

**Osage Project
FERC No. 459**

Shoreline Management Plan
Rev. 2



MARCH 2017

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GLOSSARY

ACHP	Advisory Council on Historic Preservation
AHJ	Authorities having jurisdiction
ATS	Adopt-the-Shoreline Program
Boat house	A non-floating structure on the shoreline utilized for the storage of boats and other marine-type vehicles.
Causeway	A road built on an embankment across a water body.
Cove	An area of a lake that extends away from the main body of the lake, where the area extends at least 50 feet from the main shoreline area.
CSR	Code of State Regulations
CWA	Clean Water Act
Development	Development, as used in this Shoreline Management Plan, means any non-project land use activity that will disturb the land or add to the man-made features at the Lake of the Ozarks and along the shoreline, and has the potential to impact environmental resources.
DO	Dissolved oxygen
Dock	A platform extending from a shore over water and supported by piles, pillars, or flotation materials, used to secure, protect, and provide access to boats.
FERC or the Commission	Federal Energy Regulatory Commission
FERC Form 80	Form used by licensees to report recreational data at licensed projects, including data on the number and type of recreational facilities, capacity, the number of annual visits to all recreational areas and project costs and revenues associated with all recreational areas. The report must be filed with the Commission every 6 years.
Fish structure	Any structure or natural material that is placed below the surface of the water to enhance existing fish habitat. Examples include evergreen trees, brush piles, or stake beds.
FPA	Federal Power Act
GIS	Geographic Information System
GPS	Global Positioning System

Head of Cove	That portion of any cove, regardless of size, which lies landward of a perpendicular line drawn across the cove, this line being known as the Head of Cove boundary line. The Head of Cove boundary line is located at the point at which the natural stream channel bottom (flooded by the lake water) is at the 652-foot elevation. If no natural stream channel can be identified, the perpendicular line will be located at the point farthest in to the cove where a 652-foot elevation is found.
Historic Property	Any pre-historic or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR 800.16(l)(1)). Sites that have been determined to likely be eligible for listing by a qualified archaeologist are included in this definition.
HPMP	Historic Properties Management Plan
Marina	A commercial facility located at the Lake that provides docking, storage, maintenance, and/or other facilities equipped to provide marine repair service, gassing, and supplies. It may also include land-based areas for car parking, boat ramps, and associated facilities and services.
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MISO	Midwest Independent Transmission System Operator
MNHD	Missouri Natural Heritage Database
MNHP	The Missouri Natural Heritage Program represents a comprehensive effort to inventory and preserve the animal, plant, and natural community resources of the State of Missouri and is a part of the MDC.
MSWP	Missouri State Water Patrol
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places

NWI	National Wetlands Inventory
NWS	National Weather Service
OHWM	Ordinary high-water mark as defined by the U.S. Army Corps of Engineers, 658.5 feet
ORFCA	Osage River Flood Control Association
OSR	Outstanding State Resource Water
PA	Programmatic Agreement
Project Boundary	The project boundary along the shoreline of Lake of the Ozarks generally follows an elevation of 662 U.E. datum, which is 2 feet above full pool elevation of 660.0 feet. The boundary is higher in some areas to protect project resources. Downstream from the project, the project boundary extends approximately one mile along both banks of the Osage River, and includes a 64.53-acre parcel of land on the west bank of the river, up to elevation 600.0 msl
REP	Recreation Enhancement Plan
RM	River mile
RTE	Rare, threatened, and endangered species
SA	Settlement Agreement
SEMA	State Emergency Management Agency
Shallow Water Habitat	While there is no strict definition of shallow water habitat, it often is considered as the depth to which aquatic vegetation will grow, in most areas of normal water clarity this can be in the range of five to six feet of water depth.
SHPO	The Missouri State Historic Preservation Office is within the MDNR whose mission is to foster, encourage, and support the stewardship of Missouri's significant historic, architectural, archaeological, and historic resources.
SMP	Shoreline Management Plan
SMT	Shoreline Management Team
Stakeholders	Any agency, government official, business, non-government organization, or private individual who will be influenced by, or has an interest in shoreline management at Lake of the Ozarks
SWPA	Southwest Power Authority
SWPPP	Storm Water Pollution Prevention Plan

UED	Union Electric Datum
USACE	U.S. Army Corps of Engineers
USCGA	U.S. Coast Guard Auxiliary
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WPD	Water Patrol Division of the Missouri State Highway Patrol

1.0 INTRODUCTION

Article 417 of the license for the Osage Project, issued on March 30, 2007, included the following requirements to address shoreline management.

Article 417. Shoreline Management Plan. The shoreline management plan required by condition 8 of the water quality certification shall be filed, for Commission approval, within one year of the issuance date of this license. The purpose of this plan is to coordinate land-management activities along the project shoreline.

Consistent with the Commission's Guidance for Shoreline Management Planning at Hydropower Projects dated April 2001 and the August 2006 final Environmental Assessment for the Osage Project, the plan shall include, at a minimum:

- (1) a discussion of the plan's purpose, goals, and objectives;*
- (2) a discussion of key issues associated with shoreline management at the project, and how issues were addressed in developing the plan (e.g., the public's right to access the entire shoreline, excluding project works, within the project boundary, as well as boating carrying capacity, navigation hazards, and the effect permitted structures have on boating safety);*
- (3) identification and description of land use along the project shoreline (taking into account the need to protect sensitive habitats, historic properties, and aesthetic resources), including (a) maps identifying the locations of land use types, as well as sensitive habitats, aesthetic areas, historic sites, etc., (b) a description of how the use classifications were defined and delineated, and (c) descriptions of activities and uses that will be allowed in those classifications;*
- (4) if the licensee chooses to file an amendment to remove land from the project boundary, a map showing the location of the lands proposed for removal, overlaid with its SMP shoreline classification map developed for item (3);*
- (5) a description of all types of permitted uses, the permit application process, and guidelines for applying for a construction permit within the project boundary;*
- (6) the licensee's existing programs (e.g., Adopt-A-Shoreline program, vector control program, derelict dock removal program, shoreline protection hotline, etc.);*
- (7) measures to protect water, fish, wildlife, important habitat areas, and historic properties (e.g., an updated permitting program addressing set backs, size, density, and placement of docks, piers and other in-water structures; an encroachment policy; buffer zones and vegetative buffer policy; restricting development in critical or sensitive habitats; shoreline stabilization requirements; dredging and excavation restrictions, such as restricting the timing of the activity and testing sediments for contaminants if dredging is proposed; and measures to control erosion associated with permitted development);*
- (8) a description of management policies (e.g., shoreline structure permitting guidelines), monitoring programs, educational programs, and enforcement;*
- (9) provisions for periodically reviewing and updating the shoreline management plan;*
- (10) a provision to undertake the shoreline erosion assessment for the Missouri State Park lands near the project specified in section 8.3 of the settlement agreement,*

with a schedule for filing a report, prepared after consultation with the Missouri DNR, documenting the findings of the assessment with the Commission. The report shall identify any actions the licensee may need to take to address any erosion problems attributed to project operations; and

- (11) *provisions for consultation with agencies and other interested parties in the implementation of the shoreline management plan.*

The shoreline management plan shall be developed in conjunction with the historic properties management plan (Article 418) and recreation enhancement plan (Article 416). The licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service; the Department of the Army, Corps of Engineers; the National Park Service; the Missouri Department of Conservation; the Missouri Department of Natural Resources; the Advisory Council on Historic Preservation; and the shoreline management committee for the Osage Project. The licensee shall include with the plan an implementation schedule, documentation of consultation, copies of comments and recommendations on the completed shoreline management plan after it has been prepared and provided to the aforementioned parties, and specific descriptions of how their comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the shoreline management plan. This plan shall not be implemented until the Commission notifies the licensee that the plan is approved. Upon Commission approval, the licensee shall implement the shoreline management plan, including any changes required by the Commission.

