

Chapter 5

Cumulative Effects

5.1 Introduction

Cumulative effects analyses are an important element of the environmental documentation and approval process and are required by NEPA. The CEQ defines cumulative effects as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

This section describes the regulatory basis for cumulative effects, identifies past, present, and future projects that have a potential to lead to cumulative effects, and evaluates the combined cumulative effects of each alternative and other projects that could have effects similar to each alternative. The No Action and action alternatives are all evaluated for cumulative effects for each environmental resource area. Although the full build out potential of the alternatives may span many decades (*e.g.* over 100 years under Alternative 4), cumulative projects are only reasonably foreseeable over about the next decade. Many of the potential effects from the implementation of a revised SMP are anticipated to occur in response to general growth and development in the counties surrounding the lake. This growth is likely influenced by many factors that extend far beyond the Eufaula Lake study area, such as national interest rates and economic health that could influence the market for second homes. Therefore, most potential impacts are evaluated within the planning horizon of the next 20 years with additional qualitative consideration given to potential effects further removed in time.

5.2 Regulatory Basis

NEPA regulations state that when determining the scope of an EIS, cumulative actions must be considered (40 CFR 1508.25(a)(2)). Cumulative effects are defined under NEPA as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Section 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impact is the total effect on a given resource, ecosystem, or human community of all actions taken, including actions unrelated to the proposed action (CEQ 1997; CEQ 2005). For each environmental issue area, the scope of analysis for cumulative impacts can vary. Therefore, in the analysis that follows, the scope of analysis is discussed, followed by whether or not implementation of the alternatives would have the potential to result in significant adverse cumulative effects.

5.3 Past, Present, and Future Projects

Numerous past, present and foreseeable future activities have either occurred or are planned at or within the general vicinity of Eufaula Lake. These activities, and the respective status of each activity, are shown in **Table 5-1** and are included in the cumulative effects analysis. The list includes activities planned by the USACE, local governments (counties and cities around Eufaula Lake), and federal and state agencies including the Oklahoma Department of Transportation (ODOT), Oklahoma Department of Wildlife Conservation (ODWC), and the Bureau of Land Management. These agencies include those with

jurisdiction over land management and development within the study area. Each of these agencies was contacted about their future project plans. No specific projects were identified during scoping by any of these agencies. As identified in **Table 5-1**, the majority of USACE planned activities lack funding sources, and, therefore, project schedules are unknown.

Table 5-1. Cumulative Projects

Project Name	Description	Location	Owner	Status
South Point	Boat ramp renovation to include installation of docks and parking facilities	Eufaula Cove	ODWC, City of Eufaula	Scheduled for completion in late 2013 pending funding
Powerhouse Penstocks	Rehab Penstocks and Expansion Joints	Eufaula Powerhouse	USACE	Fully funded; at or near completion
Powerhouse Switchyard	Replace switchyard disconnect and ground switches and CCPDs	Eufaula Powerhouse	USACE	Fully funded; at or near completion
Powerhouse Fire Detection	Fire detection/alarm system	Eufaula Powerhouse	USACE	Fully funded; at or near completion
Powerhouse SER Replacement	SER/Annunciator system replacement	Eufaula Powerhouse	USACE	Fully funded; at or near completion
Powerhouse Switchyard	Replace CCPDs/CVTs - Switchyard	Eufaula Switchyard	USACE	Fully funded; at or near completion
Powerhouse Storage	Replace roadway sluice gate bulkhead storage hatch cover	Eufaula Powerhouse	USACE	Fully funded; at or near completion
Highway 9 Boat Launch Complex	Construct boat launch complex	Highway 9 Landing	USACE	Not funded
Spillway Basin	Repair stilling basin	Spillway	USACE	Not funded
Powerhouse Exciter	Replace exciter solid state front end with digital	Eufaula Powerhouse	USACE	Not funded
Spillway Bulkhead	Repair and paint floating bulkhead	Spillway	USACE	Not funded
Elm Point Campsites	Add 10 campsites	Elm Point	USACE	Not funded
Porum Landing Boat Ramp	Day use boat ramp	Porum Landing	USACE	Not funded
Powerhouse Crane	Rehab controls on draft tube crane	Eufaula Powerhouse	USACE	Not funded
Brooken Cove Campsites	Repair campsites	Brooken Cove	USACE	Not funded
Powerhouse Turbine	Procure turbine maintenance platform	Eufaula Powerhouse	USACE	Not funded
Belle Starr Toilet	Replace vault toilet	Belle Starr	USACE	Not funded
Powerhouse Strainers	Replace main unit twin strainers	Eufaula Powerhouse	USACE	Not funded

Project Name	Description	Location	Owner	Status
Highway 9 Day Use Facility	Rehab day use facility at Highway 9	Highway 9 Landing	USACE	Not funded
Highway 9 Campsites	Rehab campsites	Highway 9 Landing	USACE	Not funded
Tailrace	Repair erosion at North Fishing area	Tailrace	USACE	Not funded
Powerhouse Elevators	Rehab PH and Intake Elevators	Eufaula Powerhouse	USACE	Not funded
Elm Point	Construct WBS/T	Elm Point	USACE	Not funded
Van Allan Road	Road raised above the existing lake elevation	Van Allan Road in Longtown	Pittsburg County	Scheduled for construction start in July 2012
US 69 Bridge Reconstruction	Bridge reconstruction at US 69	US 69 over North Canadian River	ODOT	Construction scheduled summer 2012
Highway 9a Bridge Reconstruction	Bridge reconstruction/deck replacement on Highway 9a	Highway 9a at Gaines Creek	ODOT	Construction scheduled June through September 2012
BLM Oil Drilling	Future drilling of oil wells	West of McAlester, north and west of US 270 and Highway 31 intersection	BLM	Unknown

Sources: ACORE 2012; Rogers 2012a; Gilliland 2012; McCarty 2012; Frank 2012; Flynn 2012

5.3.1 Land Use Planning

As discussed in Appendix H, Haskell, McIntosh, and Pittsburg Counties and the Town of Crowder do not have any land use plans, policies or regulations to prescribe and control land use and development patterns (Brooks 2012; Brown 2012; Dawson 2012; Smith 2012). In the absence of land use controls, all land uses are acceptable on town and county land, and any of the proposed changes to shoreline designations under any of the four action alternatives would be compatible with local land uses.

The City of Eufaula has a zoning ordinance that allows all types of residential and commercial uses, except for mobile homes, on land near the Eufaula Lake shoreline (Pennington 2012). Since land near the shoreline within the city limits is zoned broadly, any changes to shoreline designations that may occur under the four action alternatives under consideration would be compatible with city land uses.

5.3.2 Subdivision Development Trends

Development trends in the Eufaula Lake study area were reviewed by studying the number of new subdivisions built in each county annually. In the last 25 years, there were 13 new subdivisions developed in Haskell County, 11 in McIntosh County, 22 in Okmulgee County, and 38 in Pittsburg County. Pittsburg County experienced the greatest growth averaging approximately three new subdivisions every three years. The four county region as a whole experienced an average of approximately three new subdivisions per year. This trend included new subdivisions throughout the four counties and not just those adjacent to

Eufaula Lake; although, many of the existing subdivisions in these counties are located near the lake. It can be reasonably inferred that the development trend of approximately three new subdivisions annually throughout the area of analysis will continue into the future. Development pressures include the oil and gas exploration boom and recreational pressure from more people living in the immediate vicinity of Eufaula Lake. **Figure 5-1** shows the areas of existing subdivision development in each county.

5.4 Summary of Cumulative Effects by Environmental Resource Areas

This section presents a detailed analysis of the cumulative effects by environmental resource area. For each resource area, the effects of combined actions (*i.e.*, the project alternatives together with other past, present or future projects) are evaluated. In general, Alternatives 1 and 2 are least likely to contribute to negative cumulative effects, because they provide the greatest amount of protection to the human and natural environment. The No Action and Preferred Alternatives and Alternatives 3 and 4 are more likely to contribute to cumulative effects when combined with other foreseeable development projects.

5.4.1 Vegetation, Wetlands, and Aquatic Habitats

Significant cumulative effects on vegetation, wetlands, and aquatic habitats could occur if combined actions affect vegetation, wetlands, or aquatic habitats in the area of analysis. As described in Section 4.1, the No Action Alternative would result in direct and indirect impacts on habitats similar to those found under existing conditions. Alternatives 1 and 2, which emphasize natural resource conservation, would likely see an increase in the quality and quantity of both terrestrial and aquatic habitats resulting from an increase in shoreline allocated as Protected. The Preferred Alternative would result in similar impacts to those described for the No Action Alternative except that the implementation of the 45-foot vegetation buffer along the shoreline would result in less impact in areas subject to vegetation modification. The quality and quantity of habitats would decrease slightly under Alternative 3 and would decrease further under Alternative 4, as more shoreline allocated Protected would convert to Limited Development and/or Public Recreation and habitats would be converted to recreational facilities or residential developments. The amount of land subject to vegetation management under Alternatives 1 and 2 would be less than under the No Action Alternative and greater under Alternatives 3 and 4. Long-term mowing could prevent regeneration of trees over large areas. The potential increase in development induced by changes in shoreline designations could lead to measurable decreases in habitats over time.

Other projects have been identified that could disturb vegetation, wetlands, and aquatic habitats, including the installation of docks and parking facilities at South Point, the construction of a boat launch complex at Highway 9 and at Porum Landing, and the addition of campsites at Elm Point. The construction of boating and recreational facilities would result in direct habitat loss and could lead to an increase in foot and recreational vehicle traffic disturbing habitats. Together, these projects and four of the six alternatives under consideration (the No Action and Preferred Alternatives, Alternative 3, and Alternative 4) could result in significant negative cumulative effects on habitats.

