US Army Corps
of Engineers

# DRAFT ENVIRONMENTAL ASSESSMENT

## Draft Shoreline Management Plan Revision
## Table Rock Lake, Missouri

October 2019

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# DRAFT SHORELINE MANAGEMENTPLAN REVISION TABLE ROCK LAKE ENVIRONMENTAL ASSESSMENT

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# DRAFT SHORELINE MANAGEMENT PLAN REVISION TABLE ROCK LAKE DRAFT ENVIRONMENTAL ASSESSMENT

## 1.0 INTRODUCTION

The Table Rock Shoreline Management Plan (SMP) is the required U.S. Army Corps of Engineers (Corps) approval document (Title 36, Section 327.30 and ER 1130-2-406) that protects and manages shorelines of USACE Civil Works water resource development projects under Corps jurisdiction in a manner that promotes safe and healthful public use of shorelines while maintaining environmental safeguards. The objectives of management actions in this SMP are to balance permitted private uses and natural resource protection for general public use. The Corps last updated the Table Rock Lake SMP in March 1996; and thus, the document is currently out of date.

The updated Table Rock SMP, once approved by the Southwestern Division Engineer, will become an appendix to the Operation Management Plan (OMP) for the lake. The OMP is currently under review and being updated; and once approved by the Little Rock District Chief of Operations, will become an appendix to the recently revised Table Rock Lake Master Plan. The objectives of the SMP are to**:**

1) Provide access to project lands and waters while maintaining the shoreline for general public use.

2) Provide recreational opportunities that does not overly impact project lands and waters.

3) Promote a reasonably safe and healthful environment for project visitors.

4) Respond to changing land and water conditions.

5) Manage and protect project lands and waters in a sustainable manner that will conserve natural resources and environmental quality for future generations.

6) Give special consideration for the protection of threatened and endangered plant and animal species.

7) Manage recreational and natural resources in a manner that is responsive to the general public.

8) Reduce or prevent long-term damage or hazards to the project's natural resources from invasive and nonindigenous species that pose a significant ecological threat.

9) Manage the lake's shoreline to properly establish, enhance, and maintain fish and wildlife habitat, aesthetic quality, and to sustain natural environmental conditions.

10) Balance public services with permitted private use through commercial sites, marinas, and other public use areas.

11) Preserve important historic, cultural, and natural aspects of our heritage.

12) Establish a consistent means of education and communication with the project user.

13) Establish a consistent means of administering and managing the shoreline use permit program in an effectual, efficient and cost effective manner.

With the draft SMP update, the Corps is completing an Environmental Assessment (EA) that evaluates existing conditions and potential impacts of proposed alternatives. The EA is prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR, 1500–1517), and the Corps Policy and Procedures for Implementing NEPA as directed by Engineer Regulation (ER) 200-2-2 (1988).

# 2.0 PURPOSE AND PROJECT BACKGROUND

## 2.1 Purpose

The Corps approved the original Table Rock Lake SMP (also known as the Lakeshore Management Plan) in April of 1976; and the Little Rock District Engineer reviewed, updated and approved the SMP in May of 1982. The SMP was again supplemented in January of 1988 and April of 1989; which the Southwestern Division Engineer approved in July of 1990. In August of 1991, the Corps SMP once again supplemented the document, and approved changes in September of the same year. The last review, update, and approval of the SMP took place in March 1996. Updating the 1996 SMP is necessary because:

1) Most of the approved plans in the 1996 previous update have been implemented.

2) Current GIS technology allows for a more accurate analysis and mapping of the lake's shoreline.

3) Current Corps policies and regulations, budget processes, business line performance measures, and priorities are not reflected in the 1996 plan.

4) Customer use, trends, and facility and service demands have changed over the past 20 years (e.g., dramatically increased shoreline use has increased significantly).

5) Trends in shoreline development, and resulting environmental and management issues have increased causing sustainability concerns;

6) Stakeholders, and the general public are increasingly more engaged with the Corps regarding improvements and private development issues.

7) Partners are increasingly concerned with management of lake resources.

The Corps prepared the draft SMP revision in accordance with the following policies:

1) Corps Policy guidance ER 1130-2-406 of 31 October 1990 and 28 May 1999.

2) Title 36, Chapter III, Part 327, Code of Federal Regulations, "Rules and Regulations Governing Public Use of Water Resource Development Projects Administered by the Chief of Engineers."

This current revision also included public participation in the form of several comment periods, focus group sessions, and informational public workshops, and Table Rock Lake Oversight Committee which were included as part of the preparation of an Environmental Assessment (EA). This EA provides the documentation of the impacts of the program and will allow for future revisions of this plan.

## 2.2 Project Background

The Table Rock Lake Civil Works project on the White River located within Southwest Missouri (Stone, Taney, and Barry counties) and Northwest Arkansas (Boone and Carroll counties) was authorized by the Flood Control Act of 28 June 1938, Public Law 761, 75th Congress, 3rd Session. Table Rock Lake was authorized for five missions: Flood control, generation of hydroelectric power, provide recreational development, fish and wildlife, and water supply (storage to provide water for operation of a fish hatchery by the State of Missouri). The construction of the dam was completed in 1958, and the powerhouse and switchyard were completed in 1959. The lake was declared operational for public use in 1960.

Table Rock Lake is a major component of a comprehensive plan for water resource development in the White River Basin of Missouri and Arkansas. Additional beneficial uses include increased power output of downstream power stations resulting from the regulated flow from the Table Rock Lake project.

The project is in the scenic Ozark Mountain region of southwest Missouri and northwest Arkansas. The total area contained in the Table Rock project, including both land and water surface, consists of 62,207 acres. Of this total, 2,576 acres are in flowage easement. When the lake is at the top of the conservation pool, the water area comprises 42,644 acres and 758 miles of shoreline (including both fee and inundated private property). Table Rock Lake has a seasonal conservation pool from May through November, topping at the 917' elevation contour. The top of the flood pool is the 931' elevation contour and the 936' elevation contour is the top of the surcharge pool. The region is characterized by narrow ridges between deeply cut valleys that are well wooded with deciduous trees and scattered pine and cedar. The shoreline is irregular with topography ranging from steep bluffs to gentle slopes.

**Figure 2.1 Table Rock Lake Map**

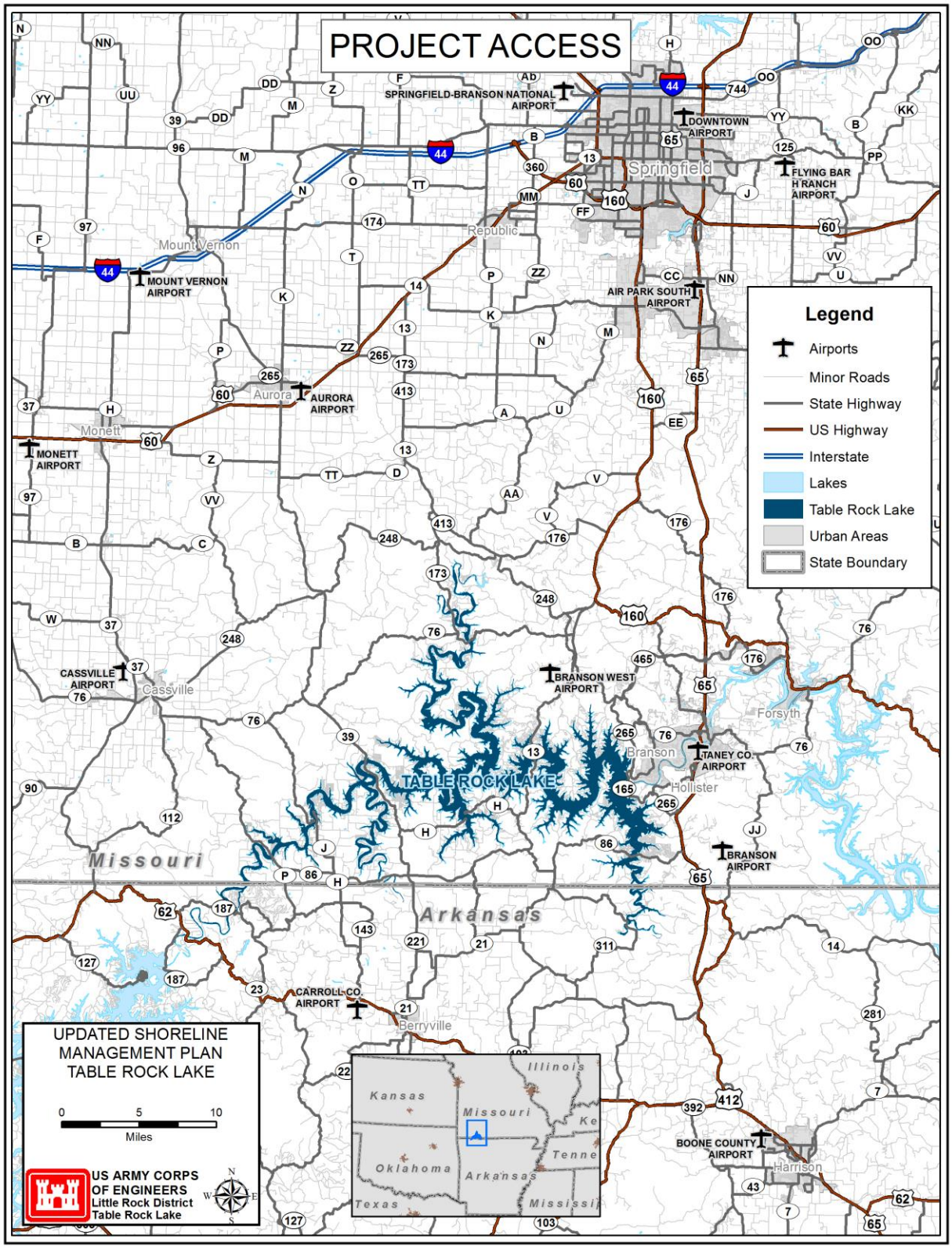

PROJECT ACCESS
SPRINGFIELD-BRANSON NATIONAL AIRPORT
DOWNTOWN AIRPORT
FLYING BAR H RANCH AIRPORT
Springfield
Republic
Mount Vernon
MOUNT VERNON AIRPORT
AIR PARK SOUTH AIRPORT
Aurora
AURORA AIRPORT
Monett
MONETT AIRPORT
CASSVILLE AIRPORT
Cassville
BRANSON WEST AIRPORT
Forsyth
Branson
TANEY CO. AIRPORT
Hollister
TABLE ROCK LAKE
BRANSON AIRPORT
Missouri
Arkansas
CARROLL CO. AIRPORT
Berryville
BOONE COUNTY AIRPORT
Harrison
Legend
Airports
Minor Roads
State Highway
US Highway
Interstate
Lakes
Table Rock Lake
Urban Areas
State Boundary
UPDATED SHORELINE MANAGEMENT PLAN
TABLE ROCK LAKE
0 5 10
Miles
US ARMY CORPS OF ENGINEERS
Little Rock District
Table Rock Lake
Illinois
Kansas
Missouri
Oklahoma
Arkansas
Texas

**Table 2.1**

**Pertinent Data of Table Rock Dam and Lake**

| | |
|---|---|
| **Physical characteristics of area and lake pool** | |
| Drainage area, square miles | 4,020 |
| Approximate average annual rainfall (inches) | 45.4 |
| Nominal bottom of power drawdown elevation (feet above mean sea level) | 881 |
| Area (acres) | 27,300 |
| Nominal top of conservation pool elevation (feet above mean sea level) | 915 |
| Area, acres | 42,644 |
| Length of shoreline (miles) | 758 |
| Nominal top of flood-control pool elevation (feet above mean sea level) | 931 |
| Area (acres) | 51,291 |
| Length of shoreline (miles) | 927 |
| Five-year frequency flood pool elevation (feet above mean sea level) | 921 |
| Five-year drawdown elevation (feet above mean sea level) | 902 |
| **Dam characteristics** | |
| Length (feet) | 6,423 |
| Height (feet above streambed) | 252 |
| Top of dam elevation (feet above mean sea level) | 947 |
| **Generators** | |
| Main units (number) | 4 |
| Rated capacity each unit (kilowatts) | 50,000 |
| Station service units | 2 |
| Rated capacity each unit (kilowatts) | 700 |

## 3.0 ALTERNATIVES

Seven alternatives evaluated for the draft EA:

- Alternative 1(No Growth)
- Alternative 2 (Benefit General Public Use)
- Alternative 3 (No Action)
- Alternative 4 (Neutral Change)
- Alternative 4a (Revised Neutral Change) Preferred Alternative
- Alternative 5 (Accelerated Private Development)
- Alternative 6 (Maximum Private Growth)

At the writing of this document, Alternative 4a (Revised Neutral Change) is identified as the Corps Preferred Alternative.

### 3.1 No-Growth (Alternative 1)

Under Alternative 1, 92 percent of shoreline would be allocated as Protected Areas. There would be no Limited Development Area (LDA) allocation on the lake. Components include no new shoreline use permits issued for any purpose. No new docks, including resorts wanting to convert to a private/community dock, would be allowed on the lake. No new vegetation permits would be issued, nor would there be any new permits for other private recreational facilities (ski courses, etc.) added to the lake. There would be no expansion of, or addition to, existing shoreline use permits, which would include no new boat slips being added, no new personal water craft lifts allowed, and no addition to the current number of existing swim decks. In addition, no new out-grants for private uses would be allowed. All existing permits would be allowed to remain until they no longer meet the permit requirements and or the permit is revoked or terminated.

### 3.2 Benefit General Public Use (Alternative 2)

In this alternative, allocations are very similar to the allocations in Alternative 3, No Change. The most substantial difference in allocations is the removal of Resort, Community Dock Only, and Courtesy Dock only allocations, converting these allocated areas to LDA, Restricted Limited Development Areas (RLDA), or Public Recreation Areas (PRA), as appropriate. Components of this alternative include:

- No re-allocation requests allowed
- Parking for new docks required within in 200 feet of the dock site
- Places a cap on the total number of slips allowed on the lake
- No PWC lifts allowed on outside of the dock
- No new slip boarding up allowed
- New docks limited to a 2 slip maximum
- New courtesy docks allowed in LDA only
- Maximum slip size for new slips is 12 by 30 feet
- Only adjacent landowners may be slip owners

- Proof of slip ownership not required for slip registration
- 100 percent slip owner approval required for dock modification
- Mowing and under brushing limited to a maximum acreage
- Do not allow mowing across any natural or manmade break in vegetation
- Require landowner to have boundary surveyed prior to permit issuance
- Mowing and under brushing limited to 3 feet of path for dock cables
- Pedestrian paths in Environmentally Sensitive Areas (ESA) cannot have path materials or vegetation modification
- Only hand tools are allowed for vegetation modification
- No new steps or stairs allowed

## 3.3 No Action (Alternative 3)

The No-Action alternative is defined as the Corps continuing utilization of the current SMP, with the inclusion of new policies enacted since 1994, which include the following project policies:

- 08-01, Access and Parking for Private Community Docks
- 08-05, Multiple Ownership in a Single Slip
- 08-06, Placement of PWC lifts on Private Floating Facilities
- 09-01, Slip Owner Meeting Requirements for New Slips in Private and Community Docks
- 13-01, Enforcement of Title 36, 327.3(b) Vessels and Title 36, 327.18(a) Commercial Activities
- 13-02, Dock Main Walkways, Walkways between Slips, and Slip Enclosures
- 13-03, Issuing Duck Blind Permits
- 13-04, Access on Public Lands for Persons with Special Needs (Golf Cart Permits)
- 13-05, Management of Grandfathered Docks on TRL
- 13-06, Hard Surface Path for Special Access Needs
- 13-07, Placement of Newly Permitted Community Single-sided Perpendicular Docks on TRL
- 13-08, Shoreline Use Permit for Slalom Courses
- 13-09, Swim/Sun Decks Attached to Boat Docks
- 13-10, Traditional Use Roads & Road Access Fee, TRL
- 13-11, Electrical Power to Private Community Boat Docks
- 13-12, Fish Attractor Policy

Alternative 3 would also include SWLR 1130-2-48 (updated Title 36), and a new project policy requiring the use of solar or other alternative power sources for boat docks, minimum and maximum boat access walkway dimensions, all dock additions/modifications such boat lifts, lockers, and slip boarding must be shown on dock plans, no “no wake” buoys, and 8-foot water depth requirement for placement of new docks.

## 3.4 Neutral Change (Alternative 4)

Alternative 4 includes unique management measures, but also includes management measures shared by other proposed alternatives. In this alternative, allocations are very similar to the allocations in Alternative 3, No Change. The most substantial difference in allocations is the

removal of Resort, Community Dock Only, and Courtesy Dock Only allocations, converting these allocated areas to Protected, LDA, Restricted Limited Development Areas (RLDA), or Public Recreation Areas (PRA), as appropriate. Additionally, unusable LDA and RLDA were relocated to correct errors. Components of this alternative include:

- There is now a threshold of 30,806 access opportunities (boat slips and boat launching ramp parking spaces)
- No new LDA until existing is full and a carrying capacity study is completed
- New docks can be a 1-slip up to a 20-slip dock
- Allow placement of new parallel docks in any LDA
- Allow placement of new courtesy docks in LDA and RLDA (RLDA for existing boat launching ramps only)
- New maximum slip size is 12 feet wide by 30 feet long
- Individual or dock association can be permittee of multiple docks
- Allow slips to be owned by a trust
- Proof of ownership not required for slip transfer
- No minimum boat size requirement for new slip construction
- Require any dock modification request be submitted by the permittee only, with written approval of a majority of the slips owners
- Only accept one dock modification request per permit term
- Do not allow mowing across any natural or manmade break in vegetation
- Allow removal of trees less than 2 inches at ground level within a permitted mowing area, excluding dogwood, redbud and serviceberry.
- Allow removal of cedar trees less than 3 inches at ground level within a permitted mowing area
- Allow removal of dead trees that are hazards to structures, paths, or in permitted mowing areas
- Mowing and under brushing limited to 6 feet of path for dock cables
- Pedestrian paths in ESA limited to 3 feet wide meandering path, no materials allowed
- No new steps or stairs allowed
- Existing "No Wake" buoys at private floating facilities will be allowed to remain until December 31, 2020
- No new power lines to private floating facilities. Existing power lines at private floating facilities will not be allowed to renew after December 31, 2027. All new electric service to private floating facilities must be provided by an alternative power source (i.e. wind, solar, etc.). In any instance of ground disturbance, compliance with Archeological Resources Protection Act (ARPA) must be met at the landowner's expense.

## 3.5 Revised Neutral Change (Alternative 4a) (Preferred)

Alternative 4a includes unique management measures, but also includes management measures shared by other proposed alternatives. In this alternative, allocations are very similar to the allocations in Alternative 3, No Change. The most substantial difference in allocations is the removal of Resort, Community Dock Only, and Courtesy Dock Only allocations, converting these allocated areas to Protected, LDA, Restricted Limited Development Areas (RLDA), or Public Recreation Areas (PRA), as appropriate. Additionally, unusable LDA and RLDA were relocated to correct errors. Components of this alternative are substantially the same as alternative 4 with the following exceptions:

- Licenses for new land based electric service will not be approved. If a dock with existing land based electric service is relocated or moved, the existing electric service must be removed and the area restored prior to the issuance or approval of the boat dock permit. In these instances, new electric service must be provided by an alternative power source. If a dock is rebuilt at the same location, the existing electric service may be used. Licenses for existing electrical service to docks may be renewed. In any instance of ground disturbance, compliance with ARPA must be met at the landowner's expense or the updated electric service must be provided by an alternative power source.
- Mowing and/or underbrushing permitted area may be limited in circumstances when determined to be in the best interest of the stewardship of the natural resources, for instance if a protected species habitat is discovered such as a Bald Eagle nest or if a safety issue is discovered on site such as crossing a creek, bluff, or a government maintained road.
- Any existing "No Wake" buoys at private floating facilities will be allowed to remain.

The following Alternative 4/4a discussions will reflect the components of Revised Preferred Alternative 4a where applicable.

## 3.6 Accelerated Private Development (Alternative 5)

In this alternative the Shoreline Allocations would be similar to the Shoreline Allocations presented in Alternative 4 except, LDA would be increased to 20 percent of total shoreline and the Marina Buffer Allocation would convert to Protected Areas or LDA as appropriate. Unique management measures include:

- Parking for docks would be required within 400 feet or the closest possible location on private property
- Allow expansion of traditional parking area easements on government to accommodate parking for new boat slips
- New permits issued for minimum one slip dock only where larger docks cannot fit in zoning, 20 slip maximum
- Allow new parallel dock in any LDA
- Allow new courtesy docks in LDA and RLDA (RLDA only to support existing boat launching ramps)
- Allow new swim docks in any LDA
- New slips limited to 12 feet wide by 30 feet long maximum
- Individual or dock association can be permittee of multiple docks
- Only adjacent landowners may own slips in new docks
- Allow unlimited slip ownership
- Proof of ownership not required for boat slip transfer
- Boat ownership required for new slip construction but no minimum size boat requirement
- Require any dock modification request be submitted by the permittee only, with written approval of a majority of the slips owners
- Only accept one dock modification request per permit term
- Mowing and under brushing allowed up to a maximum of 200 feet from the boundary line under a general permit
- Allow mowing across only minor roads
- Allow limbing of healthy cedar trees up to 25 percent of the canopy within permitted areas

- Allow removal of trees less than 2 inches at ground level within a permitted mowing area, excluding dogwood, redbud and serviceberry,.
- Allow cedar tree removal with required tree or native grass mitigation within the permitted mowing area
- Allow removal of dead trees that are hazards to structures, paths, or in permitted mowing areas
- Mowing and under brushing limited to 6 foot path for dock cables
- No path material allowed on pedestrian paths in ESA
- No new steps or stairs allowed
- Allow installation of new boat tramways and ski courses

## 3.7 Maximum Private Growth (Alternative 6)

Alternative 6 would include all unique management measures found in Alternative 5, with the expansion of shoreline miles from the current 12 percent to 47 percent for use as Limited Development Area (LDA). Additionally, Alternative 6 would allow for new parking areas on government land.