This document addresses the requirements to prepare a Shoreline Management Plan (SMP) covering the items noted in Article 417 of the license. Table 1 identifies the section or Appendix of the SMP where each requirement of Article 417 is addressed.

**TABLE 1
CHECKLIST IDENTIFYING FERC LICENSE ARTICLE 417 REQUIREMENTS AND
WHERE EACH IS ADDRESSED IN THE SHORELINE MANAGEMENT PLAN**

Article 417 Requirement	Addressed in SMP
(1) a discussion of the plan's purpose, goals, and objectives;	Section 1.2
(2) a discussion of key issues associated with shoreline management at the project, and how issues were addressed in developing the plan (e.g., the public's right to access the entire shoreline, excluding project works, within the project boundary, as well as boating carrying capacity, navigation hazards, and the effect permitted structures have on boating safety);	Section 1.4 - project operations Section 1.6 - property rights Sections 2.3-2.5 - natural resources Section 2.6 - historic properties Section 2.7 - recreation, safety Section 2.8 - land use Section 2.9 - aesthetics Appendix B, Section 6.2 - public access

Article 417 Requirement	Addressed in SMP
(3) identification and description of land use along the project shoreline (taking into account the need to protect sensitive habitats, historic properties, and aesthetic resources), including (a) maps identifying the locations of land use types, as well as sensitive habitats, aesthetic areas, historic sites, etc., (b) a description of how the use classifications were defined and delineated, and (c) descriptions of activities and uses that will be allowed in those classifications;	Appendix A - maps Section 2.0 - land use classifications Section 3.2, Table 4 - allowable uses
(4) if the licensee chooses to file an amendment to remove land from the project boundary, a map showing the location of the lands proposed for removal, overlaid with its SMP shoreline classification map developed for item (3);	Not Applicable to Rev. 2 SMP filing
(5) a description of all types of permitted uses, the permit application process, and guidelines for applying for a construction permit within the project boundary;	Section 3.2, Table 4, Appendix B
(6) the licensee's existing programs (e.g., Adopt-A-Shoreline program, vector control program, derelict dock removal program, shoreline protection hotline, etc.);	Section 3.7 - Derelict Dock Removal Section 3.9 - Adopt-the-Shoreline Section 3.10 - Shoreline Protection Hotline Section 3.11 - Flotation Program Section 3.16 - Mile Marker Project Section 3.19 - Mosquito Vector Control
(7) measures to protect water, fish, wildlife, important habitat areas, and historic properties (e.g., an updated permitting program addressing set backs, size, density, and placement of docks, piers and other in-water structures; an encroachment policy; buffer zones and vegetative buffer policy; restricting development in critical or sensitive habitats; shoreline stabilization requirements; dredging and excavation restrictions, such as restricting the timing of the activity and testing sediments for contaminants if dredging is proposed; and measures to control erosion associated with permitted development);	Section 3.2, Appendix B
(8) a description of management policies (e.g., shoreline structure permitting guidelines), monitoring programs, educational programs, and enforcement;	Appendix B - Permitting guidelines Section 4.0 - Enforcement Section 3.3 - Land Disturbance Education Section 3.4 - Dock Builder Program Section 3.8 - Dock Electrical Safety Section 3.12 - Public Education
(9) provisions for periodically reviewing and updating the shoreline management plan;	Section 5.0
(10) a provision to undertake the shoreline erosion assessment for the Missouri State Park lands near the project specified in section 8.3 of the settlement agreement, with a schedule for filing a report, prepared after consultation with the MDNR, documenting the findings of the assessment with the Commission. The report shall identify any actions the licensee may need to take to address any erosion problems attributed to project operations	Section 2.2
(11) provisions for consultation with agencies and other interested parties in the implementation of the shoreline management plan.	Section 6.0
The shoreline management plan shall be developed in conjunction with the historic properties management plan (Article 418) and recreation enhancement plan (Article 416).	Section 2.6, 2.7, 3.2

Article 417 Requirement	Addressed in SMP
The licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service; the Department of the Army, Corps of Engineers; the National Park Service; the Missouri Department of Conservation; the Missouri Department of Natural Resources; the Advisory Council on Historic Preservation; and the shoreline management committee for the Osage Project.	Section 7.0
The licensee shall include with the plan an implementation schedule,	Section 6.0
Documentation of consultation, and copies of comments and recommendations on the completed shoreline management plan.	Appendix G of Rev. 2 SMP
Specific descriptions of how comments are accommodated by the plan. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.	Appendix G of Rev. 2 SMP

1.1 Background on Shoreline Management

In deciding whether to issue a license under the Federal Power Act (FPA) for any project, the Federal Energy Regulatory Commission (the Commission or FERC), in addition to the power and development purposes for which licenses are issued, has to give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality (FPA 1920). A FERC licensee must hold all rights in project property necessary to fulfill project purposes, including the provision of reasonable public access to project lands and waters and the protection of aesthetic and natural resources. In the context of a FERC-licensed hydropower project, a shoreline management plan (SMP) is, generally, a document that is used to meet a hydropower project licensee's obligations under the Federal Power Act, associated regulations, other federal and state laws, and the FERC license authorizing the project. Such a plan typically represents balance between resource protection and enhancement and development rights, and gives priority to water-dependent uses and also emphasizes public access.

Licenses issued by the Commission include a "standard land use article", which addresses "non-project use of project lands". The standard article requires that a licensee retain sufficient control over all property and/or rights necessary or appropriate to construct, operate, and maintain a project, and may not dispose of interests in project property without prior Commission approval, except as specifically permitted under the license. A licensee of a hydropower project may receive requests from neighboring landowners, government agencies, or private organizations to use project land for a variety of purposes unrelated to operating the project. These uses may include, but are not limited to, construction and maintenance of boat docks, marinas, bridges, pipelines, water withdrawals, and utility lines.

