 13186 and 13112 on migratory birds and invasive species.

Endangered and Threatened Species are populations of state-listed or federally listed or rare plants and animals known to exist in the vicinity of the nine mountain reservoirs including the occurrence and habitats on TVA lands and waters. TVA will comply with the Endangered Species Act (ESA) and similar state laws.

Wetlands are an important ecosystem for many types of plants and animals found on TVA land and along the mountain reservoirs shoreline. TVA will comply with EO 11990 on wetlands and the Clean Water Act.

Floodplains are important to flood control and water quality issues and are productive natural areas. TVA will comply with EO 11988 on floodplains.

Cultural Resources are archaeological sites, historic buildings, and cultural landscapes and properties on or near the nine reservoirs lands including sites listed on the National Register of Historic Places (NRHP). TVA will comply with the National Historic Preservation Act (NHPA).

Managed Areas and Sensitive Ecological Sites are special and unique natural areas on or in the vicinity of reservoirs set aside for a particular management objective or lands that are known to contain sensitive biological, cultural, or scenic resources.

Visual Resources relate to the scenic qualities of the nine mountain reservoirs and the lands surrounding them.

Water Quality and Aquatic Ecology Water quality conditions affect the overall ecological conditions of the nine mountain reservoirs. Water quality is influenced by activities causing shoreline erosion as well as pollution, litter, and debris control. Aquatic ecology considers the plants and animals found in the waters of the mountain reservoirs and their tributaries. Issues include the identification and protection of rare species' habitat, important aquatic habitat, or locally uncommon aquatic community types.

Air Quality and Noise are important resources for public health and welfare. An important issue is compliance with National Ambient Air Quality Standards, which establish safe concentration limits of various air pollutants.

Socioeconomic issues include the impacts of the MRLMP on current population, labor force, employment statistics, income, and property values of the mountain reservoirs region. A subset of these issues is environmental justice, the potential for disproportionate impacts to minority and low-income communities.

DELEGATION OF WORK ASSIGNMENTS

Office of Environment and Research, Environmental Stewardship and Policy, NEPA Services, will have primary responsibility for management of the EIS process and assembly of the Draft and Final EISs, in consultation with NEPA Policy, Watershed Operations, and the Office of the General Counsel. Other TVA groups, including Environmental Research & Technical Services, River Operations, and Economic Development may contribute to the analysis.

LEAD AND COOPERATING AGENCIES

TVA will be the lead Federal agency for this environmental review. No other agencies were identified as potential cooperating agencies for the purposes of environmental review.

INTERDISCIPLINARY TEAM

The following TVA staff individuals are participating in preparation of the EIS. Their respective responsibilities for the individual resource area discussions are also denoted.

Tyler Baker.....Water Quality
Gary Springston .....Water Supply
John Baxter ..... Endangered Aquatic Species
Pat Cox .....Vegetation, Endangered Plants
Evan Crews..... Watershed Team Supervisor and Project Manager
Janice Dockery.....Document Editor
Pat Ezzell ..... Historian
Hill Henry..... Endangered Terrestrial Animals
Ted Wells .....Cultural Resources
Sabrina Melton ..... Recreation
Alan Mays .....Prime Farmland
Laura Smith.....Communications
Mark McNeely ..... Graphics
Roger Milstead ..... Floodplains
Jason M. Mitchell .....Natural Areas
Cassandra Wylie ..... Noise
Barry Barnard.....Air Quality
Steven Moore.....Economic Development
Chett Peebles..... Visual Resources, Historic Structures
Peter Scheffler .....Land Use, Socioeconomic Resources
Kim Pilarski-Brand.....Wetlands
Clint Jones .....Aquatic Ecology
Ken Parr ..... NEPA Project Manager
Charles Nicholson ..... NEPA Policy Compliance

RELATED ENVIRONMENTAL DOCUMENTS

Shoreline Management Initiative: An Assessment of Residential Shoreline Development Impacts in the Tennessee Valley Final EIS (TVA, 1998) (SMI EIS)

In 1998, TVA completed an EIS analyzing possible alternatives for managing residential shoreline development throughout the Tennessee River Valley. The alternative selected determined TVA's current Shoreline Management Policy (SMP), which incorporates a strategy of maintaining and gaining public shoreline through an integrated approach that conserves, protects, and enhances shoreline resources and public use opportunities, while providing for reasonable and compatible use of the shoreline by adjacent residents. The SMP defines the standards for vegetation management, docks, shoreline stabilization, and other residential shoreline alterations. The MRLMP EIS will tier from the Final SMI EIS.

Reservoir Operations Study Final Programmatic Environmental Impact Statement (TVA, 2004)

This EIS describes TVA's operation of the reservoirs included in the MRLMP.

Control of Oriental Bittersweet (Celastrus orbiculatus) on TVA Property Near Fontana Dam, Graham and Swain Counties, North Carolina, Environmental Assessment (TVA, 1997)

This environmental assessment addresses invasive species control and related natural resource management issues on the Fontana Dam reservation.

Upper Ocoee River Corridor Recreational Development Final EIS (U.S. Forest Service, 1997)

TVA was a cooperating agency in the development of this EIS, which describes resources in the vicinity of the Ocoee projects, with an emphasis on recreational activities.

Environmental Impact Statement and Revised Land and Resource Management Plan - Cherokee National Forest (U.S. Forest Service, 2004)
This plan and Final EIS describes the existing environment and management of National Forest lands adjacent to the Ocoee projects and part of the Apalachia Reservoir lands.

SCHEDULE FOR DEIS PREPARATION AND REVIEW
Following is a tentative schedule for the completion of the EIS.

Task	Date
o DEIS NOA	May 27, 2008
o Public review of DEIS	May 28 to July 14, 2008
o Development of FEIS	July 15 to October 23, 2008
o FEIS NOA (Sign ROD and Post)	September 12, 2008
o Board Approval of MRLMP	October 31, 2008

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Mountain Reservoirs Land Management Plan

Summary of Public Participation

Tennessee Valley Authority

September 2007

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Reservoir-Specific Information	**28-37**
Chatuge Reservoir	28-29
Hiwassee Reservoir	29-30
Blue Ridge Reservoir	30-32
Nottely Reservoir	32
Fontana Reservoir	33-34
Ocoees 1, 2, and 3 Reservoirs	34-36
Apalachia Reservoir	36-37
Attachment I: Questionnaire	**37-41**

Overview

From May 2007 through June 2007, public participation was sought to assist the Chickamauga-Hiwassee Watershed Team in developing a Mountain Reservoirs Land Management Plan to identify specific future uses for TVA-managed land around nine mountain region reservoirs (Chatuge, Hiwassee, Blue Ridge, Nottely, Fontana, Ocoees 1, 2 & 3, and Apalachia Reservoirs).

Public Notification and Comment Opportunities
Notification of TVA's intent to prepare an Environmental Impact Statement, requests for comments, and the public scoping meeting announcement appeared in the Federal Register on June 1, 2007. Notification of the land use planning review process was mailed to interested people and TVA held 14 briefing sessions with stakeholders groups, organizations and agencies. TVA hosted a public meeting in Blairsville, Georgia on June 21, 2007. A total of 83 participants attended the public meeting. During the public meeting, TVA personnel were available to answer questions and discuss land use allocations.

Additional Public Input
In addition to the public meeting, TVA advertised public participation opportunities through eleven local newspapers, and radio and television public service announcements on nine stations during June 2007.

Analysis
TVA received 473 comments from the public scoping effort in various formats - from completing electronic questionnaires on the TVA web site, questionnaires mailed to TVA, letters and e-mails. All public comments were compiled and analyzed to identify the range of issues and concerns that should be considered as part of the public scoping process. Each comment was categorized by major issue, and comments were sorted into themes by reservoir. This summary includes the potential environmental issues and themes identified from all the public comments received during the scoping process.

Summary

Overall Public Comment Themes:
Five predominant themes or general issues were identified from all of the comments provided: Land Planning and Policy, Recreation, Natural Resources, Compliance, and Reservoir Levels. Other comment areas included Power Delivery and Industrial Development as well as Appreciation for TVA land management practices.

Summary of Predominant Themes:
Land Planning and Policy
Comments related to loss of public lands, maintaining natural areas, future development, land use and other considerations for the current land planning effort.

Recreation
Comments related to the use of hiking and mountain biking trails and requests to build additional trails on public lands. Other comments regarding boating restrictions, off-road vehicle use, camping and available facilities were also provided.

Natural Resources
Comments related to all aspects of natural resource preservation and management including water quality and aquatic habitats, air quality, sedimentation and shoreline erosion, wildlife and forestry. Cultural resource compliance was also addressed.

Compliance
Comments requested TVA's attention to poor camping practices, houseboats and ATV use, boating restrictions, non-permitted boat docks and illegal waste dumps and littering.

Reservoir Levels
Many comments received related to low reservoir levels and their associated impacts.

Summary of Public Comments by Parcel:
Several parcel-specific comments were received during scoping and are listed in this report by reservoir. A majority of the parcel-specific comments can be accommodated within the existing allocations, such as Mountain Bike Trails, Hiking Trails and Natural Resource Conservation within Zone 4. On both Chatuge and Hiwassee there were several comments suggesting new Zone 6-Recreation areas for water access, trail expansion and ball fields. A parcel on Chatuge has also been identified for consideration as a Zone 5-Industrial and two parcels have been identified as potential sites for a new substation. Several

comments on Nottely have called for expansion of the existing recreation facilities, such as Poteete Creek Campground, to accommodate the growing recreation demands on this reservoir.

Summary of Questionnaire Results

Respondents were asked to select from the nine reservoirs listed which reservoirs they use and their method of access to the reservoirs; private residential access, private commercial recreation access areas, via TVA or other agency managed areas. We also asked them to indicate the frequency of their participation from a list of recreation activities; select uses for public lands; and provide their opinion if there is currently enough, too much or an adequate amount or availability for the uses listed. And finally, the respondents were asked to identify for each reservoir if the amount of facilities available were meeting their current needs. The results provided in Part III of this report show a majority interest in no change, hiking and mountain biking trails and expansion or improvements at recreation areas.

Part I:

Public Comments Identified by Issue

Abbreviations for Government Agencies and Stakeholder Groups

BRMEMC	Blue Ridge Mountain Electric Membership Corporation
GDNR	Georgia Department of Natural Resources
GHPD	Georgia Historic Preservation Division
GMRDC HPO	Georgia Mountains Regional Development Center – Historic Preservation Office
NCDA	North Carolina Department of Administration
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEH	North Carolina Division of Environmental Health
NCDF	North Carolina Division of Forestry
NCDPR	North Carolina Division of Parks and Recreation
NCDWQ	North Carolina Division of Water Quality
NCWRC	North Carolina Wildlife Resources Commission
THC	Tennessee Historical Commission
EBCI	The Eastern Band of Cherokee Indians

General Comments (comments that are not reservoir specific)		
Appreciation		
General Non-motorized Recreation	I don't know what I would do without these lands. The joy I get from life is on public land enjoying parks. I personally enjoy mtn biking trails the most, but also enjoy all the activities offered in parks.	Individuals (3)
General Non-motorized Recreation	I think TVA does a fantastic job allocating certain land to certain users. Keep up the good work! Thanks!	Individuals (2)
Visual	Keep up the good work. Maintain the beauty of the TVA for those to share for years.	Individual
Mountain Biking	Thank you for all the nice trails you have allowed to be built on Raccoon Mtn. This was an under-utilized resource and since you have opened it to Mountain Bikers it is becoming a destination for bikers all over the south.	Individuals (4)
Land Policy and Planning		
Mountain Biking	Please incorporate mountain biking into your long term planning process. Mountain biking is a low impact activity that on properly designed trails has very little obvious impact.	Individuals (2)
Maintain Natural Areas	Stop the conversion of land to commercial, residential and industrial uses. We will need more open lands as the population increases and expands.	Individual
Generalized Non-motorized Recreation	Land Managers must continue to function and co-exist with Horse Back, Hiking, and Cycling. The TVA is a beautiful area for my family to visit and the Land Management which has taken place is a breathe of fresh air, which may serve as an example for other State and Federal Power Plant Conservation Projects.	Individuals (8)

Mountain Reservoirs Land Management Plan
Summary of Public Participation

General Comments (comments that are not reservoir specific)		
Land Rights	I am concerned that the forest, national, and government managed areas will be used for other than original intent.	Individual
Natural Resources		
Archaeology	Will comment on the Draft EIS regarding archaeological and historic resources	NCDWQ
Potential Historic Properties	May affect properties potentially eligible for National Register of Historic Places	THC
Air Quality	Air quality must be improved through continued emissions reductions from TVA generating facilities and limited vehicular traffic in sensitive areas.	Individual
Air Quality	Consider potential impacts to air quality.	NCDWQ
Ecosystem Health	Address priorities and practices for sustainability of forest ecosystems. Promote healthy forest ecosystems and manage risks associated with wildfires, insects, diseases, invasive species, and other threats.	NCDF
Forest Resources	Use BMPs anywhere land use changes occur. Consider potential impacts to forest resources and natural vegetation. Consider potential impacts to water resources. Consider potential impacts to wetlands, prime agricultural lands, forest resources, wildlife, and natural vegetation.	NCDWQ NCFF
Natural Resources Protection	Conservation, Preservation	Individual
Natural Resources Protection	Apply appropriate Silvaculture practices and address how TVA will work with other groups and agencies to respond to wildfires and other issues. Protect Water quality.	NCDF
Natural Resources Protection	Consider potential impacts to wetlands, prime agricultural lands, public lands and scenic areas, archaeological or historic sites, air quality, noise levels, water resources, forest resources, wildlife, and natural vegetation.	NCDWQ
Water Quality	Opposed to impoundments on steep slopes because of possibility of failure and impacts to aquatic resources.	NCDENR NCDWQ
Water Quality	Water quality must be maintained by stopping or greatly curtailing residential and industrial development in reservoir watersheds.	Individual
Water Quality	Address priorities and practices for sustainability of forest ecosystems. Protect Water quality.	NCDF
Water Quality/Supply	Supports the development of a management plan that would protect water quality and quantity or our water resources. These mountain reservoirs, related watersheds and the proper management thereof plays a crucial role in providing safe and adequate drinking water to our region.	NCDEH
Water Quality/Supply	Determine water supply classification along each waterbody to determine acceptable land use policy.	NCDWQ
Wildfires	Promote healthy forest ecosystems and manage risks associated with wildfires and other threats. Address how TVA will work with other groups and agencies to respond to wildfires and other issues.	NCDF
Wildlife	TVA appears to me to have had a long standing good reputation for their management practices. Limited access to natural areas yet provision for unobtrusive access has kept wildlife areas in great shape - attractive to the public and yet the environment has remained stable for wild life, etc.	Individual
Compliance		
Enforcement	Signage and fines concerning littering. Maintenance and updating at TVA dam overlooks	Elected Official
Recreation		
Camping	Avid mountain biker and camper.	Individuals (2)
Wildlife	Avid hunter. Concerned about hunter access to TVA land and across TVA lands to access other public lands.	Individual
Economic Impacts	Mountain biking. It's a boon to the local economy, particularly when major events are held there.	Individuals (2)
Mountain Biking	Land managers can work with local and national mountain biking organizations to develop a trail system that is both fun and functional.	Individual
Mountain Biking	Mountain biking has been many times misunderstood and detractors may be mislead or misinformed regarding environmental impact of MTB trails.	Individual

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General Comments (comments that are not reservoir specific)		
Mountain Biking	Mountain bike trails with involvement with IMBA and SORBA.	Individuals (2)
Mountain Biking	Supports mountain biking	Individuals (8)
Multiple Use Trails	I know that hikers need trails for only their use but many hiking trails are not being utilized and are becoming over-grown. If some of these trails were opened to mountain-bike use it would not interfere with hikers and it would help keep the trails from being over-grown.	Individuals (2)
Multiple Use Trails	Would like to see day use of the area surrounding the dam area for more recreation, i.e. picnic areas with tables, nature trails, more boat ramps, hiking.	Individuals (2)
Recreation Facilities	TVA needs to address the need for canoe portages at all TVA dams	NCDPR
General Non-motorized Recreation	Camping and economic impact go hand and hand with mountain biking and thus generate broad support for the protection of public lands.	Individual
Mountain Biking	Please give priority to providing access to single track mountain bike trails.	Individual
Mountain Biking	I think it is worth pointing out the rewards that have been reaped when land managers work with mountain biking communities to preserve and create trail systems. Mountain biking is a quiet activity that has been shown to leave a similar environmental footprint to hiking (and no greater).	Individuals (2)
Mountain Biking	Mountain biking is quiet, low impact, and human powered. Mountain biking continues to grow in popularity every day.	Individual
Mountain Biking	Please allow for continued & expanded mountain bike access in TVA-managed public areas.	Individuals (2)
Mountain Biking	I would like to see as much property opened to mountain biking as possible. I've watched Raccoon Mountain transform from an under used area to a destination park, because of the building of mountain bike trails.	Individuals (5)
Trail Construction and Management	I think mountain biking has proven to be one of the most non-obtrusive recreational sports to our public land. I think we need to keep the trails we have, and hopefully add a few more.	Individuals (2)
Trail Construction and Management	The Chattanooga Southern Off Road Bicycling Association (SORBA) has donated thousands of volunteer hours each year for the past several years at Raccoon Mountain, land owned by the TVA. Mountain biking is a quiet activity that has been shown to leave a similar environmental footprint to hiking (and no greater). I would like to see the success of Raccoon Mountain be repeated on other TVA-managed land. The mountain biking community contains a vast potential resource for trail management that should be put to use on public land.	Individual
Trail Construction and Management	Mountain biking is quiet, low impact, and human powered. Mountain biking trails typically are maintained, to a great degree, by local clubs through volunteer efforts. Great emphasis is placed upon a minimal footprint in whatever area the trails may be in. Trails are constructed and maintained to insure environmental impact is at the lowest level possible. It is my wish that all trails be kept open and in good repair for the continued enjoyment of all who utilize them, with an eye towards expanding the trail systems on all TVA managed public lands. Mountain biking continues to grow in popularity every day. Thanks, Concerned Mountain Biker.	Individual
Trail Construction and Management	Built using International Mountain Bike Association (IMBA) guidelines, the Raccoon mountain trails have demonstrated how such trails can be built in a durable and environmentally-sensitive manner.	Individuals (2)
Trail Construction and Management	I think a comprehensive TVA trail construction and management plan would have widespread public support.	Individual

Chatuge Reservoir		
Compliance		
Enforcement	Too many boats blaring loud music that disturbs residents. Loudness	Individual

Chatuge Reservoir		
	ordinance needs to be enacted and enforced. Too few law enforcement patrols.	
Enforcement	All comments relate to Chatuge Woods Campsite-TVA/Towns County health issues with environmental implications. Remove underground primitively installed septic at one campsite. Remove illegal permanent storage facilities, boat docks, Astroturf, along water and at campsites (lease violations). Stop clear cutting to provide view at new & existing campsites.	Individuals (2)
Erosion	Comments relate to Chatuge Woods Campsite-TVA/Towns County health issues with environmental implications. Re-establish lake vegetative buffers to prevent erosion and run-off into the lake.	Individual
Enforcement	Enforce removal of all boats from shoreline during winter (lease violations). a)Never agree to lease any parcel if lessee cannot and will not enforce lease specifications, and TVA seriously consider lease withdrawals for non-compliance over a number of years proven dereliction of duties. b) Never issue a lease without proof, maps and drawings, and agreement between TVA and Lessee of improvements. Old paper trail at Chatuge Woods is not documented as to improvements.	Homeowners Association Representative
Land Policy and Planning		
Balanced Use	TVA lands are, first and foremost, important to our regional economic development. These lands need to be preserved, but likewise consideration needs to be given to the idea that these lands can be used for other than natural resource conservation without compromising the environmental stability of the land. We who have lived here all of our lives don't want to lose the beauty, the green space, or the water quality, but at the same time believe that a balance can be achieved without a loser having to be chosen on either side of the environment -vs.- development argument every time.	Individual
Commercial, Residential, and Industrial Development	Don't bow to pressure and money from developers that want to come in, make money, strip the land, pollute the reservoirs and then leave.	Individual
TVA Info sources	It is hard to read the maps provided on the website to get a good overall view of what is being asked. Hopefully it will become clearer when I attend the public meeting and can see a larger map.	Individuals (3)
Development	The less industrial the better	Individuals (3)
Industrial Development		
Commercial, Residential, and Industrial Development	Request to re-zone Tract #10 from Zone 4 to Zone 5 (Industrial)	BRMEMC
Commercial, Residential, and Industrial Development	Tract #10 is currently designated as Zone 4, natural resource conservation. Supports changing this allocation to Zone 5, Industrial Development	Elected Official
Natural Resources		
Potential Historic Properties	GHPD withholds comment until receiving Section 106 information pertaining to cultural resources	GHPD
Archaeological Resources	Further info necessary to formulate valid conclusions regarding archaeological resources	GMRDC HPO
Water Quality	Something has got to be done about the continued decline in the quality of the water. Too much development has already been done on the lake.	Individuals (3)
Erosion	The reckless development, clear cutting, and earthmoving on the steep ridgelines above Lake Chatuge is ruining the views and creating sedimentation and erosion issues. If any other lakefront TVA or USFS lands are transferred, including Parcel 105 that is surrounded by my property, restrictions should be imposed that greatly limit development.	Individual
Natural Resources Protection	Evaluate areas for timber harvest and other habitat manipulation to benefit wildlife, especially parcel 6 and 78 on Chatuge. Integrate recreation and wildlife and waterfowl enhancements.	NCWRC
Natural Resource Conservation	On mountain lakes that have already experienced growth and development (Blue Ridge, Nottely, Chatuge), to the extent possible (if not already	Individual

Chatuge Reservoir		
	surpassed), a ratio of 60/40 (undeveloped/developed shoreline) should be maintained in order to preserve the integrity of natural resource values (habitat, recreation, etc.), water quality, and essence of what makes these lakes in our region unique.	
Water quality/Safety	There are too many multi-family docks being allowed to be built on this reservoir. As a result, there are far too many boats (large & small) being allowed access to the reservoir. The water quality & safety for all is being impacted in a negative manner.	Individual
Visual	Lake Chatuge already has an excessive amount of unsightly development and high traffic.	Individual
Water Quality	All comments relate to Chatuge Woods Campsite-TVA/Towns County health issues with environmental implications. Remove underground primitively installed septic at one campsite. TVA and Towns County Health Department and Commissioners (three successive!) have been advised (and provided photos) it is present and nothing has been done to remove it. Health Department evaluates the ability of existing septic disposal systems to handle sewage volume and to test for leakage of septic into Lake Chatuge shoreline.	Individuals (2)
Wildlife	Integrate recreation and wildlife and waterfowl enhancements.	NCWRC
Power Delivery		
Substation Site	Request for two acres of Parcels 52 or, as an alternative, 51 for substation site	BRMEMC
Recreation		
Recreation Facilities	All comments relate to Chatuge Woods Campsite-TVA/Towns County health issues with environmental implications. Reduce number of campsites to prevent further degradation of the land. Currently 2 new roads with additional campsites have been installed in 2006-2007.	Individuals (2)
Commercial, Residential, and Industrial Development	Selfishly I would simply like to see Lake Chatuge be more recreational friendly. Higher water for longer period of time, better water hazard markings, fishing berms and piers etc.	Individuals (3)
General Non-motorized Recreation	Request for Parcels 52, 77, and 78 for Recreational activities	Elected Official
Natural Resources Protection	Encourages new public access, especially Parcels 6, 88, and 96 on Chatuge.	NCWRC
Trail Construction and Management	Am an avid mountain biker who notes that bikers build and maintain many trails	Individuals (2)
Recreation Access	Improve public access, provide protection of riparian zones, and recommendation that lands remain zoned as Natural Resource Conservation areas. Also recommended a review of potential recreation uses on uncommitted lands be included in the EIS.	GADNR
Boating	Far too many boats (large & small) being allowed access to the reservoir.	Individual
Reservoir Levels		
Boating and Fishing	I realize the lake is low now because of our drought, but low lake levels have been the number one issue I have had, even after the alterations where made to levels a couple of years ago. Fishing & boating in particular becomes very difficult in the fall and too late in the spring.	Individual
Reservoir Levels	Simply would like to ask for a more recreational friendly lake for a longer time during the year. I realize the lake is low now because of our drought, but low lake levels have been the number one issue I have had, even after the alterations where made to levels a couple of years ago.	Individual
Reservoir Levels	Water levels are too low to enjoy year round use. Need to keep lake levels elevated higher and throughout the year.	Individual
Reservoir Levels/Safety	The lake should not be lowered so quickly during the summer months (drought years excluded). Due to the popularity of boating on this reservoir, the lake level should be kept as high as possible from safety and water quality point of view.	Individual
Reservoir Levels/Water	Due to the popularity of boating on this reservoir, the lake level should be	Individual

Chatuge Reservoir		
Quality	kept as high as possible from safety and water quality point of view.	