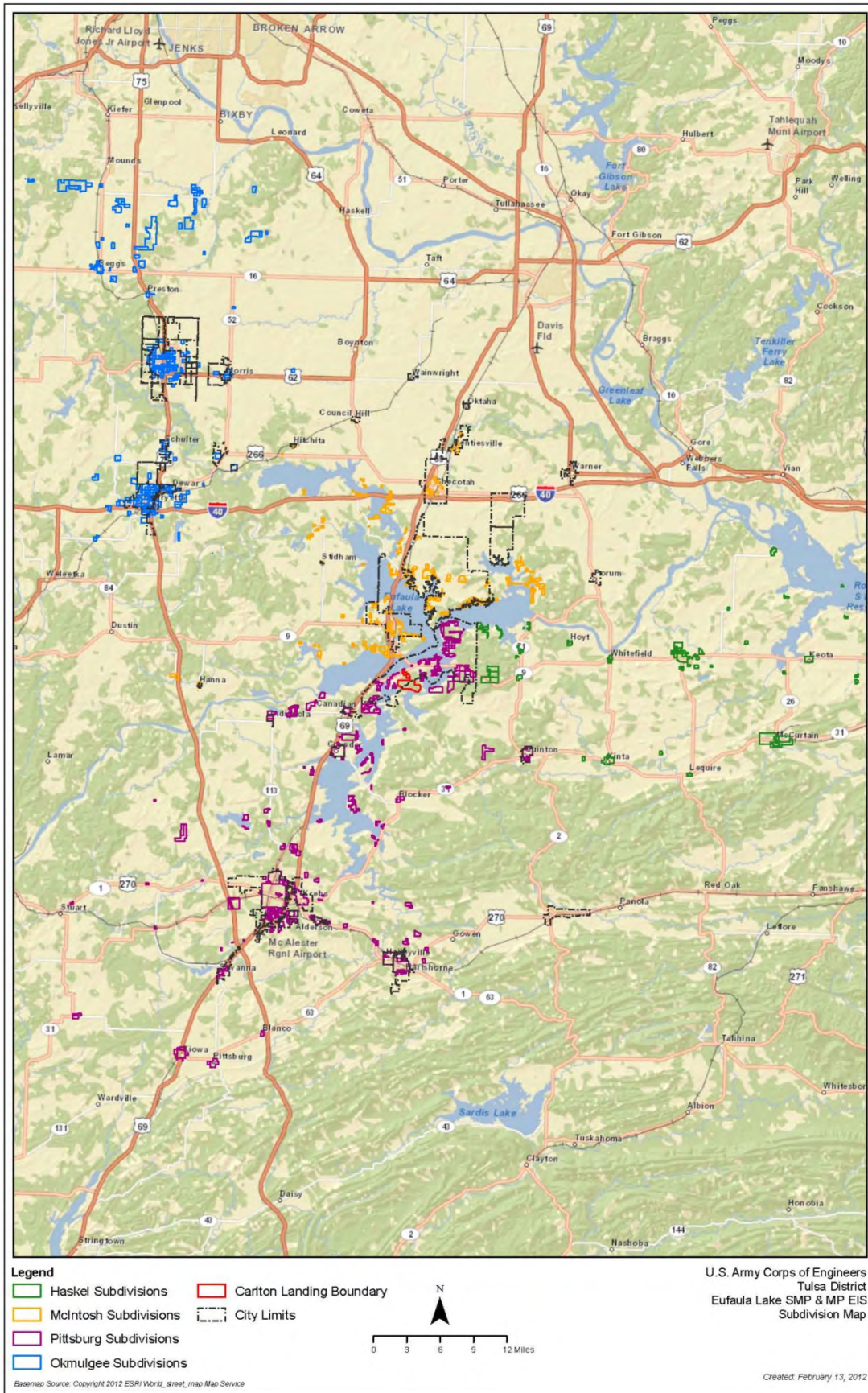


Figure 5-1. Areas of Subdivision Development in Study Area

5.4.2 Fish and Wildlife

Significant cumulative effects to fish and wildlife could occur if combined actions contribute to declines in fish and wildlife populations, including threatened and endangered species, in the area of analysis. As described in Section 4.2, potential impacts on most fish and wildlife populations under the No Action Alternative would result in a future condition similar to that described for the existing condition and observed rates of increase or decline would most likely continue. Alternatives 1 and 2, which emphasize natural resource conservation, would likely see an increase in the quality and quantity of fish and wildlife habitats resulting from an increase in shoreline allocated as Protected. The quality and quantity of fish and wildlife populations would decrease slightly under Alternative 3 and would decrease further under Alternative 4, as more shoreline allocated Protected would be converted to Limited Development and/or Public Recreation and habitats would be converted to recreational facilities or residential developments, including at Carlton Landing. Specifically, full build-out of the private lands at Carlton Landing development under Alternative 4 would result in the development of 1,650 acres of confirmed American burying beetle habitat, likely resulting in adverse effects on the species. Removal of standing timber at Carlton Landing would also have potential adverse effects on fish habitat. The Preferred Alternative would have similar effects as the No Action Alternative around most of the lake, but with the added adverse effect in the Carlton Landing area as described for Alternative 4. The potential increase in development induced by changes in shoreline designations could lead to measurable decreases in fish and wildlife populations over time as habitats are altered or destroyed by land use changes and human disturbance.

Other projects have been identified that could disturb fish and wildlife, including the installation of docks and parking facilities at South Point, the construction of a boat launch complex at Highway 9 and at Porum Landing, and the addition of campsites at Elm Point. Construction at Highway 9 and Elm Point is scheduled within the existing footprint of the parks in areas previously impacted. The construction of boating and recreational facilities would result in habitat loss and could lead to an increase in foot and recreational vehicle traffic disturbing habitats. Together, these projects and four of the six alternatives under consideration (the No Action and Preferred Alternatives, and Alternatives 3 and 4) could result in significant negative cumulative effects on fish and wildlife. USACE and USFWS have consulted on potential cumulative effects on listed species that specifically includes potential effects on the American burying beetle from the Carlton Landing development and other planned development in the area as described in Section 7.4.3. Appropriate measures would be implemented to address identified cumulative impacts.

5.4.3 Water Quality

Significant cumulative effects could occur if combined actions exceed existing water quality standards. As described in Section 4.3, the No Action and Preferred Alternatives would likely continue the current trend of water quality degradation due to development on adjacent private lands that would be attracted to the existing Limited Development shoreline allocations. Alternative 1 and Alternative 2, which increase the amount of Protected shoreline as compared to the No Action Alternative, would likely result in improved water quality due to less recreational and development activity occurring on and around the lake. Water quality under Alternative 3 and Alternative 4 would likely decline as a result of increased land-based and water-based activity that results in increased soil erosion, lower dissolved oxygen, higher turbidity, and larger phosphorus and nitrogen loads. Alternative 4 would have the greatest potential for negative impacts on water quality in Eufaula Lake because of the potential water quality degradation associated with increased development, including full build-out of Carlton Landing. The Preferred Alternative would also have the potential for water quality impacts associated with the Carlton Landing development. Mitigation measures including nutrient and vegetation management and stormwater, equestrian, and

boating best management practices would be required to lessen potential water quality impacts to a less than significant level. However, many of the potential water quality impacts would largely be the result of activities on adjacent private lands and opportunities for effective mitigation through USACE action may be limited.

Other projects have been identified that could increase boating and recreational activity at the lake. These projects include the installation of docks and parking facilities at South Point, the construction of a boat launch complex at Highway 9 and at Porum Landing, and the addition of campsites at Elm Point. The construction of boating and camping facilities could lead to an increase in the number of visitors using the lake. However, only the South Point project is funded and could occur at the same time as the alternatives under consideration. The No Action and Preferred Alternatives and Alternatives 3 and 4, together with other reasonably foreseeable development in the area, could result in significant negative cumulative effects related to increased erosion and sedimentation in the lake.

5.4.4 Geology, Soils, and Minerals

Significant cumulative effects on geology, soils, and minerals could occur if combined actions contribute to the alteration or destruction of unique geologic features, substantial soil erosion or loss of topsoil, or loss of access to mineral resources. As described in Section 4.4, there would be no adverse effects on geology or minerals under any of the alternatives. Potential soil erosion impacts could occur from construction of new boat docks under all alternatives and from construction of the proposed Carlton Landing development under the Preferred Alternative and Alternative 4. An increase of impervious surfaces such as roads, buildings, and driveways would lead to increased runoff and sedimentation. Indirect impacts of increased development, induced by changes in shoreline allocations, could affect erosion and sedimentation. Additionally, the use of shoreline footpaths to access new boat docks would also result in soil erosion. Alternative 1 would permit the least number of new docks and potentially result in the least amount of new development on adjacent private lands; therefore, Alternative 1 would have the least potential for impacts of any of the alternatives. Alternative 4, which includes the full-build out of Carlton Landing, would have the most potential for impacts. An increase in soil erosion would be a significant impact under all alternatives, and mitigation would be required to reduce this impact to a less than significant level.

Other potential projects have been identified that could contribute to substantial soil erosion or loss of topsoil as a result of construction and excavation, including oil drilling, and construction of additional campsites. Many of these projects are unfunded with no identified construction dates; however, these projects could occur at the same time as the alternatives under consideration. Together, these projects and any of the alternatives under consideration could result in significant negative cumulative construction effects associated with soils.

During construction activities on government-owned lands, USACE would implement appropriate erosion and sediment control techniques, such as silt fences and sediment retention ponds, to reduce impacts from soil erosion to a less than significant level. Additionally, permits from USACE under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act would be required for development in waters of the U.S. A Shoreline Use Permit would also be required for all improved pathways providing access across government lands to the lake shore, and permits would require paths to avoid steep slopes that may increase erosion. However, these mitigation measures would not address potential soil erosion impacts generated by development on private lands.

5.4.5 Aesthetics and Visual Resources

Significant cumulative effects on aesthetics and visual resources could occur if combined actions adversely affect aesthetics and visual resources. As described in Section 4.5, potential impacts on aesthetics and visual resources would occur from construction of docks. Indirect impacts on aesthetics and visual resources could occur from private development induced by changes in shoreline allocations. Development activities would alter the existing ecosystems (forest, grasslands, etc.) through the construction of buildings and infrastructure, thus change the current natural landscape aesthetic. Under Alternative 1 and Alternative 2, the amount of shoreline designated as Limited Development would be reduced; thus, there would be less conversion of natural areas and an improved aesthetic compared to the No Action Alternative. Although the Preferred Alternative would have slightly less shoreline designated as Limited Development as compared to the No Action Alternative, the Preferred Alternative would approve shoreline development at Carlton Landing with the associated visual impacts associated with that location. The quality of aesthetic and visual resources would decrease slightly under Alternative 3 and further under Alternative 4, as more development would occur with the full build-out of Carlton Landing. The potential decrease in visual quality through the conversion of natural areas to development areas induced by changes in shoreline allocations could adversely affect aesthetics and visual resources. Mitigation would be required.

Other projects have been identified that could adversely affect aesthetics and visual resources, including the installation of docks and parking facilities at South Point, the construction of a boat launch complex at Highway 9 and at Porum Landing, and the addition of campsites at Elm Point. Construction at Highway 9 and Elm Point is scheduled within the existing footprint of the parks in areas previously impacted. The construction of boating and recreational facilities could lead to an increase in private development and change the current natural landscape aesthetic. However, only the South Point project is both funded and could occur at the same time as the alternatives under consideration. Together, these projects and any of the five alternatives under consideration could result in significant negative cumulative effects.

While the USACE would implement appropriate mitigation measures, including limiting the number of slips per dock, requiring marinas to be well kept, and screening off restrooms, dumpsters, and other facilities with vegetation from adjacent areas with less compatible uses, these mitigation measures would not be able to control development activities on adjacent private lands.

5.4.6 Cultural and Historic Resources

Significant cumulative effects on cultural and historic resources could occur if combined actions adversely affect cultural and historic resources. As described in Section 4.6, potential impacts on cultural and historic resources could occur from dock construction and construction of shoreline access. Increased development on adjacent private lands induced by changes in shoreline allocations could also affect cultural and historic resources. Mitigation would be required to minimize significant adverse impacts on government-owned lands.

It is unknown whether the other cumulative activities and projects that have been identified within the study area occur on or near cultural and historic properties and whether they would adversely affect cultural and historic resources. However, since the majority of cumulative projects involve the rehabilitation of existing infrastructure, it is unlikely that cultural and historic resources would be adversely affected. Although some projects, including oil drilling, may occur in the vicinity of cultural and historic

properties, measures to avoid or mitigate impacts would be required per federal and state regulations. Therefore, there would be no significant negative cumulative effects on cultural and historic resources.

5.4.7 Recreation

Significant cumulative recreation effects could occur if combined actions exceed the existing carrying capacity of Eufaula Lake for both land-based and water-based recreational facilities within the study area. As described in Section 4.7, potential impacts under Alternative 1 would be negligible and within the available capacity for both land and water-based recreational facilities. However, potential impacts under the No Action and Preferred Alternatives, Alternative 2, Alternative 3, and Alternative 4 could be substantial over time. The potential to substantially increase the number of boat docks would result in more boaters, and thus, more visitors using land-based and water-based recreational facilities. While the No Action and Preferred Alternatives and Alternatives 2, 3, and 4 would not exceed the carrying capacity for the lake within the 20-year planning time horizon (2032), they could exceed the carrying capacity of the lake in the long-term.

Other projects have been identified that could also affect the carrying capacity of Eufaula Lake for both land-based and water-based recreational facilities. These projects include the installation of docks and parking facilities at South Point, the construction of a boat launch complex at Highway 9 and at Porum Landing, and the addition of campsites at Elm Point. The construction of boating and camping facilities could lead to an increase in the number of visitors using the lake's recreational facilities. The addition of land-based recreational facilities would mitigate the potential impact of increased visitation, while the addition of additional boat access to the lake could add to the cumulative effect on lake carrying capacity. Some of these other projects could occur at the same time as the alternatives under consideration. A significant negative cumulative impact on recreation could occur as a result.

5.4.8 Noise

Significant cumulative noise effects could occur if combined actions contribute to long-term substantial increases in noise levels that are incompatible with existing noise types within the study area. As discussed in Section 4.8, there could be potential noise impacts resulting from dock construction, residential development, and increased recreational activities induced by changes in the shoreline allocations and the number of new dock permits granted. However, impacts would not be adverse. Construction noise would be temporary, would take place during normal construction hours, and would be limited to the area around construction sites. Recreational-related and residential-related noise would be compatible with existing noise types, and therefore, would not be adverse.

Other projects have been identified that would involve construction activities that would generate noise from heavy equipment use and truck and vehicle traffic. Many of these projects would occur at the same time as the activities under the alternatives. However, noise impacts resulting from these projects would be temporary, would take place during normal construction hours, and would be distant from activities proposed under the alternatives. Any noise disturbance would not be substantial. Therefore, there would not be a significant negative cumulative impact resulting from the combination of any of the alternatives under consideration with other reasonably foreseeable projects.

5.4.9 Transportation

Significant cumulative effects to transportation could occur if combined actions adversely affect the physical conditions or traffic flow of roads within the study area. As discussed in Section 4.9, there would

be no direct impacts to transportation under the No Action Alternative and action alternatives. Indirect transportation impacts would include increased visitor and resident traffic on highways, state routes, and local roads as a result of increased recreational activities and private development induced by changes in shoreline allocations. However, potential transportation impacts would be localized, would occur during peak recreational periods only, and would not result in a decrease in the level of service to the road system.