To provide the licensee with flexibility in responding to such requests, the standard land use article allows licensees to convey interests in project lands and waters (through leases, rights-of-way, or fee title conveyances) for, or permit certain non-project uses. Conveyances and permits allowed under the standard land use article must be consistent with the scenic, recreational, and other environmental values of the project. In addition, the requesting entity must fulfill specific requirements before the licensee can convey an interest in project lands or waters, or permit non-project uses of project lands. The requirements are based on the characteristics of the proposed

use and the type of conveyance or permit. The licensee must also consult with the appropriate federal and state agencies to assure that the proposed use is compatible with the project's recreation plan and environmental resources, and that the instrument of conveyance includes appropriate covenants to protect the scenic, recreational, and other environmental values. If a proposed use does not meet the criteria of the standard land use article or an approved Shoreline Management Plan, the licensee must then obtain Commission approval prior to issuing the conveyance or permit.

Often requests for non-project use of project lands involve complex issues related to commercial marina construction, water withdrawals, dredging, or shoreline stabilization. The development pressure on shorelines for non-project uses and occupancies is fueled largely by increasing demand for water-oriented recreation and waterfront property. The Commission requires that licensees have the responsibility to ensure that the reservoir shorelines within their project boundaries are managed in a manner that is consistent with project license requirements, and project purposes. As the development and multiple uses of the shoreline grow, licensees face more and more challenges in resolving potential conflicts among competing interests including providing for public recreation and conserving environmental resources (FERC 2004).

The Commission has concluded that a comprehensive plan, such as a Shoreline Management Plan (SMP), can assist licensees in providing for proper use, conservation, and development of a project's resources (FERC 2004). One of the conditions in the Commission's March 2007 license for the continued operation of the Osage Project is the requirement to develop and implement an SMP for the Project in consultation with agencies and other stakeholders with an interest in the Project and the resources at Lake of the Ozarks.

Ameren Missouri submitted an SMP to the Commission for approval on March 28, 2008. The Commission approved the SMP with modifications and amendments by Orders issued July 26, 2011 and November 10, 2011. Revision 1 of the SMP, dated November 2012, incorporated the modifications and amendments ordered by the Commission. Revision 2 of the SMP, dated March 2017, is the first scheduled update of the plan filed in compliance with the Commission's July 26, 2011 order modifying and approving the SMP.

1.2 Components of Shoreline Management Plan

Ameren Missouri is responsible for management of lands within the project boundary established for the Osage Project under provisions of its federal license for the operation of Bagnell Dam and the Osage Power Plant, which created the lake in 1931. This SMP governs lands within the FERC project boundary.

The purpose of this plan is to properly coordinate shoreline management activities at Lake of the Ozarks. The goals and objectives of this SMP are to define the procedures and policies that Ameren Missouri has in place for successful shoreline management activities at Lake of the Ozarks, and the reasons why the procedures and policies are needed and important to all stakeholders for protecting the energy, natural resources, and historic properties that are unique to the Osage Project.

As a part of its responsibility, Ameren Missouri is required to regulate all structures within the project boundary including docks, seawalls, decks, and other structures around the lake, as well as the lands within the project boundary downstream of Bagnell Dam, to ensure that these structures do not become an environmental hazard, an obstacle to navigation, adversely impact sensitive and critical environmental resources, or become a threat to the safe operation of the dam and power plant. The policies, guidelines, and existing programs to manage the Lake of the Ozarks shoreline are contained in this SMP. The SMP policies and procedures require notification of Missouri Department of Conservation (MDC), Missouri Department of Natural Resources (MDNR) (including the State Historic Preservation Office [SHPO]) for activities that may affect certain natural resources or known historic properties. This procedure ensures resource agency input before such activities are undertaken. See Section 3 for details.

Ameren Missouri's SMP for the Osage Project (FERC No. 459) includes four key components: (1) a description of shoreline conditions and development requirements; (2) Ameren Missouri's review process, programs, and guidelines for managing shoreline development; (3) shoreline management plan enforcement; and (4) a shoreline management plan review and update process. This plan presents baseline conditions for the Osage Project, can be used to help assess proposals for non-project use of project lands and other alterations to the shoreline, and sets requirements for development.

1.3 Project and Project Area Description

The Osage Project is located on the Osage River in south-central Missouri in Benton, Camden, Miller and Morgan counties about 4 miles upstream of the town of Bagnell, Missouri; about 150 miles southeast of Kansas City, Missouri; 170 miles southwest of St. Louis, Missouri; and 40 miles south of the state capitol of Jefferson City, Missouri. The primary project features include Bagnell Dam (located at RM 81.7), the Osage Project powerhouse, and an impoundment (Lake of the Ozarks). These facilities were constructed between 1929 and 1931.

The Osage River is formed by the confluence of the Little Osage and Marais des Cygnes rivers near the Kansas-Missouri border. The Osage River flows generally eastward through west-central Missouri to join the Missouri River downstream from Jefferson City. The Osage River drainage basin is roughly 250 miles long and has a total area of approximately 15,300 square miles of which 13,944 square miles lie above Bagnell Dam. The project extends upstream from Bagnell Dam to the tail water of the Harry S. Truman Project and lies between river miles (RM) 81.7 and 174.5, a length of approximately 93 miles. There are approximately 1,150 miles of shoreline within this area and, at normal pool, a surface area of approximately 94 square miles and a total volume of almost 2 million acre-feet.

The FERC project boundary generally follows an elevation of 662 (U.E. Datum) above Bagnell Dam and extends downstream of the Dam approximately 1 mile. The project boundary is higher than 662 in certain shoreline areas to protect project resources. The steep shoreline and limited land within the FERC project boundary downstream of Bagnell Dam limit the applicability of the SMP for the Lower Osage River.

1.4 Project Operations

Ameren Missouri operates the Osage Project primarily as a peaking and load-following facility, and as an emergency backup system to meet the electrical needs of Ameren Missouri’s customers and to support the Midwest Independent Transmission System Operator (MISO). The U.S. Army Corps of Engineers (USACE), through its Truman Dam and five other upstream flood control facilities, controls most of the flow of the Osage River entering Lake of the Ozarks (about 82 percent). The remaining inflow comes from local tributaries and intervening drainage between the Truman and Bagnell dams. Flow from Bagnell Dam is controlled by turbine discharge from the Osage Plant and radial gate operations at the spillway of the dam. Turbine operations change on a daily and hourly basis in response to hydroelectric generation needs, while operation of the radial gates occurs on an infrequent basis when high-flow events occur in the Osage River drainage basin.

Storage in Lake of the Ozarks is regulated to provide recreational opportunities, protect environmental resources, and manage flood flows. Under the terms of the Settlement Agreement (SA) signed with the resource agencies for the relicensing of the Osage Project (filed with FERC on May 18, 2005), and as defined in the March 2007 operating license, Ameren Missouri will operate the Osage Project in accordance with an agreed upon guide curve (Table 2). The guide curve is defined by a series of target elevations for Lake of the Ozarks to provide Ameren Missouri operations personnel with a guideline for normal operations. It is recognized that the actual water levels at any point in time may vary somewhat from the levels listed. Ameren Missouri, to the extent possible, strives to replicate Lake level management practices that result in Lake levels consistent with historical operation represented by the guide curve.