Hiwassee Reservoir		
Land Policy and Planning		
Maintain Natural Areas	Leave land in its natural state. The land is subject to too much development already.	Individuals (4)
Commercial, Residential, and Industrial Development	TVA should continue to manage their lands and not be giving land away to private developers such as Little Cedar Mountain on Nickajack Reservoir.	Individual
Natural Resources		
Forestry	PLEASE REFRAIN FROM LOGGING AROUND LAKE HIWASSEE UNLESS IT IS SELECT CUTTING AND THE BEST FOR THE FOREST AND NOT FOR THE LOGGING COMPANY.	Individual
Wildlife	Evaluate areas for timber harvest and other habitat manipulation to benefit wildlife, especially parcel10 on Hiwassee. Integrate recreation and wildlife and waterfowl enhancements.	NCWRC
Natural Resource Protection	Massive tree cutting should not be allowed near Hiwassee lake	Individual
Natural Resources Protection	Within the Hanging Dog Watershed are lands held in trust for EBCI. Your current operations negatively impact tribal aquatic habitat and species diversity in this area.	EBCI
Water Quality	KEEPING THE LAKE CLEAN FROM SEDIMENT AND OTHER POLLUTANTS SHOULD BE A HIGH PRIORITY	Individual
Reservoir Levels		
Reservoir Levels	I would like to see the lake level at Hiwassee stay up between May and September.	Individual
Reservoir Levels	You should be ashamed of the summer lake level at Hiwassee. There is no reason to drop the levels 10 feet before the fourth of July !!!!!	Individual
Reservoir Levels	Concerned about water releases, lake levels, impacts to fish and wildlife, and balancing water levels for kayakers and reservoir boaters.	Individuals (5)
Recreation		
Boating Restrictions	There are too many engine powered boats on the reservoir.	Individuals(2)
Reservoir Access	Encourages new public access, especially Parcel 10 on Hiwassee.	NCWRC
Trail Construction and Management	I love the trails at Hiawassee. And my all time favorite place to go to is Ocoee (and Chilhowee, to ride mountain bikes and to white water raft. These places are extremely well managed and maintained. What has been built there and the way the trails are maintained are nothing short of fantastic.	Individuals (2)
ATV	Need OHV	Individual
Mountain Biking	Mtn biking is a low impact recreational activity that brings money to the local economy and is, by an large, practiced by environmentally minded people.	Individuals (2)
Visual	More trails around the lake. This way they won't be TOO challenging and they will be beautiful.	Individuals (2)

Blue Ridge Reservoir		
Reservoir Levels		
Reservoir Levels	If possible, it would make the lake more enjoyable if you could come up with a way of maintaining the elevation, similar to the way GA Power does at Lake Burton.	Individual
Reservoir Levels/Water quality	Concerns regarding water quality and economic impacts from low lake levels	Individual (2)
Reservoir Levels	Demand on lake blue ridge to provide downstream river levels is too great. It detracts from the natural beauty of the area and also affects boating safety.	Individuals (2)
Reservoir Levels	Concerned about water being released from Blue Ridge so rafters on the Ocoee will have water.	Individual
Reservoir Levels/Erosion	Lake levels are taken down too low in the winter. Consider how much less silt is washed into the lake with the reduced amount of exposed lake bed. Consider the improvement in the fish population with less silt.	Individual
Reservoir Levels	TVA policy states this is for flood control. 1991 flood in McCaysville, GA was considered a 100 year flood. Lake Blue Ridge increased 6 feet from that rain. This is not much when you consider the lake was probably down around 30 feet and the surface area of the lake was considerably smaller than if it were down only 12 feet. The current plan has the lake going down 17 feet in the winter.	Individual
Reservoir Levels	Lake levels should be maintained at near not necessarily full pool from may 15 thru labor day and you would stop 90% of your complaints. We need public, day use facilities such as picnicking, swimming beach, boat access, etc.	Individual
Reservoir Levels	The lake level is not kept high enough later into the year. I'm not sure this is environmental, but the lake's primary purpose should be recreation/power generation now.	Individual
Reservoir Levels	The water level in Blue Ridge Lake is NOT being maintained at the desired levels for safe recreational use and as determined by the recent lake "balancing" plan by the TVA. Since it's implementation, the TVA has not maintained the lake levels per the new guidelines.	Individuals (2)
Reservoir Levels	I do understand that there is a drought going on this year, however, you all continue to pull more water than comes in whether there is rain or not. I understand you sell the water to the outfitters which make me wonder why they are more important than those who live on the lake. We pay taxes to our county which isn't inexpensive. Maybe the lake should the managed by Corp of Engineers since apparently you all could care less about our enjoyment.	Individual
Reservoir Levels	I have serious concern over the dam repair on Lake Blue Ridge in 2010. I hope that every effort will be made by TVA if at all possible to have water in the lake by that summer.	Individual
Reservoir Levels	Lake Blue Ridge - Keep it fuller longer. All lakes in GA started with full pools this year except those managed by TVA.	Individual
Reservoir Levels/Balanced Use	Concerned about lake levels and related safety, recreation, and aesthetic issues, and erosion issues as well as concerned that rafters get too much water	Individuals (4)
Reservoir Levels environmental impacts	Concerned about water releases, lake levels, impacts to fish and wildlife, and balancing water levels for kayakers and reservoir boaters.	Individuals (4)
Reservoir Levels	Lake Blue Ridge needs to stay full longer during the recreational season.	Individuals (3)
Reservoir Levels	No water in lake when needed, docks on dry land in June! Boot them out. TVA shouldn't handle Georgia Reservoirs.	Individual
Reservoir Levels	TVA is not concerned with water or lake level management as much as it is concerned for its power generating and revenue potential.	Individual
Reservoir Levels/Balanced Use	Want balanced between rafter's needs and lake users.	Individual (3)
Land Policy and Planning		
New Development	The lake is becoming very crowded on week-ends because of the large	Individual

Blue Ridge Reservoir		
	amount of development. Please do not open any additional TVA managed lands for development.	
Commercial Development	We hope the TVA continues to manage all of the land around Lake Blue Ridge that it currently controls. We would not be happy to see a large hotel or commercial business at Blue Ridge	Individual (2)
Visual	Development in the N. GA, TN & NC mountains is getting out of hand. We need TVA to protect our heritage and the beauty of the mountains.	Individual
Natural Resource Protection	Blue Ridge Lake is a beautiful reservoir that has been well-managed. Preserving what is left of uncommitted land should be a priority. Packing in more tourists would damage the natural resources that have, so far, been so well preserved.	Individual
Maintain natural Areas	Would like to see the area left as natural as possible. I hope the TVA will not give in to the developers who come in and build with no sensitivity to the people and wildlife in Blue Ridge. There is potential to stress the North Georgia ecosystem.	Individual
General Non-motorized Recreation	The recreational areas on TVA lands are some of my favorite places to be and I would like to see all of these areas remain as natural as possible to preserve the beauty of our area and to allow continued or expanded access to non motorized activities such as hiking, mountain biking, kayaking and canoeing. All of these activities are proven to have low impact on the lands and allow the public to enjoy this great natural resource.	Individual
Maintain Natural Areas	Would like to see the area left as natural as possible. I think the next 5 years will have developers pushing for more and more subdivisions and condos. I hope the TVA will not give in to the developers who come in and build with no sensitivity to the people and wildlife in Blue Ridge. With the big push of people coming from Florida and Southern Georgia there is potential to stress the North Georgia ecosystem. Do not over build to the point where the reason people came here in the first place is lost.	Individual
Preserve Remaining Resources	If more development is encouraged or allowed, the future of the natural beauty of this reservoir would be in jeopardy. There is tremendous pressure to bring in more tourists, but the reservoir is already plenty populated on any given day. Please keep preservation of what is left on Blue Ridge Lake a top priority when you make your decisions.	Individuals(2)
Land Rights	Want to rent adjacent TVA land. Want right of first refusal on adjacent TVA land if for sale.	Individual
Land Rights	Land near Charlie's Creek on Blue Ridge should be given more flexibility by adjacent landowners. We need to be able to cut down small scrubs and poison ivy and do some small landscaping.	Individual
Compliance		
ATV Impacts	Too much motorized access to trails and waterways! ATV's cause severe damage and should be restricted. Recreation ATV use and abuse of marked trails, unmarked and prohibited trails is destroying many trails and related areas. The severe damage done by ATV'rs is getting worse every year.	Individual
Enforcement	Some type of enforcement is needed or increase at the public areas as well as lake traffic.	Individual
Enforcement	TVA needs to enforce its rules prohibiting houseboats. Houseboats are ruining Blue Ridge Lake. They tie up all summer long on public lands, pay no taxes and essentially are non-permitted docks. .	Individuals (2)
Houseboats	Houseboats are ruining Blue Ridge Lake. They string wires across some of the best coves in the lake and create a real hazard with the wires. What if a boat runs into one of the wires? They spoil the beauty of the area with trashy grills and broken down structures, not to mention creating a real hazard with the wires.	Individuals (2)
Houseboats	Opposed to houseboats for safety and aesthetic reasons.	Individual
Boating	Need more boating speed limit enforcement	Individual
Natural Resources		

Blue Ridge Reservoir		
General	Hopes nothing will happen to No. 23.	Individual
Erosion	Soil erosion on banks of lake (erosion of the shoreline) - need corrective measures - land owners should have help	Individuals (5)
Erosion	TVA should endeavor to preserve the natural shorelines in the mountain reservoirs. They should also prohibit any additional runoff into the reservoirs due to additional development.	Individuals (2)
Archaeological Resources	Further info necessary to formulate valid conclusions regarding archaeological resources	GMRDC HPO
Natural Resource Conservation	On mountain lakes that have already experienced growth and development (Blue Ridge, Nottely, Chatuge), to the extent possible (if not already surpassed), a ratio of 60/40 (undeveloped/developed shoreline) should be maintained in order to preserve the integrity of natural resource values (habitat, recreation, etc.), water quality, and essence of what makes these lakes in our region unique.	Individual
Visual	There is "visual pollution" provided by the marina parking lot plainly visible from all surrounding points. A "green screen" of fast-growing, indigenous, evergreen trees (white pine or Virginia pine) at the perimeter of the parking lot would be a cost effective and dramatic improvement.	Individual
Water Quality	Clean water	Individual
Wildlife	The amount of motorized traffic on Lake Blue Ridge poses a distinct environmental hazard and disturbs wildlife and their habitats.	Individual
Wildlife	Wild animal protection	Individual
Recreation		
Reservoir Access	Blue Ridge lake should not expand its recreational areas due to already present overcrowding on the lake. The lake has plenty of access points. More trails for hiking and walking are needed but not more access points or other things that would increase lake traffic.	Individual
Reservoir Access	Improve public access, provide protection of riparian zones, and recommendation that lands remain zoned as Natural Resource Conservation areas. Also recommended a review of potential recreation uses on uncommitted lands be included in the EIS.	GADNR
Boating	Boat traffic and noise on the water are increasing every year, so it is clear that the available facilities for public use are being used. However, if more development is encouraged or allowed, the future of the natural beauty of this reservoir would be in jeopardy. There is tremendous pressure to bring in more tourists, but the reservoir is already plenty populated on any given day. Please keep preservation of what is left on Blue Ridge Lake a top priority when you make your decisions.	Individual
Public Facilities	Boat traffic and noise on the water are increasing every year, so it is clear that the available facilities for public use are being used.	Individuals (2)
Safety	The amount of motorized traffic on Lake Blue Ridge is outrageous. It poses a danger to anyone in the way of the excessive speeding and inconsiderate drivers of these crafts.	Individual
Recreation Facilities	Keep up the good, no GREAT work that's being done there at all of these facilities.	Individual
ATV	Hunters are generally good stewards of ATV trails, hunting access trails and trials should be open/accessible for legal hunting.	Individual
Mountain Biking	Avid mountain biker involved with building and maintaining trails	Individuals (2)
Boating/Water Quality	Too much boating and jet ski use. Fishing, water quality is impacted.	Individuals (4)
Boating	Ban jet skis	Individual
Camping	We stay at the local hotels when we have a big group, but also camp in smaller groups.	Individual
Informal Recreation	Any land that is currently committed to activities such as mountain biking, hiking, or primitive camping should remain. These are low impact activities that help us all to improve our relationship with nature. The more contact we have with the land management areas, the more we will respect them. In addition, mountain biking clubs in the Southeast are the primary stewards of	Individuals (2)

Blue Ridge Reservoir		
	many parks and trail systems. For example, Raccoon Mountain (a TVA property) is maintained in large part by a local mountain biking club that donates thousands of volunteer hours each year. The activities mentioned above are imperative to our ongoing relationship and respect of nature.	
Trail Construction and Management	Mountain bikers, hikers and to some extent horse riders are good stewards and in the case of mountain biking have organizations willing to do trail development and maintenance. More trails need to be dedicated to theses pastimes and time needs to be spent developing partnerships with these organizations to help preserve trials/access/land.	Individuals (3)

Nottely Reservoir		
Land Policy and Planning		
Maintain Natural Areas	No development. Keep it natural. Desire to keep property non-commercial for the enjoyment of families. The land around Nottely is great, please do not Develop land.	Individuals (3)
Land agreements	Several tracts and issues. Tract 27--Requesting USFS trade this to TVA and subsequently TVA give the property to the county. Tract 25--Similar to Tract 27. Tract 4--Currently leased to Union County, but requesting longer lease for additional camping. Portion of Tract 1--Unspecified request for public recreation use. BR-1 through BR5--Adjacent to TVA property. Youngcane Creek Development Property--Asking TVA to work with developers of adjacent property. Requesting TVA consider handicapped fishing access. Requesting TVA to work with Union County to trade land between USFS and TVA and subsequently make available to Union County. Tract 2 (Adjacent to west side of Nottely Dam)—Clean up and better patrol of the area.	Elected Official
Compliance		
Enforcement	Uncommitted land on Nottely is used as a dump. Also users of this area, campers and day users leave their trash behind.	Individual
Enforcement	There are several illegal private boat docks on Lake Nottely TVA land. Given that I followed the TVA rules and paid the application fee of $200 for my dock permit and another $200 when I changed the docks design, the fact that people are installing boat docks on TVA land dilutes my property value. There is one dock on on Parcel 18 of Nottely Tile Map b3, and another on Parcel 22, Nottely Map tile b3 as well.	Individual
Natural Resources		
Archaeological Resources	Further info necessary to formulate valid conclusions regarding archaeological resources	GMRDC HPO
Cultural Resources	GDHP withholds comment until receiving Section 106 information pertaining to cultural resources	GHPD
Erosion	Sediment erosion from the ATV/motorcycle/off-road vehicle usage on Davenport mountain is terrible.	Individual
Water Quality	Water level, water pollutants, highest and best use.	Individuals (2)
Natural Resource Conservation	On mountain lakes that have already experienced growth and development (Blue Ridge, Nottely, Chatuge), to the extent possible (if not already surpassed), a ratio of 60/40 (undeveloped/developed shoreline) should be maintained in order to preserve the integrity of natural resource values (habitat, recreation, etc.), water quality, and essence of what makes these lakes in our region unique.	Individual
Wildlife	Please limit hunting as much as possible. Areas designated for hunting are	Individual

Nottely Reservoir		
	not multi-use during hunting season and put us all at risk. Biking and trail running are my primary activities and during hunting season, these areas are off limits.	
Recreation		
ATV Use	Prohibit all off-road vehicular access on TVA lands.	Individual
Off road vehicle use	Limiting motorized traffic will also keep the area pristine for years to come rather than leaving us to smell the fumes and step past oil and gas spills on the trails.	Individual
Camping	Prohibit all camping on TVA lands.	Individual
Reservoir Access	Improve public access, provide protection of riparian zones, and recommendation that lands remain zoned as Natural Resource Conservation areas. Also recommended a review of potential recreation uses on uncommitted lands be included in the EIS.	GADNR
Reservoir Levels		
Reservoir Levels	Water levels at Nottely too low in '07.	Individual
Reservoir Levels/Economic Impacts	PLEASE HELP US ENJOY THE INVESTMENTS THAT WE HAVE MADE IN OUR LAKE HOMES BY KEEPING WATER LEVELS UP IN THE SUMMER!!!	Individual
Reservoir Levels	I HAVE HAD A HOME ON LAKE NOTTLEY FOR 4 YEARS NOW. THIS SUMMER IS THE ABSOLUTE WORST EVER FOR WATER LEVELS. I AM CERTAIN THAT THIS LAKE IS THE FIRST DRAINED AND THE LAST FILLED. WE NEED TO ENSURE THAT WATER LEVELS ARE EVENLY SPREAD ACROSS ALL TVA LAKES.	Individual
Reservoir Levels	Would love to have a higher water level until later in the year.	Individual
Reservoir Levels	Is there (going to be) a water treatment facility built on Lake Nottley? If so, does (will) this affect the draw down of the lake?	Individual

Fontana Reservoir		
Land Policy and Planning		
Maintain Public Lands	I am not happy with releasing TVA land for private development	Individual
Maintain Natural Areas	A highlight of the quality of life here in east Tennessee is the variety of water, trails, habitats and areas for recreation and wildlife. I feel strongly the reservoir waterfronts should be preserved for public use and that bird and other wildlife habitats should not be endangered.	Individual
Land Rights	Between TVA and the USFS private docks are basically prohibited on Fontana Lake, even when a property owner joins the 1720 contour. The management strip held by USFS between the 1710 and 1720 contour should not prohibit property owners from being able to have a dock on Fontana Lake.	Individual (2)
Generalized Non-motorized Recreation	Keep your eye on the goal of not disturbing nature. Activities like hiking and mountain biking are very low impact on nature. Motorized and camper activities, while popular, are higher negative impacts to nature, and spoil the experience for the rest of us.	Individual
Water Quality	Maintaining/improving water quality should be the focus of planning	Individual
Mountain Biking	Please include the ability to include better managed mountain bike trail systems to these areas.	Individual
Mountain Biking	Mtn. biking should be considered in all land management decisions.	Individuals (2)
Balanced Use	The facilities you have provide access for the average person and should be preserved so everyone has the opportunity to enjoy the great outdoors. While I mostly enjoy mountain biking and dual sport motorcycle riding, I strongly support hunters, boaters, hikers, etc. for mixed use in parks and on public lands. I find the trail setup at Tsali, horses on one set of trail while	Individual

Fontana Reservoir		
	bikers use the others and alternating on different days a great solution so everyone can get outdoors. Planned correctly, a lot of people can make great use of these lands and they should be added to before they are lost to developers.	
Maintain Natural Areas	Less development with paved roads and the sort would be ideal to preserve the "natural" aspects of this land.	Individual
Reservoir Levels		
Reservoir Levels/Economic Impacts	Low lake levels are having a negative impact this spring/summer on local businesses around Fontana.	Individual
Reservoir Levels	I am very concerned about the lake levels this spring/summer at Fontana Reservoir, which are currently at nearly winter-time levels. I am completely aware the entire area is experiencing severe drought. I also know that Tennessee reservoirs levels are down some. But nothing to compare with Fontana. I would like to see less daily release of water so that Fontana has water closer to full pool and is thus able to better support boating, fishing, and other water activities.	Individuals (2)
Reservoir Levels	Issues are negatively affecting Fontana reservoir for recreation and environmental quality. First is poor water-level management. There is no sound reason behind the policy of drawing down Fontana to such low levels in winter. With large draw-downs, recreation is diminished and scenery degraded by barren shoreline.	Individuals (2)
Reservoir Levels/Aquatic Habitat	Lake levels that disturb fish reproduction.	Individual
Reservoir Levels	Water in Fontana Lake is being mismanaged. We haven't had a wet spring since 2003, and yet TVA continues to draw the lake down dramatically and unnecessarily in the winter causing tragically low water levels during the months when people want to enjoy the lake. Water levels should be maintained so that dry springs and summers do not cause the lake to be so low.	Individual (5)
Reservoir Levels	It seems very unfair to drop Fontana Lake during this summer drought period disproportionate to any other of the TVA managed lakes. We are so dependent and appreciative for its summer use to our family and we pump thousands of dollars yearly into Swain and Graham Counties. We have been grateful to TVA for its delaying the draw down until September in the past year or two. This year has been very difficult both due to rainfall shortage and seemingly reinstituted early draw down policy.	Individual
Reservoir Levels	We are aware that this is an unusual summer with the drought. However, the TVA has continued to drain Fontana 6-12 inches a day even since it has started to rain. This is a terrible inconvenience to homeowners in Fontana Lake Estates (FLE), Houseboat owners, day users and the marinas. It's understandable that the lake is not full, but draining it to the low levels you are is proving terrible for the Swain county economy and lake users. You impact so many lives when you bring the lake so low.	Individual
Natural Resources		
Natural Resource Protection	Support continued public cleanup days at varied locations for litter along shore and floating.	Individual
Aquatic Habitat	Need signs and aggressive penalties for the introduction of unapproved species in any waters. Specifically spotted bass in Fontana. Because of this smallmouth bass are extinct in Chatuge. Do something before it happens at Fontana!!!	Individual
Water Quality	Avoid any industrial & silt runoff from new construction.	Individual
Erosion	Sediment and trash loads. Counties need stronger erosion control programs.	Individual
Compliance		
Enforcement	FONTANA: enforce the law concerning camp fires particularly near the homes at Fontana Lake estates. ie: reduce the potential for a fire	Individual
Enforcement	Need to enforce littering and fine folks on land and water! When walking	Individual