Tables 3.1 and 3.2 summarize and compare alternatives described above. Table 3.1 compares changes in miles of shoreline allocated to Public Recreation Areas, Protect Areas and Prohibited Areas for each alternative (Alternative 3 – the No Action alternative – serves as the baseline), and Table 3.2 compares alternatives based on key decision criteria, the number of additional boat docks allowed under each, and the percent of shoreline where dock owners could add slips and new docks.

**Table 3.1**

**Changes in Miles of Shoreline Allocated to Public Recreation Areas, Protect Areas and Prohibited Areas for each Proposed Alternative**

| **Alternative 1 (No Growth)** | **Miles** | **Percent of shoreline** | **Change in miles** | **Percent change in miles** |
|---|---|---|---|---|
| Total Shoreline | 758.2 | 100.0% | - | - |
| Public Recreation Area | 58.2 | 7.7% | 2.6 | 0.3% |
| Protected | 699.1 | 92.2% | 157.8 | 20.8% |
| Prohibited | 1.0 | 0.1% | 0.0 | 0.0% |
| **Alternative 2 (Benefit General Public Use)** | **Miles** | **Percent of Shoreline** | **Change in miles** | **Percent change in miles** |
| Total Shoreline | 758.2 | 100.0% | - | - |
| LDA | 90.7 | 12.0% | 3.2 | 0.4% |
| RLDA | 6.3 | 0.8% | -4.5 | -0.6% |
| Marina | 65.8 | 8.7% | 3.7 | 0.5% |
| Public Recreation Area | 58.1 | 7.7% | 2.4 | 0.3% |
| Protected | 536.4 | 70.7% | -4.9 | -0.6% |
| Prohibited | 1.0 | 0.1% | 0.0 | 0.0% |
| **Alternative 3 (No Action)** | **Miles** | **Percent of Shoreline** | **Change in miles** | **Percent change in miles** |
| Total Shoreline | 758.2 | 100.0% | - | - |
| LDA | 87.4 | 11.5% | **0** | **0%** |
| RLDA | 10.8 | 1.4% | **0** | **0%** |
| Marina | 62.1 | 8.2% | **0** | **0%** |
| Public Recreation Area | 55.6 | 7.3% | **0** | **0%** |
| Protected | 541.3 | 71.4% | **0** | **0%** |
| Prohibited | 1.0 | 0.1% | **0** | **0%** |
| **Alternative 4 (Neutral Change)/4a (Revised Neutral Change)** | **Miles** | **Percent of Shoreline** | **Change in miles** | **Percent change in miles** |
| Total Shoreline | 758.2 | 100.0% | - | - |
| LDA | 91.3 | 12.0% | 3.7 | 0.5% |
| RLDA | 6.8 | 0.9% | -4.0 | -0.5% |
| Marina | 76.3 | 10.1% | 14.2 | 1.9% |
| Public Recreation Area | 40.6 | 5.4% | -15.0 | -2.0% |
| Protected | 542.4 | 71.5% | 1.1 | 0.1% |
| Prohibited | 1.0 | 0.1% | 0.0 | 0.0% |
| **Alternative 5 (Accelerated Private Development)** | **Miles** | **Percent of Shoreline** | **Change in miles** | **Percent change in miles** |
| Total Shoreline | 758.2 | 100.0% | - | - |
| LDA (7% needs to be identified) | 151.6 | 20.0% | 64.2 | 8.5% |
| Public Rec Area | 40.6 | 5.4% | -15.0 | -2.0% |
| Protected | 564.9 | 74.5% | 23.7 | 3.1% |
| Prohibited | 1.0 | 0.1% | 0.0 | 0.0% |
| | | | | |
| **Alternative 6 (Maximum Private Growth)** | **Miles** | **Percent of Shoreline** | **Change in miles** | **Percent change in miles** |
| Total Shoreline | 758.2 | 100.0% | - | - |
| LDA | 349.0 | 46.0% | 261.6 | 34.5% |
| Public Rec Area | 40.6 | 5.4% | -15.0 | -2.0% |
| Protected | 367.5 | 48.5% | -173.7 | -22.9% |
| Prohibited | 1.0 | 0.1% | 0.0 | 0.0% |

**Table 3.2**
**Alternatives Comparison Based on Key Decision Criteria**

## TABLE ROCK SMP ALTERNATIVE EVALUATION CHART

Benefits to General Public Use ↓ Benefits to Private Use

| Alternatives | Indicator(s) | Fiscal Sustainability: # annual man-hours required increase\decrease potential at the end of 5 years | Fiscal Sustainability: # annual man-hours required increase\decrease potential at the end of 10 years | Environmental Sustainability: % of landbase acres that will be open to private use mowing | Public Safety: Potential Number of Additional Slips | Economic Development: % of parcels which "may" be developed with new home and new dock | Public Perception: Professional Opinion of PDT | Number of Additional Boat Docks | % of shoreline where new docks could be placed (all LDA) |
|---|---|---|---|---|---|---|---|---|---|
| | *Decision Criteria* | | | | | | | | |
| 1 | No Growth | - 1,472 | - 1,472 | 4% | 0 | 0% | Highly Negative | 0 | 0% |
| 2 | | + 1,485 | + 1,765 | 25% | 2,076 | 4% | Slightly Negative | 987 | 12% |
| 3 | No Action | + 1,065 | + 1,265 | 25% | 11,954 | 5% | Neutral | 763 | 12% |
| 4 /4a | Preferred | + 864 | + 1,074 | 26% | 15,708 | 5% | Neutral | 763 | 12% |
| 5 | | + 2,292 | + 2,542 | 31% | 20,780 | 11% | Slightly Negative | 1,644 | 20% |
| 6 - Max. | Growth | + 3,977 | + 4,357 | 31% | 44,771 | 17% | Highly Negative | 3,780 | 46% |

Positive Impact to Decision Criteria

Neutral Impact to Decision Criteria

Negative Impact to Decision Criteria

# 4.0 AFFECTED ENVIRONMENT

## 4.1 Project Setting

The project area is located in the heart of the Ozark Mountain region. Most of Table Rock Lake lies in southwestern Missouri with a small portion in northwestern Arkansas. Lake waters have become a playground for visitors from all over the nation. Table Rock Lake's water recreation and activities are as varied as the Ozark Mountain terrain that surrounds the lake.

With nearly 800 miles of shoreline, Table Rock's many coves and lake arms make boating and water recreation such as skiing, fishing, diving, and swimming especially popular. Four major rivers, James River, White River, Kings River, and Long Creek, make up the lake's major tributaries. Commercial concessions like marinas and resorts are scattered throughout the lake and currently about 17 percent of the shoreline is made available for wet slip storage, private and commercial. Also scattered around the lake are public recreation areas that are known nationwide for camping.

Much of the shoreline has numerous subdivisions, as the Branson and Kimberling City areas of the lake are extremely developed. Predominant shoreline vegetation is an oak-hickory hard wood forest. Numerous limestone bluffs are found around the lake also, and red cedar is the principal evergreen and is dispersed throughout the region. The Cow Creek area, on the south border and center of the lake, remains relatively undeveloped. The extent of Table Rock Lake and the structural features of the project also contribute to the tremendous attraction for a large amount of visitors to this area. The quality recreational and environmental resources of the project have greatly influenced the development of the entire region.

## 4.2 Climate, Physiography, Topography, Geology, and Soils

Climate within the Table Rock Lake watershed is temperate, with summer extremes lasting for longer periods throughout northern Arkansas, and winter temperatures being more influential in the zone's northern reaches in Missouri. Temperature extremes may vary from winter lows around 0 degrees Fahrenheit in central Missouri to highs above 100 degrees occurring from southern Arkansas to central Missouri during the summer months. Extreme temperatures may occur for short periods of time at any location within the watershed. Average annual rainfall over the watershed varies from 44 to 46 inches, and heavy rainfall events and flash floods in tributaries are common. Monthly rainfall varies from 2.5 inches in the winter months to about 5 inches in the spring. Average snowfall each year averages from 8 to 16 inches from south to north across the watershed. Snow packs are usually short lived and are not commonly a concern for flooding.

Table Rock Lake is on the southwest flank of the Ozark uplift, a structural and topographic high, which is often referred to as the Ozark Plateaus province. The plateau surfaces of this province are underlain by gently dipping, sedimentary bedrock. The highest ridges in the area surrounding the lake are a part of the Springfield Plateau, the middle level of the plateau province, which in this region rises to an elevation of about 1,400 feet. In this region the river and its tributaries have entrenched themselves about 700 feet below the plateau surface. As a result, the plateau has been

deeply dissected by erosion and the original surface is present only as the tops of narrow steep ridges.

Bedrock strata exposed in the uplands bordering the lake are of Mississippian and Ordovician age. The formations of Mississippian age underlie the plateau surface and most of the higher slopes of the basin and in most areas are well away from the lake and associated lake shore developments. Strata of the Jefferson City-Cotter Formation of Ordovician age underlie the lake and the adjoining slopes. This formation is predominantly dolomite but contains subordinate amounts of chert, quartzite, sandstone, and shale. Most of the strata are more or less argillaceous, and several have been silicified in various degrees. Chert occurs as nodules, and in thin beds along with sandstone or quartzite. Shale occurs as material along partings, and as thin seams along bedding planes.

The strata about the lake appear to be nearly horizontal, but are warped gently over a large area by the Osage-Verona anticline, the crest of which is aligned over the Kings River arm of the lake. Two major faults are in the lake area (Figure 4-1). These are very old and there are no indications of recent movement along them. One, a part of the Shell Knob - Eagle Rock structure crosses Roaring River where it empties into the lake. It trends about N. 37 E., and is downthrown on the east. It has no effect on the strata beyond the immediate vicinity of the fault. The other, Lampe fault crosses under the Highway 13 White River Bridge. It trends N. 30 E., has a displacement of about 190 feet, and is downthrown on the east. Joints observed in rock along the lake are nearly vertical and do not carry through many beds. The strike of the most prominent set (primary) ranges from N. 5 E. to N. 10 W. A secondary, more poorly developed set intersects these at near right angles.

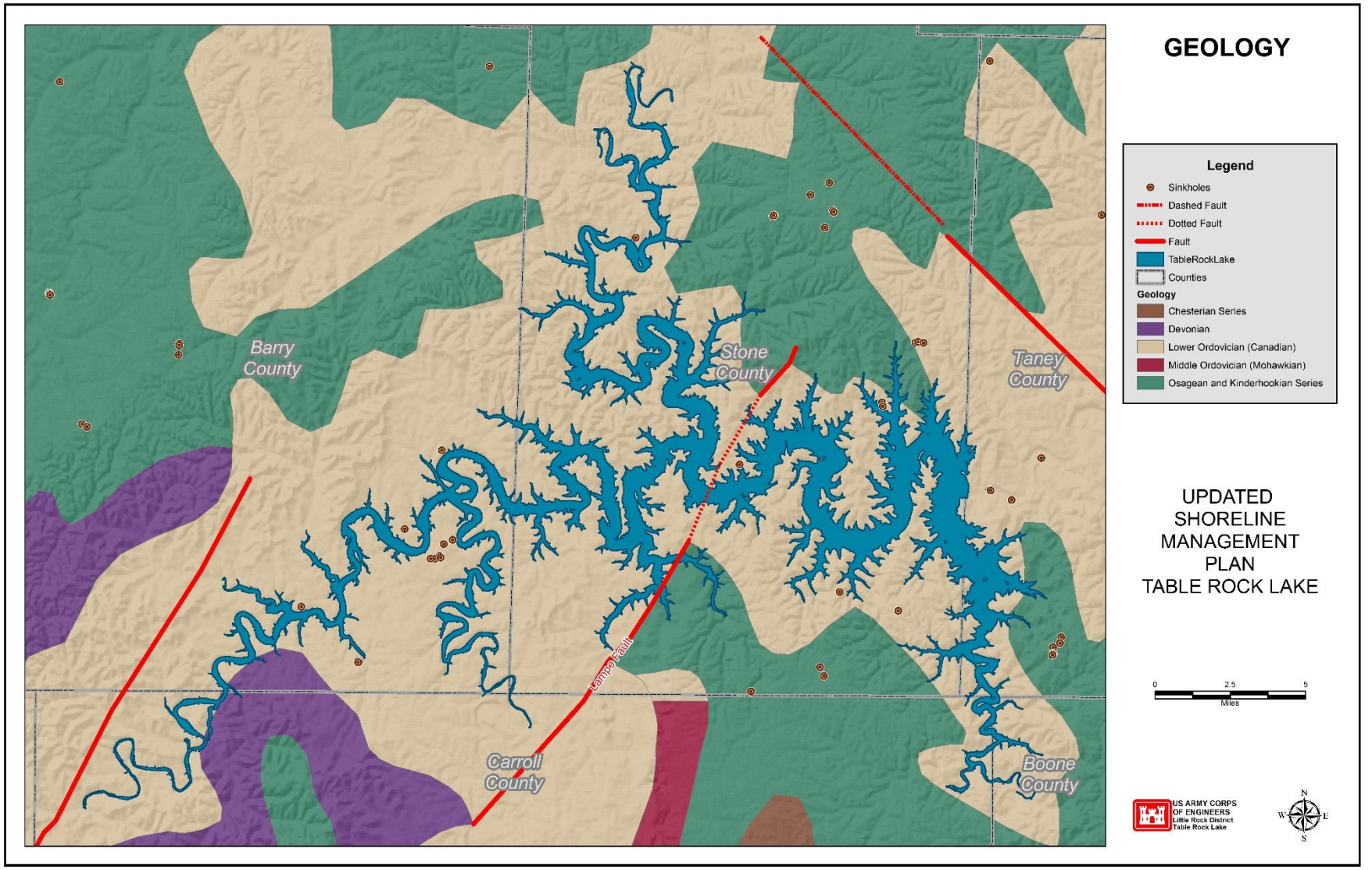



**Figure 4.1 Geology and Fault Lines of Table Rock Lake**

The region surrounding Table Rock Dam is subject to infrequent, mild, seismic shocks but not within recorded history are any shocks of sufficient intensity to damage structures or property. Although the bedrock of the region is soluble, most of the basin where it is underlain by the dolomites of the Jefferson City-Cotter Formation is characterized by surface drainage. This is indicated by the scarcity of important sinks, the absence of large areas without surface drainage, and a well-developed stream system with normal well-branched tributaries. Two caves, Marvel Cave and Fairy Cave, are operated commercially in the region of the lake. Both caves are in the Boone Formation and extend into the Jefferson City-Cotter Formation. However, it should be noted that over most of the area in the Jefferson City-Cotter Formation is not favorable to the extensive development of caves, and those noted in the formation are small.

The most significant factor limiting the development of project land is topography. The typical ruggedness of this area hampers intensive development in many locations, and limits the number of sites containing appropriate slopes and adequately-sized areas of land desirable for the location of water access recreation facilities. Extensive alteration of landforms is not acceptable under Corps of Engineers guidelines.

The geology of the area imposes no unusual restraints on construction. However, ground water pollution is potentially a problem because of the easy access of surface water into the water table and of the free interchange of water between rock formations. Soils around the lake, except in the flood plain, and terrace deposits along the streams, are principally residual material formed by decomposition of the dolomite beds. Generally, they are silty soil over clay subsoil, both containing chert fragments from sand size up to small boulders. The material is loose and friable near the surface but becomes harder and more compact with depth. Contacts of leached chert, disintegrated limestone, and plasticity also increase with depth. As much as 20 feet of residual soil has been encountered by borings, but at most places it is less than 8 feet thick and in some places it is entirely absent. Flood plain material consists of silt and sand over sandy, chert gravel at many places in stream channels. Most of the soils in the vicinity of the lake are low in fertility. Detailed soil survey information can be found through Natural Resources Conservation Service at: (http://SoilDataMart.nrcs.usda.gov).

The following four soils associations are found in and around the Table Rock Project area: Clarksville-Noark, Captina-Nixa, Caydon-Pembroke-Sogn, and the Caydon-Sogn. Most of the soils found in the Table Rock project do have characteristics which must be considered in development. The ability of soils to withstand intensive use should be investigated prior to initiation of construction. Trampling on these sites may cause soil compaction, resulting in increased surface runoff and accelerated erosion. Also, vegetative cover may be affected because of the reduction of air and water holding capacity of the soil. It should be noted, however, that soil compaction on use sites is not now a major problem because most of the soils are stony and resist compaction. Another factor in some areas is shoreline erosion resulting from wave action which may cause serious problems in maintenance and hamper development of water related facilities.

## 4.3 Aquatic Environment

*Hydrology and Groundwater*. Three of the large springs of Missouri feed into Table Rock Lake. Reeds Spring is at the town of the same name in Stone County; Crystal Spring is one-half mile north of Cassville in Barry County; and Roaring River Spring is in Roaring River State Park 7

Miles south of Cassville. A great many unnamed springs, both permanent and intermittent, are in the lake area, and all appear to derive their water from higher ground. Information from wells and small springs in the area indicates that the water table under the higher part of that portion of the lake rim is probably near elevation 900. Many impermeable zones exist which create perched water tables, and many of the shallow wells obtain their water from perched ground water pools. However, because of solution widened joints and structures in the rock, an interchange of water occurs between the formations that underlie the area and leaky aquifers are common. Additionally, because of exposed fractured, weathered, permeable rock, percolation of surface water into the water table is common place.

Major tributaries to Table Rock Lake are the Kings River and Long Creek from the south and the James River from the north. The drainage is typically steep in the headwaters of the smaller streams and transitions to lesser slopes as they reach the main stem of the White River. These streams can be flashy with intense rainfall. The percent of the basin which is impervious has increased with the rapid development of the area, but remains a small percentage of the overall watershed.

*Water Quality.* Table Rock Lake has been listed by the Missouri Department of Natural Resources (MDNR) as an impaired waterbody in the 303(d) list portion of their biennial Integrated Surface Water Quality Report to the Environmental Protection Agency. The initial listing was due to excessive nutrient concentrations, particularly nitrogen and phosphorus, in 2002. The listing has continued in each of MDNR's Integrated Reports, with the most recent listing in 2010. According to the Integrated Report, these excessive nutrient concentrations occur most frequently in the James River, Kings River and Long Creek arms of the lake. The upper portion of the White River is also listed as impaired for excessive chlorophyll and nitrogen. In the study by Jones, et. al. (2008), it was shown that Table Rock Lake was an oligotrophic lake based on the samples taken near Table Rock Dam, while various arms or branches of the lake such as the James River mouth or Long Creek area, where it receives water from these tributaries, shows tendencies toward being more eutrophic *(Information provided by Table Rock Lake Water Quality, Inc., citing the Jones et. al. 2008 report). A* Total Maximum Daily Load (TMDL) evaluation is scheduled for completion in 2016 by MDNR.

Lake fluctuations, associated with power production and flood control procedures, produce changes in the environment along the shoreline of the lake. Turbidity adversely affects Table Rock Lake for short periods of time after heavy rains. During these periods of heavy runoff, urban areas and other parts of the terrain, especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. Table Rock, like all other lakes of its size in the Ozark region, stratifies chemically and thermally in the late spring with stratification extending into late fall and early winter. This naturally occurring phenomenon causes portions of the lake below the thermocline to be unfit for fish habitat because of low concentrations of dissolved oxygen. This undesirable water, when discharged downstream may cause some problems in the tailwaters. To combat this problem, the dissolved oxygen content is monitored and liquid oxygen is added to the discharge waters as necessary. A highly productive trout fishery has been established in Lake Taneycomo by the Missouri Department of Conservation because of the available discharge of cold water from the dam.

Historically, Table Rock Lake experiences periods of up to five months (July-November) duration when dissolved oxygen (DO) concentrations are less than 4 mg/L near the turbine intakes.

Accordingly, turbine release DO levels have been low enough to cause concern for downstream aquatic life. During these low DO periods, the turbines at Table Rock have been operated at reduced capacity to aspirate air through the vacuum breaker system (i.e. 'venting operation').

Water releases are generally made for power generation except in the case of flood control operation. The Southwestern Power Administration (SWPA) markets power generated at this dam and other projects in the region. Four 50-mega-watt (MW) generating units provide approximately 640,000 mega-watt hours (MWh) annually. The typical peak flow for the hydro facility is 13,000 cubic feet per second (cfs). The maximum turbine discharge is 15,100 cfs.