Other projects have been identified that would involve construction activities requiring transport of construction materials and construction employee commuting. Many of these projects would occur at the same time as the activities under the alternatives. However, most of the potential transportation effects would be related to project construction and would be short-term and temporary. Additionally, road improvements planned at Van Allan Road and bridge reconstruction planned at US 69 and Highway 9A would improve transportation service in the study area. Therefore, reasonably foreseeable projects, combined with any of the alternatives, would not result in significant negative cumulative transportation effects.

5.4.10 Public Lands and Access

Significant cumulative effects on public lands and access would occur if combined actions contribute to the restriction of public access to the lake through the loss or alteration of public recreation areas or restriction of access for disabled persons within the study area. As discussed in Section 4.10, there would not be a significant impact to public lands and access under the No Action Alternative or the action alternatives. With an increase in Protected shorelines under Alternatives 1 and 2, there would be less public access to the shoreline in certain areas. However, this would not be a significant impact to public access overall, as existing recreational opportunities, including nature centers, hiking trails, campgrounds, and picnic areas would not change. Under the No Action and Preferred Alternatives and Alternatives 2, 3, and 4, residential development on private lands adjacent to the lake would increase the use of the lake and could result in overcrowding of some facilities potentially leading to less accessibility. In addition, public access to the lake under the Preferred Alternative and Alternative 4 would increase with the addition of a new marina. Under all alternatives, public recreation areas would continue to provide the required access for disabled persons.

No other activities or projects have been identified that would contribute to the restriction of public access to the lake through the loss or alteration of public recreation areas or restriction of access for disabled persons to public recreation areas. As a result, there would be no significant negative cumulative effect resulting from the combination of any of the alternatives with other projects in the area.

5.4.11 Socioeconomics and Demographics

Significant cumulative effects on socioeconomics and demographics could occur if combined actions cause a measurable change in population, housing, employment, education, or children's health and safety characteristics. As described in Section 4.11, the No Action Alternative and action alternatives would not result in adverse impacts to socioeconomics and demographics. The projected increases in population associated with new residential development encouraged by changes in shoreline allocations would be consistent with historic levels of growth and within the planning horizons of appropriate social service agencies. Construction of new residential developments on private lands adjacent to government shorelines, including the expected development at Carlton Landing development, under all alternatives would result in beneficial effects including job creation from construction, an increase in median income

within the study area, and an increase the average property values of the study area. In addition, the Carlton Landing development has constructed a new magnet school that is part of the public school system and which is providing educational opportunities for the local population.

No other activities or projects have been identified that would cause a measurable change in population, housing, employment, education, or children's health and safety characteristics. As a result, there would be no significant negative cumulative effects from the combination of any of the five project alternatives with other reasonably foreseeable projects.

5.4.12 Agricultural Lands

Significant cumulative effects on agricultural lands could occur if the combined actions contribute to the conversion of agricultural lands to non-agricultural uses. As described in Section 3.1 of Appendix H, none of the alternatives would result in direct impacts to agricultural lands. Any indirect impacts (*i.e.* trend towards residential development as a result of changes in shoreline) resulting from any of the alternatives under consideration would not be adverse.

No other activities or projects have been identified that would contribute to the conversion of agricultural lands to non-agricultural uses. Given that none of the alternatives under consideration would adversely affect agricultural land and no other activities have been identified that would adversely affect agricultural lands, none of the alternatives combined with other foreseeable projects would result in significant negative cumulative effects.

5.4.13 Air Quality

Significant cumulative air quality effects would occur if the combined actions contribute to ambient air concentrations that exceed a NAAQS in the area of analysis. As described in Section 3.2 of Appendix H, no adverse air quality effects would occur under any of the alternatives. There would be no increase in air emissions due to increased transportation, recreational, construction, or building operation activities under Alternative 1 and Alternative 2. Under Alternative 3 and Alternative 4, an increase in the amount of Limited Development shorelines would result in a potential increase in construction of additional docks and boating access resulting in construction emissions and mobile air emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use. The Preferred Alternative and Alternative 4 would contribute additional construction emissions resulting from development at Carlton Landing. However, construction emissions would only occur in areas where construction is taking place, would be temporary in nature, and would be controlled by standard fugitive dust mitigation techniques. In addition, the projected time for full build out to occur under any of the alternatives is very long, indicating that only a small portion of the potential construction would occur at any given time. Mobile air emissions resulting from increased watercraft use would be controlled by regulating carrying capacity and other safety measures. Therefore, emissions resulting from the Preferred Alternative and Alternatives 3 and 4 would not lead to an increase in air emissions beyond the significance thresholds for air quality. The Preferred Alternative and Alternative 4 have identified a potential need for transportation safety improvements at the entrance to the Carlton Landing development at a point in the future close to full build-out of the development (expected to be 25 to 30 years from present). Although transportation improvements may be needed to improve the safety of turning movements into and out of the development, it is not expected to create an air quality impact even without the improvements.

Several projects listed in **Table 5-1** have been identified that would contribute to air emissions as a result of construction activities, including boat ramp renovation and bridge and road reconstruction projects. The road reconstruction projects identified, however, are scheduled to be completed in 2012 and so would not occur at the same time as activities under the alternatives. Some of the other construction projects identified may occur at the same time as construction, transportation, and recreational activities occurring under the Preferred Alternative and Alternatives 3 and 4. However, construction emissions, specifically those resulting from the Carlton Landing development, would occur in a small area distant from the other identified projects, would be temporary in nature, and would be controlled by standard fugitive dust mitigation techniques. Therefore, construction emissions would not come close to exceeding the significance thresholds. The combination of any of the alternatives with reasonably foreseeable projects would not result in significant negative cumulative air quality effects.

5.4.14 Greenhouse Gas Emissions/ Climate Change

Significant cumulative GHG and climate change effects could occur if combined actions contribute GHG emissions in the area of analysis. As described in Section 3.3 of Appendix H, no adverse GHG and climate change effects would occur under the No Action Alternative or any of the alternatives. There would be no increase in GHG emissions under Alternative 1 and Alternative 2. Under Alternative 3 and Alternative 4, an increase in the amount of Limited Development areas would lead to construction of additional docks and increased boating access resulting in construction emissions and mobile air emissions from increased vehicle transportation to Eufaula Lake and from increased watercraft use. The Preferred Alternative and Alternative 4 would contribute additional GHG emissions resulting from construction and operation of the Carlton Landing development and from the proposed sewage treatment plant on the adjacent private lands. However, construction emissions would only occur in areas where construction is taking place, be temporary in nature, and would be controlled by standard fugitive dust mitigation techniques. Mobile air emissions resulting from increased watercraft use would be controlled by regulating carrying capacity and other safety measures. GHG emissions from the proposed sewage treatment plant would not be adverse due to the small size of the development. Therefore, GHG emissions resulting from the Preferred Alternative and Alternatives 3 and 4 would not lead to a significant increase in GHG emissions. The Preferred Alternative and Alternative 4 have identified a potential need for transportation safety improvements at the entrance to the Carlton Landing development at a point in the future close to full build-out of the development (expected to be 25 to 30 years from present). Although transportation improvements may be needed to improve the safety of turning movements into and out of the development, it is not expected to create a GHG impact even without the improvements.

Several cumulative projects listed in **Table 5-1** have been identified that would contribute to GHG emissions as a result of construction activities. Some of these construction projects would occur at the same time as construction, transportation, and recreational activities occurring under Alternative 3 and Alternative 4. The largest and most concentrated development would be the residential/resort community expected on private lands at Carlton Landing. However, construction emissions associated with development of Carlton Landing would occur in a small area distant from the other identified projects and would be temporary in nature. Operational emissions of Carlton Landing, including sewage treatment and solid waste disposal, would be less than significant due to the size of the development. GHG emissions would not come close to exceeding the significance thresholds. Therefore, the cumulative GHG and climate change effects from any of the alternatives combined with reasonably foreseeable projects would not result in significant negative cumulative GHG and climate effects.

5.4.15 Water Supply, Flood Storage and Operation

Significant cumulative effects could occur if combined actions adversely affect water supply, flood storage, and operation. As described in Section 3.4 of Appendix H, there would be no direct or indirect effects to water supply, flood storage, or operation under the No Action Alternative or Alternatives 1, 2, and 3. Carlton Landing has a water right to withdraw up to 30 AF/year that would be exercised under the Preferred Alternative and Alternative 4. However, this withdrawal would not result in a significant impact to water supply, flood storage, or operation of Eufaula Lake.

No other activities or projects have been identified that would contribute to the reduction in available water supply, flood storage capacity, or other changes in the ability to operate Eufaula Lake for its intended purposes. Given that none of the alternatives would adversely affect water supply, flood storage, and operation and no other activities have been identified that would adversely affect water supply, flood storage, and operation, there would be no significant negative cumulative effects.

5.4.16 Hazardous Materials

Significant cumulative hazardous materials effects could occur if combined actions contribute to a significant hazard to the public or environment involving hazardous materials. As described in Section 3.5 of Appendix H, potential impacts related to hazardous materials under the No Action Alternative, and Alternatives 1, 2, and 3 would be less than significant. Construction of the Carlton Landing development under the Preferred Alternative and Alternative 4 would have the potential for hazardous materials releases, and mitigation would be required to reduce the potential impact to a less than significant level.

Other projects have been identified that would involve construction activities that could pose a threat of hazardous materials spills as a result of refueling or maintenance of construction equipment. Many of these projects could occur at the same time as expected construction at Carlton Landing but they would occur far away from other construction activities. Therefore, there would not be a significant negative cumulative effect related to hazardous materials from the combination of any of the project alternatives with other reasonably foreseeable projects.

5.4.17 Navigation

Significant cumulative effects to navigation could occur if combined actions contribute to a reduction in USACE's ability to maintain navigation aids within Eufaula Lake. As discussed in Section 3.6 of Appendix H, there could be potential navigation impacts under the No Action Alternative and Alternatives 2, 3, and 4. Under the No Action and Preferred Alternatives, Alternatives 2 and 3, an increase in the number of boats using the lake would be anticipated as a result of an increase in the number of boat docks potentially constructed. However, this would not be expected to reduce the ability of the USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, potential impacts would be less than significant. Under the Preferred Alternative and Alternative 4, there would be an increase in the number of boats that would be expected to use the lake as well as an increase in the area of unrestricted water at Carlton Landing and the construction of a new marina at Carlton Landing. These additional factors would likely require the installation and maintenance of new navigational aids in the vicinity of Carlton Landing. Removal of standing timber in Area K of the lake (**Figure 2-11** and **Figures 2-15** and **2-16**) would be expected to benefit navigation in that area and potential impacts on navigation would not be adverse.

Other projects have been identified that could result in effects on navigation including the renovation of the South Point boat ramp to include installation of docks, construction at the Porum Landing boat ramp, and the Highway 9 boat launch complex. The South Point boat ramp project would occur at the same time as the initial activities under the alternatives, but the other identified projects lack funding and have no set construction start dates. The South Point boat ramp project could increase the number of boats on the lake. However, any increase in the number of boats would be small and would not be expected to reduce the ability of USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, these cumulative projects combined with any of the project alternatives would not result in significant negative cumulative effects on navigation.

5.4.18 Energy

Significant cumulative energy effects could occur if combined actions adversely affect local or regional energy supplies or affect peak demands for electricity within the study area. As discussed in Section 3.7 of Appendix H, there could be potential impacts on the use of energy as a result of increased residential development encouraged by changes in shoreline allocations. Proposed development at Carlton Landing under the Preferred Alternative and Alternative 4 could result in increased energy use and direct and indirect impacts to energy resources; however, the energy needs of the Carlton Landing development would not be expected to exceed supply. The electric and natural gas utilities would continue to meet demands throughout their service areas through a combination of increased efficiencies, the development of alternative sources of energy, and increased demand-side management techniques.

While additional development in the area would create additional energy demand, it would not adversely affect local and regional energy supplies or peak demands for electricity within the study area. Construction projects occurring at the same time as the activities under the alternatives would use small amounts of energy for construction equipment and transport of materials; however, the amount needed for construction would be temporary and would not adversely affect local and regional energy supplies or demands. A number of the reasonably foreseeable projects are related to dam operations and its ability to generate power efficiently. These projects would maintain the dam's hydropower functions and would not increase the potential power generation capabilities. As a result, there would be no significant negative cumulative effects on energy resulting from the combination of any of the project alternatives with other reasonably foreseeable projects in the area.