Fontana Reservoir		
	across dam you see lots of cigarette butts on the side of the road. This seems to be overlooked in lots of places.	
Enforcement	Next is waste and environmental destruction created by careless weekend lake campers on Fontana. Accessible ridges and flat areas on Fontana are overused and degraded by camping. Garbage covers these areas, including abandoned mattresses, couches, and tarps left strung in trees. Many campers stake out an area by leaving their tents and equipment on a piece of shoreline for the entire summer. This then becomes trash in winter. There needs to be a set-back from the water for camping, and enforcement against littering and abuse of the camping privileges on the lake.	Individual
New Highway Construction		
Highway Construction	We are thrilled that the "road to nowhere" is probably going to be dropped. For that road to be finished would be an environmental disaster.	Individual
Recreation		
Boating Safety	Should be weight/size limit on all mountain lakes. Outsiders are bringing boats that leave such a large wake it is dangerous to be in a small vessel.	Individual
Recreation Facilities	Port-a-johns would be nice.	Individual
Mountain Biking	Avid mountain biker involved with building and maintaining trails	Individuals (2)
Mountain Biking	I mostly enjoy mountain biking and dual sport motorcycle riding.	Individual
Mountain Biking	I am an avid mountain biker and enjoy trying the different trails available within a few hours drive from Knoxville - would love to have even more to choose from when I have a free day to go for an epic ride!	Individual
Multiple Biking	Supports mountain biking and other trail uses	Individual (22)
Mountain Biking	In general, the mountain bike trails provide that are currently in the TVA with access to a well developed, volunteer trail maintenance contingent.	Individuals (6)
Mountain Biking	More utilization by low impact mountain bike riders will increase support for TVA with the Federal representatives.	Individual
Build More Trails	I would like to see more mountain bike trails at all reservoirs, but Fontana is most accessible to me.	Individuals (2)
Trail Construction and Management	I would like to see more Bike/Hike specific trails.	Individual
Trail Construction and Management	Mountain biking trails should be expanded.	Private Company
Trail Construction and Management	I ride the mountain bike trails at Fontana. Please keep these trails open to mountain bikers and hikers.	Individuals (3)
Mtn Biking/Economic Impacts	Mountain bike riders are a diverse group from all social and economic backgrounds. They travel long distances SPECIFICALLY to mountain bike on particular trails and spend money in the communities to which they travel.	Individual
Mtn Biking/Economic Impacts	Regions that have "destination trails" for mountain biker's benefit from increase revenue as mountain bikers tend to spend money in these regions.	Individual
Mountain Biking	I think the TVA does better than most when our MTB needs are discussed and hope we can continue to use the TVA lands for riding and can have future opportunities to expand the riding in your system!	Individual
Mountain Biking	Mountain biking is a quiet, low-impact, human-powered activity. A growing scientific consensus has shown the environmental impacts of mountain biking to be similar to hiking and far less than other uses.	Individuals (2)
Mountain Biking	Mountain biking is an important use on their public lands. Several of these sites contain valuable trails that should remain open, while others have tremendous potential for future mountain biking opportunities	Individual
Multiple Use Trails	Volunteers are reluctant to spend time maintaining trails if they are also asked to donate money every time they hike/bike.	Individual
Trail Construction and Management	Riders and the clubs they belong to take "ownership" of the trails they are provided, ensuring regular maintenance and proper usage.	Individual
Visual	I ride Fontana (Tsali) and very much enjoy the scenic nature connection it provides. This is a very peaceful and soul mending location! Mountain biking is a quiet, low-impact, human-powered activity.	Individual

Ocoee Reservoirs 1, 2, and 3		
Land Policy and Planning		
Low Impact Development	Protect the reservoirs and their watersheds in as many ways as possible that allow recreational use without high impact commercial development which restricts use and harms the natural appeal of the areas. All development should encourage our citizenry to utilize the TVA areas in a natural low impact manner that preserves these areas for all generations to come and does not allow these pristine areas to be slowly consumed with incremental development that results in their ultimate demise.	Individuals (2)
Commercial, Residential, and Industrial Development	Use for manufacturing/industrial purposes should be banned. Further residential development should be extremely limited.	Individuals (2)
Informal Recreation	I would like to see a variety of activities available for use on any public land, my favorites are horseback riding, mountain biking, canoeing, camping and birding.	Individual (3)
Balanced Use	The lands protected by TVA are a wonderful opportunity to provide outdoor recreation of all types for the residents of this area. I would hope that we continue to wisely develop our land in a manner that is open to the public but of a low impact nature.	Individual
Natural Resource Protection	Protect the reservoirs and their watersheds in as many ways as possible that allow recreational use without high impact commercial development which restricts use and harms the natural appeal of the areas.	Individual
Mountain Biking	Please keep Mountain Biking a top priority in future land planning.	Individuals (3)
Natural Resources		
Natural Resources Protection	Love to camp, hike, mountain bike, fish, and boat. Appreciate the use of TVA managed lands, their beauty, and natural treasures.	Individuals (2)
Camping Impacts to Shoreline	Ocoee1. I feel primitive camping is one of the most damaging activities to the shoreline. The amount of frequent use of these limited sites creates a visible scar. The island locations have been stripped of vegetation for the use of camping fires and constant traffic has left them with little to no soil. As a special use permit holder, cabin owner, I am held to certain standards to uphold the scenic beauty of the lake and minimize my environmental impact, the primitive campers however are not held to such standards.	Individual
Forestry	Controlled burns for the undergrowth and deadfall.	Individual
Wildlife	I am concerned about possible fragmentation of wildlife habitat by building new facilities.	Individual
Compliance		
Safety	I feel the facilities are well managed and cared for. Continue patrolling these sites for the safety of all using these wonderful sites and protect families from those who want to cause harm to others or our land.	Individual (2)
Reservoir Levels		
Reservoir Levels	Concerned about water releases, lake levels, impacts to fish and wildlife, and balancing water levels for kayakers and reservoir boaters.	Individual
New Highway Construction		
Highway Impacts on Access	I am concerned about TDOT's proposed corridor K project and it's potential effect on the Ocoee River Gorge. I am concerned, that as proposed, the project will negatively affect the area. Specifically, the construction of the highway through areas that are used by so many different user groups who enjoy outdoor recreation. Trail access (in fact the continued existence of many of the best trails in the region) is used by hikers, mountain bikers, hunters, horse riders, bird watchers. River access is enjoyed by kayakers, swimmers, fishermen.	Individual
Highway Impacts on Access	The construction of the highway through areas that are used by so many different user group (Ocoee River Gorge) who enjoy outdoor recreation. Trail access (in fact the continued existence of many of the best trails in the region) is used by hikers, mountain bikers, hunters, horse riders, bird watchers.	Individual

Ocoee Reservoirs 1, 2, and 3		
Recreation		
Boating Restrictions	I would propose boating restrictions limiting the horse power, length, and speed of vessels. There also needs to be maximum capacity restriction for Ocoee 1.	Individual
Boating safety	Ocoee 1 has seen an explosion of boating traffic over the last 10-20 years. . I would propose boating restrictions limiting the horse power, length, and speed of vessels. There also needs to be maximum capacity restriction for Ocoee 1. I feel if this is not done, we will see more and more accidents, and shoreline erosion.	Individual
Camping	The mountain biking and tent camping opportunities around the mountain reservoirs are some of the best in the country and should be maintained as such.	Individual (3)
Camping	Need more tent camping around Tanasi area with sites that are more secluded. I'd prefer more primitive camping areas.	Individual
Raccoon Mountain	Raccoon Mountain. The mountain bike trails are awesome and there is so much excitement in the community about these trails. We all hope the trail system expands.	Individuals (2)
Raccoon Mountain	TVA needs to continue their close work with SORBA in creating MTB trails on public land, Raccoon Mtn being the prime example of collaboration between organizations in providing wonderful recreational opportunities and respecting the environment	Individual
Mountain Biking	Avid mountain biker involved with building and maintaining trails	Individuals (8)
Mountain Biking	I'm heading to the trails at TSALI N.C. this weekend from South Florida and my all time favorite place to go to is Ocoee and Chilhowee to ride mountain bikes.	Individual
Multiple Use Trails	I would like to see the areas used for minimally intrusive sports and recreation, especially all types of cycling, and walking/running/hiking. IMBA has techniques that work to minimize the impact of my sport on the environment.	Individuals (2)
Mountain Biking	Mountain biking and whitewater kayaking. Continued development of access for these two sports and camping/accommodations to support them is encouraged.	Individual
Economic Impacts	Please keep mountain bike trails in consideration when revising future plans for use of the land. Each year friends and I travel from Middle TN to every trail and campsite available along The Ocoees, Hiwassee, Apalachia, Blue Ridge, and Fontana reservoirs. We buy food, gas, and supplies from the small nearby towns. It's a state treasure and a beneficial, yet under-considered tourism goldmine. Bringing tourism dollars to Chattanooga, Ducktown, Cleveland, Murphy NC, Andrews NC, and many other towns along the gorge.	Individual
Economic Impacts	The biking community is growing in both numbers and tax impact. Nearly 40% of all Americans ride bikes. They provide an extremely compelling economic force with a mean annual household income of greater than $60,000. A full 25% of all cyclists demonstrate annual household incomes over $80,000. Bicycling is an industry of over $5.5 billion annually. In 2003 consumers bought more than 18.5 million bicycles. That's a full 3.7 million more than all of the cars and trucks sold in the U.S. in the same year.	Individual
Economic Impacts	Mountain biking is a growing sport. People come from all over the country to ride in this area and allowing more land to be used for mountain biking results in significant economic to surrounding communities.	Individual (2)
Informal Recreation	I certainly appreciate the access to such wonderful land, enabling my favorite activities of climbing, mtn biking, and kayaking to occur.	Individual
Mountain Biking	Mountain biking and whitewater kayaking are excellent fits for the properties you manage. Continued development of access for these two sports and camping/accommodations to support them are encouraged.	Individual
Mountain Biking	Please continue to build more mountain bike trails.	Individuals (16)
Mountain Biking	Please note that many mountain bikers use TVA lands.	Individual

Ocoee Reservoirs 1, 2, and 3		
Mountain Biking	The use of TVA land is much appreciated especially for mountain biking. All of mtn bikers I know respect and care for the land as if it were our own.	Individual
Mountain Biking	Please open up more land to Sorba for the development of more mountain biking/hiking trails on TVA managed public land.	Individual
Mountain Biking	Would like to see the Tsali trail system expanded.	Individual
Mountain Biking	We are in need of preserving the current mountain biking trails located near the Olympic White Water Center near the Ocoee river as well as adding new trails in this area.	Individual
Appreciation	And my all time favorite place to go to is Ocoee (and Chilhowee, to ride mountain bikes and to white water raft. These places are extremely well managed and maintained. What has been built there and the way the trails are maintained are nothing short of fantastic.	Individual
Appreciation	The mountain biking and tent camping opportunities around the mountain reservoirs are some of the best in the country and should be maintained as such.	Individual
Appreciation	Everywhere I have ridden my mtn. bike, the TVA officials are always friendly and helpful	Individual (3)
Mountain Biking	The lands protected by TVA are a wonderful opportunity to provide outdoor recreation of all types for the residents of this area. Mountain biking and hiking are two good examples of this type of development for the public.	Individual
Mountain Biking	Just the hope that you will continue to allow access to mountain bike trails	Individuals (4)
Mountain Biking	Mountain biking is a growing sport with very little impact on the natural terrain and the trails are maintained by SORBA and concerned cyclists.	Individual (2)
Building Trail Standards	All multiple use trails should be designed using strict guidelines to make them sustainable. Most public agencies don't follow these rules so they are not providing quality trails for users.	Individual (2)
Trail Construction and Management	The mountain biking community will build and maintain the trails and locate them in cooperation with TVA in a manner to minimize damage to the locale.	Individual

Apalachia Reservoir		
Recreation		
Trail Construction and Management	Land adjacent to Warriors Path Park could be used to expand bike trails already in the area. Cost/upkeep would be minimal.	Individual

Part II:

Public Comments Identified by Reservoir and Parcel

Chatuge Reservoir		
Parcel	**Suggested Land Use**	**Comment**
4	Zone 3-Sensitive Resource Management	The water quality of the lake is getting worse each year and larger amounts of land need to be set aside for nature with non-human disturbance. You don't want this lake to end up like the super polluted lakes in the Atlantic area.
6	Zone 3-Sensitive Resource Management	The water quality of the lake is getting worse each year and larger amounts of land need to be set aside for nature with non-human disturbance. You don't want this lake to end up like the super polluted lakes in the Atlantic area.
6	Zone 6-Recreation	This property is in close proximity to the existing Chatgue Shores Golf Course. It would be beneficial to zone this property as recreational so that it could one day be used to develop complementary services / offerings immediately adjacent to the golf course facilities.
10	Zone 3-Sensitive Resource Management	The water quality of the lake is getting worse each year and larger amounts of land need to be set aside for nature with non-human disturbance. You don't want this lake to end up like the super polluted lakes in the Atlantic area.
10	Zone 5-Industrial	for the purposes of accommodating manufacturing clients interested in the Clay-Towns Regional Industrial Park located nearby reserve access to the reservoir for the Clay-Towns County Industrial/Technology Park for companies requiring such access
13	Zone 6-Recreation, Campground Compliance Issues	TVA/Towns County health issues with environmental implications. Remove underground primitively installed septic at one campsite. Remove illegal permanent storage facilities, boat docks, Astroturf, along water and at campsites (lease violations). Stop clear cutting to provide view at new & existing campsites.
13	Zone 6-Recreation, Campground Compliance Issues	TVA/Towns County health issues with environmental implications. Re-establish lake vegetative buffers to prevent erosion and run-off into the lake.
13	Zone 6-Recreation, Campground Compliance Issues	Enforce removal of all boats from shoreline during winter (lease violations). a)Never agree to lease any parcel if lessee cannot and will not enforce lease specifications, and TVA seriously consider lease withdrawals for non-compliance over a number of years proven dereliction of duties. b) Never issue a lease without proof, maps and drawings, and agreement between TVA and Lessee of improvements. Old paper trail at Chatuge Woods is not documented as to improvements.
18	Zone 6-Fishing piers and picnic areas	This is a small parcel and is currently being used to fish off the shoreline and picnic. A fishing pier and additional picnic tables would be wonderful.

Chatuge Reservoir		
Parcel	**Suggested Land Use**	**Comment**
51 or 52	Zone 2-New substation	BRMEMC requests that two acres of land from 52 (or 51 as an alternate site) be made available for the construction of a new substation.
52	Zone 6 – Recreation	City of Hiwassee has made a formal request to use this parcel as a city park to be made available to the general public for public recreation, green way buffers and water access.
52	Zone 6 – recreation	GADNR commented parcel 52 should be a potential site to provide deepwater boat access. In addition, general comments regarding Blue Ridge, Chatuge and Nottely included improving public access, provide protection of riparian zones, & a recommendation that lands remain zoned as Natural Resource Conservation areas. GADNR also recommended a review of potential recreation uses on uncommitted lands be included in the EIS.
52 77 78	Zone 6 – Recreation	Towns County has made a formal request to use these parcels for recreational activities including fishing piers, boat ramps, beach and swimming areas, lakeside and interior camping areas, marina, bike and nature trails, ball fields, photography trails, etc.
73	Nature, art and natural history museum, fresh water aquarium and walking trails	We have a great number of migrating birds and we have no arts center or wildlife rescue center

Hiwassee Reservoir		
Parcel	**Suggested Land Use**	**Comment**
10	Zone 6-Recreation (Swimming Beach)	Lake access with swimming beach needed.
29	N/A	USFS land joining parcel 29 is actually DOT – it is now a flea market.
39	Zone 6-Recreation	Passive and active recreation including ball fields, gymnasium, trails, etc.
39	Zone 6-Recreation	Structured and non-structured recreation, baseball, trails, etc.
34, 54, 59	Zone 6-Recreation	Portion of this parcel be changed to recreation zoning to accommodate future recreation needs.
53, 57, 58	Zone 6-Recreation	Continued access for river walk & trailheads.

Blue Ridge		
3	Zone 4-Natural Resource Conservation	This currently only serves as a neglected roadside park. It should be protected.
15	Zone 4-Natural Resource Conservation	Preserve the natural areas and avoid further development which could adversely impact the environment and destroy the beautiful surroundings The current map shows the Blue Ridge Recreation Area as "recreation" however, the US Forest Service has completely decommissioned this recreation area and it is no longer open to the public. The map should either be changed to reflect this closing or this area should again be opened for much needed public use.
16	Zone 4-Natural Resource Conservation	Any changes might interfere with the existing boat ramp access and natural beauty.
23	Zone 4-Natural Resource Conservation	Area is already over-developed with homes from a subdivision Preserve the natural areas and avoid further development which could adversely impact the environment and destroy the beautiful surroundings
29	Zone 4-Natural Resource Conservation	Area is already over-developed with homes from a subdivision
30	Zone 4-Natural Resource Conservation	Preserve the natural areas and avoid further development which could adversely impact the environment and destroy the beautiful surroundings Any changes might interfere with the existing boat ramp access and natural beauty.
30	Zone 4-Natural Resource Conservation	Preserve the natural areas and avoid further development which could adversely impact the environment and destroy the beautiful surroundings

Nottely		
Parcel	**Suggested Land Use**	**Comment**
1	Zone 6-Recreation (Public)	Portion of Tract 1--Unspecified request for public recreation use.
4	Zone 6-Recreation (Expansion)	Poteete Park is too small to accommodate increasing population. Beach area is not satisfactory, needs more parking.
4	Zone 6-Recreation (Expansion)	Tract 4--Currently leased to Union County, but requesting longer lease for additional camping.
25	Change in Ownership	Tract 25--Similar to Tract 27.
27	Change in Ownership	Tract 27--Requesting USFS trade this to TVA and subsequently TVA give the property to the county.

Fontana		
Parcel	**Suggested Land Use**	**Comment**
General / Tanasi Area	Zone 4-Natural Resource Conservation (Informal Recreation)	Mountain bike and Horse riding

Ocoee Reservoirs 1, 2, and 3		
Parcel	**Suggested Land Use**	**Comment**
22	Zone 4- Natural Resource Conservation (Informal/Dispersed Recreation-Primitive Camping Areas)	There needs to be improved control of primitive camping. At present, primitive camping is permitted in all non designated areas. This has lead to degradation along many areas of highly visible shoreline. If primitive camping could be restricted to specified areas within some of the lakes' sloughs this could improve the scenic beauty and environmental impact of these activities.

Apalachia		
Parcel	**Suggested Land Use**	**Comment**
4, 5,6	Zone 4-Natural Resource Conservation (Informal Recreation)	Mountain Bike Trails

Part III:

Questionnaire Results

I. General Land Use

A total of 430 questionnaires were received both online and by mail. Some respondents provided information on just one reservoir while many provided information on more than one reservoir. Because information was provided on a range from one to all reservoirs the totals for the different columns vary based on the number of respondents providing information on each reservoir.

A. Reservoir Access

Fifty percent of the respondents who specified use of a particular reservoir indicated they access the reservoirs using areas managed by public agencies, such as TVA, USFS, the state, and the county.

Reservoir	I do not use this reservoir	Private Residential Access	Private/Commercial Areas (Marinas, Campgrounds, etc.)	Areas Managed by Public Agencies (TVA, USFS, State, County)	I do not know
Apalachia	150	2	19	135	17
Blue Ridge	112	2	27	165	7
Chatuge	151	14	21	114	20
Fontana	67	8	48	221	7
Hiwassee	86	8	39	193	13
Nottely	188	18	11	87	13
Ocoees	61	1	29	246	15
TOTAL	**815**	**83**	**194**	**1161**	**92**

B. Activity Frequency

The activities with the most frequent participation on the mountain reservoirs are mountain biking on dirt trails, sightseeing and viewing natural scenery, swimming in lakes and streams (including beach use), hiking on dirt trails, motorized boating, non-motorized/paddle-craft boating, biking on paved trails, and walking on paved trails. The second-highest ranking activities are developed camping, primitive camping, and bank fishing.

Activity	Never	1 Time	2 - 5 Times	6 - 10 Times	11 or More Times
Walking (paved trail)	96	47	89	31	51

Activity	Never	1 Time	2 - 5 Times	6 - 10 Times	11 or More Times
Hiking (dirt trail)	50	24	143	47	81
Birding	221	21	33	6	14
Sightseeing/Viewing Natural Scenery	43	19	108	54	96
Picnicking/Family Gathering	84	45	112	40	31
Boating (motorized)	168	23	29	19	75
Boating (non-motorized/paddle-craft)	118	38	70	32	58
Swimming in lakes & Streams/Beach Use	84	32	93	35	86
Bank Fishing	181	26	57	16	25
Developed Camping	133	43	98	17	20
Primitive Camping (undeveloped)	153	43	75	20	12
Bicycling (paved trails)	129	44	67	20	54
Mountain Biking (dirt trails)	67	7	61	51	199
Hunting	262	6	12	6	5
Horseback Riding	272	9	8	0	4
Other					
Off-Roading	0	0	0	1	1
Scuba Diving	0	0	1	0	0
Rock Climbing	0	0	0	0	1
Disc Golf	0	0	0	0	1
Geocaching	0	0	1	0	0

C. Allocation of Public Land

A large number of respondents indicated a preference for more land being allocated to the following uses: mountain bike trails (80%), preserve natural areas/open space (65%), dirt hiking trails (51%), greenways and paved trails (45%), forest management and habitat improvement (43%), stream and river access sites (35%), wildlife observation and photography areas (33%), water trails (31%), undeveloped or primitive camping areas (31%), recreation day-use areas (27%), and museum and nature centers (26%). A large number of respondents indicated that there is currently too much land devoted to industry and light manufacturing (49%).