**TABLE 2
GUIDE CURVE GOVERNING LAKE LEVELS IN LAKE OF THE OZARKS**

GUIDE CURVE	
Period	Lake Elevation
January 1	659 feet
January 2 - February 14	Incremental decrease from 659 to 654 feet
February 15 - April 1	654 feet
April 2 - May 21	Incremental increase from 654 to 659 feet
May 22 - September 9	659 feet
September 10 - September 20	Incremental decrease from 659 to 658 feet
September 21 - December 10	658 feet
December 11 - December 31	Incremental increase from 658 to 659 feet

During large flood events, Ameren Missouri communicates with the USACE, National Weather Service (NWS), Southwest Power Authority (SWPA), State Emergency Management Agency (SEMA), Osage River Flood Control Association (ORFCA) and others as needed to address expected inflows and discharges from the Osage Project. Ameren Missouri manages releases prior to and during a large flood by accounting for existing and forecasted Truman and Lake of the Ozarks elevations, inflow data, weather forecast and ground conditions, as well as upstream and downstream flooding conditions. Management of floods is adjusted continually as conditions change and until the flooding event has ended.

1.5 History of Shoreline Management

Shoreline management at the Lake of the Ozarks has been developing over time. From 1931 to 1982, most permits for development within the project boundary were issued and administered by the USACE. Union Electric began issuing permits for residential docks in 1983 and for commercial docks in 1987. Additional measures added to the management efforts over the years by Ameren Missouri have included:

- instituting a Lake and Shoreline Protection Hotline and Derelict Dock Removal Program in 1994;
- dock flotation requirements established in 1995;
- developed a Dredging Management Plan in 1996;
- first implemented permit application processing fees in 1997;
- held public workshops on shoreline management in 1998;
- developed new permitting guidelines and a fee schedule in 1999;
- added staff and moved the majority of the shoreline management function to an office at the Lake of the Ozarks in 2003;
- held task force meetings and implemented new dock length guidelines in 2004;
- developed the initial SMP in consultation with stakeholders and the Commission in 2001-2012;
- revised the project boundary in 2012 in response to Orders issued by the Commission;
- registered 215 non-conforming decks, patios, gazebos, and similar structures located within the project boundary in June 2013;
- systematically inventoried, permitted, and filed a report to FERC on all non-conforming structures in 2016;
- drafted SMP Rev 2 to reflect revisions to Guidelines in Appendix B and including revised permitting requirements for island development, decks, patios, and walkways; and
- developed this SMP Rev 2 update in consultation with stakeholders and the Commission in 2016-2017.

Ameren Missouri has taken a number of steps to ensure the accuracy and efficiency of its permitting program. The first was to develop an electronic permitting system that allows for easier tracking of permit information. In addition, Ameren Missouri can search and query permit information, which allows for ease of enforcement and permit verification. As part of the electronic permit process, Ameren Missouri has instituted a state-of-the-art geographic information system (GIS) that contains information about the entire shoreline around the Lake of the Ozarks; permit information, including any conditions that must be met; and county land ownership information.

Ameren Missouri conducted an “as-is assessment” of the entire shoreline of the Lake of the Ozarks in late summer and early fall of 2002. Inspectors traversed the shoreline of the lake and collected information about all of the structures around the lake and shoreline condition for all 1,150 miles of shoreline. This information has been overlaid onto Ameren Missouri’s existing GIS. Since 2002 Ameren Missouri shoreline staff have expanded shoreline conditions, compliance, and permitting information within their GIS and automated permitting system. In 2009, a fully automated GIS and permitting database system was launched to capture and track all complaints, violations, permits, and shoreline management tasks. Beginning in 2013, annual lake-wide inspections have occurred each year associated with required non-conforming structure and encroachment inventories included in Ameren Missouri’s GIS and automated permitting system.

1.6 Property Ownership and Interests

Ameren Missouri has various property interests to lands within the project, including fee title ownership and easements over lands owned by others. Ameren Missouri recognizes that other parties (e.g., state of Missouri, private individuals) also possess property interests on lands that lie within the Osage project boundary. Ameren Missouri recognizes and respects all property interests and believes this SMP accommodates all property interests in project lands. The SMP establishes the basis on which Ameren Missouri will approve permits for use of project lands and waters. So long as the use is consistent with project purposes and does not adversely impact protected resources, permits will be issued.

2.0 SHORELINE CONDITIONS AND DEVELOPMENT REQUIREMENTS

This section presents the following components of the Osage Project SMP: (1) an inventory of shoreline uses; (2) resource conditions the plan is designed to protect; and (3) the requirements Ameren Missouri has in place to protect shoreline resources. Ameren Missouri will use the information in this section to assess requests for non-project use of project lands and other alterations to the shoreline.

Shoreline use classification maps were created to inventory the current shoreline resources uses and classify those uses as a shoreline management tool. These shoreline use classification maps were developed through the use of digital ortho-rectified aerial photography that was collected in 1999, with updated photography in 2004, 2008, 2011, 2014, and 2016. Shoreline use classification maps for the Osage Project (see Appendix A) show two types of information about the Osage Project shoreline: (1) existing shoreline use classifications; and (2) the location and type of wetland resources based on the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) discussed in detail in Section 2.5, *Terrestrial Resources*. The existing shoreline is classified into six existing use categories. The six existing use classifications are:

- Commercial (e.g., marinas)
- Multi-Family Residential (e.g., condo/homeowners)
- Public Recreation (i.e., state-owned access areas)
- Single-Family Residential
- State protected
- Undeveloped

Additionally, there are locations within undeveloped areas that require additional protection due to sensitive resources, which include wetlands, historic properties, heads of coves, and areas of woody debris (discussed in detail in Section 3.2, and *Resource Protection Guidelines* in Appendix B). Requests for projects in these areas potentially affecting wetlands, heads of coves, islands, or land disturbance **may be subject to regulation and/or review (emphasis added)** by the USACE, MDC, MDNR, and possibly FERC as per the requirements of FERC for licensee's management of shoreline resources.

The remainder of this section is organized by resource area. Each subsection presents a summary of conditions within the Osage Project boundary, the resources to be protected, and the mechanisms designed to protect these resources.

2.1 Mapping Revision Process

Ameren Missouri realizes there are minor inaccuracies associated with any mapping exercise and that the resources of Lake of the Ozarks may change over time. Agencies, individuals, businesses, organizations and others that believe that the classification along the shoreline is inaccurate as depicted in Appendix A can bring the issue to the attention of Ameren Missouri at any time. Once a shoreline segment has been challenged, Ameren Missouri will evaluate the shoreline with a site visit if necessary and make a determination as outlined in Appendix F, *Procedures for Addressing Challenges to Shoreline Management Plan Mapping Accuracy*. If

Ameren Missouri determines there are no inaccuracies based on the parameters outlined in this document, the classification will stand. If Ameren Missouri determines there is a discrepancy in the classification involving existing conditions, Ameren Missouri will make the appropriate revisions to the maps. Ameren Missouri, through its own field observations will continually update the maps, as appropriate. These updates to the maps will be an ongoing process and will be addressed as they are brought to Ameren Missouri's attention.