5.4.19 Land Use

Cumulative effects on land use were considered within the context of local land use plans, policies, or regulations for counties and municipalities adjacent to Eufaula Lake. Significant cumulative effects on land use could occur if combined actions adversely affect or conflict with designated land uses within the study area. As discussed in Section 3.8 of Appendix H, there is no potential for incompatibility with local land use planning under any of the alternatives.

No other activities or projects have been identified that would conflict with designated land uses. As a result, there would be no significant negative cumulative effects from any of the project alternatives when combined with other projects in the area.

5.4.20 Public Infrastructure and Utilities

Significant cumulative effects on public infrastructure and utilities would occur if combined actions adversely affect or cause a deficiency in available capacity of public infrastructure and utilities within the study area. As discussed in Section 3.9 of Appendix H, there would be no adverse impacts to public infrastructure and utilities under any of the alternatives. The expected development on private lands at Carlton Landing under the No Action Alternative and Alternatives 1, 2, and 3 would be a small residential community that would not adversely affect public infrastructure. The expected full build out of Carlton Landing under the Preferred Alternative and Alternative 4 would apply principles of new urbanism that promote walkability and connectivity to the development on private lands, thereby minimizing impacts to the transportation network. In addition, solid waste disposal needs would not exceed current capacity of the existing offsite landfill. The proposed sewage treatment system located on private lands is currently sized to accommodate wastewater demands of the development anticipated for the first five to ten years. Once the system demands approach capacity, additional wastewater treatment would be developed at the developer's expense.

No other projects have been identified that could cause deficiencies in available capacity of public infrastructure and utilities. Therefore, there would not be significant negative cumulative effects on existing public infrastructure and utilities.

5.4.21 Social Services and Community Facilities

Significant cumulative effects on social services and community facilities could occur if combined actions cause deficiencies in available social services and community facilities. As described in Section 3.10 of Appendix H, the No Action Alternative or any of the alternatives would not result in adverse impacts to social services, including healthcare, education, and fire and police protection. The expected development on private lands at Carlton Landing under the No Action Alternative and Alternatives 1, 2, and 3 would be served by the existing school, police, and fire districts. The expected full build-out of Carlton Landing under the Preferred Alternative and Alternative 4 would include formation of a volunteer fire department, construction and operation of a K-12 school, and a private security staff; therefore, the Preferred Alternative and Alternative 4 would not significantly impact social services and community facilities.

No other projects have been identified that could cause deficiencies in available capacity of social services and community facilities. Therefore, there would not be significant negative cumulative effects on existing social services and community facilities.

5.4.22 Environmental Justice

Significant cumulative effects related to environmental justice could occur if combined actions cause a "disproportionately high and adverse" effect on a minority or low-income populations. As described in Section 3.11 of Appendix H, the No Action Alternative or any of the alternatives would not result in adverse impacts related to environmental justice. The projected increases in new residential development encouraged by changes in shoreline allocations and new dock construction, including the proposed Carlton Landing development would not result in the removal or relocation of existing homes including those of minority or low-income populations; therefore, there would be no adverse impacts related to environmental justice.

No other activities or projects have been identified that would cause a disproportionately high and adverse effect on a minority or low-income population. As a result, there would be no significant negative

cumulative effects related to environmental justice from the combination of any of the alternatives with other reasonably foreseeable projects.

Chapter 6

Summary of Mitigation Measures and Conclusions

6.1 Overview

This chapter provides a summary of the anticipated direct and indirect impacts associated with each alternative, the relative significance of those impacts, and proposed mitigation measures for each resource topic. Potential indirect impacts resulting from development that is “attracted” to areas adjacent to Limited Development shoreline allocations are largely outside the control of the USACE; therefore, mitigation is generally not feasible for those impacts. Instead, the focus of the mitigation measures proposed in this section is on mitigation measures that USACE can implement, which would be those primarily within the government-owned lands.

Mitigation (40 CFR 1508.20) includes:

- (a) avoiding an impact by not taking a certain action or parts of an action;
- (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
- (e) compensating for the impact by replacing or providing substitute resources or environments.

The detailed discussion of environmental consequences is presented in Chapter 4.0 and the conclusions are summarized in this chapter.

6.2 Vegetation, Wetlands, and Aquatic Habitats

The alternatives having the greatest potential for significant adverse direct and indirect impacts on vegetation, wetlands, and aquatic habitats are Alternatives 3 and 4. The No Action Alternative is not likely to result in significant impacts that cannot be avoided or mitigated. Of all the alternatives, Alternative 1 has the least potential to result in significant direct or indirect impacts, followed by Alternative 2. The Preferred Alternative would be similar to the No Action Alternative in terms of the overall scope of the potential for development, but it would include the protection of 45-foot vegetated buffers and approval of the Carlton Landing proposed shoreline developments similar to Alternative 4.

To mitigate for potential impacts of human disturbance on terrestrial and aquatic habitats and the natural resources that reside therein, USACE would implement a number of BMPs during construction that would be included as conditions of shoreline permit approvals. The focus on these BMPs would be on controlling sedimentation and erosion from construction on the shoreline, managing dock construction activities and materials, and minimizing impacts to and restoring wetlands.

6.3 Fish and Wildlife

Similar to impacts on vegetation, wetlands, and aquatic habitat, the alternatives having the greatest potential for significant adverse direct and indirect impacts on fish and wildlife are Alternatives 3 and 4. The No Action Alternative is not likely to result in significant impacts. Of all the alternatives, Alternative 1 has the least potential to result in significant direct or indirect impacts, followed by Alternative 2. The Preferred Alternative would be similar to the No Action Alternative in terms of the overall scope of the potential for development, but it would include the protection of 45-foot vegetated buffers and approval of the Carlton Landing proposed shoreline developments similar to Alternative 4.

The mitigation measures recommended to address impacts on vegetation, wetlands, and aquatic habitats would also provide mitigation for potential impacts to fish and wildlife. In addition, additional measures related to vegetation modification, protected species, and removal of standing timber from within the lake (Sections 4.2.9.1; 4.2.9.2; and 4.2.9.3) would be implemented.

Specific mitigation measures for protection of fish habitat increase the likelihood that the removal of existing standing timber will not adversely affect riparian, shoreline, and aquatic habitats and will not adversely impact Eufaula Lake's fisheries.

- Selective timber removal – creation of access lanes in Areas B, K, D, and E
- Use barge-based tree removal operations rather than land-based operations
- Establish speed and wake limits to protect remaining standing timber and other aquatic habitat structures
- Plant native aquatic vegetation along the shoreline
- Install shallow water nest boxes and nest platforms for birds
- Install natural or artificial submerged aquatic habitat structures for fish

With respect to impacts on the American burying beetle, the Section 7 consultation process with USFWS has generated terms and conditions that would be implemented to address potential effects on the beetle and its habitat. USACE would classify approximately 135 acres of Low Density Recreation area to Environmentally Sensitive Area under the revised MP. This classification would protect this area for American burying beetle habitat. A detailed explanation of the Section 7 ESA consultation process is located in Section 7.4.3.

6.4 Water Quality

Direct and indirect impacts on water quality may originate from nonpoint source pollution associated with activity along the lake shoreline, development activities, and existing nonpoint source pollution. These potential impacts would be significant under the Preferred Alternative and Alternatives 3 and 4 and insignificant under Alternatives 1 and 2. Alternative 4 would have the greatest potential to have significant negative direct and indirect impacts on water quality.

A wide range of mitigation measures is available to address potential water quality impacts. If Alternative 1, 2, or 3 is selected, USACE would consider implementation of more stringent no-wake zones and speed limit zones to minimize shoreline erosion resulting from boating activities. Approval of the Preferred

Alternative 1 or Alternative 4 would include implementation of mitigation measures to address equestrian and boating activities as well as stormwater BMPs to mitigate construction impacts. EPA has an extensive database of BMPs which can serve as a valuable resource during consideration and selection of mitigation measures.

6.5 Geology, Soils, and Mineral Resources

Direct and indirect impacts on geology, soils, and mineral resources would be less than significant under Alternative 1. Dock construction would likely have a significant direct impact to soils along the shoreline, resulting in erosion under the No Action and Preferred Alternatives and Alternatives 2, 3, and 4, which would require mitigation. Residential development on adjacent private lands would potentially result in soil erosion that could impact the lake, but the vegetation management buffers under the action alternatives would prevent this effect from becoming adverse.

Appropriate erosion and sediment control techniques, such as silt fences and sediment retention ponds, would be required during construction, including development at Carlton Landing, to reduce impacts from soil erosion to a less than significant level. Development along the shoreline, including construction of a marina, would require a lease or license from USACE, and may also require permits under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Mitigation measures to reduce soil erosion would be specified in these permits and required during construction. With implementation of mitigation to reduce soil erosion, direct impacts from construction would be reduced to a less than significant level.

While USACE does not have jurisdiction over construction of residential developments on adjacent private land, it is reasonable to expect that local jurisdictions would require the use of appropriate erosion control measures such as sediment retention ponds during construction. Permits issued by local jurisdictions for residential development on private lands, including development at Carlton Landing, would reduce potential indirect impacts from soil erosion.

In accordance with the existing SMP, all improved pathways providing access across government lands would require a Shoreline Use Permit and would follow a route as to avoid steep slopes that may increase erosion. Compliance with this process would reduce potential impacts from increased use of footpaths along the shoreline to a less than significant level.

6.6 Aesthetics and Visual Resources

The Visual Impact Analysis (VIA) values summarize the relative visual impacts of each of the alternatives.

The VIA value for Alternative 1 represents an improvement in the overall visual quality of Eufaula Lake as compared to the No Action Alternative. The VIA value for Alternative 2 represents a small improvement in the overall visual quality of Eufaula Lake as compared to the No Action Alternative. The VIA value for Alternative 3 represents a decrease in the overall visual quality while the VIA for Alternative 4 represents the greatest decrease as compared to the No Action Alternative. The Preferred Alternative represents the smallest decrease as compared to the No Action Alternative, particularly in the vicinity of the proposed Carlton Landing shoreline developments.

Indirect visual impacts from induced development in adjacent areas would be the least for Alternative 1 and the greatest under Alternative 4 due to the increase in development in areas adjacent to government-

owned lands surrounding the lake. The indirect visual impacts from the Preferred Alternative would be nearly the same as those of the No Action Alternative.

USACE can only control aspects of land use that occur on government-owned property. However, considerable mitigation of visual and aesthetic impacts could be accomplished by focusing on higher-intensity land uses.

The aesthetic impact of additional docks under any of the alternatives could be reduced by the following measures:

- Limit the number of slips per dock
- Prohibit permit holders from selling slips to anyone other than a purchaser of the permit holder's adjacent property
- Prohibit or limit the size of dock roofs
- Limit acceptable colors for dock roofs to ones that may be less visually intrusive.

The negative aesthetic impact of marinas on the lake and adjacent shorelines could be reduced by the following measures:

- Prohibit the accumulation of miscellaneous materials and/or junk piles
- Prohibit driving on unimproved surfaces
- Prohibit the storage of boats and trailers on unimproved surfaces
- Plant vegetation to screen upland marina areas from the lake
- Prohibit mowing of land not used for marina amenities
- Require dock floats to be encased in plastic as they are repaired or replaced
- Prohibit the use of tires or other waste materials as breakwaters
- Require the removal of litter from adjacent shoreline and wetland areas

The aesthetic impact of heavily used recreation areas on the lake, adjacent shorelines, and other spaces within recreational areas could be reduced by the following measures:

- Prohibit driving on unimproved surfaces
- Strategic screening of play areas, restrooms, dumpsters, and other facilities with vegetation from adjacent areas with less compatible uses, such as nature trails and fishing areas.

6.7 Cultural and Historic Resources

The potential for direct impacts on cultural and historic resources exists under all alternatives due to dock construction. A Phase I archeological survey was conducted at the Carlton Landing shoreline areas and one NHRP-eligible sites was found. This site would be excluded from the lease proposed under the Preferred

Alternative and Alternative 4; therefore, there would be no potential impact from the development of a marina or other shoreline recreational facilities. Potential effects could occur on private lands inland from the lake where there may be unknown sites. Potential impacts to cultural and historic resources would be the most significant under Alternative 4 due to the amount of anticipated additional residential development on private uplands adjacent to government-owned lands and the expected full build out of Carlton Landing.

For new activities requiring USACE permits, USACE would check for known sites prior to issuing new permits for shoreline activities, such as docks, access paths, and vegetation management, to avoid affecting known eligible cultural resource sites. USACE would also conduct site reviews to ensure that significant unknown cultural resource sites are not affected without proper consultation for activities occurring on government lands. Inadvertent discoveries may still occur, and in the case of an inadvertent discovery the USACE Historic Properties Management Plan procedures would be implemented.