Land Use	Too Much Land	About Right Amount	Need More Land	No Opinion
Industry/light manufacturing	206	97	7	59
Preserve natural areas/open space	4	113	247	15
Forest management/habitat	8	154	182	24

Land Use	Too Much Land	About Right Amount	Need More Land	No Opinion
improvement				
Wildlife observation/photography areas	0	178	141	53
Horseback riding trails	62	163	42	98
Mountain bike trails	12	47	324	22
Hiking trails (dirt)	2	132	228	23
Greenways and paved trails	24	128	191	33
Stream/river access sites	6	184	146	41
Water trails	0	145	132	87
Hunting areas	79	145	33	110
Fishing berms or piers	22	177	48	117
Undeveloped or primitive camping areas	15	164	132	54
Recreation day-use areas (swimming areas, picnic areas)	14	203	113	42
Year-round boat ramps	17	217	49	83
Developed campgrounds	25	194	94	54
Commercial marinas	78	184	15	79
Overnight lodging (cabins, cottages, resort lodges)	43	189	83	56
Museums/nature centers	15	173	108	70
Visitor centers/overlooks	10	217	84	53
Other (please specify)				
Off-Road Trails	1		2	
Ball fields			1	
Rockclimbing			1	
Disc Golf			1	

II. Reservoir & Facility Specific Information

CHATUGE RESERVOIR

The suggestions for Chatuge include more short-term sites at Clay County Park, Gibson Cove, and Chatuge Woods campgrounds; a better take-out at the Hiwassee River Access; clean-up at Chatuge Woods; better management at Towns County Campground; more mountain bike trails; and the addition of a skeet/target shooting range.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	13	1	3	6

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Trails	5	3	9	6
Swimming beach	13	2	2	6
RV camping (in campground)	8	2	1	12
Tent camping	9	3	2	9
Marina facilities	16	1	0	6
Stream/river access	9	4	2	8
Fishing berms or piers	10	3	3	7
Boat ramps	17	1	1	4
Other (please specify)				
Ball fields	0	0	1	0

Facility Type	Name/Location	Parcel	Suggested Improvements
Campground	Clay County Park	5	More short-term sites
Hiwassee River Access/Kayak take-out	Shallowford Bridge River Access		Need better take-out. Current take-out is dangerous.
Campground	Chatuge Woods Campground	13	Needs to be cleaned up
Public campground	Clay County Park and Gibson Cove	5	More turnover of campsites
Campground	Chatuge Woods Campground	13	Remove primitively installed septic, reduce number of campsites
Towns County Campground			Better management by users—trash and unsightly camping facilities, no disturbance of 25' buffer
Campground	Chatuge Woods Campground		

Activity	Facility or Amenity Needed
better fishing and boating environment	more and better water hazard markings
mountain bike trails	more trails
biking/ general use trails	more trails
skeet shooting/target shooting	skeet shooting/target shooting range
jet ski use	restrict activity

HIWASSEE RESERVOIR

The suggestions for Hiwassee include lake access with a swimming beach, fishing piers, overlooks, walking trails, interpretive areas, pavilions, disc golf, and mountain bike trails. Off-road trails were suggested as a needed amenity.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	18	3	2	1
Trails	6	1	18	0
Swimming beach	14	3	3	4
RV camping (in campground)	5	3	1	15
Tent camping	11	3	6	6
Marina facilities	9	3	1	11
Stream/river access	11	6	4	3
Fishing berms or piers	7	3	3	11
Boat ramps	9	5	2	8
Other (please specify)				
Off-road	0	0	1	0

Facility Type	Name/Location	Parcel	Suggested Improvements
Swimming beach		10	Lake access with swimming beach
	Hiwassee river put-ins and takeouts		more parking, better restrooms
Fishing		20, 27	Add fishing pier or overlook area
9 ft trail		43	walk up Hiwassee river to depot in Murphy
Completion of river walk			walking trails

Activity	Facility or Amenity Needed
off-road trails	Trails
mountain biking	series of short mountain bike trails
frisbee golf	frisbee golf course
mountain biking	
scenic overlook, interpretive areas, overlook pavilion/bridge	
walking or hiking	riverwalk continuation

BLUE RIDGE RESERVOIR

The suggested improvements and facilities or amenities needed on Blue Ridge include more single track trails for mountain biking, resort lodge and restaurants, and overall public access with more swimming areas, hiking, trails, picnic areas, fishing piers and camping. Improvements and facilities or amenities needed include better beaches, more covered picnic areas, a playground, and refurbishing and extending the boat ramp at Morganton Point and tent camping at Charlie's Creek.

Mountain Reservoirs Land Management Plan
Summary of Public Participation

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	18	1	7	13
Trails	14	5	17	5
Swimming beach	19	3	5	10
RV camping (in campground)	7	1	3	24
Tent camping	15	1	6	16
Marina facilities	19	1	6	10
Stream/river access	26	1	5	7
Fishing berms or piers	14	4	1	17
Boat ramps	20	1	6	10
Other (please specify)				

Facility Type	Name/Location	Parcel	Suggested Improvements
Fishing berms or piers	None exist		Need some
Marina	Blue Ridge Marina		Additional rock
all	any		More mountain bike trails
Swimming beach	Morganton Point		Better beach, more and better covered picnic areas (groups and individual), playground
Tent camping			Add tent camping at Charlie's Creek
Swimming, boat launch, beach, picnic, day use facilities	Blue Ridge		
Boat launch ramp	Morganton Point	37	Refurbish and extend boat ramp

Activity	Facility or Amenity Needed
mountain biking/hiking/horse trails	more trails
mountain biking	single track mountain bike trails
biking	paved trails
lodging and eating	resort lodge and restaurants
flatwater kayaking, non-motorized boating	personal watercraft banned
mountain biking	more trails
mountain bike trails, multi-use trails	
restocking fish	restocking fish

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Activity	Facility or Amenity Needed
public day use and camping	overall public access, swimming areas, hiking trails, picnic areas, fishing pier, camping, RV camping
sand beach at Morgantan	

NOTTELY RESERVOIR

The suggestions for Nottely include additional garbage cans for secondary trails, pavilions, swimming beaches, parking, dirt hiking trails, trail heads with bathrooms, hiking trails and mountain biking trails.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	15	0	3	1
Trails	7	3	7	1
Swimming beach	5	1	4	7
RV camping (in campground)	5	0	3	11
Tent camping	6	0	2	11
Marina facilities	12	0	2	5
Stream/river access	13	1	2	3
Fishing berms or piers	10	0	3	6
Boat ramps	13	2	1	3
Other (please specify)				

Facility Type	Name/Location	Parcel	Suggested Improvements
Nottely river below dam			Add garbage cans to secondary trails, manage river better for trout or small-mouth bass
Recreation area	Poteete Creek	4	Additional pavilions, better swimming beaches, more parking
Recreation area	Poteete Creek	4	Additional pavilions, better swimming beaches, more parking
Recreation area	Poteete Creek	4	Dirt hiking trails need improvement

Activity	Facility or Amenity Needed
bike trails	trail heads with bathrooms
hiking trails	hiking trails
trout or smallmouth bass fishing, mountain biking/hiking exclusive trails (without ATV/ORV access)	area similar to Tsali or Tanasi mountain biking

FONTANA RESERVOIR

The suggestions for Fontana include more mountain bike trails, hiking trails, picnic areas with tables and grills, beach area for swimming, wildlife observation area, tent camping, bike wash station, water slide and trampoline, disc golf and private docks. Respondents also indicated a need for additional swimming beaches, tent camping, stream and river access and fishing berms or piers. Improvements and facilities or amenities needed include more trails with no horseback riding, campground dump station, better maintenance and restoration of the second set of bathrooms and showers at Tsali as well as a year-round floating dock at the Lemon Grass Tsali boat ramp. Many of these comments were directed at public land managed by the U.S. Forest Service, such as the Tsali Mountain Bike Trails.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	44	11	6	11
Trails	19	10	48	0
Swimming beach	31	6	14	24
RV camping (in campground)	14	4	3	51
Tent camping	33	12	16	13
Marina facilities	30	2	1	40
Stream/river access	43	9	10	12
Fishing berms or piers	22	3	9	40
Boat ramps	29	3	6	35
Other (please specify)				
Disc Golf	0	0	1	0

Facility Type	Name/Location	Parcel	Suggested Improvements
Boat dock	Prince @ Panther Creek		Control houseboats
Marina	Greasy Branch		Additional dock spaces for fueling, etc.
Mountain bike trails	Tsali		Need more miles for the number of people.
Bike trails	Fontana/Tsali		Restore 2nd set of bathrooms/showers
Trails	Fontana/Ocoee		More mountain bike trails
Mountain bike trails	Tsali		More mountain bike trails
Mountain bike trails	Fontana		More trails
Trails	Tsali Mountain Biking Trails		Trails should be extended
Mountain bike trails	Fontana		Bike trails for beginners

Facility Type	Name/Location	Parcel	Suggested Improvements
Power plant	Fontana		More picnic areas with tables and grills, beach area for swimming, wildlife observation area
Lemon Grass Tsali boat ramp			Need floating dock year round to get boats in and out of water
Tsali trails	Fontana		Additional trails, no horseback riding
Multi-use trails	wherever available		Expand trail network system available for hiking and biking
Campground and mountain bike trails	Tsali		Campground needs dump station, trail maintenance
Mountain biking, horeseback riding	Tsali		New trails
Boat launch	Lemmon's Branch		Ramp needs to be extended
Mountain Biking Trails	Tsali		Reroute trails so they don't hold water, at least one mountain bike only trail

Activity	Facility or Amenity Needed
non-motorized boating	powerboat exclusion zones
mountain bike trails	maintenance, new bike trails
mountain bike trails	more mountain bike trails and bike greenways
mountain biking	more trails
more access for private owners	private docks
public toilets	floating toilets in select locations for kayakers/boaters
tent camping	40 sites with 2 showers and 2 toilets
more access to mountain bike trails	additional campsites
	biking trails
more mountain biking	mountain bike trails
mountain biking	trails on north side of Fontana dam open to mountain biking
mountain biking	more mountain bike trails
bike wash	bike wash at trail head
tour power plant again	
sand beach for swimming	water slide and water trampolines at beach
mountain biking	
disc golf	disc baskets and tee pads

OCOEE RESERVOIRS 1, 2, AND 3

The suggestions for the Ocoees include mountain bike trails; partnership opportunities for trail building; primitive campgrounds; bike wash stations; restrooms and campgrounds with parking, boat piers, garbage cans, restrooms and specified tent areas. The respondents also indicated a need for RV camping, tent camping, and stream and river access. Improvements and facilities or amenities needed include more

picnic areas at the Whitewater Center, additional mountain bike trails, a restroom for rafters and kayakers at Goforth Creek and off-road Trails. Many of these comments were directed at public land managed by the U.S. Forest Service.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	87	8	5	15
Trails	38	11	68	1
Swimming beach	65	6	6	34
RV camping (in campground)	24	1	14	72
Tent camping	55	9	36	13
Marina facilities	32	3	2	69
Stream/river access	68	10	19	13
Fishing berms or piers	39	3	7	57
Boat ramps	43	3	4	59
Other (please specify)				
Off-Road Trails	0	0	1	0

Facility Type	Name/Location	Parcel	Suggested Improvements
Mountain bike trails	Throughout Ocoees		More trails
Mountain bike trails	Ocoee		More trails
Campground	Thunderrock		More sites
Trails, Stream/River Access, Tent Camping	Ocoee 2 and 3	Tiles A3, A4, B4, & B5	Need more trails, campsites and access for nonmotorized recreation
Picnicking	Whitewater Center/Hwy 64 area		Need more picnic areas
Ocoee	Aska Road Trails		Additional mountain bike trails.
Mountain bike trails			New trail systems on new parcels, primitive camping, bike wash stations
Trails	Ocoee		More trails
Marina	Ocoee Inn and Marina	Ocoee 1 A1:4	Marina is too big for the lake
Stream/river access	Commercial takeout / private takout at Ocoees		Additional restrooms
Restroom and parking	Goforth Creek		Needs restroom for rafters and kayakers

Activity	Facility or Amenity Needed
mountain bike trails	more access to mountain bike trails

Activity	Facility or Amenity Needed
mountain biking	beginner mountain bike trail
allow clubs to add trails for public use	
allow clubs to add trails for public use	
allow clubs to add trails for public use	
mountain biking	more trails
off-road trails	Trails
boatable flows at higher water levels	more water
camping	designated campgrounds that have parking, boat piers, garbage cans, restrooms, specified tent areas
paved trails or paths for bikes along road	
mountain biking	
more trails for mountain bikers	

APALACHIA RESERVOIR

There were few suggestions for Appalachia. There was one suggestion for trail and boat ramp improvement, one suggestion each for a new trail and an RV Campground, and suggestions to accommodate road cycling and mountain biking.

Facility Type	Meeting my needs	Facility needs improvement	Additional facility needed	Do not use facility
Picnic facilities	8	0	0	0
Trails	5	1	1	1
Swimming beach	6	0	0	2
RV camping (in campground)	1	0	1	6
Tent camping	6	0	0	2
Marina facilities	1	0	0	7
Stream/river access	6	0	1	1
Fishing berms or piers	2	0	0	6
Boat ramps	5	1	0	3
Other (please specify)				

Activity	Facility or Amenity Needed
road cycling	wider roads or bike lanes for road cycling
mountain biking	

OTHER/RACCOON MOUNTAIN

The following comments are beyond the geographic scope of the nine mountain reservoirs.

Facility Type	Name/Location	Parcel	Suggested Improvements
Primitive or developed camping	Raccoon Mountain Reservation		Convert Laurel Point to camping facilities
Mountain bike trails	Raccoon Mountain Reservation		More trails

What is your vision for TVA-Managed Public Lands on the Mountain Reservoirs?

Your opinions on how TVA manages your public lands are important to us. Please take a few minutes to complete this questionnaire and return it by June 30, 2007. If you prefer to complete the questionnaire online, it is available on TVA's website at http://www.tva.gov/environment/reports/mtnres/. Your input is a valuable part of the planning process. Thank you for your comments.

TVA is developing a Land Management Plan to guide land use and resource management decisions concerning TVA-managed public lands located along nine TVA mountain reservoirs: Apalachia, Blue Ridge, Chatuge, Fontana, Hiwassee, Nottely and Ocoee 1 (Parksville), Ocoee 2 and Ocoee 3. The Plan will identify the most suitable and appropriate use for each parcel of TVA-managed public land along these reservoirs for the next ten years.

Uncommitted Land: Blue Ridge, Chatuge, Hiwassee & Nottely
Four of the mountain reservoirs have parcels of TVA-managed public land that are not committed to a long-term use (uncommitted land). TVA invites input on how this land should be managed to achieve an appropriate mix of recreation, conservation, and industry objectives that produce multiple public benefits.

Committed Land: Apalachia, Fontana & Ocoees (1, 2 & 3)
All of the TVA-managed public land on these five reservoirs is committed to a long-term use (committed land), because it is 1) managed under existing agreements, 2) shoreline fronting U. S. Forest Service Property or 3) dam reservation property. While the use on committed land will not change, TVA welcomes input such as improvements compatible with the existing use to better accomodate public needs. Please note that Ocoee 1, Ocoee 2 and Ocoee 3 include Parksville and Ocoee River areas and will be referred to as the Ocoees.

Part I-General Questions

1. What is the Zip Code of your primary residence? _____ (Zip Code)

   If you have a second home, please also give the Zip Code of your second residence. _____ (Zip Code)

2. What is the primary way you gain access to each reservoir? (Check only one for each reservoir ☑)

Reservoir	I do not use this reservoir	Private Residential Access	Private/Commercial Areas (Marinas, Campgrounds, etc.)	Areas Managed by Public Agencies (TVA, USFS, State, County)	I do not know
Apalachia	☐	☐	☐	☐	☐
Blue Ridge	☐	☐	☐	☐	☐
Chatuge	☐	☐	☐	☐	☐
Fontana	☐	☐	☐	☐	☐
Hiwassee	☐	☐	☐	☐	☐
Nottely	☐	☐	☐	☐	☐
Ocoees	☐	☐	☐	☐	☐

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3. In the past 12 months, please indicate how frequently you participate in the following activities on or near the mountain reservoirs: (Check only one for each activity ☑)

Activity	Never	1 Time	2 - 5 Times	6 - 10 Times	11 or More Times
Walking (paved trail)	☐	☐	☐	☐	☐
Hiking (dirt trail)	☐	☐	☐	☐	☐
Birding	☐	☐	☐	☐	☐
Sightseeing/Viewing natural scenery	☐	☐	☐	☐	☐
Picnicking/Family Gathering	☐	☐	☐	☐	☐
Boating (motorized)	☐	☐	☐	☐	☐
Boating (non-motorized/paddle-craft)	☐	☐	☐	☐	☐
Swimming in lakes & streams/beach use	☐	☐	☐	☐	☐
Bank fishing	☐	☐	☐	☐	☐
Developed Camping	☐	☐	☐	☐	☐
Primitive Camping (undeveloped)	☐	☐	☐	☐	☐
Bicycling (paved trails)	☐	☐	☐	☐	☐
Mountain Biking (dirt trails)	☐	☐	☐	☐	☐
Hunting	☐	☐	☐	☐	☐
Horseback riding	☐	☐	☐	☐	☐
Other (please specify)_____	☐	☐	☐	☐	☐

4. TVA is interested in you preference concerning the allocation of public land for specific uses. How do you feel about the amount of public land devoted to these uses? (Check only one for each activity ☑)

Land Use	Too Much Land	About Right Amount	Need More Land	No Opinion
Industry/light manufacturing	☐	☐	☐	☐
Preserve natural areas/open space	☐	☐	☐	☐
Forest management/habitat improvement	☐	☐	☐	☐
Wildlife observation/photography areas	☐	☐	☐	☐
Horseback riding trails	☐	☐	☐	☐
Mountain bike trails	☐	☐	☐	☐
Hiking trails (dirt)	☐	☐	☐	☐
Greenways and paved trails	☐	☐	☐	☐
Stream/river access sites	☐	☐	☐	☐
Water trails	☐	☐	☐	☐
Hunting areas	☐	☐	☐	☐
Fishing berms or piers	☐	☐	☐	☐
Undeveloped or primitive camping areas	☐	☐	☐	☐
Recreation day-use areas (swimming areas, picnic areas)	☐	☐	☐	☐
Year-round boat ramps	☐	☐	☐	☐
Developed campgrounds	☐	☐	☐	☐
Commercial marinas	☐	☐	☐	☐
Overnight lodging (cabins, cottages, resort lodges)	☐	☐	☐	☐
Museums/nature centers	☐	☐	☐	☐
Visitor centers/overlooks	☐	☐	☐	☐
Other (please specify)_____	☐	☐	☐	☐

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Part II. Reservoir Specific Questions

For Questions 5-9, please select one mountain reservoir for which you will focus your answers. You may complete additional Part II sheet(s) if you would like to comment on other reservoir(s). If you do not wish to provide input on a specific reservoir you may skip to Part III, questions 10 & 11.

5. Please indicate below which reservoir you are providing information on: (Circle only one reservoir)

Apalachia Blue Ridge Chatuge Fontana Hiwassee Nottely Ocoees

6. If answering for Blue Ridge, Chatuge, Hiwassee or Nottely Reservoirs, refer to the maps provided to see the current uses of uncommitted lands. Are there any parcels that should be changed to a different use? (Uncommitted parcels are crosshatched on the maps)

(Check one) ____ Yes _____ No _____ No opinion

If yes, please indicate the uncommitted parcel number and your desired land use
(you may refer back to question 4 for a list of land uses that may occur on TVA-managed public land)

Parcel No.	Desired Land Use	Why?
		_____
		_____
		_____

7. Below is a list of developed recreation facilities available on both TVA-managed and other public lands. Please rank the facilities on this reservoir according to your needs. (Check only one for each facility type ☑)

Facility Type	Meeting my needs	Facility needs improvements	Additional facility(s) needed	Do not use facility
Picnic facilities	☐	☐	☐	☐
Trails	☐	☐	☐	☐
Swimming beach	☐	☐	☐	☐
RV camping (in a campground)	☐	☐	☐	☐
Tent camping	☐	☐	☐	☐
Marina facilities	☐	☐	☐	☐
Stream/river access	☐	☐	☐	☐
Fishing berms or piers	☐	☐	☐	☐
Boat ramps	☐	☐	☐	☐
Other (please specify) _____	☐	☐	☐	☐

8. If you feel that a particular facility needs improvements please indicate below the location and improvement needed. Please use the maps provided to indicate a specific parcel number, if a name is not known.

Facility Type	Name/Location (if Known)	Parcel No. (if known)	Suggested Improvement(s)

9. Are there other activities you would like to see on this reservoir, but the facility or amenities are not available?

Yes_____ No _____

What activity? _____

What facility or amenity is needed?_____

Part III. Open-ended questions

10. Please list any environmental issues regarding the management of lands on the mountain reservoirs (be reservoir specific, if possible) that should be addressed during this planning process.

_____

_____

_____

_____

_____

_____

11. Do you have any other comments concerning TVA-managed public land on the mountain reservoirs?

_____

_____

_____

_____

_____

_____

THANK YOU FOR TAKING THE TIME TO PROVIDE TVA WITH YOUR VISION FOR THE MOUNTAIN RESERVOIRS!

Please return this form to the following address:

TENNESSEE VALLEY AUTHORITY
MOUNTAIN RESERVOIRS LAND MANAGEMENT PLAN
NEPA SERVICES, WT 11D
400 W SUMMIT HILL DR
KNOXVILLE TN 37902-1401
FAX (865) 632-3451

Return by **June 30, 2007** to have your comments included.

If you would like your name to be added either to the TVA mailing list or TVA e-mailing list to receive more information about the Mountain Reservoirs Land Management Plan please fill in your name and address or e-mail address below.

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

E-MAIL: _____

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Appendix C – Mountain Bike Trails Inventory in Mountain Reservoirs Region

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Trail	National Forest	City/State	Trail Miles
Bear Paw Trail	Cherokee	Ducktown, Tenn.	1.9
Boyd Gap Trail	Cherokee	Ducktown, Tenn.	8.4
Chilhowee	Cherokee	Benton, Tenn.	4
Citco Creek	Cherokee	Tellico Plains, Tenn.	22.6
Clemmer/Clear Creek	Cherokee	Ocoee, Tenn.	11.4
Conasauga River	Cherokee	Ocoee, Tenn.	6.4
Double Camp	Cherokee	Tellico Plains, Tenn.	18.3
Indian Boundary	Cherokee	Tellico Plains, Tenn.	3.2
Mulepen Gap Trail	Cherokee	Benton, Tenn.	9.3
Naked Widow Trail	Cherokee	Benton, Tenn.	4
North River Trail	Cherokee	Tellico Plains, Tenn.	18.7
Old Copper Road	Cherokee	Copperhill, Tenn.	5.2
Oswald Dome	Cherokee	Benton, Tenn.	16.4
Quartz Loop Trail	Cherokee	Ducktown, Tenn.	8
Rim Trail	Cherokee	Benton, Tenn.	6
River View Trail	Cherokee	Ducktown, Tenn.	7.4
Slick Rock Trail	Cherokee	Benton, Tenn.	6.4
Sylco Creek	Cherokee	Ocoee, Tenn.	16.5
Thunder Rock Express	Cherokee	Ducktown, Tenn.	11.7
Upper Tellico Trail	Cherokee	Tellico Plains, Tenn.	31.8
West Fork Trail	Cherokee	Ducktown, Tenn.	11.5
Whigg Meadow Trail	Cherokee	Tellico Plains, Tenn.	9
Amicalola Falls	Chattahoochee	Ellijay, Ga.	15.8
Black Branch	Chattahoochee	Dahlonega, Ga.	12.4
Black Branch Loop	Chattahoochee	Dahlonega, Ga.	5.5
Bull Mountain	Chattahoochee	Dahlonega, Ga.	11.5
Bull Mountain Loop	Chattahoochee	Dahlonega, Ga.	14.5
Bull/Jake Combo	Chattahoochee	Dahlonega, Ga.	25.6
Canada Creek	Chattahoochee	Dahlonega, Ga.	14.8
Cooper Creek	Chattahoochee	Suches, Ga.	12.4
Duncan Ridge	Chattahoochee	Suches, Ga.	20.5
Jake Mountain	Chattahoochee	Dahlonega, Ga.	7.6
Jones Creek	Chattahoochee	Dahlonega, Ga.	8.5
Jones Creek Ridge Trail	Chattahoochee	Dahlonega, Ga.	3.3
Little Sal Mountain Loop	Chattahoochee	Dahlonega, Ga.	9
Montgomery Creek Loop	Chattahoochee	Dahlonega, Ga.	8.5
Moss Creek	Chattahoochee	Dahlonega, Ga.	11.3
No-Tell Loop	Chattahoochee	Dahlonega, Ga.	2.9
Short Bull	Chattahoochee	Dahlonega, Ga.	4.6
Sosebee Cove	Chattahoochee	Suches, Ga.	7.8
Turner Creek	Chattahoochee	Dahlonega, Ga.	5.3
Flat Creek	Chattahoochee	Blue Ridge, Ga.	5.6
Flat Creek Loop	Chattahoochee	Blue Ridge, Ga.	5.9
Green Mountain	Chattahoochee	Blue Ridge, Ga.	7.5
Green Mountain Trail	Chattahoochee	Blue Ridge, Ga.	7.7
Hickey Knob	Chattahoochee	Blue Ridge, Ga.	4.6
Long Branch	Chattahoochee	Blue Ridge, Ga.	2.2
Long Branch Loop	Chattahoochee	Blue Ridge, Ga.	2.3
Noontootla	Chattahoochee	Ellijay, Ga.	26.2
Red & White Loop	Chattahoochee	Ellijay, Ga.	2.6
Rich Mountain WMA	Chattahoochee	Ellijay, Ga.	6