2.2 Geology and Soils

Ameren Missouri reports that there are 24 soil types occurring within the project boundary (AmerenUE 2002e). The Natural Resource Conservation Service (NRCS) has identified the Niangua-Bardley association as the predominant soil composition surrounding the Lake of the Ozarks. Minor non-hydric soil series within the project boundary include the Cedargap, Jamesfin, Jemerson, Kaintuck, Racket, Sturkie, and Winnipeg series, all deep, moderately to well drained soils. The NRCS describes the Niangua-Bardley association as "deep and moderately deep, well drained, moderately sloping to very steep, very cherty, silty soils; on uplands." The slope, the shrink-swell potential, the erosion hazard, and the depth to bedrock are management concerns evoking the NRCS position. More specifically seepage is a management concern in areas of the Bardley soils, and permeability is a management concern in areas of the Niangua soils.

The MDC has made general comments to the soil types and erosion rates within the East Osage River basin aside from the NRCS. Across all soil types, the majority of the basin has annual erosion rates between 0 and 100 tons of sediment/mi², while higher erosion rates (100 to 300 tons/year/mi²) may occur along the southeastern and western borders of the basin (MDC 2003b). Land use practices may contribute to higher localized erosion rates. New housing developments, road construction, and overgrazing by livestock may denude land causing increased erosion and sediment pollution (MDC 2003b).

The SA between Ameren Missouri and the resource agencies (filed with the Commission on May 18, 2005 and incorporated into the 2007 license issued by the Commission for the Osage Project) included a requirement that Ameren Missouri complete an erosion assessment of the shoreline of the State Park lands. The specific language from the SA, which is referenced in the 2007 license in Article 417 (the Shoreline Management Plan article) follows:

8.3 Future Studies. No earlier than the fifteenth year of the license term, the Licensee, in consultation with the MDNR, shall perform a recreational assessment, including water safety. The Licensee shall also perform a shoreline erosion assessment for the Missouri State Park lands near the licensed project. The Licensee shall submit the results of the foregoing planning efforts and recommended proposals to the Commission within 60 days of completion, for proposed implementation during the second half of the New License.

Ameren Missouri's plan to meet the requirements of the SA and 2007 license for this assessment is provided below.

Geology and Soils Conditions and Requirements

- Soils are important components of wetland areas as they support and provide a substrate for vegetation to anchor to. Soils are especially important in areas with palustrine and riverine wetland communities (see Appendix A for locations within the Osage Project boundary). No land disturbance is allowed in these areas without Ameren Missouri's approval; Ameren Missouri's consultation with resource agencies; and the permittee obtaining all necessary state and federal permits, as appropriate.
- Existing shoreline erosion may be stabilized following *Vegetative Cover Policy* in Section 3.17 and details in Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).
- As per section 8.3 of the SA, Ameren Missouri will complete an assessment of the erosion on the Missouri State Park lands that border the Lake of the Ozarks during year 16 (2022) of the 2007 license term, in accordance with section 8.3 of the SA. The study for this erosion assessment will be completed from June through September 2022. A draft study report will be filed with the MDNR and consultation with the agency will take place during the fall of 2022. A final report will be prepared, addressing any comments from the MDNR and filed with the Commission on or before December 31, 2022.

2.3 Water Resources

The Osage Project obtained a 401 Water Quality Certification on June 3, 2005, from the MDNR. The certification includes a compliance schedule that must be met. The Historical Water Quality Report for the Lake of the Ozarks is a comprehensive collection of water quality data compiled by Ameren Missouri. The report describes the water quality classifications within the Lake of the Ozarks, the 303(d)-listed water bodies, water uses, water discharges, historical water quality (physical, biological/waste water, and contaminants), dissolved oxygen (DO), temperature, and the relationship between the compiled data and Missouri use standards. The sampling record dates back to the late 1960s with significant amounts of water quality information for the period 1986 to 1997 (AmerenUE 2002c).

The designated uses for Lake of the Ozarks dictate the parameters covered in Ameren Missouri's water quality studies. The designated uses for Lake of the Ozarks includes Whole Body Contact Recreation (WBC-A), Secondary Contact Recreation (SCR), Aquatic Life and Human Health (AQL), Irrigation (IRR), and Livestock and Wildlife Protection (LWP). The water quality parameters with state standards assigned to these uses are found in 10 CSR 20-7.031 and include DO, temperature, pH, fecal coliform, certain metals, and other contaminants (State of Missouri 2016).

Spring Branch, which discharges into the Gravois Arm of Lake of the Ozarks, is designated as a cold water fishery. Approximately 1 mile of the lower portion of the stream is located within the project boundary. Any project activity in this area would require attention to effects on water temperature and compliance with cold water fisheries criteria. Missouri's water designated for Cold Water Habitat can be found at 10 CSR 20-7.031 Table C, with associated criteria at 10 CSR 20-7.031 Table A. Coakley Hollow, located at the Lake of the Ozarks State Park, is an Outstanding State Resource Water (OSR). There shall be no lowered water quality in OSR waters as designated in 10 CSR 20-7.031 Table E.

Statistical analysis of 18 years of limnological data for the Lake of the Ozarks (1980-1998) describes a longitudinal gradient in water quality along the main channel of the Lake of the Ozarks (AmerenUE 2002c; Kaiser and Jones 1999). Ameren Missouri reported a decrease of about 90 percent in inorganic suspended solids, a decrease of about 30 percent in total phosphorus and 30 percent in total nitrogen, and an increase of more than four times in Secchi disk measurements from the upper lake to the dam (Kaiser and Jones 1999). This pattern can be attributed to the reduced velocity of the river afforded by the lake environment and the corresponding settling of solids and nutrient uptake during primary production.

Water quality concerns specific to shoreline management include the relationship between watershed development and increases in pollutant loading to the lake. MDNR (1996) reported that the most significant water quality concern for the Lake of the Ozarks continues to be excessive nutrient and wastewater loading due to development occurring in the drainage basin, especially in the lower part of the Lake of the Ozarks. In 1998, the MDNR performed studies to determine the effects of increased activity in the watershed and specifically on Anderson Hollow Cove. Results revealed that, although the increase in boat traffic had an effect on water quality and shoreline erosion, it had not caused impairment in water quality because of the high rate of turnover of water in the Lake of the Ozarks (AmerenUE 2002c). Studies monitoring nutrients and fecal coliform levels within coves have found elevated concentrations near areas with high use or point source discharges; overall, the water quality standards are being met (AmerenUE 2002c). Historical evidence provided by Ameren Missouri indicates no long-term pattern to suggest nutrient concentrations have changed over time except for an increase in total nitrogen concentrations in the Gravois Arm of the Lake (Kaiser and Jones 1999).