6.8 Recreation

Potential impacts on both land-based and water-based recreation would be considerable over time under the No Action and Preferred Alternatives and Alternatives 2, 3, and 4. Alternative 1 would have minimal potential direct or indirect impacts on land-based and water-based recreation and would not exceed the carrying capacity of the lake.

Once the carrying capacity of the lake is exceeded the following mitigation measures would be implemented:

- **Restricting the number of boats:** This mitigation measure would be accomplished by limiting access to the water surface, by restricting the number of boat docks, marina slips and car/trailer spaces at boat ramp parking lots. Public access points could be closed. This mitigation may be difficult to implement given the large number of private docks around the lake.
- **Zoning for certain activities:** Activity specific zoning may reduce conflicts between various types of users and reduce the potential for accidents. Zones might include:
 - Swim Zones: These are established at designated swimming beaches by sectioning off an area with floating buoys.
 - Water skiing and other activity area zones: Whether marked by buoys or indicated on a map, these zones may be used for safety purposes and to reduce activity conflicts.
 - Pass through zones: May be established along narrow waterway segments, especially those near waterfront developments, “pass through” zones and regulations can help move boat traffic more safely and reduce conflicts between recreational water activity and adjacent development. The zone serves solely as a transportation channel, prohibiting recreational activities.
 - Time or day zoning: For areas where certain water activities bring high traffic density or space limitations, especially on particular days or at particular times of the day, this type of zoning is used to help reduce conflict and competition for space. For example, on weekends, water skiing and high-speed traffic could be prohibited in coves or other areas.

- “No Wake” Zones: This is probably the most used type of zoning and is typically applied within 100 to 300 feet of shorelines or moored vessels, fixed objects, swimmers, anglers, or water skiers.
- **Restrictions on certain types of watercraft:** This type of mitigation initiative would most likely be implemented on a time schedule basis, such as on weekends. Also, certain types of watercraft could be allowed only in certain areas of the lake, prohibited within coves, or within 100 feet of other watercraft, docks, or the shoreline.

6.9 Noise

None of the alternatives would result in significant direct impacts related to noise in the area of analysis. Indirect impacts could result from increased development and recreational activities under each alternative. The most significant indirect impacts would be associated with Alternative 4; the least would be associated with Alternative 1. The Preferred Alternative would be similar to the No Action Alternative except with the potentially mitigating effect of the shoreline vegetation buffers.

Implementation of vegetation management buffers could mitigate (decrease) noise impacts on USACE shorelines.

6.10 Transportation

No potential impacts on transportation would occur under the No Action Alternative or Alternatives 1, 2, or 3. Under the Preferred Alternative and Alternative 4, the residential development at Carlton Landing would likely require roadway improvements on Highway 9A.

To mitigate indirect impacts on roadway conditions, local roadway improvements would be required. To mitigate impacts associated with development of Carlton Landing, transportation infrastructure improvements would be required. These infrastructure improvements would likely be needed as the residential community at Carlton Landing approaches full build out in 25 to 30 years and would not be located on USACE-owned land. Any necessary transportation improvements would be conducted by the Oklahoma Department of Transportation and/or Pittsburg County.

6.11 Public Lands and Access

Under Alternative 1, the minimal increase in new private docks may limit access to lake through dispersed recreation access points and result in potential overcrowding at public access points. Under Alternative 4 the capacity of some land-based recreation facilities, such as picnic facilities would be exceeded. Other alternatives would not have an effect on public lands and access.

Mitigation measures might include the construction of new facilities or the restriction of boating access, such as described in Section 6.8. However, capacity would not be exceeded for over 20 years.

6.12 Resource Categories without Significant Impacts

The following resource categories would not result in significant effects and would not require mitigation. A detailed analysis of each of these categories is found in Appendix H, except for Socioeconomics and Demographics, which is described in Chapter 4.0.

6.12.1 Agricultural Lands

None of the alternatives, including the No Action Alternative, would result in direct impacts on lands leased for agricultural uses on USACE-owned lands. However, there is the potential for indirect effects to farmlands around the lake as a result of changes in shoreline allocations and changes in the amount of new residential development adjacent to the lake. These indirect effects would be less than significant.

No mitigation measures would be required because there would be no significant impacts to agricultural lands under any of the alternatives.

6.12.2 Air Quality

There would be no direct or indirect impacts on air quality under the No Action and Preferred Alternatives and Alternatives 1 and 2. Alternatives 3 and 4 would result in no direct impacts and minor indirect impacts as a result of the increase in amount of Limited Development area, which leads to more dock construction, boat operation, and development of new residential areas on adjacent private lands.

Although air quality impacts are considered unlikely, there are several BMPs that would be applied to construction projects proposed on USACE lands when large areas are disturbed, storage piles are created, or heavy equipment is used. These measures might be most likely to be applied to shoreline construction activities associated with the development of recreational facilities at Carlton Landing. These BMPs include:

- Fugitive Dust Source Controls:
 - Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions;
 - Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
 - Prevent spillage when hauling material and operating non-earthmoving equipment and limit speed to 15 miles per hour. Limit speed of earthmoving equipment to 10 mph.
- Mobile and Stationary Source Controls:
 - Plan construction scheduling to minimize vehicle trips;
 - Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections; and
 - Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed.

No other mitigation would be required for any alternative.

6.12.3 Climate Change and Greenhouse Gas Emissions

No direct GHG emissions from changes to shoreline designation would occur; however, indirect GHG emissions from construction, development, and recreational activities allowed as a result of those changes would vary for each alternative. Under the No Action and Preferred Alternatives and Alternatives 1 and 2, there would be no direct or indirect impacts. Alternatives 3 and 4 would have no direct and minor indirect impacts to climate change and GHG emissions.

The BMPs proposed for construction activities under air quality would also reduce greenhouse gas emissions. No other mitigation would be required for any alternative.

6.12.4 Water Supply, Flood Storage, and Operation

There would be no significant direct or indirect impacts on water supply, flood storage or operation of Eufaula Lake under any of the alternatives. Therefore, no mitigation would be required.

6.12.5 Hazardous Materials

Direct and indirect impacts related to hazardous materials would be less than significant for No Action and Alternatives 1, 2, and 3. Under the Preferred Alternative and Alternative 4, there is a potential for adverse direct impacts related to hazardous material releases during construction of boat docks and the proposed marina. Similarly, there is an increased potential for spills or leaks from boat engines under Alternative 4, an indirect impact due to increased recreational use of the lake.

Appropriate pollution control techniques would be required during construction, including development at Carlton Landing, to reduce potential impacts from the accidental release of hazardous materials associated with construction equipment (*e.g.*, fuels and oils) to a less than significant level. Development along the shoreline, including construction of a marina, may require a permit from the USACE under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act, which would include requirements to prevent hazardous materials releases to Eufaula Lake. With implementation of these mitigation measures, potential impacts from construction would be reduced to a less than significant level.

6.12.6 Navigation

None of the alternatives would have significant direct or indirect impacts related to the ability of USACE to maintain navigation aids. (Note, however, that USACE's ability to maintain additional navigational aids is contingent upon budgetary and manpower constraints.) Therefore, no mitigation would be required.

6.12.7 Energy

None of the alternatives would have significant direct or indirect impacts on energy resources. Therefore, no mitigation would be required.

6.12.8 Land Use Compatibility

There would be no conflicts with local land use planning under any of the alternatives. Therefore, no mitigation would be required.

6.12.9 Public Infrastructure and Utilities

The Preferred Alternative and Alternative 4 are the only alternatives that would potentially result in significant direct impacts on public infrastructure and utilities (due to the expected development on

adjacent private lands at Carlton Landing). None of the alternatives would have significant indirect impacts.

Carlton Landing, as developed under the Preferred Alternative and Alternative 4, would likely increase traffic within and around the proposed neighborhood. Any necessary improvements to Highway 9A would need to be developed by the developer, the county, and ODOT if the traffic generated by the residents of Carlton Landing reach thresholds that impact level of service and safety at the entrance of the development. In addition, the developers would need to determine a means to meet the community's sanitary sewer needs beyond the first five years that would not require discharges onto USACE lands. The developers should also ensure that the receiving landfill can handle the capacity of residents' and businesses' solid waste over the long-term. The implementation of these measures would alleviate potential adverse impacts to the study area.

6.12.10 Social Services and Community Facilities

None of the alternatives would result in significant direct or indirect impacts on social services and community facilities. Therefore, no mitigation would be required.

6.12.11 Socioeconomics and Demographics

None of the alternatives would result in significant direct or indirect impacts related to socioeconomics and demographics. Therefore, no mitigation would be required.

6.12.12 Environmental Justice

None of the alternatives would result in significant direct or indirect impacts on environmental justice populations. Therefore, no mitigation would be required.

Chapter 7

Public Involvement, Consultation and Coordination

7.1 Overview

The NEPA process requires public disclosure of a proposed project's impacts and a federal agency's justification for selection of a preferred project alternative. Substantial efforts have been made, and are planned in the future, to inform and obtain input from the public, local community, and state and federal agencies, regarding the alternatives and potential impacts associated with a revision of the SMP and supplement to the MP for Eufaula Lake.

This chapter summarized the public involvement, consultation and coordination activities to date, as well as the upcoming planned process and activities. Additional information is found in Appendix A.

7.2 Notice of Intent to Prepare an EIS

In accordance with 40 CFR 1501.7, the USACE Tulsa District filed a Notice of Intent (NOI) to prepare an EIS with EPA, which was published in the *Federal Register* (Volume 76, No. 79; April 25, 2011). A copy of the NOI is provided in Appendix A. The NOI summarized the proposed action and purpose of the EIS, provided contact information, and announced the planned public involvement activities, including a public scoping meeting, and comment periods to be held on the draft and final EISs. Affected federal, state and local agencies, affected Indian Tribes, and other interested private organizations and parties were encouraged to participate in the scoping process, as described further below.

7.3 Scoping

The Tulsa District conducted scoping for this federal action in compliance with NEPA and CEQ guidelines. The process of determining the scope, focus, and content of an EIS is known as "scoping." The scoping meeting is an opportunity to obtain information from the public and governmental agencies. In particular, the scoping process asks agencies and interested parties to provide input on potential alternatives, the proposed topics of evaluation, and potential impacts and mitigation measures to be considered.

Prior to the scoping meeting for this project, held on 2 June 2011 at the Middle School Gymnasium in Eufaula, the Tulsa District placed paid advertisements announcing the meeting date, location, and purpose in the *McAlester News-Capital* in McAlester, Oklahoma, and in the *Eufaula Indian Journal* in Eufaula, Oklahoma.

The Tulsa District prepared a Scoping Summary Report, included in Appendix A, which describes the meeting attendees and comments. A total of 99 people signed in and four comments were received at the meeting. An additional 36 comment letters or cards were received during the public comment period from concerned citizens, interest groups, partner agencies, other government agencies, and businesses. These comments were considered in determining the scope of this EIS.

During scoping for the EIS, the Tulsa District solicited specific proposals for new developments on federal lands at Eufaula Lake. One development proposal (Carlton Landing) was received that would require a reallocation of shoreline, a reclassification of government lands, and a grant of a lease to use government

property. Ten other requests for specific zoning under the SMP revision were also received during scoping. Another three zoning requests were added during the comment period on the Draft EIS. This EIS evaluates the project specific environmental effects of the Carlton Landing development proposal and the associated requested lease of government property as well as the other zoning requests received both during scoping and during the comment period on the Draft EIS.

The following major issues were identified during scoping and are evaluated in this EIS:

- Public Lands and Access Considerations
- Socioeconomic Impacts
- Fish and Wildlife Considerations
- Federally Listed Endangered Species
- Water Quality Concerns
- Aesthetics: Visual/Scenic Considerations
- Handicap Accessibility
- Cumulative Effect Analysis

7.4 Consultation and Coordination

7.4.1 Overview

In accordance with 40 CFR 1501.6, the Tulsa District sent coordination and cooperating agency request letters to appropriate agencies. "Cooperating agency" means any federal or state agency, other than a lead agency, which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (40 CFR 1508.5). Invitations to participate as a cooperating agency were sent to the following agencies:

- EPA
- USFWS
- Bureau of Land Management
- Oklahoma Department of Environmental Quality
- Oklahoma Department of Wildlife Conservation
- Oklahoma Tourism and Recreation Department
- Oklahoma Water Resources Board

Copies of these letters are included in the Scoping Summary Report (Appendix A).