Trail	National Forest	City/State	Trail Miles
Ridgeway	Chattahoochee	Ellijay, Ga.	6
Ridgeway Bike Trail	Chattahoochee	Ellijay, Ga.	5.6
River Loop	Chattahoochee	Ellijay, Ga.	3.9
River Loop	Chattahoochee	Ellijay, Ga.	6.3
South Fork	Chattahoochee	Blue Ridge, Ga.	8.1
Stanley Creek Loop	Chattahoochee	Blue Ridge, Ga.	2.8
Stanley Gap	Chattahoochee	Blue Ridge, Ga.	12.5
Stanley Gap Trail	Chattahoochee	Blue Ridge, Ga.	5
Turkey Farm Loop	Chattahoochee	Blue Ridge, Ga.	4.7
Big Witch	Nantahala	Cherokee, N.C.	21.8
Calfpen Gap	Nantahala	Wesser, N.C.	13
Cheoah Bald	Nantahala	Topton, N.C.	13
Elmer Hollow	Nantahala	Tuskegee, N.C.	3.8
Flint Ridge	Nantahala	Almond, N.C.	5
Fontana – Hoor Hollow	Nantahala	Dillsboro, N.C.	3.6
Fontana – Night Train Loop	Nantahala	Dillsboro, N.C.	12.1
Fontana Village	Nantahala	Murphy, N.C.	5.2
Hanging Dog Trail	Nantahala	Murphy, N.C.	4
Heintooga	Nantahala	Cherokee, N.C.	46.5
Horse Branch	Nantahala	Almond, N.C.	12.8
Knobscorcher	Nantahala	Nantahala Village, N.C.	4
Left Loop	Nantahala	Wesser, N.C.	12
Lemmons Branch	Nantahala	Wesser, N.C.	5
Meetinghouse	Nantahala	Wesser, N.C.	16
Mile High	Nantahala	Maggie Valley, N.C.	14.5
Moses Creek	Nantahala	Cullowhee, N.C.	26.1
Mouse Branch	Nantahala	Wesser, N.C.	7
Nantahala Village	Nantahala	Almond, N.C.	5.5
Old River Road	Nantahala	Topton, N.C.	11
Right Loop	Nantahala	Wesser, N.C.	11
Shell Stand Creek	Nantahala	Wesser, N.C.	16
Stecoah Gap	Nantahala	Wesser, N.C.	8
Swinging Bridge	Nantahala	Almond, N.C.	11.6
Thompson Loop	Nantahala	Wesser, N.C.	7.5
Tsali – Left Loop	Nantahala	Dillsboro, N.C.	12.2
Tsali – Mouse Branch Loop	Nantahala	Dillsboro, N.C.	9.1
Tsali – Right Loop	Nantahala	Dillsboro, N.C.	12.6
Tsali – Thompson Loop	Nantahala	Dillsboro, N.C.	7.6
Turkey Chute	Nantahala	Tuskegee, N.C.	3.8
Wauchecha Bald	Nantahala	Wesser, N.C.	7.5
Wayehutta	Nantahala	Cullowhee, N.C.	8.5
Winding Stairs	Nantahala	Topton, N.C.	13.7
Wolfpen Gap	Nantahala	Cullowhee, N.C.	6

Note: All inventory information was obtained from www.trails.com

Appendix D – Suitability/Capability Analyses

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Zone 4 – Natural Resource Conservation							
Zone 4 Activity	**Size of Land Base**	**Access**	**Ecological Diversity**	**Habitat Management**	**Forestation**	**Avg. Slope**	**Compatibility With Sensitive Features or Existing Natural Resource Management Practices**
Informal/ Dispersed Camping	H = >20 acres M = 10-20 acres L= <10 acres	H = Good road access or good boat access on most of parcel M = Road Access or boat access on <50% of parcel L = No road or boat access	N/A	N/A	H = >50% cover M = 25-50% cover L = <25% cover	H = Slope of <5% on >25% of parcel M = Slope of <5% on <25% of parcel L = No area with <5% slope	H = No potential to impact sensitive species or current management M = Some potential to impact sensitive species or management L = Will impact sensitive species or management
Hunting	H = >40 acres M = 20-40 acres L = <20 acres	H = Good road access or good boat access on most of parcel M = Road access or boat access on <50% of parcel L = No road or boat access	N/A	H = Easily managed (for target game animal habitat) M = Could be managed L = Difficult to manage	N/A (species specific)	N/A	H = No potential to impact sensitive species or current management M = Some potential to impact sensitive species or management L = Will impact sensitive species or management
Informal Bank Fishing (no structure)	N/A	H = Existing road and parking adjacent to shoreline M = Road within overland access possible L = No overland public access	N/A	H = Easily managed (for target game animal habitat) M = Could be managed L = Difficult to manage	N/A	H = Slope of <5% on >25% of parcel M = Slope of <5% on <25% of parcel L = No area with <5% slope	N/A
Informal Trails	H = >40 acres M = 20-40 acres L = <20 acres	H = Road to site and parking possible M = Road within 0.5 mile with possible parking L = Road >0.5 mile away and no parking	N/A	N/A	H = >50% cover M = 25-50% cover L = <25% cover	H = General slope conducive to trails on >50% M = General slope conducive to trails on 25-50% of parcel L = General slope conducive to trails on <25% of parcel	H = No potential to impact sensitive species or current management M = Some potential to impact sensitive species or management L = Will impact sensitive species or management

Zone 4 – Natural Resource Conservation							
Zone 4 Activity	**Size of Land Base**	**Access**	**Ecological Diversity**	**Habitat Management**	**Forestation**	**Avg. Slope**	**Compatibility With Sensitive Features or Existing Natural Resource Management Practices**
General dispersed use (i.e., bird watching, geo-cacheing, photograph wildlife)	H = >20 acres M = 10-20 acres L = <10 acres	H = Road to site and parking possible M = Road within 0.5 mile with parking possible L = Road >0.5 mile away and/or no parking	N/A	N/A	N/A	N/A	H = No potential to impact sensitive species or current management M = Some potential to impact sensitive species or management L = Will impact sensitive species or management
Management for diversity of ecological communities, and/or a variety of successional stages	H = >100 acres - not in linear strips M = 50-100 acres - not in linear strips L = <50 acres	H = Existing road network M = Overland access possible L = No overland public access	H = >5 Ecological communities or successional stages M = 3-5 Ecological communities or successional stages L = 1-3 Ecological communities or successional stages	H = Easily managed M = Could be managed L = Difficult to manage	N/A	N/A	N/A

H = High
M = Medium
L = Low
N/A = Not applicable

Zone 5 - Industry																
Type	Rating	Land Base	Industry Requiring Water Access	Topography	Flood Plain	Miles to Major State Highway	Available Utilities	Road Access	Land Condition	Water Supply	Waste Water Management	Storm Water Management	Air Quality	Energy-Electric Distribution	Financial Benefits	Alignment with Existing Reservoir Land Zone
Business Parks, Light Manufacturing, Industrial Access, Barge Terminal, Minor Landings	High	>10 ac.	Yes	1-15%	Majority above	<5	All	Road within 1/2 mi. of site	Brownfield/previous site alteration and/or development	Municipal capacity and distribution line directly adjacent	Municipal assimilative capacity available with adjacent trunk lines	Full range of BMP applicable to reach non-degradation	Attainment area	Municipal capacity available distribution line within 1 mi.	>$25 million to regional economy >$100 million to tax base	Yes
	Low	<10 ac.	No	>15%	Majority below	>5	None	Road >1/2 mi. of site	Wooded/ no previous site disturbance	No public water supply available; distribution line available more than 5 mi. away	Municipal assimilative capacity not available with no adjacent trunk lines	Infiltration BMPs not available	Non-attainent	New substation required; lines available > 5 mi. away	<$5 million to local economy <$25 million to tax base	No

ED Approved Definitions

Business Parks - TVA waterfront land which would support businesses and light manufacturing activities.

Business parks should not include retail, service bases businesses lake laundry, fast food, grocery stores, gas stations, daycares, or any walk-in type businesses.

Industrial Access - Access t the waterfront by back-lying property owners across TVA property for water intakes, wastewater discharge, or conveyance of commodities (i.e., pipelines, rail, or road).

Barge terminals are associated with industrial access corridors.

Barge Terminal Sites - Public or private facilities used for the transfer, loading, and unloading of commodities between barges and trucks, trains, storage areas, or industrial plants

Fleeting Areas - Sites used by the towing industry to switch barges between tots or barge terminals which have both offshore and onshore facilities

Minor Commercial Landing - A temporary or intermittent activity that takes place without permanent improvements to the property. These sites can be used for transferring pulpwood, sand, gravel, and other natural resource commodities between barges and trucks.

Zone 6 - Developed Recreation								
Zone 6	**Land Base**	**Forestation**	**Shoreline**	**Harbor Area**	**Reservoir Drawdown**	**Location**	**Road Access**	**Outside Interest**
Public Parks (Local, state, or federal Parks)	H >20 acs.; 1-10% slope M 10-20 acs.; 10-15% slope L <5acs.; >15% slope	H >50% cover M 25-50% cover L <25% cover	H <15% slope underwater; no water hazards M 15-20% slope underwater; correctable hazards L >20% slope underwater; prohibitive hazards	N/A	H minimal visual aesthetic impact M moderate visual aesthetic impact L major visual aesthetic impact	H Major area of need M may be needed L duplicates or is questionable	H road to the site M road within 1/2 mile L road >1/2 mile away	H Use requested M Potential exists L Unlikely
Commercial (Campgrounds, marinas, and resorts)	H >20 acs.; 1-10% slope M 10-20 acs.; 10-15% slope L <5acs.; >15% slope	H <25% cover M 25-50% cover L >50% cover	H <15% slope underwater; no water hazards M 15-20% slope underwater; correctable hazards L >20% slope underwater; prohibitive hazards	H >10 acs.; wind-protected M 5-10 acs.; partial protection L <5 acs.; no natural protection	H minimal visual aesthetic impact M moderate visual aesthetic impact L major visual aesthetic impact	H Major area of need M may be needed L duplicates or is questionable	H road to the site M road within 1/2 mile L road >1/2 mile away	H Use requested M Potential exists L Unlikely
Water Access (Lake or river access sites)	H >3 acs. M 1-3 acs. L <1 ac.	N/A	H <15% slope underwater; no water hazards M 15-20% slope underwater; correctable hazards L >20% slope underwater; prohibitive hazards	N/A	N/A	H Major area of need M may be needed L duplicates or is questionable	H road to the site M road within 1/2 mile L road >1/2 mile away	H Use requested M Potential exists L Unlikely

Rating Categories: H=high; M=medium; L=low.

Appendix E – Forecast System Definitions

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Forecast Designation	Definition
Dam Reservation	*Land managed to protect the integrity of the dam and associated switchyards and power lines*. Most TVA dam reservations provide a visitor reception building that overlooks the facilities. Day use recreational activities such as picnicking, fishing, hiking, and bird watching are encouraged. Campgrounds and boat-launching facilities are often available. Generally speaking, maintenance levels and care of the facilities are higher on dam reservation land than on other areas of the reservoir. Hunting and unregulated camping are generally prohibited on the reservations.
Public Recreation	*Land set aside for use by the general public for recreational activities*. This includes informal, dispersed activities such as hunting, hiking, fishing, and primitive camping, as well as more formal activities in developed areas such as parks, boat-launching areas, and campgrounds.
Reservoir Operations (Islands)	*Islands in the mainstream or tributaries used for informal, dispersed recreation and natural resource management projects.*
Reservoir Operations (Mainland)	*Generally narrow bands of shoreland retained by TVA for flood control and other reservoir operations purposes*. Although there are no outstanding rights to construct water use facilities, TVA allowed back-lying residential property owners to construct facilities on these lands until 1992. Since 1992, facilities have only been allowed on reservoir operations land in those areas where existing facilities have been permitted.
Power Transmission and Power Needs	*Land reserved for future power development or to maintain the integrity of existing power lines*. Interim wildlife enhancement projects are often implemented on these lands.
Commercial Recreation	*Land that TVA has reserved primarily for commercial use.* This use includes, but is not limited to marinas, commercial boat docks, and campgrounds. Informal, dispersed recreational activities often occur on this land as an interim use.
Minor Commercial Landings	*Tracts allocated for minor commercial landings available for public or private development of small-scale barge facilities*. These are sites that can be used for transferring pulpwood, sand, gravel, and other natural resource commodities between barges and trucks. Since this use is intermittent and usually not a major activity, there would generally be no significant impact on adjacent land uses.
Industrial	*Land that TVA identified as having potential for future industrial development*. Informal, dispersed recreational activities often occur on this land as an interim use.
Navigation Safety Harbors Landings	*Sites used for tying off commercial barge tows and recreational boats during adverse weather conditions*. Safety landings are straight stretches of shoreline fronting the commercial channel, and safety harbors are shoreline areas recessed into coves or creeks off the commercial channel.
Forestry Research	*Tracts used as ongoing sites for monitoring tree growth and stress*. In addition, trees are used in these areas to produce reliable seed sources.
Steam Plant Study	*Tracts set aside to potentially serve as a future steam plant location*. The actual construction of a steam plant would depend on energy demands and cost-benefit considerations.

Forecast Designation	Definition
Wildlife Management	*Land managed for the enhancement of natural resources for human use and appreciation*. Management of resources is the primary focus of this designation - Management strategies include planting food plots, selective timber harvesting, and other forms of manipulating habitat to attract certain wildlife species. Appropriate activities in this zone include hunting, wildlife observation, and camping on undeveloped sites.
Small Wild Areas	*These TVA natural areas are areas managed by TVA or in cooperation with other public agencies or private conservation organizations to protect exceptional natural or aesthetic qualities that can also support dispersed, low-impact types of outdoor recreation.* Where appropriate development could include foot trails, signs, parking areas, and primitive camping and efforts can be undertaken to encourage public and interpretation for visitors.

Appendix F – Comparison of Alternative A (No Action) to Alternatives B, C, and D, by Reservoir and Parcel Number

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Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge Reservoir									
1	321.5	Dam Reservation	2	2	2	2	Dam Reservation including Overlook, Boat Ramp, Walking Trail and Picnic Area	C	No
2	4.1	Reservoir Operations (Islands)	4	4	4	4	Gibby Island	C	No
3	25.1	Dam Reservation	2	2	2	4	Gibson Cove Campground Operated by Clay County, N.C., on Dam Reservation	C	No
4	33.6	Public Recreation	4	4	4	4	Pine/Hardwood Forest with Diverse Habitat Features	U	No
5	118.9	Public Recreation	6	6	6	6	Clay County Park Campground and Day Use Area Operated by Clay County, N.C.	C	No
6	210.7	Public Recreation	4	4	4	4	Pine/Hardwood Forest with Diverse Habitat Providing Dispersed Recreation	U	No
7	4.4	Reservoir Operations	4	4	4	4	Island	C	No
8	1.5	Reservoir Operations	4	4	4	4	State Line Island	C	No
9	3.0	N/A	Unplanned	7	7	4	Fronts McClure Subdivision	C	Yes**
10	27.2	Public Recreation	4	4	5	4	Forest Characterized by Large Mature Hardwoods	U	No
11	1.0	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
12	0.4	N/A	Unplanned	4	4	4	Fronts Hideaway Point Subdivision; No Deeded Access Rights	U	No
13	42.2	Public Recreation	6	6	6	6	Chatuge Woods Campground Operated by Towns County, Georgia	C	No
14	0.4	N/A	Unplanned	4	4	4	Small Parcel with No Deeded Access Rights	U	No
15	53.2	Public Recreation (Mainland)	4	4	4	4	Highly Visible Peninsula with Limited Access Providing Dispersed Recreation	U	No
16	4.5	N/A	Unplanned	6	6	6	Fronts The Ridges Resort and Marina	C	Yes
17	3.7	Public Recreation	2	2	2	2	State Road Right-of-Way	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge (continued)									
18	3.7	Public Recreation	6	6	6	6	Forest Providing Dispersed Recreation Suitable for Future Developed Recreation	C	No
19	7.3	Public Recreation	2	2	2	2	Blue Ridge Electric Membership Corporation Substation Site	C	No
20	0.3	N/A	Unplanned	7	7	7	Fronts Ridgecrest Circle Drive	C	Yes
21	2.3	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
22	2.1	N/A	Unplanned	7	7	7	Fronts Sutton Cove Subdivision	C	Yes
23	2.7	N/A	Unplanned	7	7	7	Fronts Chatuge Shores Subdivision	C	Yes
24	11.5	N/A	Unplanned	7	7	7	Fronts Cedar Cliff Subdivision	C	Yes
25	1.5	N/A	Unplanned	7	7	7	Fronts Tranquil Pointe Subdivision	C	Yes
26	1.4	Reservoir Operations	4	4	4	4	Island Providing Visual Benefits	C	No
27	39.0	Public Recreation	6	6	6	6	Georgia Mountain Fair Grounds	C	No
28	104.9	Public Recreation	6	6	6	6	Towns County Park-Campground and Day Use Area Operated by Georgia Mountain Fair Inc.	C	No
29	17.0	Public Recreation	6	6	6	6	Commercial Development including Restaurant and Hotel	C	No
30	1.2	Reservoir Operations (Islands)	4	4	4	4	Island Providing Visual Benefits	C	No
31	0.5	Reservoir Operations (Mainland)	4	4	4	4	Riparian Protection with No Deeded Access Rights	U	No
32	9.2	N/A	Unplanned	6	6	6	Fronts USFS Day Use Area	C	No
33	4.8	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
34	26.8	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
35	0.3	N/A	Unplanned	7	7	7	Fronts Acree Sunnyside Estates Subdivisions	C	Yes
36	3.6	N/A	Unplanned	7	7	7	Fronts Martin Burrell and Collins Subdivisions	C	Yes
37	1.6	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge (continued)									
38	0.1	N/A	Unplanned	4	4	4	Small Parcel with No Deeded Access Rights	U	No
39	0.3	N/A	Unplanned	7	7	7	Fronts Lake Chatuge Heights Subdivision	C	Yes
40	2.3	N/A	Unplanned	7	7	7	Fronts Beech Cove Vista Subdivision	C	Yes
41	2.7	N/A	Unplanned	7	7	7	Fronts Stonecrest Subdivision	C	Yes
42	0.3	N/A	Unplanned	2	2	2	State Road Right-of-Way	C	No
43	2.1	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
44	0.3	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
45	3.3	Public Recreation	6	6	6	6	Georgia Highway Department Park and Ride with Picnic Tables	C	No
46	0.6	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
47	4.2	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources - Wetlands at Hightower Creek Inflow	C	No
48	3.2	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
49	4.3	Reservoir Operations (Mainland)	4	4	4	4	Narrow Steep Parcel Adjacent to River Channel	U	No
50	0.7	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
51	7.6	Public Recreation	4	4	4	4	Small Parcel Characterized by Wooded Slope	U	No
52	6.1	Public Recreation	4	4	6	6	Open Space Suitable for Future Developed Recreation	U	No
52A	1.9	Public Recreation	4	4	4	4	Open field and strip of forested riparian zone	U	No
53	4.1	Public Recreation	2	2	2	2	Municipal Water Treatment Plant	C	No
54	0.5	Reservoir Operations	4	4	4	4	Small Parcel with No Deeded Access Rights	C	No
55	0.9	N/A	Unplanned	7	7	7	Fronts Nacoochee Shores Subdivision	C	Yes

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge (continued)									
56	0.4	Public Recreation	4	4	4	4	Small Parcel with No Deeded Access Rights	U	No
57	0.9	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
58	1.7	Public Recreation	2	2	2	2	Small Parcel with No Deeded Access Rights; Fronts Towns County Fire Department	C	No
59	0.8	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
60	1.8	Public Recreation	4	3	3	3	Protection of Sensitive Archaeological Resources	C	No
61	0.2	N/A	Unplanned	4	4	4	Small Parcel with No Deeded Access Rights	U	No
62	5.7	Public Recreation	2	2	2	2	Municipal Wastewater Treatment Plant	C	No
63	29.1	Public Recreation	6	6	6	6	Towns County Park - Multipurpose Center	C	No
64	2.2	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
65	0.5	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
66	0.9	Reservoir Operations (Island)	4	4	4	4	Northern Portion of Island	C	No
67	10.3	Public Recreation	4	4	4	4	Dispersed Recreation Area with Access from State Highway	U	No
68	4.3	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
69	3.0	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
70	1.0	Reservoir Operations	4	4	4	4	Small Peninsula Providing Dispersed Recreation Use	U	No
71	0.4	Reservoir Operations	7	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
72	1.6	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
73	55.2	Public Recreation	4	4	4	4	Upland Mixed Pine Hardwood Providing Dispersed Recreation	U	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge (continued)									
74	47.0	Public Recreation	4	4	4	4	Upland Mixed Pine Hardwood Providing Dispersed Recreation	U	No
75	0.7	Reservoir Operations	4	4	4	4	Small Island	C	No
76	1.1	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
77	66.4	Public Recreation	4	4	6	4	Upland Mixed Pine Hardwood Providing Dispersed Recreation with Vehicular Access	U	No
78	108.3	Reservoir Operations	4	4	4	4	Cable Island - Upland Mixed Pine Hardwood Providing Dispersed Recreation	U	No
79	2.5	N/A	Unplanned	7	7	7	Fronts Cherokee Hills Subdivision	C	Yes
80	1.7	N/A	Unplanned	7	7	7	Fronts Hidden Valley Estates Subdivision	C	Yes
81	2.3	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
82	0.9	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
83	2.5	N/A	Unplanned	7	7	7	Fronts McIntosh Cove Subdivision	C	Yes
84	109.0	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
85	13.8	N/A	Unplanned	6	6	6	Fronting USFS - Jack Rabbit Campground	C	No
86	8.0	N/A	Unplanned	7	7	7	Fronts Cypress Point Subdivision	C	Yes**
87	7.7	Public Recreation	6	6	6	6	Chatuge Cove Complex Primitive Campground	C	No
88	26.4	Public Recreation	4	4	4	4	Variable Age Upland Hardwood/Pine Accessible from State Highway	U	No
89	0.8	N/A	Unplanned	7	7	7	Fronts Lake Breeze Acres Subdivision	C	Yes
90	1.3	N/A	Unplanned	6	6	6	Fronts N.C. Wildlife Resources Commission Property Designated Bank Fishing Area	C	No
91	0.1	N/A	Unplanned	4	4	4	Small isolated parcel below transfer and sale contours	U	No
92	1.1	N/A	Unplanned	4	4	4	Small Parcel surrounded by N.C. Wildlife Resources Commission Property	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Chatuge (continued)									
93	0.7	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
94	0.1	Reservoir Operations	4	4	4	4	Small Parcel with No Deeded Access Rights	U	No
95	1.2	Reservoir Operations	7	7	7	7	Fronts Shooting Creek Subdivision	C	Yes
96	29.9	Public Recreation	4	4	4	4	Highly Visible Point with Diverse Upland Hardwood Forest	U	No
97	0.7	Reservoir Operations	4	4	4	4	Small Island	C	No
98	6.3	N/A	Unplanned	7	7	7	Fronts Walker Point Subdivision	C	Yes
99	10.8	Public Recreation	4	4	4	4	Diverse Cove/Upland Hardwood Habitat	U	No
100	4.2	Public Recreation	6	6	6	6	Roadside Park Maintained by NCDOT	C	No
101	4.9	Public Recreation	2	2	2	2	State Road Right-of-Way	C	No
102	7.1	Public Recreation	4	4	4	4	Corridor Adjacent to Highway Right-of-Way Encumbered with Private Road Easements	U	No
103	8.0	Public Recreation	4	4	4	4	Variable Age Pine Hardwood Slope	U	No
104	13.5	N/A	Unplanned	6	6	6	Fronts Ledford Chapel Boat Ramp Maintained by N.C. Wildlife Resources Commission	C	No
105	0.3	Reservoir Operations	4	4	4	4	Small Parcels with No Deeded Access Rights	U	No
106	2.1	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes
107	6.9	N/A	Unplanned	2	2	2	Municipal Groundwater Wells and Treatment Facility Operated by Clay County, N.C.	C	No
108	2.3	N/A	Unplanned	3	3	3	Protection of Sensitive Resources	C	No
109	1.9	N/A	Unplanned	6	6	6	Hiwassee River Stream Access Site	C	No
CHATUGE TOTAL	**1765.1**								