The MDNR conducted additional water quality monitoring focused within lake coves during the recreation season from 2007 to 2011 (MDNR 2012). A total of 118 coves and 451 sites were monitored during the survey, which determined that while some fecal coliform levels were elevated following heavy periods of precipitation or runoff, the geometric means of the sample data met state standards. The USGS conducted a water quality study within and around the Grand Glaize Beach and Public Beach 1 at Lake of the Ozarks State Park, following several years of beach closures due to high bacteria levels. The study determined that a combination of bird activity, leaking septic systems, and sand and pea gravel beaches at these locations caused the high bacteria levels typically following rain events and during high beach usage that disturbed shoreline sediments containing bird feces (Wilson et al. 2014).

Ameren Missouri recognizes the importance of shoreline vegetation for protecting water quality. A shoreline buffer of vegetation acts as a filter for pesticides and insecticides (Meyer 1995). A vegetative buffer also helps reduce erosion that increases the turbidity of the water and aids in nutrient uptake that prevents excess nitrogen and phosphorus from entering the lake. Ameren Missouri has developed a *Vegetative Cover Policy* (see Section 3.17) to protect the resources, including water quality, of the Osage Project.

Water Resources Conditions and Requirements

USACE General Permit 38 (Lake of the Ozarks Shoreline Development Activities) was issued to Ameren Missouri by USACE on July 1, 2006, and re-issued in 2011 and July 5, 2016, with general and special conditions under the authority of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. General Permit 38 authorizes Ameren Missouri to

permit various shoreline development activities including common excavation, dredging, fill activities, and other work lakeward of the ordinary high water mark (658.5 feet UED). This partnership in permitting with the USACE includes a standard operating procedure (SOP) outlining the fieldwork and verifications to be conducted by Ameren Missouri to evaluate projects occurring below the OHWM. If the projects meet the requirements in GP38, a combined permit from Ameren Missouri and USACE is issued for the project and construction can begin.

- The corresponding 401 Water Quality Certification with conditions was issued by MDNR on May 15, 2006, and reissued on June 3, 2011 and on June 21, 2016.
- Ameren Missouri has established vegetative cover and leaf disposal policies to preserve shoreline vegetation and water quality. See *Vegetative Cover Policy* in Section 3.17 and *Yard Waste Disposal Policy* in Section 3.18 for information related to shoreline vegetation and water resource protection.
- Requirements for lake-water pump withdrawal are contained in Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).

2.4 Aquatic Resources

Ameren Missouri published fishery data for Lake of the Ozarks in the *Lake of the Ozarks Historical Fishery Data Summary* released in May 2003. This report describes the fish community with a particular focus on the status, health, and value of the Lake of the Ozarks' sport fishery (AmerenUE 2002a). This report identifies habitat, fish stocking trends, species-specific information, management and protection plans, and the effects of project operations on the fishery. This report lists habitat and water quality as some of the most important factors for maintaining a healthy fishery. Consistently high productivity of the fishery is closely tied to the right amount of nutrients, resulting in high primary productivity (plankton) and large populations of gizzard shad, the primary food source of sport fish except paddlefish (AmerenUE 2002a). The state of Missouri stocks paddlefish, walleye, hybrid striped bass, and striped bass to enhance fishing for these species (Personal Communication with G. Stoner, Missouri Department of Conservation, on December 5, 2016).

As one of the largest reservoirs in the country, between 700,000 to 1,000,000 fishing trips occur at the Lake of the Ozarks each year representing 14 percent of the entire fishing effort in the state of Missouri (Stoner 2000). Primary sport fish in the Lake of the Ozarks include largemouth bass, white crappie, white bass, blue and channel catfish, paddlefish, and walleye. In recent years, as many as 529 bass fishing tournaments have been held in a year at the Lake of the Ozarks.

Ameren Missouri will continue its support of the preservation, protection and enhancement of the fishery resources in the lake and downstream in the lower Osage River. A barrier net has been installed in front of the intakes to the Osage Plant. Ameren Missouri worked in consultation with the MDNR, MDC, and USFWS on this fish protection measure, which has been very successful in preventing fish mortality. The barrier has functioned successfully as designed since its installation (Ameren Missouri 2017). Ameren Missouri continues to monitor the operation of the fish barrier net.

Ameren Missouri supports the MDC's fish propagation and stocking program by providing funding that will be used to increase the fish hatchery program run by the MDC for stocking fish

in the lake and downstream in the lower Osage River. Funding is also being provided to the USFWS for use in helping that agency and the MDC improve aquatic habitat in the lower Osage River to benefit fishery resources as well as endangered species of mussels.

Aquatic Resources Conditions and Requirements

- Wetlands are important habitat for fish in the Lake of the Ozarks. Lacustrine, palustrine, and riverine systems are all important fish habitat for myriad reasons. Aquatic species use these wetland areas for feeding, spawning, and protection (see Appendix A for locations within the Osage Project boundary). No land disturbance is allowed in these areas without Ameren Missouri's approval; Ameren Missouri's consultation with resource agencies; and the permittee obtaining all necessary state and federal permits, as appropriate.
- Woody debris provides quality fish habitat, thereby improving the recreational resource within Lake of the Ozarks. Unauthorized removal of woody debris from the reservoir shoreline could compromise the aquatic resources and as such is regulated through Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).

2.5 Terrestrial Resources

Terrestrial resources within the project boundary include wetlands and shoreline vegetation; wildlife; including rare, threatened, and endangered species.

2.5.1 Wetlands

Wetlands were once a significant component of Missouri's natural heritage, accounting for 11 percent of surface area. Historical wetland losses in Missouri have been significant, approaching 90 percent. Federal and state agencies have been directed to implement a policy of "no net loss of wetlands" in permitting and certification work. Therefore, wetland impacts should be avoided or minimized if possible or, if not, appropriate mitigation should occur. Information on wetland resources within the project boundary is based on the field-verified USFWS NWI mapping and included on the Appendix A maps for easy reference. A discussion about the use of the NWI maps is included later in this section.

The NWI classifications include 11 wetland classes. The following is a brief description of each of the wetland classes displayed on the maps, including common features, locations, and functions. This information is paraphrased from the USFWS publication *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

- **Lacustrine Limnetic** - The lacustrine system includes permanently flooded lakes and reservoirs. Typically, there are extensive areas of deep water, and there is considerable wave action. These areas are lacking trees, shrubs, persistent emergents, and emergent mosses or lichens with greater than 30 percent areal coverage. The limnetic subsystem is all deepwater habitats.
- **Lacustrine Littoral** - All wetland habitats in the lacustrine system. Extends from the shoreward boundary of the system to a depth of 2 meters (6.6 feet) below low water or to the maximum extent of non-persistent emergents, if these grow at depths greater than 2 meters.