EPA is the only agency that accepted the invitation to become a cooperating agency for this EIS. EPA will review preliminary drafts of the document and provide special expertise on air and water quality effects and on NEPA documentation.

7.4.2 Section 106 Consultation

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) requires federal agencies to take into account the effects of their undertakings on historic properties. In addition, federal agencies are required to consult with tribal governments before taking actions that may affect them. A NEPA decision cannot be issued without agreement on the resolution of negative impacts; therefore

consultation is typically part of the NEPA process. Coordination letters to initiate Section 106 consultation were sent to appropriate Native American tribes, the State Historic Preservation Officer (SHPO), and the Oklahoma Archeological Survey (OAS). Copies of these letters are also included in the Scoping Summary Report in Appendix A. The agencies and tribes that received letters include:

- Oklahoma Archeological Survey
- SHPO, Oklahoma Historical Society
- Wichita and Affiliated Tribes of Oklahoma
- Thlopthlocco Tribal Town, Oklahoma
- Seminole Nation of Oklahoma
- Quapaw Tribe of Indians, Oklahoma
- Osage Nation, Oklahoma
- Muscogee (Creek) Nation, Oklahoma
- Kialegee Tribal Town, Oklahoma
- Choctaw Nation of Oklahoma
- Chickasaw Nation, Oklahoma
- Caddo Indian Tribe of Oklahoma
- Alabama - Quassarte Tribal Town, Oklahoma
- Cherokee Nation, Oklahoma
- Kialegee Tribal Town, Oklahoma
- United Keetoowah Band of Cherokee Indians in Oklahoma

The Osage Nation and the Choctaw Nation of Oklahoma responded to this outreach. The Osage Nation commented on the Draft EIS and concurred that there would be no effect on properties of cultural or sacred significance to the Osage Nation. After a special consultation on an issue of cultural significance to the Choctaw Nation, they also agreed that the Preferred Alternative would have no effect on cultural resources significant to the Choctaw Nation of Oklahoma.

7.4.3 Endangered Species Act Consultation

The Endangered Species Act (ESA) has substantive mandates that require that federal actions not jeopardize protected species. Section 7 of the ESA defines a study and consultation process to determine whether a proposed federal action would adversely affect protected species and to identify alternatives and mitigation that would avoid a jeopardy situation. A biological assessment (BA) prepared as part of the consultation process is a separate legally required ESA document, but it is often prepared in coordination with the NEPA process and may be incorporated into the NEPA document.

The Tulsa District consulted with the USFWS regarding the presence of and potential impacts to federally-listed fish and wildlife species in the Eufaula Lake region. The Tulsa and Little Rock Districts have been engaged in a consultation with USFWS regarding activities related to USACE and Southwestern Power Administration activities on the Arkansas, Canadian, and Red Rivers in Oklahoma and Arkansas. USACE submitted a BA to USFWS on 14 February 2012 on those activities. When this project to revise the SMP and supplement the MP identified potential impacts to listed species at Eufaula Lake, the Tulsa District submitted supplemental information specific to this action for consideration at the same time as the other

actions in the Little Rock and Tulsa Districts. Combining consultation on the effects of the Eufaula Lake SMP revision with the ongoing consultation was determined to be appropriate because Eufaula Lake is located within the area encompassed by the larger consultation and the species and types of activities are similar.

In a letter dated 14 August 2012, the Tulsa District requested inclusion of supplemental information regarding the SMP revision, MP update, and specific development proposal at Carlton Landing for USFWS to consider in rendering a Biological Opinion (BO) on the BA. As noted in that letter, federally-listed species for Pittsburgh County, Oklahoma, include the interior least tern, piping plover, Ouachita rock pocketbook (*Arkansia wheeleri*), Arkansas River shiner, and American burying beetle. As described in Section 3.2, only the interior least tern, Arkansas River shiner, and American burying beetle occur within the Eufaula Lake study area. The other species mentioned in the letter are pertinent to the larger consultation effort. Habitat and life history requirements for the interior least tern, and Arkansas River shiner preclude effects to these species from development on the Eufaula lake shoreline. Therefore, the Tulsa District determined that proposed activities would have “no effect” on these species.

On the other hand, the Eufaula Lake study area provides suitable foraging and reproductive habitat for the American burying beetle. Therefore, the Tulsa District concluded that a potential lease and associated construction activities “may adversely affect” the American burying beetle in the Roundtree Landing area at Eufaula Lake. USACE conservatively estimates that 75 acres of habitat could be potentially disturbed by vegetation alteration and soil-disturbing activities. In addition, existing intact habitat may be fragmented or otherwise affected by development and recreational activities, potentially affecting the American burying beetle. As a result of the “*may adversely affect*” determination, the Tulsa District initiated formal consultation under Section 7 of the ESA and requested that the information contained in their 14 August 2012 letter be included in the USFWS BO.

At the time of this Final EIS, USFWS has prepared a draft BO and USACE has reviewed it. As an offsetting measure for potential impacts to American burying beetle, USACE is proposing to allocate approximately 135 acres of area formerly classified as Low Density Recreation under the MP to Environmentally Sensitive Area under the revised MP. This classification would protect this area for American burying beetle habitat. USACE and USFWS do not anticipate any changes in either the project description or the conditions of the BO with respect to the beetle prior to the ROD (USFWS 2013). The consultation with USFWS will conclude with the issuance of the final Biological Opinion (BO) prior to the issuance of the ROD.

7.5 Public Involvement, Consultation, and Coordination Activities

As required by NEPA, the Draft EIS was made available for review by the public, tribes, and agencies. Notice of availability of the Draft EIS was published in the *Federal Register* on December 7, 2012 and copies of the Draft EIS were mailed to the distribution list on November 28 and 29, 2012, which included almost 200 agency staff and individuals. In addition, a postcard notice of availability was mailed to the approximately 2,280 shoreline permit holders. The complete Draft EIS including all of the appendices was posted on the Tulsa District’s website at www.swt.usace.army.mil and hardcopies were available at local libraries around the lake and at both the District Office in Tulsa and at the project office at the Lake.

The public comment period was 46 days long and closed on January 22, 2013. A public workshop was held on December 19, 2012 to allow the public to ask questions of USACE staff and to make written and verbal

comments about potential alternatives and potential impacts. The workshop was advertised in the following papers on the dates shown:

- Tulsa World – December 5, 2012
- The Oklahoman – December 5, 2012
- The Muskogee Phoenix – December 6, 2012
- Eufaula Indian Journal – December 6, 2012
- McIntosh County Democrat – December 6, 2012
- Stigler News Sentinel – December 6, 2012
- Country Star – December 6, 2012
- McAlester News Sentinel – December 7, 2012

A court reporter was present at the public workshop to take comments from those wishing to provide verbal comments. Comment cards were available at the workshop for those who wished to submit written comments. The comment cards were designed to be easily folded for mailing to the USACE address provided on the back. Many people also took blank comment cards away from the meeting and returned them via mail and fax during the comment period.

Two hundred and three people signed in at the public meeting. Eleven people spoke to a court reporter and 15 people submitted written comments at the meeting. Another approximately 118 written comment letters and emails were received during the public comment period. Seven comment letters were received from agencies, elected officials, and tribes.

The comments received during the review and comment period were considered and appropriate changes have been made to the document in the preparation of this Final EIS. Two additional specific zoning requests were received during the public scoping and one respondent identified a specific zoning request that had been mistakenly overlooked in the Draft EIS. These specific zoning requests have been included in the analysis presented in the Final EIS.

The Final EIS includes a Preferred Alternative that includes slightly less shoreline designated as Limited Development than the No Action Alternative and would approve the grant of a lease for a marina and public shoreline recreational developments. Each of the specific zoning requests is also addressed in the Preferred Alternative as described in Section 2.4.3.

Once the Final EIS is reviewed and approved by the USACE, it will be distributed to appropriate agencies, non-governmental entities, individuals, and organizations for review. A final decision on the preferred alternative described in the Final EIS will not be made until at least 30 days after the Final EIS is made available for review. The final decision is documented in the Record of Decision (ROD). The ROD will be published in the *Federal Register* indicating that USACE is making a decision on the proposed action.

The ROD is a written public record explaining why the lead agency, in this case USACE, is taking the proposed action. The ROD must include:

- The explanation of the decision on the proposed action
- Factors involved in making the decision
- Alternatives considered and the environmentally preferred alternative
- Adopted mitigation measures, if necessary, and monitoring and enforcement measures.

Chapter 8

List of Preparers

This chapter provides a list of those persons responsible for preparation of the EIS.

USACE

Name	Responsibilities	Education	Experience
Dunkin, Stacy, CWB	Technical Review	B.S. Biology, Fisheries, and Wildlife Management M.S., Natural Resource Ecology and Management	8 years
Gade, David	Water Quality	B.S., Biology M.S., Environmental Science Ph.D., Environmental Science	12 years
Johnson, Steven	Natural Resources and Recreation Reviewer	B.S., Biology	16 years
Knack, Jeff	Operations Project Management; Reviewer	B.S., Fisheries	21 years
Newell, Patricia	District Quality Control	M.S. Candidate, Environmental Biology and Public Policy Masters Certificate: Landscape Designer Masters Certificate: Urban Planner B.S., Botany and Horticulture	38 years
Nolen, Stephen	EIS Oversight, Reviewer	M.S., Zoology M.S. Environmental Engineering B.S., Zoology (Ecology)	27 years
Prestien, Sarah	GIS, Data Management	A.A.S. CAD-GIS/GPS	10 years
Roberts, Dean	Technical Review	B.S., Fisheries and Wildlife Management	22 years

Name	Responsibilities	Education	Experience
Shingleton, Ken	Cultural Resources, Technical Review	B.S., Business Administration M.A., Anthropology	20 years
Schrodt, Charles	Technical Review	B.S., Wildlife Ecology	33 years
Tennery, John	Shoreline Management, Recreation	B.S., Zoology (Wildlife Management)	34 years

EIS Consultant Team

Name/Firm	Responsibilities	Education	Experience
Ball, Robert CDM Smith	Cultural Resources	M.H.P., Historic Preservation B.A., Anthropology - Archaeology	18 years
Belvin, Michael CDM Smith	Socioeconomics	B.S., Agriculture	20 years
Beverly, Howard CDM Smith	Cultural Resources	M.A., Anthropology M.A.A., Applied Anthropology B.A., Anthropology,	17 years
Brown, Brendan CDM Smith	Visual	M.S., Biological Science B.S., Forest Environmental	7 years
Burbage, Laura CDM Smith	Visual	M.L.A., Landscape Architecture M.S., Ecology B.A., Biological Sciences	11 years
Clem, Andrew CDM Smith	GIS Analysis	M.S., Leadership B.S., Forestry	7 years
Dalrymple, Mark CDM Smith	Vegetation Change Analysis	M.A., Geography B.A. Anthropology GIS/Remote Sensing Certificate	7 years
Daugherty, Dona CDM Smith	Cultural Resources Fieldwork	B.A., Anthropology	10 years
Hadley, Karen CDM Smith	Socioeconomics	B.A., Environmental Studies and, Geography	13 years

Name/Firm	Responsibilities	Education	Experience
Hardison, Tanya CDM Smith	GIS Analysis	M.S., Geography M.S., Biology B.S., Geography	13 years (GIS)
Hughes, Jamie CDM Smith	GIS Analysis	B.S., Geography	5 years
Jablon, Rebecca CDM Smith	Socioeconomics; Infrastructure; Social Services and Community Facilities; Environmental Justice	M.C.R.P., City and Regional Planning B.A., Urban Studies	9 years
Jones, Jennifer CDM Smith	Hazardous Materials; Geology, Soils, Mineral Resources; Water Supply, Flood Storage, and Operations; Navigation; Public Lands and Access	M.S., Environmental Science B.A., Biology	17 years
Kennedy, Phil CDM Smith	Visual	M.U.A., Environmental and Resource Planning B.A., Geography	36 years
Keshlear, Brad Recreation Consultant	Recreation	B.S., Parks and Recreation Administration	35 years
Kleyman, Ali CDM Smith	Agriculture; Noise; Transportation; Energy	M.A., Urban and Environmental Policy and Planning B.A., Biology	5 years
Litwin, Laurie CDM Smith	General NEPA Document Preparation	M.S., Environmental Studies B.S., Political Science/Environmental Studies	13 years
Lowe, Phil CDM Smith	Project Manager	M.A., Watershed Management B.A., Wildlife Management	33 years
McAuley, Erin CDM Smith	Water Quality	M.S., Geography/Water Resources B.S., Geography – Environmental Studies	2 years