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Hiwassee Reservoir									
1	123.9	Dam Reservation	2	2	2	2	Dam Reservation including Visitor Overlook and Pavilion	C	No
2	81.1	Public Recreation	2	2	2	2	Original Dam Reservation	C	No
3	82.8	Public Recreation	2	2	2	2	Original Dam Reservation with Boat Ramp Operated by the N.C. Wildlife Resources Commission	C	No
4	199.2	Dam Reservation	4	4	4	4	Informal Recreation Easement; Hardwood Forest with Unique Natural Features	C	No
5	0.4	Dam Reservation	7	7	7	7	Designated Shoreline Access Area for Sale Tracts Contained within Parcel 4	C	Yes
6	1.7	N/A	Unplanned	6	6	6	Fronts Mountain View Marina	C	Yes
7	30.7	N/A	Unplanned	7	7	7	Fronts Bear Paw Service District Subdivision	C	Yes
8	***	N/A	Unplanned	6	6	6	Fronts Harbor Cove Marina	C	No
9	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
10	112.8	Public Recreation	4	4	4	4	Upland Mixed Pine/Hardwood Forest Providing Dispersed Recreation with Vehicular Access	U	No
11	9.2	Public Recreation	4	4	4	4	Two Large Islands Providing Dispersed Recreation Opportunities	C	No
12	2.2	Public Recreation	6	6	6	6	Micken's Branch Boat-Launching Ramp and Parking Area providing Deep Water Access	C	No
13	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
14	***	N/A	Unplanned	6	6	6	Fronts USFS Cherokee Lake Recreation Area	C	No
15	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
16	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
17	0.5	N/A	Unplanned	4	4	4	Fronts Property with No Deeded Access Rights*	U	No
18	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
19	0.5	N/A	Unplanned	4	4	4	Small Island	C	No
20	11.8	N/A	Unplanned	7	7	7	Fronts Property with Deeded Access Rights	C	Yes

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Hiwassee (continued)									
21	4.8	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
22	0.1	Reservoir Operations	2	2	2	2	Great Smoky Mountain Railroad Track	C	No
23	0.5	Reservoir Operations	2	2	2	2	Town of Murphy Fire Department Parking Lot	C	No
24	2.4	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No
25	1.5	Reservoir Operations	6	6	6	6	Murphy Boat-Launching Ramp**	C	No
26	12.6	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
27	4.6	Reservoir Operations	4	4	4	4	Early Successional Bottomland Habitat	U	No
28	2.1	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No
29	0.5	Reservoir Operations	4	4	4	4	Grass Parking Area; Proposed for Surplus	U	No
30	3.2	Power Transmission and Power Needs	2	2	2	2	Tennessee Valley Authority Customer Service Center	C	No
31	3.3	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
32	6.4	Reservoir Operations	4	4	4	4	Early Successional Bottomland Habitat	U	No
33	44.1	Industry	2	2	2	2	State Road Right-of-Way	C	No
34	2.4	Reservoir Operations	4	4	6	4	Early Successional Bottomland Habitat	U	No
35	9.8	Industry	5	4	4	4	Upland Mixed Pine Hardwood	U	No
36	70.7	Industry	5	4	4	4	Unique Topography with Multiple Natural Habitat Features	U	No
37	3.6	Reservoir Operations	2	2	2	2	Tennessee Valley Authority Substation	C	No
38	1.1	Reservoir Operations	2	2	2	2	Murphy Electric Power Board Substation	C	No
39	4.5	Reservoir Operations	4	4	4	4	Early Successional Bottomland Habitat	U	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Hiwassee (continued)									
40	17.4	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
41	7.4	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No
42	3.4	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
42	3.4	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
43	4.5	Reservoir Operations	4	4	4	4	Early Successional Bottomland Habitat	U	No
44	6.6	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
45	3.5	Reservoir Operations	4	4	4	4	Steep with Mixed Pine Hardwood	U	No
46	17.2	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
47	1.2	Reservoir Operations	6	6	6	6	Heritage Partners Riverwalk Trail	C	No
48	4.3	Reservoir Operations	2	2	2	2	Great Smoky Mountain Railway	C	No
49	1.6	Reservoir Operations	4	4	6	6	Area Proposed for Future Expansion of Heritage Partners Riverwalk Trail	U	No
50	1.7	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No
51	6.9	Reservoir Operations	6	6	6	6	Heritage Partners Riverwalk Trail	C	No
52	14.6	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
53	4.2	Reservoir Operations	4	4	4	4	Mixed Pine Hardwood	U	No
54	9.8	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
55	3.6	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
56	3.9	Reservoir Operations	6	6	6	6	Murphy High School Track and Parking Area	C	No
57	1.4	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Hiwassee (continued)									
58	0.7	Reservoir Operations	4	4	4	4	Early Successional Bottomland Habitat	U	No
59	5.8	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
60	5.0	Reservoir Operations	2	2	2	2	Tennessee Valley Authority Substation	C	No
61	23.2	Reservoir Operations	6	6	6	6	Konehete Recreation Park	C	No
62	11.6	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
63	4.0	Reservoir Operations	4	3	3	3	Protection of Sensitive Natural Resources	C	No
64	1.7	Reservoir Operations	2	2	2	2	State Road Right-of-Way	C	No
65	7.2	Reservoir Operations	4	4	4	4	Tract along Hiwassee River Providing Dispersed Recreation Opportunities; Deeded Right-of-Way to Murphy WWTP	C	No
66	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
67	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
68	***	N/A	Unplanned	6	6	6	Fronts Hiwassee Hide-A-Way Marina	C	No
69	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
70	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
71	***	N/A	Unplanned	4	4	6	Fronts Shooks Marina	C	No
72	***	N/A	Unplanned	4	4	6	Fronts Shooks Marina	C	No
73	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
74	***	N/A	Unplanned	4	4	4	Fronst USFS Property	C	No
HIWASSEE TOTAL	**1007.4**								
Blue Ridge Reservoir									
1	287.0	Dam Reservation	2	2	2	2	Dam Reservation including Overlook and Tailwater Stream Access Site	C	No
2	1.7	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes**
3	10.5	Public Recreation	6	6	6	6	Roadside Picnic Area	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Blue Ridge (continued)									
4	0.5	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes
5	4.1	N/A	Unplanned	6	6	6	Fronts Blue Ridge Marina	C	Yes
6	2.9	N/A	Unplanned	7	7	7	Fronts Blue Ridge Marina	C	Yes**
7	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
8	48.4	N/A	Unplanned	7	7	7	Fronts Azure Point, Rome Point, and Horse Point Subdivisions	C	Yes**
9	1.7	N/A	Unplanned	4	4	4	Small Island	C	No
10	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
11	1.5	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes**
12	3.6	N/A	Unplanned	7	7	7	Fronts Dry Branch Road Subdivision	C	Yes**
13	4.3	N/A	Unplanned	4	4	4	Protection of Wildlife Habitat and Shoreline Vegetation on Islands	C	No
14	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
15	***	N/A	Unplanned	6	6	6	Fronts USFS Lake Blue Ridge Recreation Area	C	No
16	1.5	N/A	Unplanned	4	4	4	Dispersed Recreation Area with Early Successional Habitat	U	No
17	34.1	N/A	Unplanned	7	7	7	Fronts Blue Ridge Lake Estates	C	Yes**
18	1.3	N/A	Unplanned	4	4	4	Protection of Wildlife Habitat and Shoreline Vegetation on Islands	C	No
19	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
20	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
21	0.3	N/A	Unplanned	4	4	4	Protection of Wildlife Habitat and Shoreline Vegetation on Island	C	No
22	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
23	0.1	N/A	Unplanned	4	4	4	Small Parcel Behind Flowage on Wilscott Creek	U	No
24	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
25	0.6	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
26	0.5	N/A	Unplanned	7	7	7	Fronts Padena Settlement Subdivision	C	Yes**
27	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Blue Ridge (continued)									
28	7.2	N/A	Unplanned	4	4	4	Protection of Wildlife Habitat and Shoreline Vegetation on Islands	C	No
29	1.4	N/A	Unplanned	4	4	4	Variable Aged Pine/Hardwood Forest adjacent to Antioch Cemetery	U	No
30	9.9	N/A	Unplanned	4	4	4	Mature Upland Hardwood Forest	U	No
31	5.4	N/A	Unplanned	7	7	7	Fronts Hazelwood Point Subdivision	C	Yes**
32	6.6	N/A	Unplanned	7	7	7	Fronts Star Creek Estates Subdivision	C	Yes**
33	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
34	2.2	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes**
35	11.6	N/A	Unplanned	3	3	3	Protection of Sensitive Natural Resources	C	No
36	0.9	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes**
37	***	N/A	Unplanned	4	4	4	Fronts USFS Morganton Point Recreation Area	C	No
38	***	N/A	Unplanned	6	6	6	Fronts USFS Morganton Point Recreation Area	C	No
39	13.6	N/A	Unplanned	7	7	7	Fronts Ridgeview Estates and Lakeview Subdivisions	C	Yes**
40	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
41	***	N/A	Unplanned	6	6	6	Fronts USFS Lakewood Landing Boat Ramp	C	No
42	6.1	N/A	Unplanned	2	2	2	Tennessee Valley Authority Substation	C	No
BLUE RIDGE TOTAL	**469.5**								
Nottely Reservoir									
1	422.6	Dam Reservation	2	2	2	2	Dam Reservation including Overlook and Day Use Area	C	No
2	120.6	Public Recreation	4	4	4	4	Pine/Hardwood Forest Providing Diverse Upland Habitat	U	No
3	2.3	N/A	Unplanned	7	7	7	Fronts Arrendale and Trent Subdivisions	C	Yes
4	91.9	Public Recreation	6	6	6	6	Poteete Creek Campground	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Nottely (continued)									
5	2.6	Reservoir Operations	4	4	4	4	Protection of Wildlife Habitat on Islands	C	No
6	0.5	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
7	0.2	N/A	Unplanned	4	4	4	Fronts Lake Worth Nottely Club Subdivision	U	No
8	1.1	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
9	0.1	N/A	Unplanned	4	4	4	Protection of Wildlife Habitat	U	No
10	15.6	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
11	3.3	N/A	Unplanned	4	4	4	Fronts USFS Property (Islands)	C	No
12	6.2	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
13	1.0	N/A	Unplanned	6	6	6	Fronts USFS Jack's Creek Boat Ramp	C	No
14	2.2	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
15	6.5	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
16	4.5	N/A	Unplanned	4	4	4	Fronts USFS Property (Islands)	C	No
17	5.6	N/A	Unplanned	4	4	4	Fronts USFS Property (Islands)	C	No
18	1.3	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
19	2.1	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
20	2.5	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
21	4.7	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
22	1.4	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
23	0.2	N/A	Unplanned	7	7	7	Fronts McAfee Subdivision	C	Yes**
24	0.7	N/A	Unplanned	7	7	7	Fronts Canal Lake Campground Subdivision	C	Yes**
25	3.0	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
26	1.7	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
27	1.7	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
28	2.0	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
29	1.3	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
30	2.6	N/A	Unplanned	7	7	7	Fronts Piney Point Subdivision	C	Yes**
31	0.2	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Nottely (continued)									
32	0.3	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
33	23.6	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
34	18.1	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
35	11.1	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
36	12.1	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
37	1.6	N/A	Unplanned	6	6	6	Fronts USFS Deaverton Boat Ramp	C	No
38	1.7	N/A	Unplanned	4	4	4	Fronts USFS Property (Islands)	C	No
39	12.5	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
40	10.7	N/A	Unplanned	7	7	7	Fronts Notla Landing Subdivision	C	Yes
41	4.0	N/A	Unplanned	7	7	7	Fronts Madison's Point and Breault Subdivisions	C	Yes
42	20.7	N/A	2	2	2	2	Notla Water Authority Water Treatment Facility	C	No
NOTTELY TOTAL	**828.6**								
Ocoee #1									
1	60.1	Dam Reservation	2	2	2	2	Dam Reservation including Overlook	C	No
2	17.3	Dam Reservation	2	2	2	2	Dam Reservation including Sugarloaf Mountain Recreation Area	C	No
3	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
4	***	N/A	Unplanned	6	6	6	Fronts Ocoee Inn and Marina	C	No
5	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
6	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
7	***	N/A	Unplanned	6	6	6	Fronts USFS Parksville Beach	C	No
8	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
9	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
10	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
11	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
12	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
13	***	N/A	Unplanned	6	6	6	Fronts USFS Parksville East and West Boat Ramps	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Ocoee #1 (continued)									
14	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
15	***	N/A	Unplanned	6	6	6	Fronts USFS Mac Point Recreation Area	C	No
16	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
17	***	N/A	Unplanned	6	6	6	Fronts USFS Parksville Lake Campground	C	No
18	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
19	***	N/A	Unplanned	6	6	6	Fronts USFS Little Caney Branch Take-Out	C	No
20	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
21	***	N/A	Unplanned	6	6	6	Fronts Camp Cherokee Operated by First Baptist Church of Cleveland	C	No
22	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
23	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
24	***	N/A	Unplanned	4	4	4	Fronts USFS Property Islands	C	No
25	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
26	***	N/A	Unplanned	6	6	6	Fronts USFS Property Camp Ocoee	C	No
27	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
28	***	N/A	Unplanned	6	6	6	Fronts USFS King Slough Boat Ramp	C	No
29	***	N/A	Unplanned	6	6	6	Fronts USFS Cabin Sites	C	No
OCOEE #1 TOTAL	**77.4**								
Ocoee #2									
1	14.2	Dam Reservation	2	2	2	2	Dam Reservation including Bath House, Parking and Stream Access Sites	C	No
2	9.0	Dam Reservation	2	2	2	2	Dam Reservation	C	No
3	7.8	Dam Reservation	2	2	2	2	Powerhouse including Stream Access Site	C	No
4	48.6	Dam Reservation	2	2	2	2	Powerhouse Reservation	C	No
OCOEE #2 TOTAL	**79.6**								

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Ocoee #3									
1	19.8	Dam Reservation	2	2	2	2	Dam Reservation including Stream Access Site	C	No
2	26.3	Dam Reservation	2	2	2	2	Dam Reservation	C	No
3	128.4	Reservoir Operations	2	2	2	2	Tunnel Tract	C	No
4	34.8	Dam Reservation	2	2	2	2	Powerhouse Reservation	C	No
5	2.9	Dam Reservation	2	2	2	2	Thunder Rock Campground operated by USFS on Powerhouse Reservation	C	No
6	6.1	Dam Reservation	2	2	2	2	Dam Reservation	C	No
OCOEE #3 TOTAL	**218.3**								
TOTAL ALL OCOEES	**375.3**								
Apalachia Reservoir									
1	139.1	Dam Reservation	2	2	2	2	Dam Reservation	C	No
2	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
3	***	N/A	Unplanned	4	4	4	Fronts USFS Property	C	No
4	538.4	Dam Reservation	2	2	2	2	Dam Reservation and Bypass Tunnel	C	No
5	63.5	Reservoir Operations	2	2	2	2	Powerhouse Reservation	C	No
6	19.5	Dam Reservation	2	2	2	2	Powerhouse Reservation	C	No
7	82.8	Reservoir Operations	6	6	6	6	Gee Creek Campground	C	No
APALACHIA TOTAL	**843.3**								
Fontana Reservoir									
1	403.0	N/A	Previously Unplanned	2	2	2	Dam Reservation including Visitor Center, Appalachian Trail, Camping and Picnic Area	C	No
2	283.7	N/A	Unplanned	6	6	6	Fontana Village Inc. (Hotel/Restaurants/Cabins)	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Fontana (continued)									
3	59.8	N/A	Unplanned	6	6	6	Fontana Village Inc. (Marina/Stable/Horse Trail)	C	No
4	8.2	N/A	Unplanned	6	6	6	Fontana Village Inc. (Marina)	C	No
5	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
6	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
7	***	N/A	Unplanned	6	6	6	Fronts Cable Cove Boat Ramp	C	No
8	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
9	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Stecoah Boat Dock	C	No
10	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
11	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Panther Creek Boat Dock	C	No
12	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
13	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Crisp Boat Dock	C	No
14	***	N/A	Unplanned	4	4	4	Fronts USFS Tsali Recreation Area	C	No
15	***	N/A	Unplanned	6	6	6	Fronts Tsali Canoe Launch	C	No
16	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Alarka Boat Dock	C	No
17	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
18	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
19	***	N/A	Unplanned	6	6	6	Fronts Lemons Branch Boat Ramp	C	No
20	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
21	0.2	N/A	Unplanned	2	2	2	Small Strip of Land Fronting Great Smoky Mountain Railway	C	No
22	1.8	N/A	Unplanned	4	4	4	Island Visible During Lower Operational Levels	C	No
23	1.8	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Fontana (continued)									
24	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
25	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Almond Boat Dock	C	No
26	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
27	1.3	N/A	Unplanned	7	7	7	Fronts Property with Access Rights	C	Yes**
28	14.3	N/A	Unplanned	4	4	4	Fontana Lake Estates Visual Protection Area	C	No
29	39.9	N/A	Unplanned	7	7	7	Fontana Lake Estates Subdivision	C	Yes**
30	7.3	N/A	Unplanned	6	6	6	Fontana Lake Estates Private Marina	C	No
31	4.0	N/A	Unplanned	4	4	4	Great Smoky Mountain Railway Visual Protection Area	C	No
32	15.1	N/A	Unplanned	4	4	4	Great Smoky Mountain Railway Visual Protection Area	C	No
33	8.4	N/A	Unplanned	4	4	4	Great Smoky Mountain Railway Visual Protection Area	C	No
34	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
35	***	N/A	Unplanned	6	6	6	Fronts USFS Property with Harbor Limits for Greasy Branch Boat Dock	C	No
36	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property - Islands	C	No
37	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
38	***	N/A	Unplanned	6	6	6	Fronts Wilderness Boat Ramp	C	No
39	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
40	***	N/A	Unplanned	4	4	4	Steep Mixed Forest Fronting USFS Property	C	No
41	1.6	N/A	Unplanned	2	2	2	Municipal Waste Water Treatment Plant	C	No
42	5.3	N/A	Unplanned	6	6	6	Bryson City Park	C	No

Parcel Number	Acres	Forecast Designation(s)	Zone Allocation				Description and/or Current Use	Committed or Uncommitted *	Residential Shoreline Access Rights
			Alt. A	Alt. B	Alt. C	Alt. D			
Fontana (continued)									
43	0.5	N/A	Unplanned	4	4	4	Riverine Island	C	No
44	70.3	N/A	Unplanned	6	6	6	SR 288 Day Use Area	C	No
45	1.4	N/A	Unplanned	4	4	4	Islands with Backcountry Camp Site Managed by National Park Service	C	No
46	3.1	N/A	Unplanned	4	4	4	Islands with Dispersed Camp Sites	C	No
FONTANA TOTAL	**931.0**								

N/A = Not applicable
* Committed Land - Existing land use agreements, contains deeded rights, presence of sensitive resources, or used for project operations
Uncommitted Land - Parcel that is not committed to existing use and may be considered for alternate allocation (Plannable)
** Permitted by policy
*** TVA land present along narrow strip of shoreline; acreage not calculated
Highlighted rows represent Alternative C

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Appendix G – Mountain Reservoirs Boating Capacity

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Shoreline Development and Boating Density

Shoreline Development

Shoreline development affects population growth, recreation demands, and boating capacity. Increasing development around the reservoirs and subsequent population growth are accompanied by an increase in recreation facilities including public and commercial developments, as well as private and community dock development. This leads to an increase in recreation activities taking place on the reservoirs and can potentially lead to boating capacity issues.

Because this increase in population and development affects how the lands around the reservoirs are used, it is important to recognize the level of development on each reservoir. For each reservoir, the percentage of shoreline open for private residential dock access was recorded, as determined by TVA's Shoreline Management Initiative. That figure was divided into an estimate of percentage of shoreline currently developed/permitted and percentage of remaining shoreline open for future residential access.

Boating Density

The mountain reservoirs are managed by TVA to provide a multitude of benefits, including high-quality recreation opportunities for nearby residents and visitors from the surrounding region. The question arises whether the number and diversity of recreation users present, along with associated local development, may threaten the safety and enjoyment of visitors and residents. To help answer this question and make more informed decisions concerning facilities associated with boating, TVA has completed an evaluation of boating density for the mountain reservoirs.

Specifically, boating capacity is the prescribed number of people/boats (demand) that a reservoir area will accommodate (supply), given the desired biophysical/cultural resources, visitor experiences, and management program. It is the reservoir condition in which a high-quality, safe, and enjoyable recreation experience can be maintained while protecting the natural resources where recreation activities occur. Because complete boating capacity data are not available at this time, boating density estimates were calculated. The objectives were to estimate existing boating density and to project future density based on shoreline development data for the reservoirs.

Analysis

Shoreline Development and Boating Density are listed together for each reservoir below. These data indicate potential for shoreline residential growth on Blue Ridge, Chatuge, Fontana, and Nottely reservoirs. Boating "units" were calculated by compiling the number of TVA Section 26a approvals (boat docks or slips) for private residential access shoreline for each reservoir. The number of units listed for the undeveloped shoreline is an extrapolated projection based on the current number of units on the developed shoreline of a particular reservoir and the ratio of developed/undeveloped shoreline. This estimate is conservative, as it is based on the ratio of the current number of permits on developed residential access shoreline, which will also continue to increase over time as lots are split and private individual facilities are replaced by multislip facilities and the availability of developable shoreline decreases.

TVA staff established assumptions about the estimated percentage of boats that would be in use on a peak summer holiday/weekend day, and an average boating season weekday.

The estimated percentage has been applied to total boating units and divided into surface acres, at the June 1st Flood Guide elevations, to obtain acres per boat.