The venting operation can improve release DO concentrations significantly, but the plant aerating is costly due to efficiency losses and loss of peaking capacity. In addition to using turbine venting to increase DO, Table Rock is utilizing an existing oxygen system where oxygen is injected into the penstocks. The oxygen storage and injection system at Table Rock was installed in 1973. Currently, oxygen is injected into the penstock through two, ¾-inch piezometer taps around the lower perimeter of the penstock. The oxygen for this system is supplied from a liquid oxygen storage and supply facility consisting of two 52-ton (11,000-gallons each) liquid oxygen storage tanks and a set of water-cooled evaporators capable of producing at least 4,430 standard cubic feet per minute (scfm) of gaseous oxygen.

During the low DO season, maximum generation is limited based on the Table Rock Operational Action Plan. The following is a quote out of the Table Rock Operational Action Plan for 2007 Low Dissolved Oxygen Season:

"Plan of Action: The operational objective is to sustain DO concentrations in the release at or above 6 mg/L as long as possible through use of the turbine venting systems improvements and to prevent DO concentrations from receding below 4 mg/L, if possible, through actions as outlined below. The plan to accomplish this consists of an oxygen monitoring program, improvements to the turbine venting systems, use of the oxygen injection system, and operational response actions scaled to the severity of DO depletions. Throughout the low DO season, all unit loadings by the powerhouse operator will take into consideration the turbine venting systems improvements to insure the release DO is as high as possible while meeting current electrical output requirements. When required generation combined with the use of the turbine venting systems improvements is insufficient to maintain DO concentrations at the first downstream monitor at or above 4 mg/L, then the use of the oxygen injection system and/or spillway releases will be used to maintain 4.0 mg/L in the downstream releases to the extent possible."

In September 2010, the Tennessee Valley Authority (TVA) released a report ("Table Rock Project Forebay Oxygen Diffuser System Report Update, September 29, 2010") that presented an analysis of a 'Forebay Oxygen Diffuser System' at Table Rock Lake; this forebay oxygen diffuser system would work in conjunction with the existing venting operation and oxygen injection system to help alleviate the low DO concentrations Table Rock Lake experiences. It was decided at the time the new system was too costly to install, with operation and maintenance costs also very high; the existing plan of action (use of the venting operation plus the existing oxygen injection system) would attain the desired results needed during events of low DO concentrations.

*Aquatic Resources.* The impoundment of the White River and other tributary streams and rivers which form Table Rock Lake resulted in changes in the composition of the fish populations.

Smallmouth bass was the principal game fish found in the White River prior to impoundment. The Missouri Department of Conservation (MDC) is the agency responsible for managing the fishery. Sport fish species currently found in Table Rock Lake include: largemouth bass, spotted bass, smallmouth bass, white bass, walleye, flathead catfish, channel catfish, white crappie, black crappie and paddlefish. Due to the quality and diversity of the fishery, Table Rock Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

Table Rock Lake was first impounded in 1959. Since its impoundment, the native forests that were flooded in abundance have begun to degrade, thus reducing existing fish and forage habitat. In 2007, the Table Rock Lake National Fish Habitat Initiative (NFHI) began with the primary objective to improve fish habitat within Table Rock Lake. Water quality, along with monitoring the effectiveness and longevity of the structures are additional goals of this project. This project has developed a framework for a broader national habitat program (Casaletto-Water Watch 2012). Since 2007, 2,096 fish habitat structures have been placed in Table Rock Lake. Structures include piles of hardwood and evergreen trees, stumps, and rocks.

The impoundment of Table Rock Lake caused environmental changes in the tailwater portion of the White River downstream from the dam. MDC realized that the cold water discharges from Table Rock Lake would necessitate a change in their fisheries management program for Lake Taneycomo, a 2,080 acre lake formed by the construction of Powersite Dam on the White River in Taney County, Missouri. Rainbow trout and brown trout were stocked in Lake Taneycomo to replace the warm-water fishery. This cold-water fishery is a success. However, because of various unfavorable environmental factors such as lack of suitable substrate, fluctuation of water temperatures and dissolved oxygen levels, and pulsation of current and water level, trout reproduction is very limited. Shepherd of the Hills trout hatchery has been established downstream from Table Rock Dam by the MDC. Public Law 86-93 provides that 27,000 acre-feet in the power drawdown storage, not to exceed 22 cubic feet per second, would be for the use of this hatchery. 700,000 rainbow and 10,000 brown trout from Shepherd of the Hills Hatchery and from hatcheries of the U.S. Fish and Wildlife Service are stocked in Taneycomo annually. The trout fishery has flourished and is now Missouri's largest and most popular trout fishing destination. Fishing effort has increased from approximately 25,000 fishing trips in 1959 to 140,000 fishing trips in 2009.

Paddlefish and walleye have been introduced into Table Rock Lake to add diversity to the fishery. Natural reproduction of paddlefish in Table Rock Lake is considered minimal. MDC stocks approximately 7,500 paddlefish in the James River Arm each year. Walleye have been stocked by both Arkansas Game and Fish Commission (AGFC) and MDC. MDC has stocked over 350,000 walleye in the James River Arm and these fish are now reproducing on their own (Bush 2012).

Wetland areas are relatively limited within Table Rock Lake and the adjacent government property surrounding the lake. This is due to the steeply sloped terrain and thin, rocky soil layers overlying bedrock along the shoreline, which do not typically support wetland vegetation. The sparse wetland areas that occur within the lake surface area have mostly formed as mud flats within the upper reaches of the major tributaries to the lake. Additionally, a few coves on the lake have also established small wetland areas. This is due to sediment washing from streams and accumulating at the point where the stream bed enters the normal lake surface at the upper end of the cove. These areas can support emergent wetland vegetation at times depending on seasonal flooding and the controlled lake elevation.

Within the State of Missouri, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) indicates approximately 12 acres of wetlands occurring within the lake surface area and in adjacent floodplains. The NWI maps also indicate wetlands in the Arkansas portion of the lake, but approximate acreages are not included. The majority of this wetland acreage is classified as palustrine scrub/shrub, either seasonally or temporarily flooded. Further, there are some areas mapped as palustrine forested occurring within wooded floodplain areas along the upper reaches of the James River, Kings River, and Long Creek.

## 4.4 Terrestrial Resources and Land Use

*Vegetation*. The area surrounding the lake is mostly forested. Trees and shrubs around the lakeshore include persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, snowberry, sumac, and buttonbush. Frequent periods of inundation keep the thin strip of government owned lands around the lake in early stages of succession. Red cedar, the principal evergreen, is dispersed throughout the region and is found in many large, scattered groups. Ground covers consist of green briar, sedge, and native grasses.

In 1999 a large tract of land was exchanged between the Corps of Engineers and the U.S. Forest Service in the Cow Creek area. The Corps gained a block of land that is approximately 3,300 acres. Land cover types in this area consist mainly of a deciduous forest. Evergreens consist of shortleaf pine that was planted by the U.S. Forest Service along the ridge tops and red cedar in the side slope glades.

*Wildlife*. White-tailed deer and eastern wild turkey are common game animals found and hunted in the Table Rock Lake area. Black bear have become more common in the area over the past few years though Missouri has yet to demonstrate that the black bear population is large enough to sustain hunting.

The principal small game species found in the Table Rock Lake area in open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas and are also popular for sportsmen. Habitat management that includes removal of exotic species and application of prescribed fire do much to benefit these populations.

The ringed-neck duck and lesser scaup are the predominant migratory waterfowl species visiting the Table Rock Lake area. Mallard ducks are also present; however, they are only transient visitors, as their characteristic feeding habits of obtaining food from shallow waters discourage them from obtaining food from the deep, clear waters of Table Rock Lake. Migratory geese common to the area are lesser snow geese and Canada geese of the Eastern Prairie Population. Giant Canada geese were introduced to the area by the MDC in 1971 and 1972 and have become established as a resident population. Resident giant Canada geese are in fact so numerous in several coves that their presence has become a nuisance. Several egg and nest destruction permits are issued every year to limit local reproduction. Ring-billed gulls are seen frequently around the Table Rock Lake area. Greater and lesser yellowlegs are also seen during their peak migration in the spring and fall. Table Rock is also one of the few places in Missouri where visitors can see both the turkey vulture and the black vulture at the same time in the winter. Principal furbearing animals found in the Table Rock Lake area are mink, muskrat, beaver, and raccoon. In recent years, otters have become more prevalent around the lake.

*Invasive Species*. In accordance with Executive Order (EO) 13112, an invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem. In contrast, exotic species, as defined by EO 11987, include all plants and animals not naturally occurring, either presently or historically, in any ecosystem of the United States. Invasive species can take over and out compete native species by consuming their food, taking over their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars every year. Table Rock Project is not protected from the spread of invasive species. Locally the project office works with its partners, MDC and United States Department of Agriculture, to help stop the spread of some of the Ozarks most unwanted species. These would include feral hogs (*Sus scrofa)*, zebra mussels (*Dreissena polymorpha)*, and the emerald ash borer (*Agrilus planipennis*). Project rangers post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Rangers also place emerald ash borer traps on project lands to monitor any infestations of this species. A complete list of invasive species in the Table Rock Lake area can be found on the Missouri Department of Conservation website.

## 4.5 Threatened and Endangered Species

There are many species in the Ozarks that are considered either threatened or endangered. Species become imperiled for a variety of reasons including over-hunting, over fishing, and habitat loss as a result of human development and pollution; of these, habitat loss is the main contributor that imperils most species. A threatened species is one that is likely to become endangered within the foreseeable future. An endangered species is one in danger of extinction throughout all or a significant portion of its range. The bald eagle, *Halieetus leucocephalus,* is common during the winter months around Table Rock Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the Bald and Golden Eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. Black vultures, a species of conservation concern, also nest in the Table Rock area. Transient populations of gray bats, a federally listed as endangered species, are documented near the Table Rock dam area. The following species listed in Figure 4.3 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Missouri Natural Heritage data set which have been reported on project lands. There are other threatened and endangered species that are known to be in the area.

**Table 4.1**
**Threatened, Endangered, Protected and Species of Concern**

| Common Name | Scientific Name | Federal/State Status | State and Global Rank |
|---|---|---|---|
| Bald Eagle | *Haliaeetus leucocephalus* | P/unknown | |
| Gray Bat | *Myotis grisescens* | E/E | S3/G3 |
| Black Vulture | *Coragyps atratus* | - | S3/G5 |
| Bush's Poppy Mallow | *Callirhoe bushii* | - | S2/G3 |

**P =** Protected **E** = Endangered; **S2**: Imperiled: Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or state (1,000 to 3,000). Species documentation is typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000). **S3**: Vulnerable: Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals; **G3**: Vulnerable: Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals; **G5**: Secure: Common; widespread and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Species documentation is typically with considerably more than 100 occurrences and more than 10,000 individuals.

## 4.6 Archaeological and Historic Resources

*Prehistoric*. Evidence of human settlement in the Ozark region can be traced back about 14,000 years, coinciding with the end of the last ice age. Early Native Americans in the region were likely a mixture of hunter-gatherers, utilizing caves and bluffs seasonally for shelter near waterways. These nomadic tribes claimed territories, which they would use seasonally for hunting, fishing, and gathering. While the archeological record shows evidence of human settlement in the Ozarks, it is difficult to identify all tribes that made this region their home.

Prehistory is primarily divided into four periods: PaleoIndian (10,000-7,800 BC), Archaic (7,800-800 BC), Woodland (800-950 AD), and Mississippian (950-1600 AD). The PaleoIndian period marks the earliest evidence of habitations in the Ozark region. The emergence of the Archaic period witnesses an increase in populations and larger seasonal encampments on the bluffs along the White River, and its tributaries. The introduction of earthen pottery and the bow and arrow is generally recognized as the Woodland Period in the Ozarks. The Mississippian Culture emerges, flourishes, then declines in present-day. Mississippi River Valley and southeastern U.S. Burial mounds, domestic structures, agriculture, and more permanent settlements characterize this era. The Jenkins Cave, located near the head of Bull Creek, and Slow Drip Rockshelter in southern Stone County, contained evidence of a Mississippian component due to the presence of shell-tempered pottery and triangular arrow point. Oral and early written history and archeological evidence suggest some tribes known to have lived or hunted in the Ozarks include the Osage, Caddo, and Quapaw.

*Historic*. Historically, Ozark country of southwestern Missouri and northwestern Arkansas had few, if any, white settlers before the Nineteenth Century. Henry Schoolcraft, the first traveler to document his excursions to the region, traveled this portion of the White and James Rivers in 1818 and 1819 while making a survey of lead mines in southwestern Missouri. The turbulent period of the Civil War was keenly felt in southwestern Missouri and northwestern Arkansas. Two of the

major battles west of the Mississippi were fought in this part of the country; one in southwestern Missouri at Wilson's Creek and one in the northwestern corner of Arkansas, the Battle of Pea Ridge. The areas surrounding Table Rock have several historical sites that are significant on the local and regional level. None of these sites have National significance. However, when combined with others like them across the country they record the theme of the American way of life. Marvel Cave, which is located at Silver Dollar City, Missouri, the largest privately owned commercial tourist attraction in the Table Rock Lake area, is listed on the National Registry of natural landmarks.

In the southern portion of the Ozarks in Eureka Springs, AR, much of the rich cultural heritage lies along an area that was once traversed by Native American people during the Trail of Tears. The Bluff Shelter at Blue Springs, which is listed on the National Register of Historic Places, is a small shelter that has evidence of prehistoric occupation that dates as far back as 8,000 BC. The small town of Beaver, Arkansas has a rich historic significance. Beaver Park, which borders the little community of Beaver, was the home place of Squire Beaver, a legendary resident of the portion of the White River which is now the upper end of Table Rock Lake. Beaver Park is the only project property with any specific historical significance. The Beaver Bridge, which is listed on the National Register of Historic Places and on Table Rock Lake property, survives as one of three wire cable suspension bridges left in Arkansas and as an outstanding example of Early Transportation Era (1903-1922) engineering. This entire portion of the Ozarks, however, represents a heritage of determined mountain dwellers who adapted to a rough way of life in order to survive. Examples of how dwellers of the Ozarks lived historically can be seen in some of the private tourist attractions within the Table Rock Lake region.

*Previous Archaeological Investigations at Table Rock.* The waterways are so important archeologically that the major physiographic regions of the state were subdivided by stream drainages to facilitate the survey and excavation of the archeological resources. A survey of the Table Rock Lake area was conducted under the supervision of Carl Chapman, University of Missouri, in 1951, with additional excavations and testing being conducted by Chapman from 1955 through 1959 during the construction phase of Table Rock Dam. At the conclusion of the work in 1959, 872 sites had been identified in and around Table Rock Lake. Subsequent studies include “Archaeological Assessments Report No. 49, Cultural Resources Survey at Selected Locations, Table Rock Lake, Missouri and Arkansas, 1986”; “Archaeological Assessments Report No. 167, Archeological Investigations at 3CR238, 1993”.

*Recorded Cultural Resources at Table Rock.* Today, Table Rock fee land is home to 1,076 archeological sites made up of open camp sites, shelter and cave sites, rock cairns, and earthen mound sites. Less than one percent of the known sites within the lake area were investigated any further than documentation. However, Chapman concluded that a reasonable picture was obtained of the archaeological potential in the lake area.

## 4.7 Air Quality

Air quality in the Branson/Table Rock Lake area is generally good. There have been no violations of the current National Ambient Air Quality Standards (NAAQS) established by EPA. Air monitoring requirements are established by EPA and are dictated under their guidance and monitoring objectives. Monitoring sites are placed in areas believed to have higher concentration

of pollutants, which generally consist of the state's larger metropolitan areas. These areas, called Metropolitan Statistical Areas (MSA's) are defined by the larger population centers and surrounding counties. Based on these guidelines, the Branson MSA has one air quality monitoring site, with ozone the only constituent being monitored. The ozone concentration is consistently below the 75 parts per billion (ppb) established by EPA for this pollutant.

## 4.8 Socioeconomics and Recreation

Section 4.8 describes existing socioeconomic resources potentially directly and indirectly affected by the SMP. The area of analysis includes counties adjacent to the lake including Barry, Stone and Taney counties in Missouri, and Boone and Carroll counties in Arkansas.

### 4.8.1 Population

Data from the 2010 Census, the U.S. Bureau of Labor Statistics, and the 2015 American Community Survey, were used to summarize existing socioeconomic conditions in the Project area. Table 1.1 displays population in year 2000 and 2015 for each county in the study area. As of 2015, the five county study area has an estimated total population of 183,823 people. Taney County, Missouri (home to the City of Branson), is the largest in terms of population with 54,592 residents followed by Boone County with 37,222 people. Populations in Barry, Boone, Carroll and Stone counties has grown at an annual average rate of nearly 0.50 percent since 2000, which is comparable to state level growth rates. In contrast, Taney County has grown at a rate of 2.51 percent since 2000.

Table 4.2 also displays projected populations for Arkansas and Missouri and for each county in the impact area. At the state level, population is expected to slow from 2015 through 2030 when compare to the period 2000 through 2015. In contrast, with the exception of Boone County in Arkansas and Taney County in Missouri, demographers expect the number of people living in the impact area to grow at faster rate over the next 15 years. Overall, the cumulative population in the study is projected to grow at a rate 1.18 percent through 2030, which is substantially higher than state level growth rates.

**Table 4.2**
**Existing Population Levels and Trends in Project Area**

| Region | Population density (persons per square mile) | 2000 population | 2015 population | 2030 population (projected) | Compound annual growth rate (2000-2015) | Compound annual growth rate (2015-2030) |
|---|---|---|---|---|---|---|
| State of Arkansas | 51 | 2,673,400 | 2,978,204 | 3,157,232 | 0.72% | 0.39% |
| State of Missouri | 87 | 5,595,211 | 6,083,672 | 6,351,566 | 0.56% | 0.29% |
| Barry (Missouri) | 44 | 34,010 | 35,829 | 44,295 | 0.35% | 1.42% |
| Boone (Arkansas) | 57 | 33,948 | 37,222 | 38,677 | 0.62% | 0.26% |
| Carroll (Arkansas) | 40 | 25,357 | 27,704 | 30,854 | 0.59% | 0.72% |
| Stone (Missouri) | 65 | 28,658 | 30,943 | 40,346 | 0.51% | 1.78% |
| Taney (Missouri) | 24 | 39,703 | 54,592 | 68,041 | 2.15% | 1.48% |
| Total project area* | 44 | 161,676 | 186,290 | 222,213 | 0.95% | 1.18% |

* Project area figures are based on county averages weighted by respective county populations. Source: Historical figures from 2000 U.S. Census and U.S Census 2015 American Community Survey. Population projections are from the Missouri Census Data Center and University of Arkansas at Little Rock Institute for Economic Advancement.

### 4.8.2 Economy and Employment

Key income indicators (per capita and median household income) for counties in the Project area vary with lower values characteristic of more rural counties and higher values for counties with more concentrated urban areas (Table 4.3). Overall, however, both per capita income and median household income on average (weighted by respective county populations) for the impact area are generally lower than state wide values. An exception is Boone County, Arkansas with a median household income of $47,585 per year compared to Arkansas's state value of $39,633. Boone County has a much higher percentage of workers employed as "Management, Business, Science, and Arts" workers by the U.S. Census that typically has a higher earnings compared to other sectors.[1] Taney County has much higher percentage of service industry workers given that it is a major tourism in the center that includes recreation on and around Table Rock Lake. The distribution of employment by occupation category in most counties tends to follow national and state allotments. For all counties in the impact area, lake related tourism and recreation is an important economic engine for local communities.

[1] Harrison Arkansas, the seat of Boone County, has large poultry processing and technology industry.

**Table 4.3**
**Existing Employment and Income in Project Area**

| County | Per capita income | Median household income | Total civilian workforce | Distribution of workforce by sector | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Management, business, science, and arts | Natural resources, construction, and maintenance | Production and transportation | Sales and office workers | Service |
| State of Arkansas | $23,045 | $39,633 | 1,245,432 | 31% | 17% | 24% | 11% | 17% |
| State of Missouri | $25,649 | $44,306 | 2,770,617 | 35% | 18% | 25% | 9% | 13% |
| Barry (Missouri) | $19,489 | $38,710 | 14,297 | 27% | 12% | 26% | 21% | 14% |
| Boone (Arkansas) | $22,160 | $47,585 | 88,035 | 46% | 6% | 8% | 24% | 16% |
| Carroll (Arkansas) | $20,637 | $36,584 | 11,843 | 25% | 13% | 25% | 19% | 17% |
| Stone (Missouri) | $21,555 | $40,136 | 13,606 | 25% | 12% | 9% | 24% | 19% |
| Taney (Missouri) | $20,231 | $38,461 | 22,601 | 23% | 8% | 8% | 31% | 29% |
| Total impact area | $20,767 | $40,354 | 136,085 | 41% | 9% | 12% | 27% | 20% |

Source: U.S. Census Bureau: 2015 American Community Survey.

### 4.8.3 Recreation

Given the scenic and natural beauty of northwest Arkansas and Southwest Missouri, Table Rock Lake is a popular recreation venue for local and non-local visitors. On average from 1999 through 2012, about 4.6 million people visited the lake for at least one day (Table 4.4).[2] Table Rock Lake offers a variety of recreational facilities (Table 4.5). Paved access roads wind through 11 developed parks with 1,194 campsites. Other facilities include swimming beaches, hiking trails, boat launching ramps, sanitary dump stations, and picnic shelters. There are also numerous public marinas with 4,127 boat slips and stores selling groceries, fuel, boat rentals and storage, fishing guides and other related supplies and services.