- **Palustrine Aquatic Bed** - Wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Aquatic beds represent a diverse group of plant communities that require surface water for optimum growth and reproduction. They are best developed in relatively permanent water or under conditions of repeated flooding. The plants are either attached to the substrate or float freely in the water above the bottom on the surface.
- **Palustrine Emergent** - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Perennial plants usually dominate these wetlands. Emergent wetlands are known by many names, including marsh, fen, prairie pothole, and slough.
- **Palustrine Scrub-Shrub** - Areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
- **Palustrine Forested** - Areas characterized by woody vegetation that is 6 meters (20 feet) tall or taller.
- **Palustrine Unconsolidated Bottom** - All wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover less than 30 percent. Water regimes are restricted to permanently flooded, intermittently exposed, and semi-permanently flooded. Characterized by the lack of large stable surfaces for plant and animal attachment.
- **Palustrine Unconsolidated Shore** - All wetland habitats having three characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders, or bedrock; (2) less than 30 percent areal cover of vegetation other than pioneering plants; and (3) any of the following water regimes: irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, intermittently flooded, saturated, or artificially flooded.
- **Riverine Lower Perennial** - The gradient is low, water velocity is slow, and some water flows throughout the year. The substrate consists mainly of sand and mud. The fauna is composed mostly of species that reach their maximum abundance in still water, and true planktonic organisms are common. The gradient is lower than that of the upper perennial subsystem and the floodplain is well developed.
- **Riverine Upper Perennial** - The gradient is high, velocity of the water fast, and some water flows throughout the year. The substrate consists of rock, cobbles, or gravel with occasional patches of sand. The natural DO concentration is normally near saturation. The fauna is characteristic of running water, and there are few or no planktonic forms. The gradient is high compared with that of the lower perennial subsystem, and there is very little floodplain development.
- **Riverine Intermittent** - The channel contains flowing water for only part of the year. When the water is not flowing, it may remain in isolated pools or surface water may be absent.

The USACE, in 1987, published the *Corps of Engineers Wetland Delineation Manual* (1987 Corps Manual), which is a technical manual that provides guidance to Federal agencies about how to use wetland field indicators to identify and delineate wetland boundaries (USACE 1987). In January of 1989, the U.S. Environmental Protection Agency (USEPA), USACE, Soil Conservation Service (SCS), and USFWS adopted a single manual for delineating wetlands under the Section 404 and Swampbuster programs—*The Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (which is commonly referred to as the “1989 Manual”).

The “1989 Manual” established a national standard for identifying and delineating wetlands by specifying the technical interrelated criteria used to determine the presence of the three wetland characteristics: wetland hydrology, water-dependent vegetation, and soils that have developed under anaerobic conditions (USGS 2002).

In 1991, the President's Council on Competitiveness proposed changes to the 1989 Manual because of some concern that nonwetland areas were regularly being classified as wetlands. The proposed 1991 Manual was characterized by many wetland scientists as politically based rather than scientifically based. In September of 1992, Congress authorized the National Academy of Science to conduct a study of the methods used to identify and delineate wetlands. On August 25, 1993, the Clinton administration's wetland policy, proclaimed that, “Federal wetlands policy should be based upon the best science available” and the 1987 Corps Manual is the sole delineation manual for the Federal Government until the National Academy of Sciences completes its study (USGS 2002).

As described in this section of the SMP, wetland resources described in the project area were based on the use of USFWS NWI maps and were field verified by professional wetland scientists. NWI maps are routinely used as a preliminary tool for determining jurisdictional wetlands for regulation under Section 404 of the Clean Water Act. USFWS NWI maps provide information on the characteristics, locations and extent of wetlands and deepwater habitat on a nationwide basis, including the project area. According to the USFWS (2016*b*) “Landowners, developers, real estate agents, and environmental consultants review NWI data as a first step in assessing the potential restrictions of land for residential, commercial, and industrial development. The [USACE] uses NWI data during its permit review process.”

NWI classification is a system for mapping wetlands in the United States developed by the USFWS and is different than the classification of wetlands identified by the USACE. The USACE uses more stringent criteria to identify wetlands than those used by the NWI. The USACE requires that, to be considered a wetland, the following three elements must be present: (1) hydric soils; (2) hydrophytic vegetation; and (3) hydrology (USACE 1987). Because the USFWS requires that only one of the preceding elements be present to be considered a wetland, NWI-listed wetlands may not be directly considered jurisdictional wetlands by the USACE if one or two elements are absent.

The use of NWI maps allows only an estimation of the presence of wetlands along the Lake of the Ozarks shoreline. However, Ameren Missouri, through its terrestrial resources consultant using professional wetland scientists, identified 16 transects for field verification of the NWI-identified wetlands and confirmed the presence of USACE-defined wetlands 93 percent of the time. Thus, the use of the field verified USFWS NWI maps proved to be a reliable method for identifying the locations and extent of wetlands and deepwater habitat within the project area without performing a more comprehensive wetland identification approach as described in the 1987 Corps Manual.

Types of wetlands observed included riverine, forested, scrub-shrub, emergent, aquatic bed, and unconsolidated bottom (AmerenUE 2002*e*). (See Appendix A for NWI-identified areas in the vicinity of the Lake of the Ozarks.)

Wetland and Shoreline Vegetation Conditions and Requirements

- Ameren Missouri works with USACE to identify and avoid disturbance in jurisdictional wetlands.
- Ameren Missouri has addressed permit requirements for wetland resources in its *Lake of the Ozarks Permit Requirements* (see Appendix B).
- Ameren Missouri has established a vegetative cover policy to preserve shoreline vegetation. See *Vegetative Cover Policy* in Section 3.17 for information related to shoreline vegetation.

2.5.2 Wildlife

The wildlife resources included in this inventory include the presence and location of aquatic mammal colonies and shoreline habitat usage, migratory bird feeding and staging areas, and waterfowl breeding habitats. MDC staff reports that aquatic mammals known to occur within the project boundary include beaver, river otter, muskrats, and mink.

Ameren Missouri (AmerenUE 2002e) compiled migratory bird feeding and staging area study results for the Lake of the Ozarks. Report summaries refined the categories of migratory birds into shorebirds and waterfowl (ducks and geese). The MDC annually conducts a mid-winter waterfowl aerial survey over various regions of Missouri. For the years in which data were available, these surveys show that mallards (*Anas platyrhynchos*) are the predominant duck species throughout most of the study area during the mid-winter surveys (AmerenUE 2002e). Other duck species noted in these surveys include common mergansers (*Mergus merganser*), green-winged teal (*Anas crecca*), hooded mergansers (*Lophodytes cucullatus*), wood ducks (*Aix sponsa*), buffleheads (*Bucephala albeola*), gadwalls (*Anas strepera*), and goldeneyes (*Bucephala clangula*) (AmerenUE 2002e). Canada geese (*Branta canadensis*) constituted the largest number of waterfowl during the survey years of 1999 and 2001 (AmerenUE 2002e). Other species potentially over-wintering on the Lake include blue-winged teal. MDC staff reported that the Lake of the Ozarks does not have localized, high-density breeding grounds utilized by waterfowl species (AmerenUE 2002e). Consultations during relicensing also indicated that the primary species to use the Lake for breeding habitat are wood ducks. Field results of the summer shorebird study were limited to sightings below Bagnell Dam outside the project boundary.