TVA estimated the effect on density from private water use facilities projected at the estimated maximum residential buildout by adding the projected number of boating units for the undeveloped shoreline and keeping the other boating unit factors constant.

Current boating density estimates do not indicate any immediate capacity issues. However, as some reservoirs (such as Blue Ridge, Chatuge and Nottely) approach total buildout of shoreline available for development, boating density estimates approach a level that may warrant additional study. It is not anticipated that any of the reservoirs will reach this point within the planning horizon of the MRLMP.

CHATUGE

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 57%

Current Percentage of Open Shoreline Developed/Permitted 74% (1,472 units)

Current Percentage Undeveloped Open Shoreline 26% (517 units)

Estimated Private Residential Maximum 1989 units

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	1472	1989
Commercial Wet Slips	573	573
Commercial Dry Slips	50	50
Subtotal Boating Units	**2095**	**2612**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	74	74
Private Community Ramp Parking	300	300
Subtotal Parking Spaces	**374**	**374**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	6840

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	389	748	1014
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	18	9	7
Projected Density at Residential "Build Out"	15	8	6

HIWASSEE

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 4%

Current Percentage of Open Shoreline Developed/Permitted 100% (224 units)

Current Percentage Undeveloped Open Shoreline 0% (0 units)

Estimated Private Residential Maximum 224 units

While there are undeveloped lots in Bear Paw Subdivision that are open for residential shoreline access and one community facility site on the Fowler Bend area of Bear Paw, the majority of these shoreline segments are permitted and are therefore represented as 100% developed based on these conservative estimates.

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	224	224
Commercial Wet Slips	385	385
Commercial Dry Slips	180	180
Subtotal Boating Units	**789**	**789**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	19	19
Private Community Ramp Parking	155	155
Subtotal Parking Spaces	**174**	**174**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	5860

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	153	302	407
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	38	19	14

Projected Density at Residential "Build Out"	38	19	14

BLUE RIDGE

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 38%

Current Percentage of Open Shoreline Developed/Permitted 71% (613 units)

Current Percentage Undeveloped Open Shoreline 29% (250 units)

Estimated Private Residential Maximum 863 units

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	613	863
Commercial Wet Slips	300	300
Commercial Dry Slips	70	70
Subtotal Boating Units	**983**	**1233**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	118	118
Private Community Ramp Parking	110	110
Subtotal Parking Spaces	**228**	**228**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	3180

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	193	383	515
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	16	8	6

Projected Density at Residential "Build Out"	14	7	5

NOTTELY

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 41%

Current Percentage of Open Shoreline Developed/Permitted 45% (765 units)

Current Percentage Undeveloped Open Shoreline 55% (935 units)

Estimated Private Residential Maximum 1,700 units

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	779	1700
Commercial Wet Slips	94	94
Commercial Dry Slips	0	0
Subtotal Boating Units	**873**	**1794**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	33	33
Private Community Ramp Parking	70	70
Subtotal Parking Spaces	**103**	**103**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	3950

	Estimated Number of Boating Units In Use		
	Average Summer Weekday #	**Average Summer Weekend Day #**	**Summer Peak Holiday #**
Total Boating Units	152	280	383
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	26	14	10

Projected Density at Residential "Build Out"	14	8	6

OCOEE 1 (PARKSVILLE)

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 23%

Current Percentage of Open Shoreline Developed/Permitted 100% (76 units)

Current Percentage Undeveloped Open Shoreline 0% (0 Units)

Estimated Private Residential Maximum 76 units

The shoreline on Ocoee 1 Reservoir that has private boat slips permitted is associated with the Recreation Cabin Sites on USFS property.

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	76	76
Commercial Wet Slips	180	180
Commercial Dry Slips	0	0
Subtotal Boating Units	**256**	**256**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	129	129
Private Community Ramp Parking	10	10
Subtotal Parking Spaces	**139**	**139**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	1930

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	66	147	194
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	29	13	10
Projected Density at Residential "Build Out"	29	13	10

APALACHIA

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) _0%_

Current Percentage of Open Shoreline Developed/Permitted _0%_ (0 units)

Current Percentage Undeveloped Open Shoreline _0%_ (0 units)

Estimated Private Residential Maximum 0 units

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	0	0
Commercial Wet Slips	0	0
Commercial Dry Slips	0	0
Subtotal Boating Units	**0**	**0**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	10	10
Private Community Ramp Parking	0	0
Subtotal Parking Spaces	**10**	**10**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	1070

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	2	6	8
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	535	178	143

Projected Density at Residential "Build Out"	535	178	143

FONTANA

Shoreline Development Data

Total Percentage of Shoreline Open for Residential Development (open) 11%

Current Percentage of Open Shoreline Developed/Permitted 7% (635 units)

Current Percentage Undeveloped Open Shoreline 4% (362 units)

Estimated Private Residential Maximum 997 units

Boating Density Worksheets

Boating Units	Current Estimate	Projected at "Build Out"
Private Water Use Facility Slips	635	997
Commercial Wet Slips	570	570
Commercial Dry Slips	0	0
Subtotal Boating Units	**1205**	**1567**

Reservoir Access Site Parking Spaces	Current Estimate	Projected at "Build Out"
Public Ramp Parking	233	233
Private Community Ramp Parking	6	6
Subtotal Parking Spaces	**239**	**239**

	Estimated Percentage of Boating Units In Use		
	Average Summer Weekday (%)	**Average Summer Weekend Day (%)**	**Summer Peak Holiday (%)**
Private and Commercial Slips	15	25	35
Public/Private Ramp Parking	20	60	75

Surface Acres at June 1 Flood Guide	10,230

	Estimated Number of Boating Units In Use		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Total Boating Units	229	445	601
	Density - Surface Acres Per Boating Unit		
	Average Summer Weekday	**Average Summer Weekend Day**	**Summer Peak Holiday**
Current Estimated Density	45	23	17
Projected Density at Residential "Build Out"	36	19	14

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Appendix H – Archaeology Programmatic Agreements

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Preserving America's Heritage

October 11, 2005

Mr. J. Bennett Graham
Senior Archaeologist
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902-1401

REF: Programmatic Agreement for proposed land plans in Tennessee

Dear ~~Mr. Graham:~~ Bennett

Enclosed is the executed Programmatic Agreement for the referenced program. By carrying out the terms of the Agreement, the Tennessee Valley Authority will have fulfilled its responsibilities under Section 106 of the National Historic Preservation Act and the Council's regulations.

We appreciate your cooperation in reaching this Agreement. If you have any questions, please call Dr. Tom McCulloch at 202-606-8554.

Sincerely,

Don L. Klima
Director
Office of Federal Agency Programs

Enclosure

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 809 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

PROGRAMMATIC AGREEMENT
AMONG
THE TENNESSEE VALLEY AUTHORITY,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
AND THE TENNESSEE STATE HISTORIC PRESERVATION OFFICER
REGARDING THE IMPLEMENTATION OF RESERVOIR LAND MANAGEMENT PLANS IN TENNESSEE

WHEREAS, the Tennessee Valley Authority (TVA) has proposed to develop Reservoir Land Management Plans for TVA land holdings within the State of Tennessee, these reservoirs being Boone in Sullivan and Washington Counties; Cherokee in Grainger, Hamblen, Hawkins, and Jefferson Counties; Chickamauga in Bradley, Hamilton, McMinn, Rhea, and Meigs Counties; Douglas in Cocke, Jefferson, and Sevier Counties; Fort Loudoun in Blount, Knox, and Loudon Counties; Fort Patrick Henry in Sullivan and Hawkins Counties; Great Falls in Van Buren, Warren, and White Counties; Guntersville in Marion County; Kentucky in Benton, Decatur, Hardin, Henry, Houston, Humphreys, Perry, Stewart, and Wayne Counties; Melton Hill in Anderson, Knox, Loudon, and Roane Counties; Nickajack in Hamilton and Marion Counties; Nolichucky in Green County; Normandy in Bedford and Coffee Counties; Norris in Anderson, Campbell, Claiborne, Grainger, and Union Counties; Ocoee #1, #2, and #3 in Polk County; Pickwick in Hardin County; South Holston in Sullivan County; Watauga in Carter and Johnson Counties; Watts Bar in Loudon, Meigs, Rhea, and Roane Counties; Wilbur in Carter County; and the Beech River Project consisting of Beech, Cedar, Dogwood, Lost Creek, Pin Oak, Pine, Redbud, and Sycamore Reservoirs in Henderson County, Tennessee; and

WHEREAS, TVA has determined that the implementation of the Land Management Plans has the potential to affect historic properties that are eligible for listing in the National Register of Historic Places (NRHP); and

WHEREAS, TVA has consulted with the Advisory Council on Historic Preservation (Council), the Tennessee State Historic Preservation Officer (SHPO), the Eastern Band of Cherokee Indians, the United Keetoowah Band, the Cherokee Nation of Oklahoma, Chickasaw Nation, the Muscogee (Creek) Nation of Oklahoma, the Poarch Band of Creek Indians, the Alabama-Coushatta Tribe, the Alabama-Quassarte Tribal Town, the Kialegee Tribal Town, the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahama, the Jena Band of Choctaw Indians, the Seminole Nation of Oklahoma, the Seminole Indian Tribe, the Eastern Shawnee Tribe of Oklahoma, and the Absentee-Shawnee Tribe of Oklahoma pursuant to 36 CFR Part 800, the regulations of the Council implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the Eastern Band of Cherokee Indians, the Chickasaw Nation, the Choctaw Nation of Oklahoma, and the Muscogee (Creek) Nation of Oklahoma have been invited to be a signatory to the Programmatic Agreement; and will assist TVA in determining NRHP eligibility of historic properties and appropriateness of treatment plans for historic properties which have religious or cultural significance to the Eastern Band of Cherokee Indians, Chickasaw Nation, the Choctaw Nation of Oklahoma, and/or the Muscogee (Creek) Nation of Oklahoma that will be adversely affected by TVA Land Management Plans; and

WHEREAS, TVA has conducted complete or partial investigations to identify historic properties on portions of lands considered in the Reservoir Land Management Plans; and

WHEREAS, 36 CFR Part 800.14(b) of the regulations of the Council encourages the use of Programmatic Agreements when effects on historic properties are regional in scope and cannot be fully determined prior to the approval of the undertaking; and

WHEREAS, TVA will develop a Reservoir Land Management Plan at each of these reservoirs which will clearly identify the area of potential effect (APE) for each reservoir;

NOW THEREFORE, TVA, the Council, the SHPO, the Eastern Band of Cherokee Indians, Chickasaw Nation, the Choctaw Nation of Oklahoma and the Muscogee (Creek) Nation of Oklahoma agree that the undertaking shall be implemented in accordance with the following stipulations to satisfy TVA's Section 106 responsibilities for Reservoir Land Management Plans. The TVA Federal Preservation Officer, or the designee thereof, shall act for TVA in all matters concerning the administration of this Agreement.

Stipulations

TVA will ensure that the measures outlined below are a part of all Reservoir Land Management Plans developed by TVA within the state of Tennessee, and that these provisions relating to identification, evaluation, and treatment of historic properties are carried out within the APE prior to the commencement of any ground-disturbing activities or activities that may have visual or other effects on a historic property. This Agreement allows phased identification, evaluation, and treatment of the historic properties located within the APE.

1. CONSULTATION:

TVA will seek comments from all appropriate consulting parties as defined at 36 CFR 800.2(c), and from signatories to this agreement on any undertaking proposed pursuant to a Reservoir Land Management Plan. All comments received in response to such requests for comments will be taken into consideration by TVA in its decision to proceed with such undertaking.

2. AREA OF POTENTIAL EFFECT (APE):

The APE is defined as all TVA fee lands described in the Reservoir Land Management Plan and those private or other non-TVA lands which may be affected by an undertaking on TVA fee land.

3. IDENTIFICATION:

A. TVA shall conduct surveys to identify all historic properties within the APE for each Reservoir Land Management Plan. Previous inventories of TVA lands have identified some but not necessarily all historic properties eligible and potentially eligible for listing in the NRHP.

B. The surveys will be carried out in a manner consistent with the *Secretary of the Interior's Standards and Guidelines for Identification* (48 FR 44720-23) and the Tennessee SHPO Standards and Guidelines for Architectural and Archaeological Resource Management Studies. Survey Plans will be provided to all signatories for thirty (30) days for review and comment, and TVA shall take all comments into account prior to implementation. A written report of the survey shall be submitted to the SHPO, Indian tribes, and the other signatories for thirty (30) days for review and comment. Existing information such as previous survey data, photographs, maps, drawings, building plans, descriptions, sketches, etc. shall be used along with new data.

4. EVALUATION:

A. TVA, in consultation with the SHPO, Indian tribes, and the other signatories to this Agreement, shall evaluate the National Register eligibility of properties identified through the surveys in accordance with 36 CFR Part 800.4(c). For properties that have been determined to be potentially eligible for listing in the NRHP, TVA shall conduct evaluation studies in a manner consistent with the *Secretary of the Interior's Standards and Guidelines for Identification and Evaluation* (48 FR 44720-26) and the Tennessee SHPO Standards and Guidelines for Architectural and Archaeological Resource Management Studies. The SHPO, Indian tribes, and the other signatories shall review and comment on the scope of work (SOW) prior to the evaluation. The evaluations shall be conducted in consultation with the SHPO, Indian tribes, and the other signatories, and a written report shall be submitted to all signatories for thirty (30) days for review and comment.

B. Properties which have been evaluated and have been found to meet National Register criteria shall be considered historic properties. Should a dispute arise on the eligibility of a historic property, TVA will consult with the SHPO to resolve the objection. If TVA and the SHPO do not agree with the determination of eligibility, or if the Council or the Secretary of the Interior (Secretary) so request, TVA shall obtain a determination of eligibility from the Secretary pursuant to 36 CFR Part 63. If an Indian tribe that attaches religious and cultural significance to a property off tribal land does not agree with the determination of eligibility, it may ask the Council to request the TVA Federal Preservation Officer to reassess the determination of eligibility.

5. TREATMENT PLANS:

A. AVOIDANCE, PROTECTION, AND MAINTENANCE:

(1) TVA, in consultation with the SHPO, Indian tribes, and the other signatories, shall ensure that historic properties determined eligible for listing in the NRHP are, to the extent prudent and feasible as determined by the consultation process, avoided and preserved in place while conducting activities that could affect the characteristics of such property. In the implementation of the Reservoir Land Management Plans, alternatives to avoid adversely affecting historic properties eligible for the NRHP will be considered. All eligible historic properties, that are avoided, will be protected by a buffer zone established in consultation with the SHPO, Indian tribes, and the other signatories.

(2) TVA will develop a protection and maintenance plan for historic properties on a particular reservoir within two (2) years of the completion of a Reservoir Land Management for that reservoir as specified under Stipulation10.B. of this Agreement. This plan will be consistent with the standards for archaeological resources set forth in *Treatment of Archaeological Properties* (Advisory Council on Historic Preservation 1989), and with the recommended approaches to rehabilitation of historic structures set forth in the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (U.S. Department of the Interior, National Park Service, 1983). Furthermore, this plan will be developed in consultation with the SHPO, Indian tribes, and the other signatories. TVA will seek and consider the views of other consulting parties pursuant to 36 CFR Part 800.3(f).

B. DATA RECOVERY:

(1) When historic properties eligible for the NRHP will be adversely affected by unavoidable physical destruction or damage and all avenues of avoidance have been considered, and a treatment plan for data recovery is found through consultation with the signatories to this Agreement and Indian tribes having a cultural affiliation with the historic properties to be the appropriate treatment, data recovery will be implemented. In such an instance, TVA shall develop a data recovery plan in consultation with the SHPO, Indian tribes, and the other signatories for the recovery of historic and archaeological data from properties that are determined to be eligible for inclusion in the NRHP.

(2) The data recovery plan shall be developed in accordance with 36 CFR Part 800.5 and 800.16 and will be consistent with 36 CFR Part 800 and the standards set forth in *Archeology and Historic Preservation: Secretary of Interior's Standards and Guidelines.* The data recovery plan shall specify, at a minimum:

(a) the property, properties, or portions of properties where data recovery is to be carried out;

(b) any property, properties, or portions of properties that will be destroyed without data recovery;

(c) the research questions to be addressed through data recovery, with an explanation of their relevance and importance;

(d) the field and laboratory methods to be used, with an explanation of their relevance to the research questions;

(e) the methods to be used in analysis, data management, and dissemination of data, including a schedule;

(f) the proposed disposition of recovered materials and records. The proposed location of this material will be at the University of Tennessee, McClung Museum except for items specified under Stipulation 9 below;

(g) proposed methods for involving the interested public in data recovery;

(h) proposed methods for disseminating results of the work to the interested public;

(i) a proposed schedule for the submission of progress reports to the SHPO; and

(j) a plan, developed in consultation with the SHPO, Indian tribes, and the other signatories, delineating the manner in which historic properties, human remains, and associated funerary objects discovered subsequent to the ratification of this Agreement document would be treated.

(3) TVA shall provide all signatories an opportunity to monitor the implementation of the data recovery plan.

6. POST REVIEW DISCOVERIES:

Previously unidentified historic properties discovered during the implementation of the Reservoir Land Management Plans will be subject to the evaluation process under Stipulation 4 and treated according to the process under Stipulation 5.

Should historic properties be discovered on TVA lands, the discovered historic properties shall be protected and stabilized to prevent any further disturbance until TVA can make an informed decision about further steps to take to meet Federal agency obligations under Section 106 and the terms of this Agreement.

7. REPORTS:

TVA shall ensure that all historical and archaeological investigations undertaken for compliance with this Agreement are recorded in formal written reports that meet the *Archeology and Historic Preservation: Secretary of Interior's Standards and Guidelines* and the Tennessee SHPO Standards and Guidelines for Architectural and Archaeological Resource Management Studies. The SHPO, Indian tribes, and the other signatories shall be afforded thirty (30) days to review and comment on any archaeological or historical reports submitted under this Agreement.

8. SHORELINE STABILIZATION:

Consistent with its obligations under Section 110 of the NHPA, TVA will monitor reservoir shorelines to determine whether any historic properties are being affected by reservoir operation and/or vandalism. TVA will implement appropriate measures, in consultation with the SHPO, Indian tribes, and the other signatories to protect eligible historic properties that are determined to be adversely affected by such causes.

Since fiscal year 1999, TVA has been pursuing a systematic effort in identifying the most significant and endangered archaeological sites along its reservoir shorelines and stabilizing/protecting them. All stabilization to date has been coordinated with the requisite SHPO and Indian tribes.

9. TREATMENT OF HUMAN REMAINS:

A. TVA shall ensure that the treatment of any human remains discovered within the APE complies with all State and Federal laws, including the Native American Graves Protection and Repatriation Act (NAGPRA), concerning archaeological sites and treatment of human remains. Regarding human remains identified on State lands, TVA shall ensure that the remains be treated in a manner that is consistent with the Advisory Council of Historic Preservation's *Policy Statement Regarding the Treatment of Human Remains and Grave Goods* (1988), and in accordance with Tennessee Code Annotated (T.C.A.) 46-4-101 et seq. "Termination of Use of Land as a Cemetery," and T.C.A. 11-6-116b, "Notification and Observation," and T.C.A. 11-6-119 "Reinterment" with implementing Tennessee Rules and Regulations Chapter 0400-9-1 "Native American Indian Cemetery Removal and Reburial." Should human remains be encountered during historic properties investigations or post-review discovery, all ground disturbing activities in the vicinity of the human remains will be ceased immediately. TVA will notify signatories within three (3) business days and invite them to comment on any plans developed to treat the human remains.

B. After consultation with signatories and culturally affiliated Indian tribes in accordance with the provisions of NAGPRA, if any Native American human remains and/or associated funerary objects are excavated during the survey, evaluation, or data recovery of historic properties, TVA shall ensure that these remains and associated objects will be repatriated in accordance with the provisions of NAGPRA within sixty (60) days of completion of any investigations specified in the research design. The temporary curation of the human remains and associated funerary objects will be at the University of Tennessee, McClung Museum during this interim.

10. TIMETABLES FOR COMPLIANCE:

A. Consistent with Stipulation 11 that allows phased compliance, TVA shall ensure that the commitments in this Agreement are met prior to commencement of any ground-disturbing activities. In the event that previously unidentified historic properties should be encountered during the implementation of any ground-disturbing activities, consultation with the SHPO, Indian tribes, and the other signatories will be conducted to determine where work can resume while the effects to the historic property are addressed.

B. Within two (2) years of completion of a Reservoir Land Management plan in Tennessee, TVA will develop a plan for protection and maintenance of historic properties at that particular reservoir. The plan will be submitted to the SHPO, Indian tribes, and the other signatories for review pursuant to Stipulation 5.A(2).

C. Throughout this agreement, unless otherwise stated, the SHPO, Indian tribes, and the other signatories shall have thirty (30) days to review and comment on all reports concerning investigations of historic properties and proposed data recovery plans provided by TVA. Comments received from the signatories shall be taken into consideration in preparing final plans. A copy of the final reports and data recovery plans shall be provided to the signatories.

11. PHASED COMPLIANCE:

Consistent with 36 CFR Part 800.4(b)(2), this Agreement allows phased identification, evaluation, and treatment of historic properties in order to meet the requirements of Section 106 of the National Historic Preservation Act (NHPA).

12. LAND TRANSFER OF PROPERTY RIGHTS:

The instrument of conveyance for the transfer, lease or sale, of any parcel containing or that may contain a historic property from the Federal Government to a third party will include provisions to ensure that all requirements of Section 106 of the NHPA and its implementing regulations (36 CFR Part 800) are met. The instrument of conveyance shall contain, when necessary to protect historic properties, a legally binding preservation covenant for the protection of such properties prepared in consultation with the SHPO, Indian tribes, and the other signatories. TVA may release the grantee from the preservation covenant in whole or in part, as appropriate, pursuant to the terms of the covenant and after consultation with the SHPO, Indian tribes, and the other signatories. The covenant may be enforced by TVA or the United States of America.

13. ADMINISTRATIVE CONDITIONS:

A. If Stipulations 1 - 12 have not been implemented within ten (10) years, this Agreement shall be considered null and void, unless the signatories have agreed in writing as provided in Paragraph 13.B. below to an extension for carrying out its terms. If no agreement is reached on an extension at the end of this 10-year period, TVA and the SHPO will resume consultation pursuant to 36 CFR Part 800.

B. If Stipulations 1 - 12 have not been implemented within nine (9) years from the date of this Agreement's execution TVA and the SHPO shall review the Agreement to determine whether the Agreement should be extended. If an extension is deemed necessary, TVA, the Council, and the SHPO and other signatories will consult to make appropriate revisions to the Agreement.

C. The signatories to this Agreement shall consult at least once every year to review implementation of the terms of this Agreement. Prior to the reviews, TVA shall provide to the signatories a report detailing how it has carried out its obligations pursuant to this Agreement.

D. The Council, SHPO, Indian tribes and the other signatories may monitor activities carried out pursuant to the Agreement, and the Council will review such activities if so requested. TVA will cooperate with the Council, SHPO, Indian tribes and the other signatories in carrying out their monitoring and review responsibilities.

E. The signatories to this Agreement may agree to amend the terms of the Agreement. Such amendment shall be effective upon the signatures of all signatories to this Agreement, which shall be appended to the Agreement as an attachment.