[2] After 2012, the Corps began to redesign its methodology for estimating and reporting annual visitation to Corps projects. Data for 2013 onward are not yet available.

**Table 4.4**

**Annual Number of Visitors to Table Rock Lake (2003 through 2012)***

| Year | No. of visitors |
|---|---|
| 2003 | 4,261,976 |
| 2004 | 3,863,076 |
| 2005 | 5,456,374 |
| 2006 | 5,410,127 |
| 2007 | 4,612,001 |
| 2008 | 4,644,347 |
| 2009 | 5,247,953 |
| 2010 | 4,792,603 |
| 2011 | 4,152,762 |
| 2012 | 3,942,796 |
| Average (2003 through 2012) | 4,638,402 |

*After 2012, the Corps began to redesign its methodology for estimating and reporting annual visitation to Corps projects. Data for 2013 onward are not yet available. Source: U.S. Army Corps of Engineers, Little Rock District

**Table 4.5**

**Recreation Facilities at Table Rock Lake**

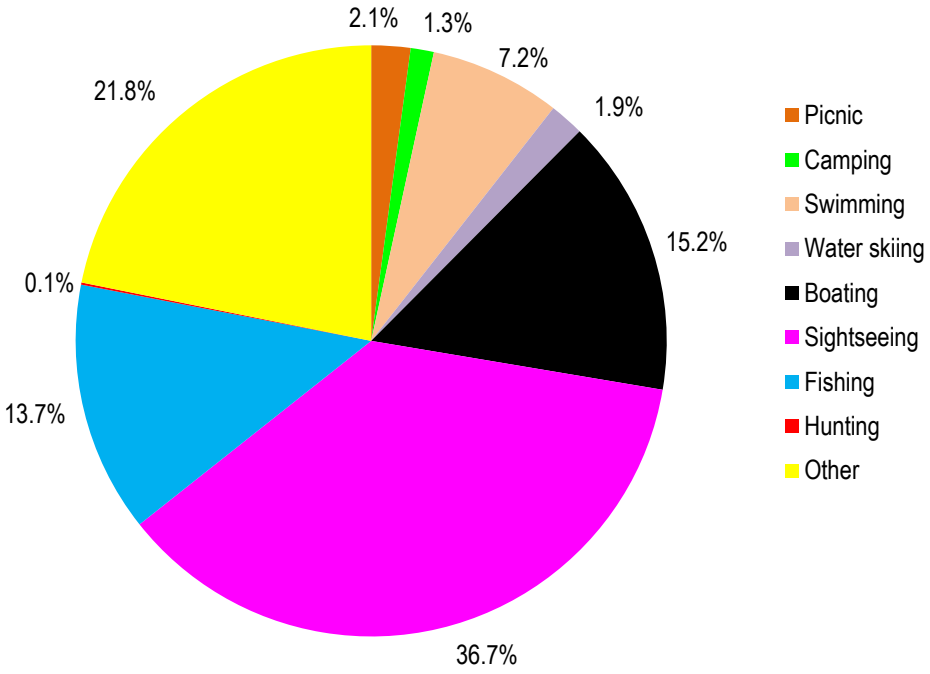
| Facilities | Number of sites |
|---|---|
| Recreation sites | 39 |
| Picnic sites | 117 |
| Camping sites | 1,194 |
| Playgrounds | 19 |
| Swimming areas | 15 |
| Trails | 2 |
| Trail miles | 3 |
| Fishing docks | 0 |
| Boat ramps | 36 |
| Marina slips | 4,217 |

Source: U.S. Army Corps of Engineers, Little Rock District

Accounting for almost one half of reported activities, water sports (swimming, boating, skiing and fishing) are popular at Table Rock Lake (Figure 4.2). There are 36 public boat ramps, and the lake is home for rainbow and German trout, and other fish including bass, crappie, bream, stripers, and catfish. Operated by the Missouri Department of Conservation near the Table Rock Dam, Shepherd of the Hills Fish Hatchery is the largest trout-rearing facility in the region; and trout fishing downstream of the dam is very popular. In addition to fishing and hunting, many other sports and activities await the visitor, picnicking, hiking and sightseeing are also reported recreational opportunities at Table Rock Lake.

**Figure 4.2**

**Distribution of Visitor Activities at Table Rock Lake**




Recreation at the lake has substantial impact to local economies based on surveys of visitor spending and attendance at Corps projects. In 2012, nearly 3.9 million people visited the lake and spent $114.2 million generating substantial impacts to local communities including:[3]

- $66.2 million in sales revenues for local businesses that supported 1,136 full and part-time local jobs;
- $25.6 million in household income; and

[3] The Corps Institute for Water Resources estimated the economic impacts of recreation at Table Rock Lake (and all Corps lakes around the nation) using various methods and tools including the IMPLAN regional economic modeling system. "Local" is defined as any economic activity within a 30-mile radius of the lake. Results and a description of the methodology are available at the Corps "Value to the Nation," URL: www.CorpsResults.us.

- $40.3 million in gross regional product.[4]

With regional economic multiplier effects, visitor spending generated:[5]

- $98.9 million in total sales that support 1,446 local jobs;
- $35.9 million in wages and salaries; and
- $59.9 million in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes).

Recreational boating accounts for the majority of tourism related expenditures and local economic impacts associated with the lake.

## 4.9 Health and Safety

Safety of project visitors and project staff are a high priority in daily project operations. Facilities and recreational areas are routinely evaluated to ensure sites are safe for visitor use. Project staff conducts numerous water safety programs and public announcements to educate children and project visitors about ways to be safe on the lake.

In coordination with the Missouri State Highway Patrol (MSHP) and Arkansas Game and Fish Commission (AGFC), water safety hazards and no wake zones are marked with buoys. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. MSHP and AGFC provides water safety patrols on the lake as their budgets allow.

The 2010 Recreational Boating Use Study suggested that increased boat traffic on the lake could cause increased boater conflict, and stated "management should strive to conserve use levels to prevent these levels from exceeding this threshold. Without this type of management strategy, opportunities for other classes of experience on the lake will be eliminated and those boaters looking to fish, swim, or relax quietly will likely be displaced elsewhere to seek out their recreational experiences."

## 4.10 Aesthetics

Management objectives include maintaining scenic vistas while limiting impacts that would negatively affect aesthetics. Aesthetics is an important feature that enhances the recreational experience. The shoreline around Table Rock Lake provides a natural setting that is aesthetically pleasing as well as buffering the lake from development and negative impacts such as erosion and stormwater runoff. However, there are problems in maintaining these aesthetic qualities. Project

[4] Gross regional product is the same as Gross Domestic Product that is commonly used to measure economic growth and prosperity at the national level, but it is measured on a regional basis. It generally includes labor income (wages and salaries), corporate income and profit, and tax revenues created by economic activity in a region that stays within the same region.

[5] Multipliers capture: 1) changes in sales, jobs and income within backward-linked industries in the region, i.e., businesses that supply goods and services to tourism-related firms, and 3) the impacts associated with household spending by employees in the affected supply chain.

resource staff is continually investigating trespasses that include activities such as timber cutting and land destruction by unauthorized off road vehicles. In addition, litter and illegal trash dumping both on project lands and project waters are continual problems.
Vandalism within recreation areas also occurs frequently.

Other concerns that impact aesthetics are demands put upon project resources for uses such as mowing areas, boat docks, foot paths, roads and utility line corridors. As Table Rock Lake continues to be surrounded by residential and commercial development, these demands are continually increasing. In many instances, these requests are in areas where the natural vegetation and landscape would be disturbed.

## 5.0 ENVIRONMENTAL CONSEQUENCES

Tables 5.1, 5.2, 5.3, 5.4, and 5.5 compare the shoreline allocation changes from No Action Alternative to other evaluated alternatives respectively. Table 5.6 summarizes which resources are likely to be affected by implementation of any of the evaluated Shoreline Management Plan Update Action Alternatives, or a No Action Alternative, which would retain the existing requirements of the current management plan. Discussion of potential impacts follows the table.

## Table 5.1

| ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE TWO- BENEFIT GENERAL PUBLIC USE | MILES | % of Alt Two Zoning | | ALTERNATIVE TWO - BENEFIT GENERAL PUBLIC USE | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 83.1 | 91.7% | | LDA | 90.7 |
| | | RLDA | 0.05 | 0.8% | | RLDA | 6.3 |
| | | Marina | 0.04 | 0.1% | | Marina | 65.8 |
| | | Public Rec Area | 1.0 | 1.8% | | Public Rec Area | 58.1 |
| | | Protected | 3.2 | 0.6% | | Protected | 536.4 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | 5.21 | 82.6% | | | |
| | | Marina | 4.50 | 6.8% | | | |
| | | Public Rec Area | 1.01 | 1.7% | | | |
| | | Protected | 0.04 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | 1.0 | 16.3% | | | |
| | | Marina | 60.2 | 91.5% | | | |
| | | Public Rec Area | 0.9 | 1.5% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 0.1 | 0.1% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 53.5 | 92.2% | | | |
| | | Protected | 1.9 | 0.4% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 7.3 | 8.1% | | | |
| | | RLDA | 0.0 | 0.4% | | | |
| | | Marina | 1.1 | 1.6% | | | |
| | | Public Rec Area | 1.6 | 2.8% | | | |
| | | Protected | 531.2 | 99.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 79.1 | 87.2% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.4 | 0.8% | | | |
| | | Protected | 2.6 | 0.5% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 0.6 | 0.6% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | 0.5 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.2 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.4 | 3.8% | | | |
| | | RLDA | 0.05 | 0.8% | | | |
| | | Marina | 0.04 | 0.1% | | | |
| | | Public Rec Area | 0.5 | 0.9% | | | |
| | | Protected | 0.0001 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | 4.4 | 69.4% | | | |
| | | Marina | 4.4 | 6.7% | | | |
| | | Public Rec Area | 0.2 | 0.4% | | | |
| | | Protected | 0.04 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (RLDA) | | LDA | NONE | 3.8% | | | |
| | | RLDA | 0.8 | 13.2% | | | |
| | | Marina | 0.1 | 0.1% | | | |
| | | Public Rec Area | 0.8 | 1.3% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |

## Table 5.2

| ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE FOUR- NEUTRAL CHANGE | MILES | % of Alt Four Zoning | | ALTERNATIVE FOUR- NEUTRAL CHANGE | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 83.1 | 91.2% | | LDA | 91.2 |
| | | RLDA | 0.05 | 0.7% | | RLDA | 6.8 |
| | | Marina | 0.04 | 0.1% | | Marina | 76.3 |
| | | Public Rec Area | 1.0 | 2.5% | | Public Rec Area | 40.6 |
| | | Protected | 3.2 | 0.6% | | Protected | 542.4 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 0.24 | 0.3% | | | |
| | | RLDA | 5.47 | 80.5% | | | |
| | | Marina | 4.51 | 5.9% | | | |
| | | Public Rec Area | 0.45 | 1.1% | | | |
| | | Protected | 0.12 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | 1.0 | 15.1% | | | |
| | | Marina | 60.2 | 78.9% | | | |
| | | Public Rec Area | 0.9 | 2.1% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 0.5 | 0.5% | | | |
| | | RLDA | 0.2 | 3.2% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 36.7 | 90.2% | | | |
| | | Protected | 7.8 | 1.4% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 7.3 | 8.1% | | | |
| | | RLDA | 0.03 | 0.5% | | | |
| | | Marina | 1.1 | 1.4% | | | |
| | | Public Rec Area | 1.6 | 4.0% | | | |
| | | Protected | 531.2 | 97.9% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 79.1 | 86.8% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.4 | 1.1% | | | |
| | | Protected | 2.5 | 0.5% | | *topo unsuitable and next to esa | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 0.6 | 0.6% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | 0.5 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.2 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.4 | 3.8% | | | |
| | | RLDA | 0.05 | 0.7% | | | |
| | | Marina | 0.04 | 0.1% | | | |
| | | Public Rec Area | 0.5 | 1.3% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 0.11 | 0.1% | | | |
| | | RLDA | 4.4 | 64.8% | | | |
| | | Marina | 4.4 | 5.8% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.1 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (RLDA) | | LDA | 0.1 | 3.8% | | | |
| | | RLDA | 1.1 | 15.7% | | | |
| | | Marina | 0.1 | 0.1% | | | |
| | | Public Rec Area | 0.4 | 1.0% | | | |
| | | Protected | 0.0 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |

## Table 5.3

| ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE FOUR A REVISED NEUTRAL CHANGE (PREFERRED) | MILES | % of Alt Four Zoning | | ALTERNATIVE FOUR A REVISED NEUTRAL CHANGE (PREFERRED) | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 83.3 | 91.2% | | LDA | 91.3 |
| | | RLDA | 0.05 | 0.7% | | RLDA | 6.8 |
| | | Marina | 0.04 | 0.1% | | Marina | 76.3 |
| | | Public Rec Area | 1.0 | 2.5% | | Public Rec Area | 40.6 |
| | | Protected | 3.1 | 0.6% | | Protected | 542.2 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 0.24 | 0.3% | | | |
| | | RLDA | 5.4646 | 80.44% | | | |
| | | Marina | 4.5252 | 5.9% | | | |
| | | Public Rec Area | 0.45 | 1.1% | | | |
| | | Protected | 0.12 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | 1.0 | 15.22% | | | |
| | | Marina | 60.2 | 78.9% | | | |
| | | Public Rec Area | 0.9 | 2.1% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 0.4 | 0.4% | | | |
| | | RLDA | 0.2 | 3.2% | | | |
| | | Marina | 10.5 | 0.0% | | | |
| | | Public Rec Area | 36.7 | 90.3% | | | |
| | | Protected | 7.9 | 1.5% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 7.4 | 8.1% | | | |
| | | RLDA | 0.03 | 0.5% | | | |
| | | Marina | 1.1 | 1.4% | | | |
| | | Public Rec Area | 1.6 | 4.0% | | | |
| | | Protected | 531.1 | 98.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 79.1 | 86.6% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.4 | 1.1% | | | |
| | | Protected | 2.5 | 0.5% | | *topo unsuitable and next to esa | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 0.7 | 0.7% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | 0.3 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.04 | 0.0% | | | |
| | | RLDA | NONE | 0.0% | | | |
| | | Marina | NONE | 0.0% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.2 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.4 | 3.7% | | | |
| | | RLDA | 0.05 | 0.7% | | | |
| | | Marina | 0.04 | 0.1% | | | |
| | | Public Rec Area | 0.5 | 1.3% | | | |
| | | Protected | 0.0 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 0.11 | 0.1% | | | |
| | | RLDA | 4.4 | 64.77% | | | |
| | | Marina | 4.4 | 5.8% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.1 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Resort (RLDA) | | LDA | 0.1 | 3.7% | | | |
| | | RLDA | 1.1 | 15.7% | | | |
| | | Marina | 0.1 | 0.1% | | | |
| | | Public Rec Area | 0.4 | 1.0% | | | |
| | | Protected | 0.0 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |

| **Table 5.4** ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE FIVE - ACCELERATED PRIVATE DEVELOPMENT | MILES | % of Alt Five Zoning | | ALTERNATIVE FIVE - ACCELERATED PRIVATE DEVELOPMENT | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 83.8 | 55.3% | | LDA | 151.6 |
| | | Public Rec Area | 1.0 | 2.5% | | Public Rec Area | 40.6 |
| | | Protected | 2.6 | 0.5% | | Protected | 564.9 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 5.70 | 3.8% | | | |
| | | Public Rec Area | 0.45 | 1.1% | | | |
| | | Protected | 4.63 | 0.8% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 1.07 | 0.7% | | | |
| | | Public Rec Area | 0.9 | 2.1% | | | |
| | | Protected | 60.2 | 10.7% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 0.7 | 0.5% | | | |
| | | Public Rec Area | 36.7 | 90.2% | | | |
| | | Protected | 18.2 | 3.2% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 60.4 | 39.9% | | (includes 53.06 additional) | |
| | | Public Rec Area | 1.6 | 4.0% | | | |
| | | Protected | 479.2 | 84.8% | | (Subtracted 53.06) | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 79.1 | 52.2% | | | |
| | | Public Rec Area | 0.4 | 1.1% | | | |
| | | Protected | 2.5 | 0.5% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 1.0 | 0.7% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.2 | 0.1% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.0 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.5 | 2.3% | | | |
| | | Public Rec Area | 0.5 | 1.3% | | | |
| | | Protected | 0.04 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 4.51 | 3.0% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 4.6 | 0.8% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (RLDA) | | LDA | 1.2 | 2.3% | | | |
| | | Public Rec Area | 0.4 | 1.3% | | | |
| | | Protected | 0.1 | 0.0% | | *Shift of Antlers, Cedardell terminated | |
| | | Prohibited | NONE | 0.0% | | | |

| ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE FIVE - ACCELERATED PRIVATE DEVELOPMENT | MILES | % of Alt Five Zoning | | ALTERNATIVE FIVE - ACCELERATED PRIVATE DEVELOPMENT | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 83.8 | 55.3% | | LDA | 151.6 |
| | | Public Rec Area | 1.0 | 2.5% | | Public Rec Area | 40.6 |
| | | Protected | 2.6 | 0.5% | | Protected | 564.9 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 5.70 | 3.8% | | | |
| | | Public Rec Area | 0.45 | 1.1% | | | |
| | | Protected | 4.63 | 0.8% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 1.07 | 0.7% | | | |
| | | Public Rec Area | 0.9 | 2.1% | | | |
| | | Protected | 60.2 | 10.7% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 0.7 | 0.5% | | | |
| | | Public Rec Area | 36.7 | 90.2% | | | |
| | | Protected | 18.2 | 3.2% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 60.4 | 39.9% | | (includes 53.06 additional) | |
| | | Public Rec Area | 1.6 | 4.0% | | | |
| | | Protected | 479.2 | 84.8% | | (Subtracted 53.06) | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 79.1 | 52.2% | | | |
| | | Public Rec Area | 0.4 | 1.1% | | | |
| | | Protected | 2.5 | 0.5% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 1.0 | 0.7% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.2 | 0.1% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.0 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.5 | 2.3% | | | |
| | | Public Rec Area | 0.5 | 1.3% | | | |
| | | Protected | 0.04 | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 4.51 | 3.0% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 4.6 | 0.8% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (RLDA) | | LDA | 1.2 | 2.3% | | | |
| | | Public Rec Area | 0.4 | 1.3% | | | |
| | | Protected | 0.1 | 0.0% | | *Shift of Antlers, Cedardell terminated | |
| | | Prohibited | NONE | 0.0% | | | |

**Table 5.5**

| ALTERNATIVE THREE-NO ACTION | CONVERTED TO | ALTERNATIVE SIX - MAXIMUM PRIVATE GROWTH | MILES | % of Alt Six Zoning | | ALTERNATIVE SIX - MAXIMUM PRIVATE GROWTH | MILES |
|---|---|---|---|---|---|---|---|
| LDA (Total) | | LDA | 85.6 | 24.5% | | LDA | 349.0 |
| | | Public Rec Area | 1.0 | 2.5% | | Public Rec Area | 40.6 |
| | | Protected | 0.7 | 0.2% | | Protected | 367.5 |
| | | Prohibited | NONE | 0.0% | | Prohibited | 1.0 |
| | | | | | | Total | **758.2** |
| RLDA (Total) | | LDA | 10.00 | 2.9% | | | |
| | | Public Rec Area | 0.45 | 1.1% | | | |
| | | Protected | 0.27 | 0.1% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Marina | | LDA | 37.81 | 10.8% | | | |
| | | Public Rec Area | 0.9 | 2.1% | | | |
| | | Protected | 23.2 | 6.3% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Public Rec Area | | LDA | 15.8 | 4.5% | | | |
| | | Public Rec Area | 36.6 | 90.1% | | | |
| | | Protected | 2.7 | 0.7% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Protected | | LDA | 196.8 | 56.4% | | | |
| | | Public Rec Area | 1.6 | 4.0% | | | |
| | | Protected | 339.6 | 92.4% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Prohibited | | LDA | NONE | 0.0% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | 1.0 | 100.0% | | | |
| | | | | | | | |
| (Breakdown of LDA and RLDA, included in total LDA and total RLDA listed above) | | | | | | | |
| LDA | | LDA | 80.7 | 23.1% | | | |
| | | Public Rec Area | 0.4 | 1.1% | | | |
| | | Protected | 0.7 | 0.2% | | *next to esa | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Community | | LDA | 1.0 | 0.3% | | | |
| | | Public Rec Area | NONE | 0.0% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Courtesy | | LDA | 0.2 | 0.1% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (LDA) | | LDA | 3.6 | 1.0% | | | |
| | | Public Rec Area | 0.5 | 1.3% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| RLDA | | LDA | 8.7 | 2.5% | | | |
| | | Public Rec Area | 0.05 | 0.1% | | | |
| | | Protected | 0.3 | 0.1% | | *next to ESA | |
| | | Prohibited | NONE | 0.0% | | | |
| | | | | | | | |
| Resort (RLDA) | | LDA | 1.3 | 1.0% | | | |
| | | Public Rec Area | 0.4 | 1.3% | | | |
| | | Protected | NONE | 0.0% | | | |
| | | Prohibited | NONE | 0.0% | | | |