Name/Firm	Responsibilities	Education	Experience
McBride, David CDM Smith	Cultural Resources Labwork	M.A., Anthropology M.S., Mass Communications B.A., Anthropology	25 years
Orrel, Alysia CDM Smith	Visual	Certificate of Professional Studies - Graphic Design B.A., Art History and Painting	12 years
Pelletier, Gwen CDM Smith	Quality Reviewer – Air and Climate Change	M.S., Environmental Studies B.S., Biochemistry	11 years
Peters, Melissa, AICP CDM Smith	Air Quality; Climate Change and Greenhouse Gas; Cumulative Impacts; Land Use Compatibility	M.A., Urban and Environmental Policy and Planning, B.A., Politics/Environment and Development Policy	5 years
Petty, Matt CDM Smith	Natural Resources	B.A. Environmental Science B.A. Zoology	6 Years
Peterson, Tina CDM Smith	Water Quality	Ph.D., Environmental Engineering, University of Houston M.S., Environmental Engineering B.S., Biology and Environmental Studies	12 years
Porter, Clint Blackbird Environmental	American Burying Beetle	M.E.S., Master of Environmental Science B.S., Zoology	10 years
Rankin, Chris	Cultural Resources Fieldwork	CREDIT - Anthropology	22 years
Sandefur, Tracey CDM Smith	Cultural Resources Labwork	B.S., Anthropology	24 years
Schwartz, Larry CDM Smith	Quality Reviewer	Ph.D., Environmental Engineering Sciences M.A., Biology B.S., Natural Resources	28 years

Name/Firm	Responsibilities	Education	Experience
Simmons, Kelly CDM Smith	General NEPA Document Preparation	M.S. Marine Biology B.S. Biology	17 years
Sousa, David, ASLA, AICP CDM Smith	Visual	B.S. Environmental Design	33 years
Stenberg, Kate CDM Smith	NEPA Documentation and	Ph.D., Wildlife Science/Regional Planning M.Admin., Environmental Administration B.A., Biology – Environmental Studies	30 years
Sutton, Mackenzie CDM Smith	Cultural Resources Fieldwork	B.S., Anthropology	4 years
Wheeler, Jane CDM Smith	Natural Resources; General NEPA Document Preparation	M.S., Environmental Management – Water Resources Focus B.A., Botany	29 years
Wondolleck, John CDM Smith	Reviewer	M.S., Zoology B.S., Biology	38 years

Chapter 9

Distribution List

Agency and elected officials noted with an “*” were added to the distribution list for the Final EIS as they commented on the Draft EIS.

Elected Officials:

Honorable Mary Fallin, Governor of Oklahoma

Honorable Tom Coburn, U. S. Senator

Honorable James M Inhofe, U. S. Senator

Honorable Markwayne Mullin, U.S. Representative *

Honorable Dan Boren, U.S. Representative (*Scoping and DEIS only*)

Senator Roger Ballenger, State Senate

Senator Earl Garrison, State Senate

Senator Richard C. Lerblance, State Senate

Representative Ed Cannaday, Oklahoma State Representative

Representative Donnie Condit, State Representative

Representative Brian Renegar, State Representative

Todd Lamb, Lieutenant Governor, State of Oklahoma *

Mr. Bob James, Commissioner, McIntosh County District 1

Mr. Tim Pindley, Commissioner, McIntosh County District 2

Mr. Michael Burns, Commissioner, McIntosh County District 3

Mr. Gene Rogers, Commissioner, Pittsburg County District 1

Mr. Kevin Smith, Commissioner, Pittsburg County District 2

Mr. Ronnie Young, Commissioner, Pittsburg County District 3

Federal Agencies

John M. Fowler, Executive Director, Advisory Council on Historic Preservation

Ms. Rae Swift, Bureau of Land Management, Oklahoma Field Office

Mr. Ronald L. Hilliard, State Conservationist, USDA, Natural Resources Conservation Service

Dr. Rebecca Blank, Acting Secretary and Deputy Secretary of Commerce, United States Department of Commerce

Cheryl Eckhardt, Environmental Compliance Specialist, United States Department of Interior, National Parks Service

Mr. Robert Anderson, Chief, Grants Division, United States Department of Interior, National Parks Service, Midwest Region

John Blevins, Director, Compliance Assurance and Enforcement Division, USEPA Region VI

Kevin Jaynes, Regional Environmental Officer, FEMA Region VI

Rhonda Smith, Chief, Office of Planning and Coordination, USEPA Region VI

Ron Curry, Region VI Administrator, U. S. Environmental Protection Agency

John MacFarlane, Office of Planning and Coordination, U. S. Environmental Protection Agency Region VI
 Dr. Dixie Porter, Field Supervisor, U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office
 Ms. Kim Winton, Director, Oklahoma Water Science Center, U.S. Geological Survey, South Central Area
 Mr. Brad Vickers, U.S. Department of Energy, Southwestern Power Administration *

Tribes:

Chief Tarpie Yargee, Alabama-Quassarte Tribal Town, Oklahoma
 Mr. Robert Cast, Tribal Historic Preservation Officer, Caddo Indian Tribe of Oklahoma
 Chairperson Brenda Shemayme Edwards, Caddo Nation, Oklahoma
 Principal Chief Bill John Baker, Cherokee Nation, Oklahoma
 Governor Bill Anoatubby, Chickasaw Nation, Oklahoma
 Mr. Terry Cole, Tribal Historic Preservation Officer, Choctaw Nation of Oklahoma
 Chief Gregory E. Pyle, Choctaw Nation, Oklahoma
 Mekko Tiger Hobia, Kialegee Tribal Town, Oklahoma
 Principal Chief A.D. Ellis, Muscogee (Creek) Nation, Oklahoma
 Mr. Ted Isham, Tribal Historic Preservation Officer, Muscogee (Creek) Nation, Oklahoma
 Principal Chief George Tiger, Muscogee (Creek) Nation, Oklahoma
 Principal Chief John Red Eagle, Osage Nation, Oklahoma
 Andrea Hunter, Ph. D., Osage Nation Tribal Historic Preservation Officer *
 Barker Fariss, Ph.D., Osage Nation Tribal Historic Preservation Office *
 Principle Chief Leonard Harjo, Seminole Nation of Oklahoma
 Emman Spain, Seminole Tribal Historic Office
 Mekko George Scott, Thlopthlocco Tribal Town, Oklahoma
 Dr. Andrea Hunter, Tribal Historic Preservation Office
 Chief George Wickliffe, United Keetoowah Band of Cherokee Indians in Oklahoma
 President Leslie Standing, Wichita and Affiliated Tribes of Oklahoma
 President Stratford Williams, Wichita and Affiliated Tribes of Oklahoma

State Agencies:

Mr. Mike Thralls, Executive Director, Oklahoma Conservation Commission
 Ms. Shanon Phillips, Director, Water Quality Programs, Oklahoma Conservation Commission"
 Jim Reese, Secretary and Commissioner of Agriculture, Oklahoma Agriculture, Food and Forestry
 Mr. Dave Lopez, Secretary, Oklahoma Department of Commerce
 Mr. Steven A. Thompson, Executive Director, Oklahoma Department of Environmental Quality
 Jay Wright, Manager, Customer Services Division, Oklahoma Department of Environmental Quality
 Darren Saliba, Division Engineer, Oklahoma Department of Transportation
 Mr. Richard Hatcher, Director, Oklahoma Department of Wildlife Conservation
 Bruce R. Mabrey, District 2 Commissioner, Oklahoma Department of Wildlife Conservation
 Danny Bowen, Oklahoma Department of Wildlife Conservation
 J.D. Ridge, Oklahoma Department of Wildlife Conservation *

Don Groom, Oklahoma Department of Wildlife Conservation *

Michael C. Thompson, Commissioner, Oklahoma Department of Public Safety, Oklahoma Highway Patrol
Marine Enforcement Section

Melvena Heisch, Deputy State Historic Preservation Officer, Oklahoma Historical Society

Dr. Bob Blackburn, State Historic Preservation Officer, Oklahoma Historical Society, Oklahoma History
Center

Mr. Ian H. Butler, Oklahoma Natural Heritage Inventory, Oklahoma Biological Survey"

Dr. Robert L. Brooks, State Archaeologist, University of Oklahoma, Oklahoma Archeological Survey"

Ms. Deby Snodgrass, Executive Director, Oklahoma Tourism and Recreation Department

Kris Marek, Oklahoma Tourism and Recreation Department

Sue Hughart, Park Manager, Lake Eufaula State Park

Jim Ramsey, Park Manager, Arrowhead State Park

Mr. J. D. Strong, Executive Director, Oklahoma Water Resources Board

Mr. Derek Smithee, Chief, OWRB, Water Quality Programs Division

Local Agencies:

Greg Anderson, Vice Mayor, City of Eufaula

Selina Jayne-Dornan, Mayor, City of Eufaula

Kevin Ledbetter, McIntosh County Sheriff's Office

Mr. Rick Fender, Pittsburg County Floodplain Manager

Mr. Harry Trottier, McIntosh County Floodplain Administrator

Captain Carrie Pennington, Oklahoma City Fire Department *

Organizations:

Bob Roberts, President, B.R. Falcon, Inc.

Al Sahli, Eufaula Cove Marina

Bob Edgmon, President, Lake Eufaula Association

Connie Morris, Executive Director, Lake Eufaula Association

Save Our Water

Lake Eufaula Association

Connie Cambell, Lake Eufaula Association

Greg McNall, Lake Eufaula Association

Emily Rodebush, Lake Eufaula Association

Marty Coltrane, Duchess Creek Estates and Docks

George Ellison, Eufaula Tri-County Real Estate

Pennie Embay, Save our Water

Karen Smenner, Save our Water

Rick Smenner, Save our Water

Sam Sylvester, Save our Water

J Bryan Vest, Save our Water

Karen Weldin, Save our Water

Stephanie Fine, Eufaula Lakeshore Realty

Debra and George Flood, Sycamore Bay Property Owners Assoc.
 Grant Humphreys, Carlton Landing
 Kirk Humphreys, Carlton Landing
 Robert Johnson, Recon Services
 Wayne Reese, Recon Services
 Earnest L Johnston, DCMHP LLC
 Mike Kern, Kern & Co
 Leanne Love, Recon Services
 Annette Nichols, Nichols Marine
 Shawn O'Brien, R&O Trading Company
 Roger Otis, President, Marine Development Inc.
 Jim Rowe, R&O Trading Company
 Parker Saltsman, Saltsman's Orchard Subdivision
 Stephanie Sellers, Dutchess Creek Acres Developer
 Charles Urquhart, Urquart Insurance Agency
 Karen Weldin, Eufaula Lakeshore Realty

Individuals:

Bert Albers
 Joe Allen
 Michael and Cassie Barkett
 Carlton Bass
 Sharon T. Bass
 Kenny and Donna Beale
 Ronnie Bernard
 Mike and Teddy Bishop
 Malcolm and Phyllis Blair
 Arleta Blevins
 R.P. Blevins, Sycamore Bay Cove
 Priscilla Bradley
 Larry Breeding
 R. Todd Brock
 Paula Carl
 Les and Valerie Cashmere
 Gary and Cheryl Clark
 John and Kris Coffman
 Mike Compton
 Tina and Mike Compton
 Arleen Cowandugh
 Charles and Carma Cruce

Craig Daniel
 Ann Davis
 Tandy and Kelly Dearneal
 Sharon Dossey
 Diana Due
 Ralph and Ali Emerson
 Charlie Everett
 Tom and Marcia Gable
 Richard and Milly Garrett
 Elwyn E Guinn
 Kendall and Peggy Guinn
 Ted and Dorothy Guinn
 Deanna Hamilton
 Brian and Melissa Hand
 Bill and Karen Hart
 James A Hewett
 Ola Howard
 Medy Jester
 Norma Johnson
 Samantha Johnson
 Mary and Leo Keenan
 Tony and Evelyn Korhuniak
 Suzanne Krohmer

John Lauer, Beacon Point Manager	Jim Rowe
Kelly Lawrence	Lynn St John
Chuck Lewis	Greg and Sharon Sanford
Jerry McCormick	Don and Nettie Seale
Jim McGuire	Don and Cindy Simonds
Haskell and Marsha Melton	Donnie Snead
Bryan Mitchell	Scott Stone
Greg Moore	Ray and Kathy Stop
Ralph Morley	Tom Taylor
Michael David Newton	Phil Theis
Bruce and Margie Nivison	Margie Urquhart
Frank and Nadia Ockerman	David and Kari Varner
Mark Otis	Johnnie A and Ly Vierling
Randy Parhan	Jim Wair
Donna Pearce	Kim White
Charles Pechacek	Don and Kristi Willoby
Larry, Deborah, and Jacob Pemberton	Smith Wycoft
Kevin Priddle	James O Zellner
Linda Richardson	Stuffed Olive Restaurant

The following individuals have been added to the distribution list for the Final EIS. These persons commented on the Draft EIS.