F. Should the SHPO, Indian tribes and the other signatories object within thirty (30) days after receipt of any plans, specifications, contracts, or other documents provided for review pursuant to this Agreement, TVA shall consult with the SHPO to resolve the objection. If TVA determines that the objection cannot be resolved, TVA shall request the further comments of the Council pursuant to 36 CFR Part 800. Any Council comment provided in response to such a request will be taken into account by TVA in accordance with 36 CFR Part 800 with reference only to the subject of the dispute; TVA's responsibility to carry out all actions under this Agreement that are not the subjects of the dispute will remain unchanged.

G. In the event the SHPO is unable to fulfill its responsibilities pursuant to this Agreement, TVA shall consult with the Council on an appropriate course of action for implementing the terms of this Agreement.

H. If the Council determines that the terms of this Programmatic Agreement are not being carried out, or if this Agreement is terminated, TVA shall comply with subpart B of 36 CFR Part 800 with regard to individual Reservoir Land Management Plans covered by this Agreement.

I. TVA shall ensure that public involvement in addition to its outreach to the signatories to this Agreement is conducted pursuant to 36 CFR Part 800.14 by inviting comment through Public meetings, Public notices, or other appropriate mechanisms as may be agreed upon by the signatories.

Execution and implementation of this Programmatic Agreement evidences that TVA has taken into account the effects on historic properties resulting from its action to develop Reservoir Land Management Plans in Tennessee and TVA has thereby complied with its obligations under Section 106 of National Historic Preservation Act for these actions..

SIGNATORIES:

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: 10/11/05
[ ]

TENNESSEE VALLEY AUTHORITY

By: _____ Date: 7.20.05
[ ]

TENNESSEE STATE HISTORIC PRESERVATION OFFICER

By: Herbert L. Harper, DSHPO Date: 8/23/05
[ ]

CONCURRING PARTIES:

EASTERN BAND OF CHEROKEE INDIANS

By: _____ Date: _____
[ ]

CHICKASAW NATION

By: _____ Date: _____
[ ]

CHOCTAW NATION OF OKLAHOMA

By: _____ Date: _____
[ ]

MUSCOGEE (CREEK) NATION OF OKLAHOMA

By: _____ Date: _____
[ ]

By: _____ Date: _____
[ ]

By: _____ Date: _____
[ ]

PROGRAMMATIC AGREEMENT
AMONG
THE TENNESSEE VALLEY AUTHORITY,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
AND THE TENNESSEE HISTORIC PRESERVATION OFFICER
REGARDING THE IMPLEMENTATION OF RESERVOIR LAND MANAGEMENT
PLANS IN
TENNESSEE

AMENDMENT 1

This Agreement shall be amended to include those portions of Apalachia Reservoir located within Polk County, Tennessee.

SIGNATORIES:

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Robert Gaf Date: 1/11/08
[ ]

TENNESSEE VALLEY AUTHORITY

By: Bridgette K. Ellis Date: 11-19-07
[ ]

TENNESSEE STATE HISTORIC PRESERVATION OFFICER

By: E Patrick McIntyre Date: October 25, 2007
[ ]

Appendix I – Scenic Value Criteria for Scenery Inventory and Management

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TENNESSEE VALLEY AUTHORITY VISUAL RESOURCES SCENIC VALUE CRITERIA FOR SCENERY INVENTORY AND MANAGEMENT

The criteria for classifying the quality and value of scenery has been adapted from a scenic management system developed by the U.S. Forest Service (USFS) and integrated with current planning methods used by the Tennessee Valley Authority (TVA). The classification process is also based on fundamental methodology and descriptions adapted from *Landscape Aesthetics, A Handbook for Scenery Management*, Agriculture Handbook Number 701, USFS 1995.

The process and criteria are used to compare the value of scenery to other resource values during inventory and land planning tasks. They are also used to evaluate the extent and magnitude of visual changes that could result from proposed projects, as part of the environmental review required under the National Environmental Policy Act. In addition, they can be useful to help establish management objectives for improving or maintaining the scenic quality of managed lands.

Scenic Attractiveness - 3 levels

Attractiveness is a measure of scenic quality based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures, and visual composition of each landscape. The combination of rock outcrops, water bodies, landforms, vegetation patterns, and other natural features that shape landscape character also help define scenic importance. The presence or absence of these features, along with valued attributes such as variety, uniqueness, mystery, pattern, order, vividness, harmony, and balance are used to classify the scenic attractiveness of a landscape.

Category 1: Distinctive - Areas where the variety of land forms, rock, vegetation patterns, water, and other features have outstanding or unique visual quality. These areas have strong, positive attributes that are relatively uncommon in the characteristic landscape. This category also includes areas in visually strategic locations that have somewhat more common attributes.

Category 2: Common - Areas where the land forms, rock, vegetation patterns, water, and other features have ordinary or common visual quality. These areas have generally positive but typical attributes, with a basic variety of forms, colors, and textures that are normally seen throughout the characteristic landscape.

Category 3: Minimal - Areas where the natural features have little change in form, line, color or texture resulting in low visual quality. Rock forms and vegetation patterns of any consequence are often not present, and these areas generally have weak or missing attributes. All areas not classified as 1 or 2 are included in this category.

Scenic Integrity - 4 levels

Integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. Human alteration can sometimes raise integrity, such as an impounded water body that unifies the landscape while adding variety, mystery, harmony, and balance. Most often scenic integrity is lowered by human alteration

and the addition of visually disruptive elements. The presence and degree of discordant alteration is used to classify the scenic integrity of a landscape.

High: Areas where the valued landscape character appears to be intact and unaltered, with very minor deviation. Any deviation present must repeat the form, line, color, texture, and pattern of the landscape so closely and at such a scale that they are not evident.

Moderate: Areas where the valued landscape character appears to be slightly altered. Noticeable deviations must be visually subordinate to the landscape being viewed, and borrow much of the natural form, line, color, texture, and pattern.

Low: Areas where the valued landscape character appears to be modestly altered. Deviations begin to dominate the landscape being viewed, but the alterations should share natural color, shape, edge pattern, and vegetation characteristics in order to remain compatible or complementary.

Very Low: Areas where the valued landscape character appears to be heavily altered. Deviations strongly dominate the landscape and may not share any of the visual attributes. The alterations may be visually disruptive and provide significant negative contrast to the natural landscape characteristics.

Scenic Visibility - 2 parts, 3 levels each

Landscape visibility is a measure of scenic importance based on several essential interrelated considerations, which include viewer context and sensitivity, number of viewers, frequency and duration of view, level of detail seen, and seasonal variation. A large number of highly concerned viewers who view the landscape for a long time period may raise the scenic importance significantly. The importance may be much lower when only a few viewers with low concern see the landscape for a brief period. These considerations are combined in two parts, which are used to classify the scenic visibility of a landscape.

Sensitivity: The level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. Sensitivity may be derived/confirmed by resident and visitor surveys.

Level 1: High - Areas seen from the reservoir, lakeshore residents, and lake view residents, where the number of viewers and concern for scenic quality are normally quite high.

Level 2: Moderate - Areas seen from principal roadways, use areas, and other public viewing areas. Concern for scenic quality is generally high while the number of viewers, view frequency, and duration are moderate.

Level 3: Low - Areas seen from secondary travel routes, use areas, and any not included in the other levels. Concern may be high in some areas, but number of viewers is generally low.

View Distance: A principal indicator of scenic importance based on the distance an area can be seen by observers and the degree of visible detail within that zone.

Foreground: From 0 feet to 0.5 mile. A distance zone where the individual details of specific objects are important and easily distinguished. Details are most significant within the immediate foreground, 0 to 300 feet.

Middleground: From 0.5 mile to 4 miles. The zone where most object characteristics are distinguishable, but their details are weak and they tend to merge into larger patterns. When landscapes are viewed in this zone, they are seen in broader context. Human alteration may contrast strongly with the larger patterns and make some middleground landscapes more sensitive than the foreground.

Background: From 4 miles to the horizon. The distant landscape, where specific features are not normally discernible unless they are especially large, standing alone, or have a substantial color contrast. Details are generally not visible, and colors are lighter.

Scenic Value Class - 4 levels

The value class of a landscape is determined by combining the levels of scenic attractiveness, scenic integrity, and visibility. The selection matrix below shows the various combinations and the resulting scenic class. It is a guide that is intended to complement both a thorough field analysis and careful review of the visual absorption capacity.

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

Excellent: Areas with outstanding natural features that appear unaltered. Very minor deviations may be present but are generally unnoticeable even in the foreground. These areas are highly visible in the foreground and middleground from both land and water. Unaltered areas that may be less outstanding but are in a visually strategic location are also classified as excellent scenic value.

Good: Areas with attractive but common scenic quality and no distinctive natural features. Minor human alteration may be seen in the foreground but is barely noticeable in the middleground. These areas have relatively high visibility from both land and water.

Fair: Areas of common or minimal scenic quality with little or no interesting features. Moderate human alteration provides discordant contrast that is seen in the foreground but is less distinct in the middleground due to compatible form and color. These areas have relatively high visibility from both land and water.

Poor: Areas that have very little scenic importance and/or visually significant disturbances resulting from human activity. The alterations provide discordant contrast in the natural landscape due to incompatible size, shape, color, and

material. The areas are clearly visible in the foreground and middleground and have relatively high visibility from both land and water.

Severity of Impact

The threshold of significance is the extent or magnitude of alteration to the existing landscape that is sufficient to change the scenic value class by two levels or more.

Visual Absorption Capacity

Absorption capacity indicates the relative ability of a landscape to accept human alteration with the least loss of landscape character and scenic value. These indicators are useful to help predict potential difficulty or success with proposed development and scenic management. They are based on characteristics of the physical factors found in a landscape. Each characteristic has a capacity range from less to more, and the primary ones are shown in the list below. Visual absorption is also affected by the variety of landscape patterns and the amount of screening provided by landforms, rock, water bodies, and vegetation.

Factor	Least Capacity to Absorb Change	Greatest Capacity to Absorb Change
Slope	Steep Unstable geology	Level Stable geology
Vegetation	Sparse cover Low cover, grasses and shrubs Few species, little or no pattern	Dense cover Tall cover, trees Multiple species, diverse pattern
Landforms	Simple shape	Diverse shapes, heavily dissected
Soils	Easily eroded Poor; slow revegetation	Erosion resistant Rich; fast revegetation
Shoreline	Simple line, little or no interruption	multiple interruptions, diverse features
Color	Narrow range of indigenous colors	Broad range of indigenous colors

Desired Landscape Character

Scenic attractiveness and the existing level of scenic integrity serve as the foundation for selecting the preferred landscape character. Lake adjacency and ecosystem trends should be considered along with the historic visual character to help any changes be more complete, attractive, and sustainable. Several types of landscape character and the related long-range objectives for scenic integrity are described below.

Natural Evolving landscape character expresses the natural change in ecological features and processes with very limited human intervention.

Natural Appearing landscape character expresses predominantly natural qualities but includes minor human interaction along with cultural features and processes that are relatively unobtrusive.

Pastoral landscape character expresses dominant human-developed pasture, range, and meadow, along with associated structures, reflecting historic land uses, values, and lifestyles.

Rural landscape character expresses sparse but dominant human residential and recreational development, along with associated structures and roadways that reflect current lifestyles.

Urban landscape character expresses concentrations of human activity in the form of commercial, residential, cultural, and transportation facilities, along with supporting infrastructure.

Visual Management Objectives

Based on the scenic value class, management objectives may be developed to accomplish or maintain the visual character desired for each area.

Preservation:
Areas classified Excellent and managed for a natural evolving landscape character. Only very low-impact recreational and scientific activities are allowed, and no facilities are permitted.

Retention:
Areas classified Good and managed for a natural appearing landscape character. Permitted activity or minor development should repeat the natural form, line, color, and texture of the area and remain visually subordinate to the surrounding landscape. Changes in the size, intensity, direction, and pattern of activity should be unobtrusive and not readily evident.

Modification:
Areas classified Good or Fair and managed for pastoral or rural landscape character. Permitted activity and development may dominate the original character but should remain visually compatible with the remaining natural landscape. Vegetation and landform alterations should repeat the natural edges, forms, color, and texture of the surrounding area. The scale and character of structures, roads, and other features should borrow naturally established forms, lines, colors, and patterns to provide the greatest possible visual harmony.

Maximum Modification:
Areas classified Fair or Poor and managed for urban landscape character. Permitted activity and development generally dominates the original visual character. Vegetation and landform alterations should remain visually harmonious with the adjacent landscape. When seen in the foreground and middleground, they may not fully borrow the surrounding natural forms, lines, colors, and textures. Likewise, development features seen from the same distances may be out of scale and have significant details that are discordant with the natural landscape character. Overall development should be directed toward achieving the greatest possible visual harmony.

Enhancement:
Any area classified less than Excellent with a relatively short-term management objective intended to restore and/or improve the desired scenic quality. Rehabilitation activities may include alteration, concealment, or removal of obtrusive and discordant elements. Enhancement activities may include addition or modification of natural elements and man-made features to increase the variety and attractiveness of spaces, edges, forms, colors, textures, and patterns.

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Appendix J – Flood Profiles

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Hiwassee River Flood Profiles
Downstream of Apalachia Dam

River Mile	100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
43.20	732.7	738.7	Gee Creek Campground
43.80	734.5	740.0	Gee Creek Campground
53.30	848.1	853.1	
53.32	848.3	853.3	
53.43	849.5	854.9	
53.55	850.9	855.8	
53.60	851.9	856.9	
53.70	854.7	860.7	
53.80	855.7	861.6	
53.92	857.3	863.1	
54.02	859.4	864.8	
54.10	862.0	867.1	
54.20	863.9	868.8	
54.48	866.0	872.9	
54.96	881.8	891.3	
55.60	904.3	910.4	
56.00	921.7	926.7	
56.30	930.5	935.5	
56.60	938.2	943.1	
56.85	947.1	951.9	
56.90	951.4	956.7	
57.45	956.1	962.7	
57.65	962.6	969.4	
57.80	969.7	976.2	
57.95	973.9	980.2	
58.20	983.4	989.3	
58.80	1010.9	1014.5	
59.20	1035.0	1038.2	
59.40	1042.9	1046.4	
59.50	1046.4	1049.1	
59.80	1055.0	1059.5	
60.40	1070.9	1075.1	
61.00	1087.6	1090.6	
61.70	1113.7	1116.7	
62.20	1125.7	1129.4	
62.40	1130.9	1134.5	
62.50	1133.8	1137.8	
62.59	1134.5	1138.8	
62.61	1134.8	1139.6	
62.80	1140.1	1144.6	
62.90	1142.3	1147.1	
63.20	1145.2	1150.4	
63.50	1152.7	1156.3	
64.00	1160.4	1164.6	
64.60	1171.1	1175.6	
64.70	1172.8	1177.8	
65.40	1177.9	1183.1	
65.45	1178.3	1183.5	
65.48	1178.5	1183.7	
65.50	1178.7	1183.8	
65.70	1181.1	1186.6	
65.80	1181.4	1186.9	
65.82	1181.7	1187.2	
66.00	1182.3	1187.8	Downstream of Apalachia Dam

All elevations are NGVD 1929

Hiwassee River Flood Profiles
Downstream of Chatuge Dam

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
120.00		1804.5	1809.6	
120.03		1804.7	1809.8	
120.12	D	1805.0	1810.4	Aeration Weir
120.12	U	1810.3	1814.4	
120.33		1810.5	1814.6	
120.54	D	1810.9	1815.3	Barnard Bridge
120.54	U	1811.3	1815.8	
121.00		1811.8	1816.5	

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridge or weir

Little Tennessee River
Approximate Flood Profiles
Downstream of Fontana Dam

River Mile	Approximate 100-Year Flood Elevation (ft)	Approximate 500-Year Flood Elevation (ft)	Landmark
59.10	1280.0	1283.5	
59.93	1282.5	1287.0	
61.00	1286.0	1291.0	Downstream of Fontana Dam

All elevations are NGVD 1929

Hiwassee River Flood Profiles
Hiwassee Reservoir

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
75.80		1529.0	1530.0	Hiwassee Dam
90.20		1529.0	1530.0	
92.80		1529.0	1530.0	
93.60		1529.0	1530.0	
95.00		1529.0	1530.0	
95.69		1529.0	1530.0	
96.20		1529.0	1530.0	
96.26		1529.0	1530.0	
96.32		1529.0	1530.0	
96.32.	D	1529.0	1530.0	U.S. Highways 19 and 129
96.41	U	1529.0	1530.0	
96.56		1529.0	1530.0	
96.75	D	1529.1	1530.2	U.S. Highway 64
96.75	U	1529.7	1530.9	
96.80		1530.7	1532.1	
97.00		1531.1	1532.5	
97.01		1531.1	1532.5	
97.02		1532.2	1532.5	
97.12		1531.5	1532.8	
97.15		1531.5	1532.9	
97.28		1532.0	1533.3	
97.47		1532.3	1533.6	
97.74		1534.5	1535.6	
97.80		1535.3	1536.3	

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridges

Nottely River Flood Profiles
Downstream of Nottely Dam

River Mile	100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
20.20	1606.2	1612.1	
20.28	1606.7	1612.6	
20.66	1612.3	1617.1	
21.00	1614.1	1618.7	Downstream of Nottely Dam

All elevations are NGVD 1929

Ocoee River Flood Profiles
Downstream of Ocoee #1 Dam

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
11.50		739.4	744.2	
11.62	D	739.5	744.3	Abandoned Railroad Bridge
11.62	U	740.4	745.8	
11.90		742.0	747.9	Downstream of Ocoee #1 Dam

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridges

Ocoee River Flood Profiles
Ocoee #3 Reservoir

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
29.20		1438.1	1439.7	Ocoee #3 Dam
30.09		1438.1	1439.7	
31.02		1438.1	1439.7	
32.28		1443.8	1446.0	
32.77		1446.1	1448.2	
32.97		1446.7	1448.9	
33.66		1448.8	1451.3	
33.94		1449.8	1452.4	
34.39		1451.4	1454.1	
34.62		1452.7	1455.5	
34.93		1454.0	1456.9	
35.17	D	1455.0	1458.1	Rogers Bridge
35.17	U	1455.2	1458.3	
35.31		1455.4	1458.5	
35.50		1455.6	1458.8	

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridges

Toccoa River Flood Profiles
Downstream of Blue Ridge Dam

River Mile	100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
52.40	1552.8	1556.9	
52.44	1553.1	1557.4	
52.50	1553.2	1557.8	
52.58	1553.6	1558.0	
53.00	1554.2	1558.7	Downstream of Blue Ridge Dam

All elevations are NGVD 1929

Tuckasegee River Flood Profiles
Fontana Reservoir

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
0.00		1710.0	1710.0	
10.13		1711.6	1714.0	
11.00		1714.3	1716.9	
11.28		1717.8	1720.2	
11.40		1719.7	1722.2	
11.75	D	1724.7	1728.7	Norfolk Southern Railway
11.75	U	1727.7	1732.2	
12.09		1728.6	1733.1	
12.25		1729.3	1733.5	
12.51	D	1732.3	1738.0	Slope Street
12.51	U	1734.2	1738.9	
12.64		1735.3	1739.5	
12.70		1735.4	1739.5	

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridges

Valley River Flood Profiles
Hiwassee Reservoir

River Mile		100-Year Flood Elevation (ft)	500-Year Flood Elevation (ft)	Landmark
0.00		1529.0	1530.0	
0.28		1529.0	1530.0	
0.46		1529.0	1531.5	
0.60		1529.0	1532.6	
0.72	D	1530.1	1533.5	U.S. Highway 19
0.72	U	1531.4	1535.7	
0.88		1532.2	1536.3	
1.20		1534.9	1538.0	
1.32		1536.3	1539.2	
1.35		1536.5	1539.4	
1.39		1536.7	1539.6	
1.43		1537.0	1539.9	
1.49		1537.2	1540.0	
1.52		1537.5	1540.3	
1.56		1538.2	1541.0	
1.58		1538.3	1541.2	
1.62		1538.9	1541.8	
1.67	D	1538.9	1541.8	Murphy High School Road
1.67	U	1541.4	1543.2	
1.72		1541.7	1543.4	
1.91		1542.8	1544.8	
2.06		1543.2	1545.3	
2.10		1543.3	1545.3	
2.17		1543.9	1546.0	
2.20		1543.9	1546.0	

All elevations are NGVD 1929
Downstream (D) and Upstream (U) at bridges

Appendix K – Common Aquatic Species From Chatuge, Hiwassee, Blue Ridge, Nottely, Ocoee 1, Apalachia, and Fontana Reservoirs

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Scientific Name	Common Name	Apalachia	Blue Ridge	Chatuge	Fontana	Hiwassee	Nottely	Ocoee 1
Dorosoma cepedianum	Gizzard shad	X	X	X	X	X	X	X
Dorosoma petenense	Threadfin shad	-	-	-	X	X	X	-
Dorosoma sp.	Hybrid shad	-	-	-	-	X	X	-
Cyprinus carpio	Common carp	X	-	X	X	X	X	X
Notropis photogenis	Silver shiner	-	-	-	X	X	-	-
Cyprinella galactura	Whitetail shiner	-	X	X	X	X	-	-
Notemigonus crysoleucas	Golden shiner	-	-	X	-	-	-	-
Cyprinella spiloptera	Spotfin shiner	-	X	-	X	-	-	-
Pimephales notatus	Bluntnose minnow	-	-	-	-	X	-	-
Hypentelium nigricans	Northern hogsucker	X	-	X	X	X	X	X
Moxostoma duquesnei	Black redhorse	X	X	X	X	X	X	X
Moxostoma carinatum	River redhorse	X	X	-	X	X	X	-
Moxostoma anisurum	Silver redhorse	-	-	-	X	X	X	-
Moxostoma macrolepidotum	Shorthead redhorse	X	-	-	X	X	-	-
Moxostoma sp.	Sicklefin redhorse	-	-	-	X	X	-	-
Moxostoma erythrurum	Golden redhorse	-	X	-	X	X	X	-
Ictalurus punctatus	Channel catfish	X	X	X	X	X	X	X
Polydictis olivaris	Flathead catfish	X	X	X	X	X	X	X
Ameiurus brunneus	Snail bullhead	-	-	X	-	-	-	-
Ameiurus platycephalus	Flat bullhead	-	-	-	X	-	-	-
Ambloplites rupestris	Rock bass	-	-	-	X	X	-	-
Micropterus dolomieu	Smallmouth bass	X	X	X	X	X	X	X
Micropterus punctulatus	Spotted bass	X	X	X	X	X	X	X
Micropterus salmoides	Largemouth bass	X	X	X	X	X	X	X
Morone chrysops	White bass	X	X	X	X	X	X	X
Morone saxatilis	Striped bass	-	-	-	X	X	X	-
Morone sp.	Hybrid striped X white	-	-	X	X	X	X	-
Morone sp.	Hybrid bass	-	-	-	-	X	X	-
Lepomis gulosus	Warmouth	-	X	X	X	X	X	X
Lepomis cyanellus	Green sunfish	X	X	X	X	X	X	X
Lepomis auritus	Redbreast sunfish	X	X	X	-	X	X	X
Lepomis macrochirus	Bluegill	X	X	X	X	X	X	X
Lepomis sp.	Hybrid sunfish	-	X	X	X	X	X	X
Lepomis megalotis	Longear sunfish	X	X	-	X	-	X	X
Lepomis microlophus	Redear Sunfish	-	-	X	-	X	X	X

X = Species Occurrence

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