**Table 5.6**

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Climate, Topography, Geology and Soils** | There would be an impact, although not significant, on climate, topography and geology as a result of implementation of the No Growth Alternative due to the potential for reduced development around the lake due to no new permits issued for any purpose on the lake. Any additional boating activity above current uses may come from increased use of public boat launching facilities and commercial marinas. | The Benefit General Public Use Alternative would result in a similar level of insignificant impacts as the No Action Alternative on climate, topography, geology and soils due to very little change in percentage of Limited Development Area (LDA) from the No Action Alternative. | The No Action Alternative is used as the base line for comparison with the other action alternatives. This alternative represents the current conditions that exist and the potential for additional development under the current regulations. There is no documentation of significant environmental concerns on climate, topography, geology and soils from current activities on and around the lake. | Potential minimal impacts on climate, topography, geology, and soils may occur due to vegetation modification due to additional dock permits issued in LDA. | Potential minimal impacts on climate, topography, geology, and soils may occur due to vegetation modification due to additional dock permits issued in the added LDA. Wave action from increased boating activity may cause localized shoreline erosion. | All lands around the lake classified as low density is allocated as LDA in this alternative. Potential impacts on climate, topography, geology, and soils may occur due to vegetation modification due to additional dock permits issued in this additional LDA. Wave action from increased boating activity may cause localized shoreline erosion. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Aquatic Environment** | The hydrology and groundwater components of Table Rock Lake would not have a significant change from the existing condition due to the implementation of the No Growth Alternative. Water quality may be enhanced due to re-vegetation of currently permitted path and mowed areas over time from possible attrition of current vegetation modification permits. The regrowth of vegetation would enhance fish habitat during high water events on the lake. | The Benefit General Public Use Alternative is similar to the No Action Alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment, but water quality would potentially be minimally impacted due to adding LDA. | The No Action Alternative would result in little to no impacts on the hydrology and groundwater components of the aquatic environment Water quality impacts would likely be minimally impacted under this alternative due to continuing the issuance and renewal of vegetation modification and dock permits. | The Revised Neutral and Neutral Change Alternatives are similar to the No Action Alternative in potential impacts on the hydrology and groundwater components of the aquatic environment, but potential exists for minimal impacts to current water quality due to the relocation of LDA. | The increased potential for additional shoreline development due to the addition of LDA has potential impacts on the hydrology and ground-water components of the aquatic environment. The potential exists for additional impacts to current water quality due to an increase in vegetation modification due to more docks. Wave action from increased boating activity may cause localized water quality problems. | All lands around the lake classified as low density are allocated as LDA in this alternative. Potential impacts on the hydrology and groundwater may occur due to an increase in vegetation modification due to more boat dock permits issued. Wave action from increased boating activity may cause localized water quality problems on more areas of the lake than would occur under the other alternatives evaluated. Potential decrease in water quality may occur from oil and gas leakage due to additional boats. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Archaeological & Historic Resources** | The No Growth Alternative would have no additional impacts on any cultural resources. Under the current SMP, there are no known significant impacts to cultural resources, and no new permits would be issued under this alternative. | Under the Benefit General Public Use Alternative, there is a decrease in unused LDA therefore less potential for impacts to cultural resources and historic properties. Potential impacts could occur in six LDAs which total 0.54 miles of shoreline. | Under the No Action Alternative there are 35.3 miles of unused LDA. Potential impacts could occur in 8 LDAs which total 1.01 miles of shoreline. | Under the Revised Neutral and Neutral Changes Alternative, there is a decrease in unused LDA therefore less potential for impacts to cultural resources and historic properties. Potential impacts could occur in six LDAs which total 0.54 miles of shoreline. | Under the Accelerated Private Development Alternative, there is an increase in unused LDA therefore more potential for impacts to cultural resources and historic properties. Estimated potential impacts could occur in nine LDAs which total 1.89 miles of shoreline. | Under the Maximum Private Growth Alternative, there is an increase in unused LDA therefore more potential for impacts to cultural resources and historic properties. Estimated potential impacts could occur in 31 LDAs which total 12.21 miles of shoreline. This alternative has the greatest potential to have an impact to this resource category of all alternatives evaluated. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Air Quality** | Under the No Growth Alternative, the air quality around the lake would remain the same as currently exists. There could be a decrease in vehicular exhaust emissions due to reduced potential boat traffic, improving air quality somewhat, but there are no violations of the current National Ambient Air Quality Standards (NAAQS) established by the EPA under the No Action Alternative (current conditions). | Implementation of the Benefit General Public Use Alternative would result in some minor increases in negative air quality impacts as compared to the No Action Alternative due to a potential to add more boat slips on the lake. | Implementation of the No Action Alternative would result in minimal potential impact to existing air quality due to a continuation of the permitting process, creating a potential for increased boating activity. | Implementation of the Revised Neutral and Neutral Change Alternatives would have similar impacts to air quality as Alternatives 2 and 3 due to a potential increase of boating activity and traffic around the lake. | The Accelerated Private Development Alternative adds 64.2 miles of LDA, representing 20% of shoreline LDA miles. Additional potential minimal impacts on existing air quality may occur due to vegetation modification for more boat docks, and potentially more boat activity and traffic around the lake due to the additional LDA. | The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase of 34.5% of total shoreline miles. All lands around the lake classified as low density is allocated as LDA in this alternative (349 total shoreline miles) The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles in this alternative, representing a reduction of 22.9%. Potential impacts on existing air quality would be the greatest under this alternative due to the increase in boat dock numbers from 763 in the No Action Alternative to 3780 in this alternative. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Socio-economics** | The No Growth Alternative would likely have the greatest negative impact on the regional socio-economic situation in the counties surrounding Table Rock Lake due to reduced development due via elimination of new shoreline use permits on the lake. | The Benefit General Public Use Alternative would likely have minimal impact on the socio-economic situation in the counties surrounding Table Rock Lake since this alternative is similar to how the lake is currently managed and operated, with potential for addition of 224 additional boat docks over the No Action Alternative. | The No Action Alternative would have some positive socioeconomic impacts in the counties surrounding Table Rock Lake due to the potential for future development of existing adjacent land parcels with homes and a potential increase of 763 additional docks above existing conditions. | The Revised Neutral and Neutral Change Alternatives may have similar impacts on the socio-economic situation in the counties surrounding Table Rock Lake as was noted in Alternative 3. | The Accelerated Private Development Alternative adds 64.2 miles of LDA, representing 20 percent of shoreline LDA miles. The potential 5 percent of land parcels that may be developed in Alternative 3 increases to 11 percent in this alternative. A potential increase in boat slips of near 9000 above Alternative 3 may occur in this alternative. | The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase of 34.5 percent of total shoreline miles. All lands around the lake classified as low density is allocated as LDA in this alternative (349 total shoreline miles) The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles, representing a reduction of 22 percent. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Recreation Resources** | Provision of recreational facilities and services could continue at Table Rock Lake under the No Growth Alternative from continued utilization of marinas, parks and public boat launching ramps. A potential reduction in overall boating relative to the No Action alternative activity is expected due to discontinuation of the private dock permitting program. Land based recreational activities may increase under this alternative. | The Benefit General Public Use Alternative could cause a potential decrease in recreational boating relative to the No Action alternative due to the reduction of potential slips. Other land based recreational activities may increase under this alternative. Continued utilization of marinas, parks and public boat launching ramps will occur under this alternative. Potential positive impacts on the recreation experience could occur due to reduced boating congestion. | The No Action Alternative could have some positive recreation impact as new docks and slips will continue to be placed in LDAs. Potential negative impacts on the recreation experience could occur due to oversaturation of boaters. | The Revised Neutral and Neutral Change Alternatives will be similar to Alternative 3 and could have some positive recreation impact as new docks and slips will continue to be placed in LDAs. Potential negative impacts on the recreation experience could occur due to oversaturation of boaters. | The Accelerated Private Development Alternative could have some positive recreation impact as new docks and slips will continue to be placed in LDAs. Potential negative impacts on the recreation experience could occur due to oversaturation of boaters. This increase in boating activity could create recreation conflicts. | The Maximum Private Growth Alternative could have some positive recreation impact as new docks and slips will continue to be placed in LDAs. Major potential negative impacts on the recreation experience could occur due to oversaturation of boaters along with more docks and parking being located along the shoreline. This large amount of increase in boating activity would most likely create recreation conflicts. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Health & Safety** | The No Growth Alternative would discontinue the current private permitting programs, in which a decrease in potential shoreline development could positively impact water quality due to potential decreased water traffic and a decrease in vegetation modification. This alternative would reduce the potential for accidents and pollution. | The Benefit General Public Use Alternative would still allow potential shoreline development opportunities, with a potential to decrease boat congestion and water related accidents, due to reduced number of potential slips. Potential decrease in dock owner conflict due to elimination of new community docks. | The No Action Alternative allows potential shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. | The Revised Neutral and Neutral Change Alternatives will be similar to Alternative 3 and allows potential shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. | The Accelerated Private Development Alternative allows potential increase in shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. Additionally potential increase in water pollution could occur due to an increase distance of mowing vegetation. Potential increase in dock owner conflict due to continuation and addition of new community docks. | The Maximum Private Growth Alternative allows potential increase in shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. Additionally potential increase in water pollution could occur due to an increase distance of mowing vegetation. Potential increase in dock owner conflict due to continuation and addition of new community docks. |

**Resources Likely Affected with Implementation of Alternatives**

| Resource Category | Alternative 1<br>No Growth | Alternative 2<br>Benefit General Public Use | Alternative 3<br>No Action | Alternative 4/Alternative 4a<br>Neutral Change/Revised Neutral Change | Alternative 5<br>Accelerated Private Development | Alternative 6<br>Maximum Private Growth |
|---|---|---|---|---|---|---|
| **Aesthetics** | Under the No Growth Alternative the visual characteristics surrounding the Table Rock Lake landscape could potentially change due to the discontinued private use permitting program, which would likely reduce the development of adjacent land parcels around the lake. Revegetation of permitted sites would occur due to attrition of existing permits. | Under the Benefit General Public Use Alternative, the wide panorama of Table Rock Lake and the nearby shore would continue to convey a sense of enormity of the lake, and the limited development would continue to promote the sense of a relatively pristine shoreline. The developed areas are, for the most part, shielded from the lake view, which preserves the view-scape of those recreating on the lake. With a decrease in mowing area, there would be more natural vegetation in the viewscape. | The No Action Alternative would allow more potential development, but not to a degree that would significantly impact the scenic beauty and/or aesthetics of the lake. | Under the Revised Neutral and Neutral Change Alternatives the unspoiled and untamed aesthetic of this landscape will not be significantly impacted. This alternative would maintain the area of pristine shoreline and preserve regions of boulders, bluffs, and mature forest flora that currently dominate views. | The Accelerated Private Development Alternative the unspoiled and untamed aesthetic of this landscape could be significantly negatively impacted. This alternative will degrade the view-scape due to increase mowing distance, limbing of trees, cutting of cedars, and potential for more docks and boats. | The Maximum Private Growth Alternative the unspoiled and untamed aesthetic of this landscape could be significantly negatively impacted due to potential boat docks being located along almost half of the shoreline. This alternative will degrade the view-scape due to increase mowing distance, limbing of trees, cutting of cedars, and potential for more docks and boats. |

## 5.1 Climate, Physiography, Topography, Geology, and Soils

### 5.1.1 No-Growth (Alternative 1)

Under Alternative 1, all LDA type allocations, including resorts, would be converted to a protected allocation or public recreation area allocation, resulting in 92.2 percent protected shoreline, with the remainder being public recreation areas and prohibited areas. There will be minimal insignificant impacts to climate, physiography, topography and geology as a result of implementation of the No Growth alternative. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases. Current soil erosion producing activities would persist due to continued use of current permitted activities, which would be allowed under this alternative. All current permits will be grandfathered, no new permits will be issued. This alternative requires a minimum tree density may prevent potential soil erosion for some areas. In this alternative there is a potential decrease in vegetation modification areas due to the restriction of mowing across a natural break in vegetation. As permitted activities decrease due to attrition of permits, previously disturbed areas would be allowed to re-vegetate, decreasing soil erosion. Of the activities associated with the protected shoreline allocation— fishing, hunting, unimproved trails, wildlife viewing and existing shoreline use permits—the shoreline use permits will typically have the greatest impacts on soil disturbance due to potential vegetation removal and transforming natural pervious surfaces to natural impervious surfaces due to soil compaction from path traffic. Any additional boating activity above current uses may come from increased use of public boat launching facilities and commercial marinas.

### 5.1.2 Benefit General Public Use (Alternative 2)

The Benefit General Public Use alternative is similar to the No Growth alternative in terms of potential impacts to climate, physiography, topography and geology. There will be little to no impact to the existing conditions regarding these features. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases. In this alternative, additional shoreline use permits for new single owner boat docks and vegetation modification permits will be issued. This promotes erosion due to previous unmodified vegetative areas being modified and increased runoff velocity after modification is completed. The remaining pervious surfaces around these developed areas will become more impervious due to increased foot traffic to boat docks, along with AAV permitted use to boat docks. This alternative requires a minimum tree density may prevent potential soil erosion for some areas. In this alternative there is a potential decrease in vegetation modification areas due to the restriction of mowing across a natural break in vegetation. Soil compaction on paths to new docks may be less due to the elimination of community docks and fewer slip owners using path to dock. This alternative does introduce a maximum acreage for mowing/under brushing vegetation modification areas, which will reduce potential vegetation modification. This will potentially reduce erosion and sediment deposition in the lake, as compared to the vegetation modification permits in Alternatives 3, 4, 5 and 6.

#### 5.1.3 No Action (Alternative 3)

The No Action Alternative is used as the base line for comparison with the other action alternatives. This alternative represents the current conditions that exist along with the potential for additional development under the current regulations. There is no documentation of significant environmental concerns on climate, topography, geology and soils from current activities on and around the lake. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases. Issuance of additional vegetation and dock permits requires soil disturbance, vegetation removal and transforming pervious surfaces to impervious areas. This promotes erosion due to previous unmodified vegetative areas being modified and increased runoff velocity after modification is completed. The remaining pervious surfaces around these developed areas will become more impervious due to increased foot traffic to boat docks, along with AAV permitted use to boat docks.

#### 5.1.4 Neutral Change (Alternative 4)

Potential minimal impacts on climate, topography, geology, and soils may occur due to vegetation modification resulting from additional dock permits issued in LDA. The Neutral Change Alternative adds 3.7 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase of 0.5 percent of total shoreline miles. However this alternative will have less impact to climate, topography, geology, and soils due to the increased LDA mileage being located where there are existing docks. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases. In this alternative there is a potential decrease in vegetation modification areas due to the restriction of mowing across a natural break in vegetation.

#### 5.1.5 Revised Neutral Change (Alternative 4a)

Potential minimal impacts on climate, topography, geology, and soils may occur due to vegetation modification resulting from additional dock permits issued in LDA. The Neutral Change Alternative adds 3.9 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase of 0.5 percent of total shoreline miles. In this alternative all existing docks will not be required to convert to solar or other alternative power source.

#### 5.1.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative adds 64.2 miles of LDA, representing 20 percent of shoreline LDA miles. The increase in LDA would result in some impact, although not significant, to climate, physiography, topography, geology and soils from implementation of this alternative. Additional potential minimal impacts on climate, topography, geology, and soils may occur due to vegetation modification due to additional dock permits issued in this additional LDA. Wave action from increased boating activity may cause localized shoreline erosion. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases. In this alternative there is a potential decrease in vegetation modification areas due to the restriction of mowing across a major road. However, there is a potential increase in vegetation modification due to increase in

mowing distance which has the potential to increase soil erosion. Expansion of non-traditional parking areas may cause compaction of soil and/or soil erosion. Under this alternative removal of cedar trees may be allowed which could potentially increase soil erosion.

#### 5.1.6 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase of 34.5percent of total shoreline miles. All lands around the lake classified as low density is allocated as LDA in this alternative (349 total shoreline miles) The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles, representing a reduction of 22.9percent. The type impacts of this alternative are similar to the type of impacts in Alternative Five; however, the impacts are significantly increased due to the potential additional LDA, addition of parking areas on Government lands, and the limited oversight on vegetation management permits. Potential impacts on climate, topography, geology, and soils may occur due to vegetation modification to accommodate additional dock permits issued in this additional LDA. Wave action from increased boating activity may cause localized shoreline erosion. In this alternative all existing docks will be required to convert to solar or other alternative power source, thus potentially reducing the production of greenhouse gases.

## 5.2 Aquatic Environment

The lake has a drainage area of 4,020 square miles, with the near-lake portion containing many springs, both perennial and intermittent, which derive their water from higher elevations. Information from wells and small springs in the area indicates that the water table under the higher part of that portion of the lake rim is probably near elevation 900. Many impermeable zones exist that create perched water tables, and many of the shallow wells obtain their water from perched ground water pools. However, because of solution widened joints and structures in the rock, an interchange of water occurs between the formations that underlie the area and leaky aquifers are common. Additionally, because of exposed fractured, weathered, permeable rock, percolation of surface water into the water table is common place.

Major tributaries to Table Rock Lake are the Kings River and Long Creek from the south and the James River from the north. The drainage is typically steep in the headwaters of the smaller streams and transitions to lesser slopes as they reach the main stem of the White River. These streams can be flashy with intense rainfall. The area is primarily wooded and rural with the exception of the Highway 65 corridor from Branson to Springfield. The percent of the basin which is impervious has increased with the rapid development of the area, but remains a small percentage of the overall watershed.

Water quality issues arise after periods of heavy rainfall in the watershed, primarily due to nutrient influx, with associated sedimentation and algal blooms. Table Rock Lake has been listed on the 303(d) List by MDNR in their biennial Integrated Surface Water Quality Report (Integrated Report) to the Environmental Protection Agency as impaired due to excessive nutrient concentrations, particularly nitrogen and phosphorus. The initial impairment listing was in 2002, with the most recent listing in 2018. According to the Integrated Report, these

excessive nutrient concentrations occur most frequently in the James River, Kings River and Long Creek arms of the lake. The upper portion of the White River is also listed as impaired for excessive chlorophyll and nitrogen. In the report by Jones, et.al. (2008), it was shown that Table Rock Lake was an oligotrophic lake based on the samples taken near Table Rock Dam, while various arms or branches of the lake such as the James River mouth or Long Creek area, where it receives water from these tributaries, shows tendencies toward being more eutrophic. A TMDL, designed to reduce nutrient contribution to the lake, is scheduled by MDNR for the time frame of 2024-2028. A previous 2004 TMDL, conducted on the James River, focused on nutrient reduction by placing nitrogen and phosphorus limits on point source dischargers in the basin.

Lake fluctuations, associated with power production and flood control procedures, produce changes in the environment along the shoreline of the lake. Turbidity adversely affects Table Rock Lake short periods of time after heavy rains. During these periods of heavy runoff, urban areas and other parts of the terrain especially those that have had the protective vegetation removed, contribute silt and other suspended particles to the tributaries. While implementation of the alternatives is relatively independent of the existing watershed drainage on the lake water quality, continued development around the lake shoreline will exacerbate water quality issues due to potential increased erosion, localized increases in turbidity and increased sedimentation in the lake following storm events.

Wetland areas are relatively limited within Table Rock Lake and throughout the adjacent government property surrounding the lake and will not undergo any significant change from existing conditions due to implementation of any of the alternatives. The steeply sloped terrain and thin, rocky soil layers overlying bedrock along the shoreline do not typically support wetland vegetation. The sparse wetland areas that occur within the lake surface area have mostly formed as mud flats within the upper reaches of the major tributaries to the lake. Additionally, a few coves on the lake have also established small wetland areas. This is due to sediment washing from streams and accumulating at the point where the stream bed enters the normal lake surface at the upper end of the cove. These areas can support emergent wetland vegetation at times depending on seasonal flooding and the controlled lake elevation.

Within the State of Missouri, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) indicates approximately 12 acres of wetlands occurring within the lake surface area and in adjacent floodplains. The NWI maps also indicate wetlands in the Arkansas portion of the lake, but approximate acreages are not included. The majority of this wetland acreage is classified as palustrine scrub/shrub, either seasonally or temporarily flooded. Further, there are some areas mapped as palustrine forested occurring within wooded floodplain areas along the upper reaches of the James River, Kings River, and Long Creek.

Fishing is a major recreation component of Table Rock Lake, having regional and nation-wide popularity. Sport fish species currently found in the lake include largemouth bass, spotted bass, smallmouth bass, white bass, walleye, flathead catfish, channel catfish, white crappie, black crappie and paddlefish. Due to the quality and diversity of the fishery, Table Rock Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

### 5.2.1 No-Growth (Alternative 1)

The hydrology and groundwater components of Table Rock Lake have the potential to improve due to the implementation of a No Growth alternative, as this alternative introduces less vegetative and landform modification than the No Action alternative. Water quality may be enhanced due to revegetation of currently permitted path and mowed areas over time from possible attrition of current vegetation modification permits. The regrowth of vegetation would enhance fish habitat during high water events on the lake. Implementation of the No Growth alternative will not allow continued development around the shoreline. It will in fact potentially require additional tree planting. Both of these requirements will positively impact shoreline stability, improve fish habitat provided by overhanging vegetation, tree trunks and roots at water's edge, and filter storm water erosion and sedimentation. During the spring spawning season this has the potential to improve conditions for spawning activity and productivity in the coves and lake arms where spawning commonly occurs. See Table 5.7, Potential Mowing Estimates, for each alternative for detailed mowing acreage information.