Samuel Kuhlman	Richard Chastain
Daniel Adams	Jeff Click
Bert Albers	Faye Cole
Lagaylia Alfonso	Shari Cooper
David & Lori Arion	Leo Cravens
Billy Baden	Bela Csendes
Tom Baldwin	Timothy Diehl
Carlton Bass	Jim Doyle
Kenny & Donna Beale	Don Edgar
Angel Bernhardt	Marlin Edwards
Jerry & Norma Bowles	Orville Edwards
Zane Box	George Ellison
Merrie Brenner	Pennie Embry
Larry Bright	Rick & Sandra Faulk
R. Todd Brock	Robert Frankboner
Kathy Brown	Mary Ann French
Lester & Valerie Cashmere	Leon French
Dave Chambers	John Goodin

Bob & Ann Green	Kittie Richardson
Mike Green	Bob Roberts
James Gross	BJ Roberts
Deanna Hamilton	Michael Saltsman
Alan & Kim Hardin	Parker Saltsman
Bill Hart	Michael Sarrault
Bill & Susie Hines	Stephanie Sellers
Garland Hooper	Randy Shannen
Grant Humphreys	George Shear
Turner Hunt	Greg Shirey
Jessica Hunt	Neva Eileen & Dean Snyder
Pamela Hunt	Billy Stanford
Fred Jackson	Renee Stanford
Jerry James	Steve Stangl
Todd Johnson	Karen Steele-Hart
Ernie Johnston	Steve Stephens
Dewayne Kalin	JT Stubbs
Lisa Kemp-Hazelwood	Steve Swadley
Gary Larson	Thomas and Dorothy Swisher
John Lauer	Cathi Taylor
Ron Lawrence	Andy Tefertiller
Ron & Linda Matlock	Joann Thomason
Debbie McCauley	Rebecca Tinker
John McCauley	Jon Tomlinson
Billy Lee McClellan	David & Kari Verner
JL McGuire	Larry & Michelle Wallace
Chris & Donna Mcree	Robin Woodley
Joe Mitcho	Steve Woodley
Richard Moore	Rick Woods
Jason Moore	The students at Carlton Landing Academy
Connie Morris	
Bill Neal	
Steve Newman	
Evelyn Newsom	
Donald Nichols	
Gary Nichols	
Edward Pearson	
Rebecca Peters	
Marion Peters	
John Polkinghorne	
James Raynor	

Chapter 10

Glossary

Alluvial	The general name for all sediments, including clay, silt, sand, gravel, or similar unconsolidated material deposited in a sorted or semi-sorted condition by a stream or other body of running water.
Anoxic	The total deprivation of oxygen.
Anthropogenic	Caused or produced by humans.
Anuran	Any amphibian of the order Anura, comprising the frogs and toads.
Attainment area	An area in which the federal and state standards for ambient air quality are being met.
Benthic	The bottom surface of an aquatic environment.
Best Management Practices	Techniques, measures, or structural controls to manage the quantity and improve the quality of stormwater runoff.
BAOT	Boats At One Time – Total number of boats on the water surface, actively being used for recreational purposes, at any given point in time. This may be measured by direct observation or calculated from the total boat capacity and the lake use rate.
Boat Density	Boating density is a measure of use that is calculated by dividing the number of unrestricted water surface acres by the total number of boats at one time (BAOT) and is expressed as the number of acres per boat.
Canopy	The uppermost layer of vegetation in a terrestrial biome.
Clean Air Act	The comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants.
Comprehensive Plan	The general, inclusive long-range statement of the future development of a community. The plan is typically a map accompanied by description and supplemented by policy statements that direct future capital improvements in an area.
Conservation Pool	The normal operating level of the lake; a lake level corresponding to an elevation of 585 feet above mean sea level.
Cooperating Agency	Any federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal.
Cuesta	A long, low ridge with a relatively steep face or escarpment on one side and a long, gentle slope on the other.

Cumulative Effects	Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.
Disjunct Population	A completely separate and removed population of individuals in a species.
Ecoregion	An area defined by its environmental conditions, especially climate, landforms, and soil characteristics.
Ecosystem	All the organisms in a given area as well as the abiotic factors with which they interact; a community and its physical environment.
Ecotone	The transition from one type of habitat or ecosystem to another, such as the transition from a forest to grassland.
Effluent	An outflowing of water or gas from a natural body of water, or from a human-made structure.
Emergent Wetland	A wetland characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed.
Farmland of Statewide or Local Importance	Land other than prime or unique farmland that is of statewide or local importance for the production of food feed, fiber, forage, or oilseed crops, as determined by the appropriate state or unit of local government agency or agencies.
Fauna	The animal community characteristic of a region, period, or special environment.
Fetch	The distance along open water or land over which the wind blows; the distance traversed by waves without obstruction.
Flood Control Pool	The lake elevation at flood levels; a lake level corresponding to an elevation of 597 feet above mean sea level.
Flowage Easements	The right to flood private property during high water event.
Forage Species	A species that provides a primary food source for higher-order species. This term is usually in reference to minnows and other small fish that serve as primary prey for popular game species.
Forb	Vascular plant without significant woody tissue above or at the ground. Forbs and herbs may be annual, biennial, or perennial but always lack significant thickening by secondary woody growth and have perennating buds borne at or below the ground surface. Graminoids are excluded but ferns, horsetails, lycopods, and whisk-ferns are included.
Herbaceous	Referring to non-woody plants.

Historic Properties	Both archeological and historic sites. Historic properties may or may not be eligible for listing on the National Register.
Lacustrine	Of, or relating to, a lake including associated wetlands and deepwater habitats.
Land Use	Refers to how land and the structures (development) on it are used, <i>i.e.</i> , commercial, residential, retail, industrial, etc.
Lake Use Rate	Lake Use rate is calculated by dividing Total Boat Capacity (TBC) into Boats At One Time (BAOT).
Lentic System	A non-flowing or standing body of fresh water, such as a lake or pond.
Limnetic	All deepwater habitats within the Lacustrine System; many small Lacustrine Systems have no Limnetic Subsystem.
Littoral	Shallow water zone of aquatic systems. Extends from the shoreward boundary of the system to a depth of 2 m (6.6 feet) below low water or to the maximum extent of non-persistent emergents, if these grow at a depth greater than 2 m.
Maintenance Areas	Geographic areas that had a history of nonattainment of air quality standards, but are now consistently meeting the National Ambient Air Quality Standard (NAAQS). Maintenance areas have been re-designated by the U.S. Environmental Protection Agency (EPA) from "nonattainment" to "attainment with a maintenance plan."
National Ambient Air Quality Standards (NAAQS)	Federal standards that set allowable concentrations and exposure limits for various air pollutants.
New Urbanism	The ideal of a walkable, compact, mixed-use community.
Non-Attainment Areas	Metropolitan areas that do not meet National Ambient Air Quality Standards (NAAQS) for carbon monoxide and/or ozone pollution; ranked by the severity of their problem as marginal, moderate, serious, severe or extreme. In accordance with the Clean Air Act Amendments of 1990, these areas must take specific emission reduction measures.
Noodling	Fishing for catfish using only bare hands. The fisherman places his hand inside a likely catfish hole, usually within the bank or underwater structure, and pulls the catfish out when it bites down.
No Wake Zone	A designated area of water where boat speeds must be kept slow enough so that the boat does not produce a discernible wake. This type of zoning is typically applied within 100 to 300 feet of shorelines or moored vessels, fixed objects, swimmers, anglers, or water skiers.

Ozone	A colorless gas with a sweet odor. Ozone is not a direct emission from transportation sources but rather a secondary pollutant formed when hydrocarbons (HC) and nitrogen oxides (NOx) combine in the presence of sunlight. Ozone is associated with smog or haze conditions. Although ozone in the upper atmosphere protects the earth from harmful ultraviolet rays, ground level ozone produces an unhealthy environment in which to live.
Palustrine	Of, or relating to, a marsh including shallow, non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens.
Particulate Matter (PM), (PM 10)	Any material that exists as solid or liquid in the atmosphere. Particulate matter may be in the form of fly ash, soot, dust, fog, fumes, etc. Small particulate matter, or PM 10, is less than 10 microns in size and is too small to be filtered by the nose and lungs.
Passage Migrant	Refers to a bird that occurs in an area for short durations between its migration origin and destination.
Passerine	Of or relating to the largest order (Passeriformes) of birds, which includes over half of all living birds and consists chiefly of altricial songbirds of perching habits.
Pass through zones	May be established along narrow waterway segments, especially those near waterfront developments, “pass through” zones and regulations can help move boat traffic more safely and reduce conflicts between recreational water activity and adjacent development. The zone serves solely as a transportation channel, prohibiting recreational activities.
Pasture/grazing Vegetation	Any type of non-irrigated, non-mowed grassland.
Prairie	Vegetation community characterized by open grassland habitats.
Prime Farmland	Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.
Restricted Water	Water that is less than three feet deep at the normal pool elevation of 585.0 feet above mean sea level (MSL) and/or water where there is standing timber.
Sluice	A water channel controlled at its head by a gate.
Standing timber	Standing dead trees in shallow water. These trees were not cleared when the reservoir was filled and may present hazards to navigation.

State Implementation Plans (SIPs)	Detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. SIPs are collections of regulations used by a state to reduce air pollution. The Clean Air Act requires that EPA approve each state's SIP.
Sub-canopy	The plant stratum composed of all woody plants and palms, exclusive of the canopy, with a trunk or main stem with a DBH between one and four inches, except vines.
Swim Zones	These are established at designated swimming beaches by sectioning off an area with floating buoys.
Tainter Gates	A type of radial arm floodgate used in dams and canal locks to control water flow.
Tailwaters	Water below a dam.
Take (as defined in the ESA)	The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species, or to attempt to engage in any such conduct.
Thermal Refuge	A structure or habitat condition such as a den or deep water in which the temperature is higher than the surrounding ambient air temperature. Thermal refuges are extremely important to ectotherms such as fish, reptiles, and amphibians during cold winter periods.
Time or Day Zoning	For areas where certain water activities bring high traffic density or space limitations, especially on particular days or at particular times of the day, this type of zoning is used to help reduce conflict and competition for space. For example, on weekends, water skiing and high-speed traffic could be prohibited in coves or other areas.
Total Boat Capacity	The total number of boats that can be moored or stored at an approved moorage facility, such as a marina or boat dock, plus the total number of boats that can be placed on the water surface, using an approved boat ramp or launch facility. (Note: the number of boats that can be placed on the water surface from public boat ramps is typically the same as the number of car/trailer parking spaces.)
Transect	A sample area usually in the form of a long continuous strip.
Understory	An underlying layer of vegetation; specifically: the vegetation layer and especially the trees and shrubs between the forest canopy and the ground cover.

Unique Farmland	Land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated or managed according to acceptable farming methods.
Unrestricted Water	Open water that is considered safe for all types of boating activities.
Visit	One person participating in recreation activities within a developed recreation area for any period of time. For example, one person picnicking for 30 minutes is one visit; one person camping for 14 consecutive days is also one visit.
Visitor Day	Used to normalize “visits” and “visitor hours.” For example, one person camping for 24 hours is equal to one visitor day, and one person hiking for four hours is also equal to one visitor day.
Visitor Hour	An aggregate of use, by one or more persons engaging in recreational activities, during continuous or intermittent periods of time, amounting to one hour. For example, one person recreating for one hour or two persons recreation for one half-hour each, are both equal to one visitor hour.
Volatile organic compounds (VOC)	Carbon-based chemical compounds that evaporate quickly (have a high vapor pressure) under atmospheric conditions.
Water Skiing and other activity area zones	Whether marked by buoys or indicated on a map, these zones may be used for safety purposes and to reduce activity conflicts.
Wetland	Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Chapter 11

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Appendix A

Scoping Summary Report

Appendix B

Vegetation and Wildlife

Appendix C

Vegetation Change Analysis

Appendix D

Water Quality

Appendix E

Recreation Study Report

Appendix F

Visual and Aesthetics

Appendix G

Cultural Resources

Appendix H

Resource Categories Not Affected

Appendix I

Responses to Comments on the Draft EIS

Appendix J

Public Comments on the Draft EIS

Appendix K

Agency Comments on the Draft EIS

Appendix L

Preferred Alternative

Master Plan Land Use Classifications