**Table 5.7**
**Potential Mowing Estimates for Selected Alternatives**

| | Acres | Percent of low density acres | Percent of total land | |
|---|---|---|---|---|
| Alternative 1 | 769 | 11% | 4% | Existing active permits only |
| Alternative 2 | 4,861 | 67% | 25% | Mowing 200 feet from home allowed |
| Alternative 3 | 4,853 | 67% | 25% | Mowing 200 feet from home allowed |
| Alternative 4/4a | 5,081 | 70% | 26% | Mowing 200 feet from home allowed |
| Alternative 5 | 5,966 | 82% | 31% | Mowing 200 feet from boundary allowed |
| Alternative 6 | 5,966 | 82% | 31% | Mowing 200 feet from boundary allowed |
| Total low density acres | 7,256 | | | |
| Total land acres | 19,535 | | | |

### 5.2.2 Benefits General Public Use (Alternative 2)

The Benefit General Public Use Alternative is similar to the No Action Alternative in terms of potential impacts to the hydrology and groundwater components of the aquatic environment. There are no foreseeable additional impacts due to adding 3.2 miles of LDA to the existing 87.4 miles in the No Growth Alternative because the additional LDA covers existing permitted structures only. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive positive benefits due to implementation of this alternative. The changes that will limit vegetation modification permit areas and establishing a minimum tree density in these areas will serve to limit vegetation and

landform modification on these lands, thereby reducing impacts to ground disturbance and subsequent increased erosion. In addition, positive impacts will be achieved by limiting the size of additional docks to single owners versus community docks thereby decreasing the foot traffic and AAV traffic on shoreline paths, which will reduce soil compaction and soil erosion. These factors will reduce erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional benefits of retention of more shoreline vegetation, better fishery habitat, and improved spawning conditions due to the decrease of turbidity and sediment deposition. There will be little to no change in the wetland status from the No Action alternative due to implementation of this alternative.

#### 5.2.3 No Action (Alternative 3)

The No Action Alternative would result in little to no impacts on the hydrology and groundwater components of the aquatic environment. Water quality impacts would likely be minimally impacted under this alternative due to continuing the issuance and renewal of vegetation modification and dock permits. As noted in Table 5.7, an estimated 4853 acres of low density lands are subject to potential vegetation modification permits (mowing, under brushing). A potential increase in the number of boats on the lake would have some limited impact on water quality due to increased potential for fuel leakage and spillage, as well as increased wave action, which can cause localized shoreline erosion and increased turbidity. Resuspension of nutrients bound in sediments can cause an increase in algae production near the shoreline.

#### 5.2.4 Neutral Change (Alternative 4)

The Neutral Change Alternative is similar to the No Action Alternative in potential impacts on the hydrology and groundwater components of the aquatic environment, but potential exists for minimal impacts to current water quality due to the addition of 3.7 miles of LDA shoreline to the existing 87.4 miles in the No Growth Alternative; however, because the additional LDA covers existing permitted structures only, additional impacts from vegetation modification and boat dock permits should be negligible. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive positive benefits due to implementation of this alternative. The changes that will limit some vegetation modification permit areas will serve to impose some potential limits to vegetation and landform modification on these lands, thereby reducing impacts to ground disturbance and subsequent increased erosion. However, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will potentially create new ground disturbance and subsequent increased erosion, therefore creating conditions similar to the No Action alternative. Similar to Alternative 3, a potential increase in the number of boats on the lake would have some limited impact on water quality due to increased potential for fuel leakage and spillage, as well as increased wave action, which can cause localized shoreline erosion and increased turbidity. Re-suspension of nutrients bound in sediments can cause an increase in algae production near the shoreline. There will be little to no change in the wetland status from the No Action alternative due to implementation of this alternative.

### 5.2.5 Revised Neutral Change (Alternative 4a)

The Revised Neutral Change Alternative is similar to the No Action Alternative in potential impacts on the hydrology and groundwater components of the aquatic environment, but potential exists for minimal impacts to current water quality due to the addition of 3.9 miles of LDA shoreline to the existing 87.4 miles in the No Growth Alternative; however, because the additional LDA covers existing permitted structures only, additional impacts from vegetation modification and boat dock permits should be negligible. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive positive benefits due to implementation of this alternative. The changes that will limit some vegetation modification permit areas will serve to impose some potential limits to vegetation and landform modification on these lands, thereby reducing impacts to ground disturbance and subsequent increased erosion. However, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will potentially create new ground disturbance and subsequent increased erosion, therefore creating conditions similar to the No Action alternative. Similar to Alternative 3, a potential increase in the number of boats on the lake would have some limited impact on water quality due to increased potential for fuel leakage and spillage, as well as increased wave action, which can cause localized shoreline erosion and increased turbidity. Re-suspension of nutrients bound in sediments can cause an increase in algae production near the shoreline. There will be little to no change in the wetland status from the No Action alternative due to implementation of this alternative.

### 5.2.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative differs from the No Action Alternative in potential impacts on the hydrology and groundwater components of the aquatic environment by increasing the potential for additional shoreline development due to the addition of 64.2 miles of LDA. This is an increase from 11.5percent LDA in the No Action Alternative to 20percent LDA in this alternative. The potential exists for additional impacts to current water quality due to an increase in vegetation modification due to more docks, and the expansion of vegetation modification permit areas. Potential mowing acres increases to 5966 in this alternative, representing 82percent of low density lands. Wave action from increased boating activity may cause localized water quality problems. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive negative impacts due to implementation of this alternative. The changes that will increase the limits of vegetation management permits will increase ground disturbance and subsequent increased erosion. Additionally, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will create the potential for more ground disturbance and subsequent increased erosion, therefore producing negative impacts as compared to the No Action alternative. Additional community docks in new LDA will potentially increase foot traffic and AAV traffic on shoreline paths, which will increase soil compaction and soil erosion. These factors will increase erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional impacts to shoreline vegetation,

fishery habitat, and spawning conditions due to the increase of turbidity and sediment deposition. There will be little to no change in the wetland status from the No Action alternative due to implementation of this alternative.

#### 5.2.7 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative. This is an increase from 11.5 percent LDA in the No Action Alternative to 46percent LDA in this alternative. All lands around the lake classified as low density are allocated as LDA in this alternative (349 total shoreline miles). The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles, representing a reduction of 22.9percent. Potential impacts on the hydrology and groundwater may occur due to an increase in vegetation modification due to more boat dock permits issued. The potential exists for additional impacts to current water quality due to an increase in vegetation modification due to more docks, and the expansion of vegetation modification permit areas. Wave action from increased boating activity may cause localized water quality problems on more areas of the lake than would occur under the other alternatives evaluated. Potential decrease in water quality may occur from oil and gas leakage due to additional boats. The hydrology and groundwater conditions will be similar due to the watershed drainage and existing geology of the area being the controlling factors affecting these components. Water quality and aquatic resources, however, may receive negative impacts due to implementation of this alternative. The changes that will increase the limits of vegetation management permits will increase ground disturbance and subsequent increased erosion. Additionally, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will create the potential for more ground disturbance and subsequent increased erosion, therefore producing negative impacts as compared to the No Action alternative. Additional community docks and public parking lots in new LDA will potentially significantly increase foot traffic and AAV traffic on shoreline paths, which will increase soil compaction and soil erosion. These factors will increase erosion sedimentation and pollutants scoured from reduced impervious surfaces, with additional impacts to shoreline vegetation, fishery habitat, and spawning conditions due to the increase of turbidity and sediment deposition. There will be little to no change in the wetland status from the No Action alternative due to implementation of this alternative.

## 5.3 Terrestrial Resources

#### 5.3.1 No-Growth (Alternative 1)

Under the No Growth Alternative there would be an increase of 157.8 miles (gained from elimination of private activity shoreline allocations) of protected shoreline over the 541.3 miles currently allocated as protected in the No Action Alternative. This Alternative will result in a positive impact on terrestrial resources due to no additional vegetation modification permits and the potential tree planting due to a minimum tree density requirement. Permitted path and mowed areas may be reduced from possible attrition, allowing revegetation of all permitted shoreline activities. Regrowth on these areas would increase habitat for terrestrial species for

feeding, nesting, and enhanced migration corridors. This will result in positive impacts to wildlife due to potential addition of trees and understory vegetation, thereby increasing food sources and habitat for both birds and mammal species. See Table 5.7, Potential Mowing Estimates, for each alternative for detailed mowing acreage information.

#### 5.3.2 Benefits General Public Use (Alternative 2)

Implementation of the Benefit General Public Use Alternative would have a minor positive impact on terrestrial resources in comparison to the No Action Alternative. This is due to limits on vegetation modification areas, which will impact habitat, feeding and movement patterns for some terrestrial species. There are no foreseeable additional impacts due to adding 3.2 miles of LDA to the existing 87.4 miles in the No Growth Alternative because the additional LDA covers existing permitted structures only. The changes that will limit vegetation modification permit areas and establishing a minimum tree density in these areas will serve to limit vegetation and landform modification on these lands, thereby reducing impacts to vegetation. In addition, positive impacts will be achieved by limiting the size of additional docks to single owners versus community docks thereby decreasing the foot traffic and AAV traffic on shoreline paths, which will reduce soil compaction and soil erosion. These factors will result in positive impacts to wildlife due to potential addition of trees and understory vegetation, thereby increasing food sources and habitat for both birds and mammal species.

#### 5.3.3 No Action (Alternative 3)

The No Action Alternative is used as the base line for comparison with the other action alternatives. This alternative represents the current conditions that exist. Currently 87.4 miles of shoreline (11.5percent) is allocated for LDA uses. Terrestrial species that occupy Table Rock Lake shoreline have adapted to current anthropogenic impacts to existing habitat. Continuous issuing of vegetation permits will have a minor negative impact on terrestrial resources. As noted in Table 5.7, an estimated 4853 acres of low density lands are subject to potential vegetation modification permits (mowing, under brushing).

#### 5.3.4 Neutral Change (Alternative 4)

The Neutral Change Alternative would be similar in potential impacts to terrestrial resources as the No Action Alternative. The potential exists for minimal impacts to current terrestrial resources. The addition of 3.7 miles of LDA shoreline to the existing 87.4 miles in the No Growth Alternative covers existing permitted structures only. The changes that will limit some vegetation modification permit areas will serve to impose some potential limits to vegetation and landform modification on these lands, thereby reducing impacts to vegetation. The potential exists for additional impacts to current terrestrial shoreline habitat and species movement patterns due to a potential increase in vegetation modification for dock permits, which include path construction and mowing/under brushing. However, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will potentially create new ground disturbance and subsequent increased erosion, therefore creating conditions similar to the No Action Alternative.

### 5.3.5 Revised Neutral Change (Alternative 4a)

The Revised Neutral Change Alternative would be similar in potential impacts to terrestrial resources as the No Action Alternative. The potential exists for minimal impacts to current terrestrial resources. The addition of 3.9 miles of LDA shoreline to the existing 87.4 miles in the No Growth Alternative covers existing permitted structures only. The changes that will limit some vegetation modification permit areas will serve to impose some potential limits to vegetation and landform modification on these lands, thereby reducing impacts to vegetation. The potential exists for additional impacts to current terrestrial shoreline habitat and species movement patterns due to a potential increase in vegetation modification for dock permits, which include path construction and mowing/under brushing. However, the conversion of 15 miles of Public Recreation Area to protected or other allocation that allows vegetation modification will potentially create new ground disturbance and subsequent increased erosion, therefore creating conditions similar to the No Action Alternative.

### 5.3.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative differs from the No Action Alternative in potential negative impacts on the terrestrial resources by increasing the potential for additional shoreline development due to the addition of 64.2 miles of LDA. This is an increase from 11.5 percent LDA in the No Action Alternative to 20percent LDA in this alternative. The potential exists for additional impacts to current terrestrial shoreline habitat and species movement patterns due to a potential increase in vegetation modification for dock permits, which include path construction and mowing/under brushing. Additionally potential impacts may occur in this alternative due to an increase in mowing distance for vegetation permits, limbing, allowing vegetation modification to cross vegetative breaks (except major roads) and wider ESA walking paths. Potential mowing acres increases to 5,966 in this alternative, representing 82 percent of low density lands. This action would potentially result in woody vegetation removal, with grass replacement, which would alter wildlife habitat, movement patterns, and feeding activity along the shoreline environment.

### 5.3.7 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative. This is an increase from 11.5 percent LDA in the No Action Alternative to 46 percent LDA in this alternative. All lands around the lake classified as low density are allocated as LDA in this alternative (349 total shoreline miles) The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles, representing a reduction of 22.9 percent. Potential negative impacts on the terrestrial resources may occur due to additional vegetation removal for new community boat dock placement, new community dock parking areas, and a more liberal vegetation modification permit which allows mowing and under brushing within 200 feet from boundary line, as well as, cutting shrubs up to 3 inch diameter at ground level. This would disrupt movement patterns and nesting/resting of birds to a greater degree than the other alternatives evaluated. This action would potentially result in woody vegetation removal, with grass replacement, which would alter wildlife habitat, movement patterns, and feeding activity along the shoreline environment.

## 5.4 Threatened and Endangered Species

Of the species listed in Table 4.5 of Section 4.0 AFFECTED ENVIRONMENT, only the Gray Bat, *Myotis grisescens,* is listed as Threatened or Endangered. This species has been observed at times around the dam area of Table Rock Lake. Since this bat roosts in nearby caves during the summer and hibernates in caves during the winter, and may be impacted by some of the alternatives. The Bald Eagle, *Haliaeetus leucocephalus,* was removed from the Threatened listing in 2007 by the USFWS, but it still remains a protected species. While there have been reports of nesting in some locations around the lake perimeter, there is only one recorded nesting site by the Missouri Department of Conservation (MDC). This species may be impacted by some of the alternatives. The state species of concern, the Black Vulture, *Coragyps atratus,* is a year-round resident species, but nests in old buildings or on the ground away from human activity, and will be likely not be significantly impacted by any alternative evaluated. The other species of state concern, Bush's Poppy Mallow, *Callirhoe bushii,* has also been documented by MDC in a remote, relatively inaccessible area. This species may be impacted by some of the alternatives.

### 5.4.1 No Growth (Alternative 1)

The No Growth Alternative would have no significant impact on any listed Threatened, Endangered, Protected, or Species of State Concern. There may be some long term positive benefit to species of concern from conversion of LDA to protected shoreline and no new vegetation permits. Habitat for the species listed above may be improved by limits placed on existing vegetation permits, no new vegetation permits, required tree planting in existing permit areas and no new dock permits. Additionally habitat may be improved through restoration of previously altered vegetation as the number of permits decline through attrition.

### 5.4.2 Benefits General Public Use (Alternative 2)

The Benefit General Public Use Alternative would likely have no significant impact on any listed Threatened, Endangered, Protected, or Species of State Concern. Two T&E species have been recorded around the shoreline. The Gray Bat has been documented in a protected allocation. Several locations of a lichen specie, one moss specie, and four documentations of other species of state concern are in this Alternative's LDA. Habitat for the species listed above may be improved by limits placed on existing vegetation permits and required tree planting in permit areas. Additionally there is potential for less human activity on the shoreline from the elimination of new community dock in favor of single owner docks.

### 5.4.3 No Action (Alternative 3)

The No Action Alternative would likely have little to no impacts on any species listed Threatened, Endangered, Protected, or Species of State Concern based on locations of documented species around the lakeshore. Under brushing activity associated with path creation in all alternatives may have some minimal impact on nesting/resting activity of a state species of concern bird, which has been documented around the lake shoreline. Other species noted in

Alternative 2 are in LDA areas proposed by this alternative.

#### 5.4.4 Neutral Change (Alternative 4)

The Neutral Change Alternative would likely have no significant impact on Threatened, Endangered, Protected, or Species of State Concern noted in Alternatives 2 and 3, due to the fact there has been no additional documentation of different species in the additional 3.7 miles of LDA proposed by this alternative.

#### 5.4.5 Revised Neutral Change (Alternative 4a)

The Revised Neutral Change Alternative would likely have no significant impact on Threatened, Endangered, Protected, or Species of State Concern noted in Alternatives 2 and 3, due to the fact there has been no additional documentation of different species in the additional 3.9 miles of LDA proposed by this alternative.

#### 5.4.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative adds 64.2 miles of LDA, representing 20 percent of shoreline LDA miles. Additional potential minimal impacts to threatened and endangered species and Species of State Concern may occur due to vegetation modification for dock permits issued in this additional LDA, along with an increase in mowing distance for vegetation permits. Potentially two plant and one animal Species of State Concern could be located within the additional LDA proposed by this alternative.

#### 5.4.7 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative, representing an increase from 11.5 percent LDA to 46 percent LDA. All lands around the lake classified as low density is allocated as LDA in this alternative (349 total shoreline miles) The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles in this alternative, representing a reduction of 22.9 percent. Potential impacts on two threatened and endangered species and 13 documented Species of State Concern may occur due to vegetation modification for new dock permits issued in this additional LDA, along with an increase in mowing distance of vegetation permits. Possible future nesting sites of the federally protected Bald Eagle (*Haliaeetus leucocephalus)* and the Black vulture, may also be impacted by this action.

## 5.5 Archaeological and Historic Resources

Any new ground disturbing activities on Corps lands would require a permit to be issued prior to commencement of the activity. Cultural resource sites within Low Density classification areas could potentially undergo the most severe impact due to the fact that activities such as boat dock construction and shoreline use permits require a degree of ground disturbance which pose a threat to intact cultural deposits. Through the site review process prior to issuance of a permit, unknown sites would be identified, and known sites would be evaluated for their significance

and eligibility for the National Register, pursuant to 36 CFR Part 800 of the National Historic Preservation Act.

#### 5.5.1 No Growth (Alternative 1)

The No Growth Alternative would have no additional impacts on any cultural resources. Under the current SMP, there are no known significant impacts to cultural resources, and no new permits would be issued under this alternative.

#### 5.5.2 Benefits General Public Use (Alternative 2)

Under the Benefit General Public Use Alternative, there is a decrease in unused LDA, therefore less potential would exist for impacts to cultural resources and historic properties. Potential impacts could occur in six LDAs which total 0.54 miles of shoreline.

#### 5.5.3 No Action (Alternative 3)

Under the No Action Alternative there are 35.3 miles of unused LDA. Potential impacts could occur in 8 LDAs which total 1.01 miles of shoreline.

#### 5.5.4 Neutral Change (Alternative 4)

Under the Neutral Change Alternative, there is a decrease in unused LDA, therefore less potential would exist for impacts to cultural resources and historic properties. Potential impacts could occur in six LDAs which total 0.54 miles of shoreline.

#### 5.5.5 Revised Neutral Change (Alternative 4a)

Under the Revised Neutral Change Alternative, there is a decrease in unused LDA, therefore less potential would exist for impacts to cultural resources and historic properties. Potential impacts could occur in six LDAs which total 0.54 miles of shoreline.

#### 5.5.6 Accelerated Private Development (Alternative 5)

Under the Accelerated Private Development Alternative, there is an increase in unused LDA, therefore more potential would exist for impacts to cultural resources and historic properties. Estimated potential impacts could occur in nine LDAs which total 1.89 miles of shoreline.

#### 5.5.7 Maximum Private Growth (Alternative 6)

Under the Maximum Private Growth Alternative, there is an increase in unused LDA, therefore more potential would exist for impacts to cultural resources and historic properties. Estimated potential impacts could occur in 31 LDAs which total 12.21 miles of shoreline. This alternative has the greatest potential to have an impact to this resource category of all alternatives evaluated.

### 5.6 Socio-Economic and Recreation Resources

Since alternative scenarios affect the amount of development along the lake's shore, impacts to population growth, the regional economy, and levels of recreation, particularly boating, are

important. Section 5.6 discusses potential impacts to existing socioeconomic resources including effects on population, the economy and recreation. Where possible impacts are quantified based on secondary sources including Corps studies of the Table Rock area. Any caveats and assumptions regarding quantitative figures are listed as appropriate. A key source of data is a study conducted by the Corps Engineering Research and Development Center (ERDC) and published in 2008 that measures the economic impact of spending by community dock slip owners at Table Rock Lake (referred to herein as the 2008 ERDC Study).[6] The study included a survey of approximately 400 dock owners on the lake, and solicited information on a variety of factors such as household information, boating frequency and activities, and boating related spending.

### 5.6.1 Population and Economy

Each alternative establishes a maximum number of parcels and adjacent docks that people could purchase and develop. As shown in Table 5.8, the number of new parcels ranges from none under Alternative 1 to 1,823 under Alternative 6. Impacts associated with development estimated for the SMP consists of incremental changes to: 1) population, 2) aggregate property value and property taxes, 3) construction expenditures that implicitly include dock construction, and 5) household income.

Figures are reported in Fiscal Year 2016 dollars, and impacts are not annualized since there would be considerable uncertainty as to the timing and location of new development. In addition, a simplifying assumption is that new parcels would be single family homes even though Alternatives 3, 5 and 6 would allow multi-family development; although it is likely that most (but not all) development under these alternatives would consist of single family homes. Lastly, figures in Table 5.1 and 5.2 assume that the parcels would house new residents or property owners rather than people who already lived in the region. If existing residents purchased a parcel, there would not be net change in population or household income in the region.

While these are often considered positive impacts, additional population increases burdens on public services such as first responders, public schools, and road and highway infrastructure. Increases sales, income and property taxes associated with the development would help fund additional public service needs.

[6] Amsden, B.L, Propst, D.B., Chang, W.H., Kasul, R., Lee, L., and Perales, K., "Economic Impacts from Spending by Community Dock Owners at Table Rock Lake." Prepared the U.S. Army Corps of Engineers Environmental Laboratory, ERDC/EL TR-0801. January 2008.

**Table 5.8**
**Incremental Changes in Selected Economic Indicators for Table Rock Lake Shoreline Management Alternatives (monetary figures in $millions)**

| Alternative | New Parcels [a] | Population [b] | Construction expenditures [c] | Property value [c] | Property taxes [e] | Total household income [f] |
|---|---|---|---|---|---|---|
| Alt. 1 | 0 | 0 | $0 | $0 | $0 | $0 |
| Alt. 2 | 440 | 1,095 | $78.62 | $127.23 | $0.73 | $44.27 |
| Alt. 3 | 555 | 1,382 | $99.17 | $160.48 | $0.92 | $55.84 |
| Alt. 4/4a | 512 | 1,275 | $91.49 | $148.04 | $0.84 | $51.51 |
| Alt. 5 | 1,165 | 2,901 | $208.17 | $336.86 | $1.92 | $117.21 |
| Alt. 6 | 1,823 | 4,539 | $325.75 | $527.12 | $3.01 | $183.40 |

[a] Corps estimates per draft Shoreline Management Plan.

[b] Assumes development of single family homes with 2.5 persons per household based on averages for the five-county area per the U.S. Census. There would only be regional increases in population (and household income) if new residents to the region developed and occupied a parcel.

[c] Estimated property value based on an average annual (2015) value compiled from sample of single-family lakefront home sales along Table Rock Lake taken from the Tri-Lakes Board of Realtors MLS database. Construction expenditures are based the portion of new home value allocated to construction expenses. Figure is based on national level averages as published by the National Association of Home Builders, see: Taylor, H. "Cost of Constructing a Home" Special Studies, National Association of Home Builders Economics and Housing Policy Group, November 2015.

[e] Estimated property taxes are based on median annual tax payment rates by county, and estimated property value for lake front homes. Data are from the Missouri Property Tax Rate Calculator published by Smartasset™ and an average rate (0.57 percent of property value) for the five county area is applied.

f Gross household income is based on average household income reported by dock and home owners and indexed to 2016 prices levels using growth rates in median household income published by the Bureau of Labor Statistics. Reported income levels are taken from a Corps survey of dock owners at the lake published in: Amsden, B.L, Propst, D.B., Chang, W.H., Kasul, R., Lee, L., and Perales, K., "Economic Impacts from Spending by Community Dock Owners at Table Rock Lake." Prepared the U.S. Army Corps of Engineers Environmental Laboratory, ERDC/EL TR-0801. January 2008.

### 5.6.2 Recreation

Table 5.9 displays potential regional economic impacts associated with recreational boating for each alternative. As shown, the *maximum* potential number of new boat slips increases moving from Alternative 1 (No Growth) to Alternative 6 (Maximum Growth). Obviously with no growth, no new slips would manifest; in contrast, under Alternative 6, property owners who develop parcels could potentially add 44,771 new slips assuming docks on each parcel were developed as community docks with multiple slips. Assuming new homes and boat slips attract new residents and boaters to the region rather than existing residents and boaters, economic benefits to the region would rise as boating and associated spending on the lake increased; however, as discussed below increased boating activity could have substantial negative impacts in terms congestion on the lake that would likely affect safety and recreation quality.

To estimate the regional impacts of new slips and associated boating recreation, key metrics from the 2008 ERDC study were adjusted to reflect price inflation and applied to the estimated maximum potential number of new slips for each alternative. Again, the 2008 study surveyed about 400 dock and slip owners along the lake, and asked how many boating trips were taken in the previous year. Responses ranged from 10 or fewer to 60 or more with a median value of 35.[7] These values include boating trips by the slip owner and guests. After adjusting using the Consumer Price Index, on average boating parties spent $200 on trip related expenditures such as boat fuel, food and groceries, and spending at lakeside restaurants and bars. Annual estimated recreational boating expenditures in Table 5.9, are based on the maximum potential number of slips, annual boating trips assuming 35 per year per slip, and expenditures per boating trip. For example, today there are 19,068 slips on the lake. Assuming 35 trips per year with $200 spent at local businesses during each trip, annual boating expenditures total roughly $109 million. Annual boating trips are adjusted by a factor of 0.70 to account for slips without boats (i.e., vacant slips).[8] Lastly, regional business sales revenues and household income generated by boating expenditures are based on the same multipliers used to estimate the impacts recreation spending as estimated by the Corps Institute for Water Resources (references listed in Table 5.9).

High growth alternatives, which would allow for a large number of additional slips (e.g., 44,100 for Alternative 6) would significantly increases recreation related expenditures in the area and benefits local businesses and households. However, it would also greatly increase boating access, and thus, boating traffic on the lake. As part of the recent update to the Table Rock Master Plan in 2014, the Corps sponsored a study regarding recreational boating on the lake and perceptions and preferences for various managerial, social, and physical resource conditions on the lake and to determine boater capacity, density, crowding, and public safety concerns on the lake. In addition, it involved identifying the boaters' most important issues. Overall, the survey indicated that many residents and lake users are concerned about boat traffic and congestion in a substantial portion of the lake (i.e., areas designated as "Class I and II Compartments" (see Figure 5.2). Class I and II compartments are areas of concern relative to boating safety, boating conflicts, and user enjoyment. Respondents also commented on the need to improve facilities; however, many boaters also listed negative concerns regarding increasing shoreline development. Survey data indicated that some additional boat ramps, campgrounds, and parking areas should be considered but does not support other substantial new development such as marinas.

Based on the above key findings, the researchers of the recreational boating study recommended that the Corps:

[7] A boating trip as defined in the study differs from what the Corps typically refers to a "recreation visit" to a project. A recreation visit is one person entering a Corps projects. A boating trip in the current context is a travel group (usually more than one person) that stays in the project area for at least one day for boating and related activities.

[8] The boat vacancy rate for slips is based on discussions with recreation managers and real estate specialists from the Corps Table Rock Lake project office.

1) Prevent substantial increases in existing use levels;

2) Preserve opportunities to escape existing heavy boat traffic and high wakes; and

3) Reduce conflicts through increased and improved boater education, on-water law enforcement and patrol, and by limiting density levels through dispersion or allocation strategies.

Thus, while high growth in the number of docks and increased boating on the lake would generate positive economic impacts, it would come at the cost of increased boating traffic and density.

**Table 5.9**
**Estimated Potential Incremental Changes in Economic Activity Associated with Recreational Boating for Table Rock Lake Shoreline Management Alternatives (monetary figures in $millions)**

| Alternative | Number of slips [a] | Annual boating trips [b] | Annual recreational boating expenditures [c] | Business sales generated [d] | Total household income generated [d] |
|---|---|---|---|---|---|
| Existing condition | 19,068 | 467,200 | $109.23 | $99.15 | $25.05 |
| **Incremental change from existing condition** | | | | | |
| Alt. 1 | 0 | 0 | $0.00 | $0.00 | $0.00 |
| Alt. 2 | 2,076 | 50,900 | $12.66 | $11.56 | $2.89 |
| Alt. 3 | 11,954 | 292,900 | $72.87 | $66.55 | $16.66 |
| Alt. 4/4a | 15,708 | 50,900 | $12.66 | $11.56 | $2.89 |
| Alt. 5 | 20,780 | 509,200 | $126.68 | $115.70 | $28.96 |
| Alt. 6 | 44,771 | 1,096,900 | $272.90 | $249.24 | $62.39 |

[a] Corps estimates per the SMP.

[b] Based on the median value for annual boating trips reported in the 2008 ERDC study. Assumes a 70 boat occupancy rate for slips, and includes private docks, community docks and marina slips.

[c] Based on average expenditures per boating trip reported in the 2008 ERDC study, number of boating trips multiplied by average trip expenditures (FY2016 $200).

[d] Estimated using ratios for recreation spending at Table Rock Lake, and include multiplier impacts. The Corps Institute for Water Resources estimated the economic impacts of recreation at Table Rock Lake (and all Corps lakes around the nation) using various methods and tools including the IMPLAN regional economic modeling system. "Local" is defined as any economic activity within a 30-mile radius of the lake. Results and a description of the methodology are available at the Corps "Value to the Nation," URL: www.CorpsResults.us.

**Figure 5.1**

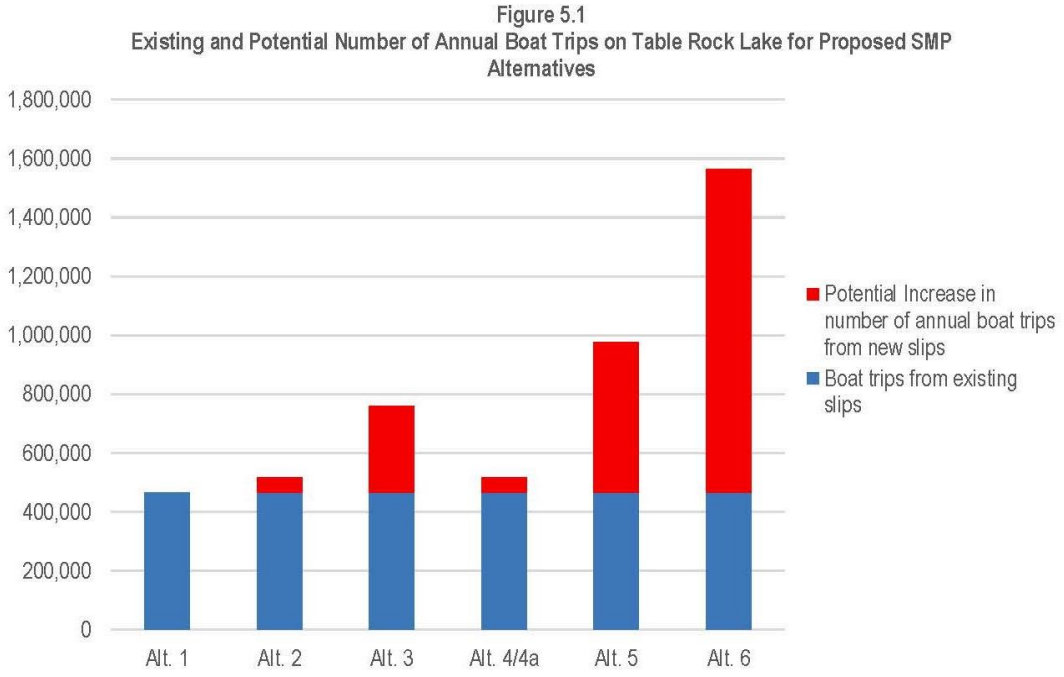
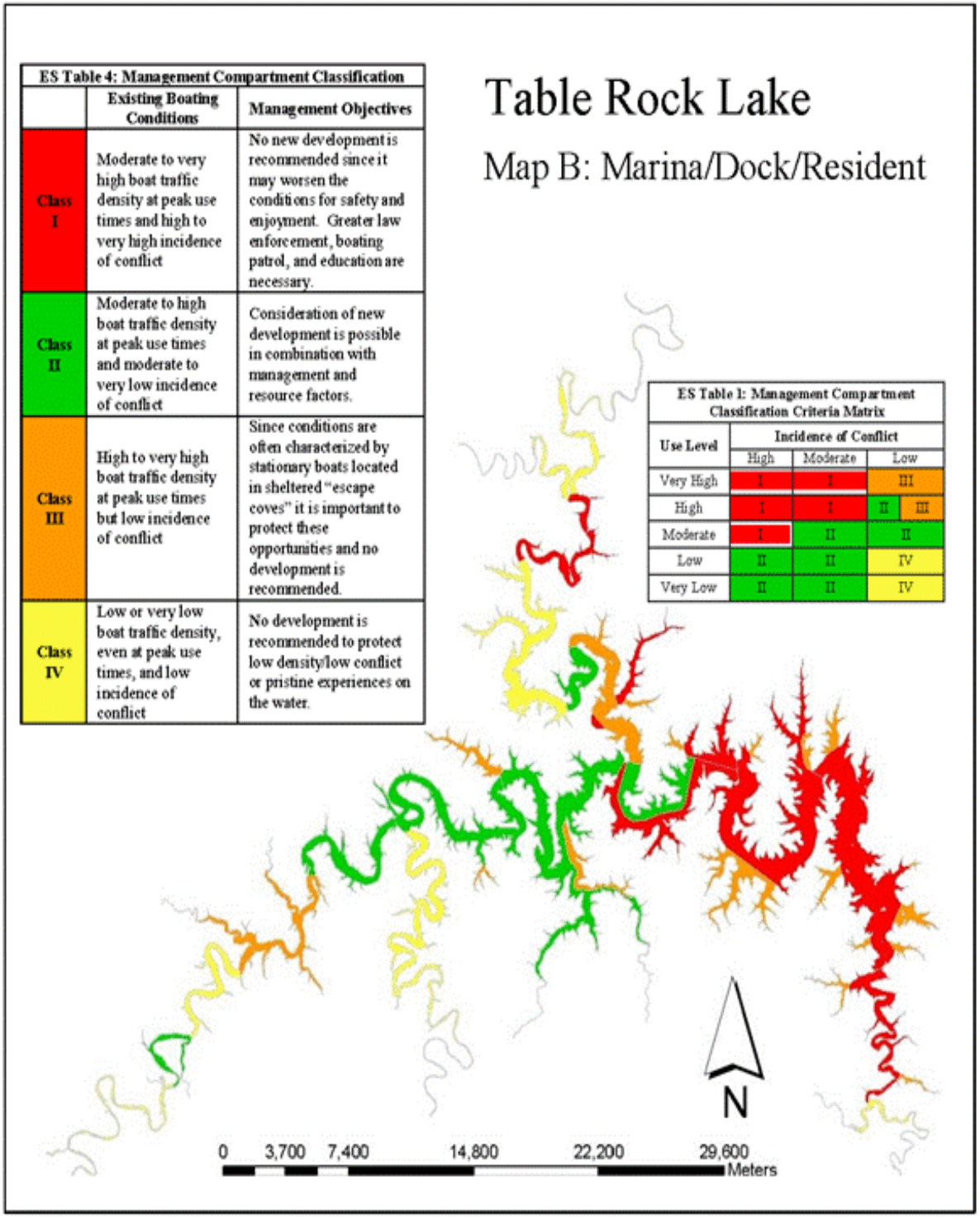


Figure 5.1
Existing and Potential Number of Annual Boat Trips on Table Rock Lake for Proposed SMP Alternatives
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Alt. 1
Alt. 2
Alt. 3
Alt. 4/4a
Alt. 5
Alt. 6
Potential Increase in number of annual boat trips from new slips
Boat trips from existing slips

**Figure 5.2**
**Table Rock Lake Management Compartment Classification Map**



## 5.7 Air Quality

### 5.7.1 No Growth (Alternative 1)

Under the No Growth Alternative, the air quality around the lake would remain the same as currently exists. There could be a decrease in vehicular exhaust emissions due to reduced potential boat traffic, improving air quality somewhat, but there are no violations of the current National Ambient Air Quality Standards (NAAQS) established by the EPA under the No Action Alternative (current conditions).

### 5.7.2 Benefits General Public Use (Alternative 2)

Implementation of the Benefit General Public Use Alternative would result in some minor increases in negative air quality impacts as compared to the No Action Alternative due to a potential to add more boat slips on the lake.

### 5.7.3 No Action (Alternative 3)

Implementation of the No Action Alternative would result in minimal potential impact to existing air quality due to a continuation of the permitting process, creating a potential for increased boating activity.

### 5.7.4 Neutral Change (Alternative 4)

Implementation of the Neutral Change Alternative would have similar impacts to air quality as Alternatives 2 and 3 due to a potential increase of boating activity and traffic around the lake.

### 5.7.5 Revised Neutral Change (Alternative 4a)

Implementation of the Revised Neutral Change Alternative would have similar impacts to air quality as Alternatives 2 and 3 due to a potential increase of boating activity and traffic around the lake.

### 5.7.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative adds 64.2 miles of LDA, representing 20% of shoreline LDA miles. Additional potential minimal impacts on existing air quality may occur due to vegetation modification for more boat docks, and potentially more boat activity and traffic around the lake due to the additional LDA.

### 5.7.6 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative adds 261.6 shoreline miles of LDA to the existing 87.4 miles in the No Action Alternative. This is an increase from 11.5 percent in the No Action Alternative to 46% in this alternative. All shoreline where the lake is classified as low density in the Master Plan is allocated as LDA in this alternative (349 total shoreline miles). The 541.3 miles of protected shoreline in Alternative 3 is reduced to 367.5 miles in this alternative, representing a reduction of 22.9 percent. Potential impacts on existing air quality would be the

greatest under this alternative due to the increase in boat dock numbers (with an assumed increase in boats) from an estimated potential of 763 in the No Action Alternative to an estimated potential 3,780 in this alternative.

## 5.8 Health & Safety

### 5.8.1 No Growth (Alternative 1)

The No Growth Alternative would discontinue the current private permitting programs, in which a decrease in potential shoreline development could positively impact water quality due to potential decreased water traffic and a decrease in vegetation modification. This alternative would reduce the potential for accidents and pollution.

Safety of project visitors and project staff are highest priority in daily project operations. Facilities and recreational areas are routinely evaluated to ensure sites are safe for visitor use. Project staff conducts numerous water safety programs and public announcements to educate children and project visitors about ways to be safe on the lake. In coordination with the Missouri State Highway Patrol (MSHP), water safety hazards are marked with buoys. Park Rangers provide visitor assistance and work with county law enforcement agencies to ensure public safety. MSHP provides water safety patrols on the lake as their budgets allow. Water quality on Table Rock is tested for pH and dissolved oxygen levels, nutrients, turbidity, and presence of fecal coliform bacteria is tested by the Arkansas Department of Environmental Quality (ADEQ) and the Missouri Department of Natural Resources (MDNR).

### 5.8.2 Benefits General Public Use (Alternative 2)

The Benefit General Public Use Alternative would still allow potential shoreline development opportunities, but with a potential to slow an increase of boat congestion and water related accidents, due to reduced number of potential slips. Potential decrease in dock owner conflict may occur due to elimination of new community docks. The increased recreational opportunities, balanced with conservation of natural environment could lead to better health, both mental and physical, of the visiting population. This alternative would continue to see some degree of traffic congestion on the water, especially in high use areas; thus water related incidents would be an issue under this alternative.

### 5.8.3 No Action (Alternative 3)

The No Action Alternative allows potential shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. This alternative has the estimated potential of 11,954 additional private slips.

### 5.8.4 Neutral Change (Alternative 4)

The Neutral Change Alternative, similar to Alternative 3, allows potential shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. However, under Alternative 4, there is now a threshold of 30,806 access opportunities (boat slips and boat launching ramp parking spaces).

#### 5.8.5 Revised Neutral Change (Alternative 4a)

The Revised Neutral Change Alternative, similar to Alternative 3, allows potential shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. However, under Alternative 4a, there is now a threshold of 30,806 boat slips and boat launching ramp parking spaces.

#### 5.8.6 Accelerated Private Development (Alternative 5)

The Accelerated Private Development Alternative allows potential increase in shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. Additionally potential increase in water pollution could occur due to an increased distance of mowing vegetation. Potential increase in dock owner conflict could occur due to continuation and addition of new community docks.

#### 5.8.7 Maximum Private Growth (Alternative 6)

The Maximum Private Growth Alternative allows for a potential increase in shoreline development opportunities, with a potential to increase boat congestion and water related accidents, due to a potential increase of slips. Additionally, potential increased water pollution could occur due to an increased distance of mowing vegetation. Additional boats could increase more fuel/oil spillages, which could possibly create potential health issues. Potential increase in dock owner conflict may occur due to continuation and addition of new community docks.

### 5.9 Aesthetics

#### 5.9.1 No Growth (Alternative 1)

Under the No Growth Alternative the visual characteristics surrounding the Table Rock Lake landscape could positively change due to the discontinued private use permitting program, which would likely reduce the development of adjacent land parcels around the lake. Revegetation of permitted sites would occur due to attrition of existing permits. Aesthetics is an important feature that enhances the recreational experience. Lands around Table Rock Lake provide a natural setting that is aesthetically pleasing as well as buffering the lake from development and negative impacts such as erosion and storm water runoff. This alternative would maintain the area of pristine shoreline and preserve regions of boulders, bluffs, and mature forest flora that currently dominate views.

#### 5.9.2 Benefits General Public Use (Alternative 2)

Under the Benefit General Public Use Alternative, the wide panorama of Table Rock Lake and the nearby shore would continue to convey a sense of enormity of the lake, and the similar percentage of LDA would continue to promote the sense of a relatively pristine shoreline. The developed areas are, for the most part, shielded from the lake view, which preserves the viewscapes of those recreating on the lake. With a decrease in mowing area, there would be more natural vegetation in the viewscape. The reduction of mowing limits, as well as maintaining a minimum tree density could have a potential positive impact to aesthetics around the lake.

#### 5.9.3 No Action (Alternative 3)

The No Action Alternative would allow more potential development, which would alter visual character of the landscape and would slowly suffer due to continued development. Dock development would eliminate the unspoiled and untamed aesthetic of this landscape. Since the lake is surrounded by residential and commercial development, these demands are continually increasing. In many instances, these requests are in areas where the natural vegetation and landscape would be disturbed.

#### 5.9.4 Neutral Change (Alternative 4)

The Neutral Change Alternative would allow more potential shoreline development, which would alter the visual character of the landscape and would slowly deteriorate the shoreline due to continued shoreline development. The small reduction of mowing limits could have a potential impact to aesthetics around the lake, depending on visual preference of the viewer.

#### 5.9.5 Revised Neutral Change (Alternative 4a)

The Neutral Change Alternative would allow more potential shoreline development, which would alter the visual character of the landscape and would slowly deteriorate the shoreline due to continued shoreline development. The small reduction of mowing limits could have a potential impact to aesthetics around the lake, depending on visual preference of the viewer.

#### 5.9.6 Accelerated Private Development (Alternative 5)

Under the Accelerated Private Development Alternative the unspoiled and untamed aesthetic of this landscape could be significantly negatively impacted. This alternative will degrade the viewscape due to increased mowing distance, limbing of trees, cutting of cedars, and potential for more docks and boats.

#### 5.9.7 Maximum Private Growth (Alternative 6)

Under the Maximum Private Growth Alternative the unspoiled and untamed aesthetic of this landscape could be significantly negatively impacted due to potential boat docks being located along almost half of the shoreline. This alternative will degrade the viewscape due to increased mowing distance, limbing of trees, cutting of cedars, parking on public lands for private boat docks, and potential for more docks and boats.

## 5.10 Cumulative Impacts

Cumulative impacts would result from the incremental impact of the proposed action added to those of other past, present, or reasonably foreseeable future actions in the local area. The Shoreline Management Plan for Table Rock Lake was last approved in 1996. Since the implementation of the 1996 Shoreline Management Plan, development and public use patterns have changed significantly, due in part to the population explosions experienced in

southwestern Missouri and northwestern Arkansas. Table Rock Lake receives constant pressure for both private shoreline use and public recreation use.

Three main themes came out of the scoping process, which was a cumulative exercise involving private and public entities, and local, state and federal agencies—Shoreline Allocation, Vegetation Modification, and Private Boat Docks.

Past watershed and development activities have resulted in Table Rock Lake being listed in 2002 on MDNR's impaired waterbody list (303d) for excessive nutrients. While it is noted that the majority of the source of this impairment is due to activities within a 4,020 square mile watershed, unregulated or poorly regulated shoreline development exacerbates water quality degradation. Existing conditions, No Action Alternative, at the lake allow for some degree of development on 50 percent of available shoreline acreage, and allows for more intensive development on 11.5 percent of the lake (LDA). Any future development will potentially impact noise, air quality, and water quality due to increased traffic and a larger number of boats on the lake, which increases the potential for fuel spillage/leakage, and increased wave action along the shoreline. This could result in localized increases in turbidity and re-suspension of sediment bound nutrients resulting in potential algal blooms. Collaboration and coordination with state and federal resource agencies, as well as local agencies and watershed groups, is necessary to monitor, evaluate and remediate aging infrastructure, failing septic systems around the shoreline, and potential water quality impacts. Coordination with these entities could also evaluate and promote watershed enhancement programs that would serve to institute stream bank stabilization, land improvement and conservation programs, and implementation of best management practices to reduce watershed runoff and erosion during storm events.

Responsible development will enhance the maintenance and/or improvement in water quality through use of best management practices during construction such as silt barriers, selective vegetation removal, use of detention basins, using pervious surface parking areas, implementation of rain gardens where practicable, and other water retention and conservation measures. Implementation of the Neutral Change Alternative allows potential shoreline development opportunities, with a possibility to increase boat congestion and water related accidents, due to a potential increase of slips. However, under this alternative, there is now a threshold of 30,806 access opportunities (boat slips and boat launching ramp parking spaces). The threshold should help to temper overall cumulative impacts to Table Rock Lake. When funding becomes available, and not later than when the lake reaches its midpoint (approximately 26,000 access opportunities) to the threshold, it is recommended by the PDT that another carrying capacity study be completed. The study will have the potential to adjust the access opportunity number either up or down depending on trends observed at the time of the study. As management of Table Rock Lake ensues, the Corps will continue to coordinate with Federal, State, and local agencies to avoid, minimize or mitigate potential impacts.

# 6.0 ENVIRONMENTAL COMPLIANCE

Compliance with Federal Acts and Executive Orders are summarized in the following table.

**Table 6: Federal Act/Executive Order Compliance**

| Act/Executive Order | Status | Compliance |
|---|---|---|
| Wetlands (EO 11990) | No effect | C |
| Prime/Unique Farmlands | N/A | N/A |
| Floodplain Management (EO 11988) | N/A | N/A |
| Clean Water Act | | C |
| Section 404 | No effect | N/A |
| Section 401 | No effect | N/A |
| NPDES | No effect | N/A |
| Fish and Wildlife Coordination Act | No effect | C |
| Endangered Species Act | No effect | C |
| National Historic Preservation Act | No effect | C |
| Environmental Justice (EO 12898) | No effect | C |
| Clean Air Act | No effect | C |
| Comprehensive Environmental Response Compensation and Liability Act (CERCLA) | N/A | N/A |
| Resource Conservation and Recovery Act (RCRA) | N/A | N/A |
| Wild and Scenic Rivers Act | N/A | N/A |
| Rivers and Harbors Act | N/A | N/A |
| N/A—not applicable C—Compliant | | |

## 6.1 Fish and Wildlife Coordination Act

The Corps is required to coordinate with the USFWS and MDNR under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 USC 661 et. seq.). Coordination was

**Table 6.1**
**Federal Act and or Executive Order Compliance**

| Act or Executive Order | Status | Compliance |
|---|---|---|
| Wetlands (EO 11990) | No effect | C |
| Prime/Unique Farmlands | N/A | N/A |
| Floodplain Management (EO 11988) | N/A | N/A |
| Clean Water Act | | |
| Section 404 | No effect | N/A |
| Section 401 | No effect | N/A |
| NPDES | No effect | N/A |
| Fish and Wildlife Coordination Act | No effect | C |
| Endangered Species Act | No effect | C |
| National Historic Preservation Act | No effect | C |
| Environmental Justice (EO 12898) | No effect | C |
| Clean Air Act | No effect | C |
| Comprehensive Environmental Response Compensation and Liability Act | N/A | N/A |
| Resource Conservation and Recovery Act (RCRA) | N/A | N/A |
| Wild and Scenic Rivers Act | N/A | N/A |
| Rivers and Harbors Act | N/A | N/A |
| Title 36, Section 327.30, Shoreline Management on Civil Works Projects | | C |

N/A = not applicable C = Compliant

initiated with a scoping notice; no concerns were raised. Review of the Environmental Assessment is pending; no concerns are anticipated.

## 6.2 Endangered Species Act

The Endangered Species Act (ESA) requires the determination of possible effects on or degradation of habitat critical to Federally-listed endangered or threatened species. Implementation of an updated Shoreline Management Plan would not affect threatened or endangered species. Individual requests for use of project lands would be evaluated to ensure compliance with this Act.

## 6.3 Environmental Justice

Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," addresses potential disproportionate human health and environmental impacts that a project may have on minority or low-income communities. Thus, the environmental effects of the Project on minority and low-income communities or Native American populations must be disclosed, and agencies must evaluate projects to ensure

that they do not disproportionally impact any such community. If such impacts are identified, appropriate mitigation measures must be implemented.

To determine whether a project has a disproportionate effect on potential environmental justice communities (i.e., minority or low income population), the demographics of an affected population within the vicinity of the Project must be considered in the context of the overall region. Guidance from the Council on Environmental Quality (CEQ) states that "minority populations should be identified where either: (1) the minority population of the affected areas exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997)."

Table 6 displays Census data summarizing racial, ethnic and poverty characteristics of counties adjacent to Table Rock Lake. The purpose is to analyze whether the demographics of the affected area differ in the context of the broader region (state level metrics); and if so, do differences meet CEQ criteria for an Environmental Justice community. Based on the analysis, it does not appear that minority or low income populations in the study area are disproportionately affected. Table 6 also displays the number of children under that age of 17 years in study area counties. The purpose of the data is to assess whether the project disproportionally affects the health or safety risks to children as specified by Executive Order (E.O.) 13045 - *Protection of Children from Environmental Health Risks and Safety Risks* (1997). Overall, it does not appear that the SMP would disproportionally affect children.

**Table 6.2**

**Racial Composition, Number of Children and Poverty Indictors in the Upper White River Basin (percent for all fields)**

| Region | White | Black or African American | Native American or Indian | Asian | Native Hawaiian or Pacific Islander | Hispanic or Latino | Other or two or more races | Percent of civilian labor force unemployed | Percent of population below poverty line | Percent of population under age 17 |
|---|---|---|---|---|---|---|---|---|---|---|
| United States | 56.1 | 12.6 | 0.9 | 4.8 | 0.2 | 16.3 | 9.1 | 9.2 | 15.4 | 23.7 |
| State of Arkansas | 70.6 | 15.4 | 0.8 | 1.2 | 0.2 | 6.4 | 5.4 | 8.4 | 15.8 | 24.2 |
| State of Missouri | 79.3 | 11.6 | 0.5 | 1.6 | 0.1 | 3.5 | 3.4 | 8.4 | 15.5 | 23.5 |
| Barry (Missouri) | 84.4 | 0.3 | 0.9 | 1.3 | 0 | 7.7 | 5.4 | 12.1 | 19.1 | 24.0 |
| Boone (Arkansas) | 94.7 | 0.2 | 0.7 | 0.4 | 0.1 | 1.8 | 2.1 | 5.6 | 16.6 | 23.0 |
| Carroll (Arkansas) | 76.9 | 0.4 | 0.9 | 0.6 | 0.1 | 12.7 | 8.4 | 8.7 | 18.8 | 22.4 |
| Stone (Missouri) | 95.5 | 0.8 | 0.6 | 0.3 | 0 | 1.7 | 1.1 | 10.7 | 13.6 | 21.1 |
| Taney (Missouri) | 85.9 | 0.9 | 0.8 | 0.7 | 0.1 | 7.7 | 3.9 | 11.6 | 18.8 | 21.8 |
| Total Project Area | 87.5 | 0.5 | 0.8 | 0.7 | 0.1 | 6.3 | 4.2 | 9.7 | 17.4 | 22.5 |

Source: U.S. Census Bureau: 2015 American Community Survey.

### 6.4 Cultural Resource Requirement

Section 106 of the National Historic Preservation Act of 1966 requires the Corps to identify historic properties affected by the proposed action and to evaluate the eligibility of those properties for the National Register of Historic Places. Section 110 of the Act requires the Corps to assume responsibility for the preservation of historic properties in its ownership. The Act also requires Federal agencies to provide the Advisory Council on Historic Preservation an opportunity to comment on undertakings through the process outlined in the Council's regulations (36 CFR 800). There would be no affect to cultural resources with implementation of an updated Shoreline Management Plan. Individual requests for use of project lands would be evaluated on a case-by-case basis to ensure compliance with this act.

## 7.0 SCOPING AND PUBLIC CONCERN

### 7.1. Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Table Rock Lake. Responsibility for natural resource and recreation management falls to several agencies that own or have jurisdiction over these public lands and waters.

Increasingly, competition for the use of these lands and waters and their natural resources can create conflicts and concerns among stakeholders. The need to coordinate a cooperative approach to protect and sustain these resources is compelling. Many opportunities exist to increase the effectiveness of Federal programs through collaboration among agencies and to facilitate the process of partnering between government and non-government agencies.
To sustain healthy and productive public lands and water with the most efficient approach requires individuals and organizations to recognize their unique ability to contribute to commonly held goals. The key to progress is building on the strengths of each sector, achieving goals collectively that could not be reasonably achieved individually. Given the inter-jurisdictional nature of Table Rock Lake, partnering opportunities exist and can promote the leveraging of limited financial and human resources. Partnering and identification of innovative approaches to deliver justified levels of service defuse polarization among interest groups, and lead to a common understanding and appreciation of individual roles, priorities, and responsibilities.

To the extent practical, this Shoreline Management Plan and a proactive approach to partnering will position Table Rock Lake to aggressively leverage project financial capability and human resources in order to identify and satisfy customer expectations, project and sustain natural and cultural resources and recreational infrastructure, and programmatically bring Corps management efforts and outputs up to a justified level of service. Public involvement and extensive coordination within the Corps of Engineers and with other affected agencies and organizations is a critical feature required in developing or revising a Project Shoreline Management Plan.

Agency and public involvement and coordination has been a key element in every phase of the Table Rock Lake Shoreline Management Plan revision.

## 7.2. Scoping

One agency workshop and three public scoping workshops were held in March 25-28, 2015, with nearly 500 people in attendance. The public scoping comment period was held from March 16, 2015 to May 1, 2015, which provided a 47-day comment period. All interested people were provided opportunities to submit written comments at the three open houses as well as via email, fax, or mail. The comment cards distributed at the public open houses were designed to facilitate return of written comments either at the open house or via mail later during the public comment period. Editable comment forms were available on the Table Rock Lake SMP webpage and could be directly submitted upon completion. Email comments could be sent to a project-specific email address, which was included on the SMP webpage as well as on all of the notice materials distributed. Many open house participants took multiple comment cards to distribute to friends and family who were not able to attend an open house in person. In total, approximately 502 comment submittals (letters, emails, comment cards, or oral comments made to a court reporter) were received from members of the public and 9 comment submittals from agencies were received by the end of the comment period.

To prepare for the scoping workshops, the Corps contracted with CDM-Smith. An after action Memorandum for Record (MFR) is included in Appendix B, Summary of Public Comments that details the preparation and work prior to, during, and after the public scoping workshops held. From the scoping process, a Scoping Report was finalized on 5 November 2015. The report summarizes the public participation process for, and the public comments resulting from, the Table Rock Lake SMP Revision public scoping workshops and comment period. “Scoping” is the process of determining the scope, focus, and content of a NEPA document. Scoping workshops are a useful tool to obtain information from the public and governmental agencies. For a planning process such as the SMP revision, the scoping process was also used as an opportunity to get input from the public and agencies about the vision for the SMP update and the issues that the SMP should address where possible. The Scoping Report is located in Appendix B, Summary of Public Comments.

## 7.3. Focus Groups

Initial Focus Group sessions were conducted in August 2015. The first three sessions (August, September, and October, 2015) were held prior to the development of alternatives and draft SMP. During these sessions, three different focus group teams met separately to provide clarification and more in depth conversation relating the public comment received for a section of the SMP as assigned to each group. One group was asked to focus on Boat Docks and similar structures, another group to focus on Vegetation Modification Permits, and the final group focused on Shoreline Allocations. PDT members selected focus group members based on known knowledge and experience to ensure all lake users were represented. Other community members were added to each team after the initial planning. During the third session, the focus group members were provided an explanation of how their input would be carried forward to the next phase of the SMP process. A fourth session was held on June 7, 2016 after the PDT had developed all the alternatives and had a draft proposed preferred alternative, with concurrence of SWL senior leadership and SWD Chief of Operations. This session was facilitated by Corps staff, and all three groups were invited to attend one meeting. The meeting objectives were to brief the process used to develop alternatives, focus on the proposed preferred alternative, and

capture feedback on the proposed preferred alternative. The final scoping report, analyzing all comments received during the comment period, was provided to the PDT in November 2015. A final Focus Group report, capturing and summarizing the work and comments that took place during the Focus Group sessions, was provided to the PDT in January 2016. Three additional sessions were held on September 20, 2016, March 3, 2017 and November 2, 2017 with all focus groups. This was a request of the Congressional staffers and members of the Focus Groups that they be notified prior to the draft release of the draft alternatives. The discussion between the Corps and focus group covered many topics included in this shoreline management plan update process.

### 7.4. Table Rock Lake Oversight Committee (TRLOC)

Section 1185(c) of the Water Resources Development Act of 2016 (also known as the Water Infrastructure and Improvements for the Nation Act of 2016 (WIIN 2016) (Pub. L. 114-322)) directed the Secretary to establish an oversight committee for the Table Rock Lake, Arkansas and Missouri project in accordance with the Federal Advisory Committee Act (5 U.S.C. App.). Section 1185 (c) (3) required that the committee be composed of no more than six (6) members with specific recommendations for each membership. The TRLOC was established in 2019. TRLOC will meet four times and will provide recommendations to the District Commander at the conclusion of the Committee.

### 7.5. Draft Shoreline Management Plan/Draft Environmental Assessment

The first round of draft documents were released in July 2017 with public workshops held 31 July through 3 August 2017. The public review period was from July through September 2017. A second draft Shoreline Management Plan, based on Alternative 4a, and Environmental Assessment will be released to the public on the date it is released to the Table Rock Lake Oversight Committee.

### 7.6. Final Shoreline Management Plan/Final Environmental Assessment

The new SMP and final EA will be presented at the final Table Rock Lake Oversight Committee meeting, date to be determined.

## 8.0 CONCLUSIONS

The Shoreline Management Plan for Table Rock Lake was last approved in 1996. During this time, public use patterns have changed significantly, and with population growth in southwestern Missouri and northwestern Arkansas increasing tremendously, Table Rock Lake receives high demand for both private shoreline use and public recreation use. The Corps is tasked with finding the balance between permitted private uses and general public use of Table Rock Lake.

The Shoreline Management Plan is not intended to address the specifics of regional water quality or water level management; these areas are covered in a project's water management plan. However, specific issues identified through the Shoreline Management Plan revision

process can still be communicated and coordinated with the appropriate internal Corps resource (i.e., operations for shoreline management) or external resource agency (Missouri Department of Natural Resources for water quality, Missouri Department of Conservation on land and fisheries management, and Missouri State Highway Patrol for boater safety) responsible for that specific area. To facilitate this action, the current Shoreline Management Plan development evaluated six alternatives relative to their potential impacts on the land and water resources of Table Rock Lake.

These alternatives spanned the gamut of increased shoreline protection to increased shoreline development and the potential effects on the human, terrestrial, and aquatic environment from their implementation. The No Action Alternative looked at leaving the lake as it currently exists in terms of developable areas and protected areas. Of the 758 miles of shoreline available land around the lake, 50 percent of this is classified as high and low density recreation (10 percent high), with potential future development occurring. Approximately 11.5 percent of mileage is allocated as LDA allowing more intensive development, including structures such as community docks.

The action alternatives included a No Growth Alternative, a Benefits General Public Use Alternative, a Neutral Change Alternative, a Revised Neutral Change Alternative, an Accelerated Private Development Alternative and a Maximum Private Growth Alternative. The No Growth Alternative would increase the protected shoreline distance by 20.8 percent, which represents 699.1 of the 758.2 total shoreline miles. Existing docks and vegetation modification permits would remain on the lake as long as compliance with permit conditions is maintained. An increase of LDA by 3.2 miles (0.4 percent) would occur from the Benefits General Public Use Alternative, with a reduction of 4.9 miles of protected shoreline. The Neutral Change Alternative would also increase the LDA shoreline mileage by 3.7 miles over the No Action Alternative, but would also increase the protected shoreline mileage by 1.1 miles. Implementation of the Revised Neutral Change Alternative (Preferred Alternative) allows potential shoreline development opportunities, with a possibility to increase boat congestion and water related accidents, due to a potential increase of slips. However, under this alternative, there is now a threshold of 30,806 access opportunities (boat slips and boat launching ramp parking spaces). The Revised Neutral Change Alternative (Preferred Alternative) would also increase the LDA shoreline mileage by 3.9 miles over the No Action Alternative, but would also increase the protected shoreline mileage by 0.9 miles. The threshold should help to temper overall cumulative impacts to Table Rock Lake. The Accelerated Private Development Alternative would add 64.2 miles of LDA to the current 87.4 miles, resulting in a total of 151.6 shoreline miles available for limited development (potential dock and vegetation modification permits). The Maximum Private Growth Alternative (Alternative 6) shifted the majority of the available shoreline acreage toward future development, with 46 percent (349 miles) allocated as LDA. Potential effects from this will be increased vegetation removal and increased soil erosion due to construction and conversion of pervious surfaces to impervious—this being detrimental to water quality and terrestrial and aquatic wildlife species. Extreme development will also result in more boats on the lake, increased health and safety issues, aesthetic impacts, and impaired recreational experiences for many visitors.

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# Appendix A: Public Comments

# Part 1: Scoping Report

# Part 2: Draft Release Public Comment

# Appendix B: Local, State, and Federal Agency Coordination Letters

# Part 1: Agency Scoping Letters

# Part 2: Draft Release Public Comment

# Appendix C: Alternative Maps