The MDC reports that nearly 70 species of wild mammals live in Missouri (MDC 2003a). The most common large mammal in the region is the white-tailed deer (AmerenUE 2002e). Other species of mammals in the area include beaver, muskrat, mink, raccoon, opossum, skunk, red and gray fox, gray squirrel, and cottontail rabbit (AmerenUE 2002e). Armadillos have expanded their distribution into Missouri and have recently been observed in the area (Greg Stoner, personal communication, and <https://nature.mdc.mo.gov/discover-nature/field-guide/nine-banded-armadillo>). Another five species no longer occur naturally in the Lake of the Ozarks area of Missouri, including gray and red wolves, bison, white-tailed jackrabbit, and elk (MDC 2003a).

Wildlife Conditions and Requirements

- Palustrine wetlands are important habitat for wildlife using the shoreline of the Lake of the Ozarks. Wildlife species use these wetland areas for feeding, breeding, and protection (see Appendix A for locations within the Osage Project boundary). No land disturbance is allowed in these areas without Ameren Missouri’s approval; Ameren Missouri’s consultation with resource agencies; and the permittee obtaining all necessary state and federal permits, as appropriate.
- Ameren Missouri has established a vegetative cover policy to preserve shoreline vegetation. See *Vegetative Cover Policy* in Section 3.17 for information related to shoreline vegetation.

2.5.3 Rare, Threatened, and Endangered Species

The Nature Conservancy, MDNR, and MDC created the Missouri Natural Heritage Database (MNHD) in 1981 to identify species and natural communities of special concern within the state and to help establish protection priorities. The MDC currently maintains MNHD with more than 11,000 records of occurrences of more than 800 sensitive species and natural communities in Missouri (MDC 2003b). The species cataloged on the MDC’s list represent 18 percent of the native vascular plants, 14 percent of the nonvascular plants, and 28 percent of the vertebrate animals in Missouri (MDC 2003b). These lists are important for assessing populations of sensitive species and potential effects resulting from development that may infringe or degrade the habitat or population of a listed species.

As part of the terrestrial resource study, the list of rare, threatened, and endangered (RTE) species historically found in the counties within the project area has been refined to reflect those species that could potentially occur within the project area. This list was taken in the field, and Table 3 lists the observed results of which species of concern are thought to occur within the project boundary (AmerenUE 2002e), as updated with 2016 species status information. The state ranking system is used to convey the degree of the level of concern granted each species.

**TABLE 3
RARE, THREATENED, AND ENDANGERED SPECIES
WITHIN THE OSAGE PROJECT AREA**

Species of Concern		Federal Status	State Rank ¹
Common Name	Scientific Name		
<i>Observed in the study area</i>			
Gray Bat	<i>Myotis grisescens</i>	Endangered	S3
Bald Eagle ²	<i>Haliaeetus leucocephalus</i>		S3
Northern Harrier	<i>Circus cyaneus</i>		S2
Osprey	<i>Pandion haliaetus</i>		S2
Cerulean Warbler	<i>Dendroica cerulea</i>		S2/S3
Trumpeter Swan	<i>Cygnus buccinator</i>		S1
<i>Potentially occurring, not observed</i>			
Indiana Bat	<i>Myotis sodalists</i>	Endangered	S1
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened	S3
Bachman’s Sparrow	<i>Aimophila aestivalis illinoensis</i>		S1
Peregrine Falcon	<i>Falco peregrinus tundrius</i>		S1

Species of Concern		Federal Status	State Rank ¹
Common Name	Scientific Name		
<i>Historically located in study area</i>			
Scarlet Snake	<i>Cemophora coccinea copei</i>		S2/S3
Brown Bog Sedge	<i>Carex buxbaumii</i>		S2
Salem Cave Crayfish	<i>Cambarus hubrichti</i>		S3

¹ State rank of threatened and endangered species as reported by MDC 2016. MDC assigns a numeric rank between S1 through S5 to represent a level of endangerment of a particular species based upon the number of occurrences of that species within Missouri. Other factors considered when assigning a rank include: abundance, population trends, distribution, number of protected sites, degree of threat, suitable habitat trends, level of survey effort, and life history information. Assigned ranks are defined as follows:

S1 - Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences or very few remaining individuals).

S2 - Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (6 to 20 occurrences or few remaining individuals or acres).

S3 - Rare and uncommon in the state (21 to 100 occurrences).

S4 - Widespread, abundant, and apparently secure in state, with many occurrences, but the species is of long-term concern (usually more than 100 occurrences).

S5 - Demonstrably widespread, abundant, and secure in the state; essentially ineradicable under present conditions.

SX - Extirpated: element is believed to be extirpated from the state.

² USFWS 2016a.

Ameren Missouri performed a biological assessment for rare, threatened, and endangered species. The assessment concluded that “operation of the Osage Project should not adversely impact bald eagle, Indiana bat, or gray bat populations in the project area” (AmerenUE 2003).

Rare, Threatened, and Endangered Species Conditions and Requirements

- In the event that activities are proposed in the vicinity of known locations of RTE species, Ameren Missouri will develop protective measures in consultation with resource agencies, as appropriate.

2.6 Historic Properties

Ameren Missouri published Phase I historic property investigations for the Lake of the Ozarks in November 2002. The objectives of the study were to identify historic properties located within the project area and provide an assessment of their eligibility for listing on the National Register of Historic Places (NRHP) in consultation with the SHPO within MDNR (AmerenUE 2002b).

Under section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register (defined as historic properties) and afford the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the Missouri SHPO and other parties with an interest in the effects of the undertaking on historic properties to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects. To satisfy these responsibilities, the Commission executed a PA, on November 13, 2006, with the Advisory Council and the SHPO. The PA required the licensee to prepare and implement a Historic

Properties Management Plan (HPMP) for the term of the new license issued for the Osage Project. Execution and subsequent implementation of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 418 of the 2007 license required Ameren Missouri to implement the PA and to file its HPMP with the Commission within one year of license issuance.

Historic Properties Conditions and Requirements

- Ameren Missouri, in consultation with the SHPO, Osage Nation of Oklahoma, Otoe-Missouri Tribe of Indians of Oklahoma, Iowa Tribe of Oklahoma, Kaw Nation of Oklahoma, and owners of properties that are eligible for listing in the NRHP prepared an HPMP and filed it with the Commission on March 28, 2008. The filing was supplemented on April 28 and June 12, 2008, and February 17 and April 16, 2009. The Commission approved the HPMP by order issued June 12, 2009.
- The new license also required that the HPMP be developed in conjunction with the SMP as well as the Recreation Enhancement Plan (REP) specified in Article 416.
- The HPMP requires that archeological site monitoring be conducted at the Osage Project in 2017, 2021, and on a 5-year cycle following the 2021 survey.
- An annual report of activities conducted under the HPMP is filed with FERC and the Section 106 consulting parties within 30 days of the anniversary of the license issuance date.

Ameren Missouri addresses permit requirements for historic properties in Section 3.2 of this SMP, the *Lake of the Ozarks Permit Requirements* (see Appendix B). Appendix E contains a narrative description of the Duncan's Point Resort site, which has been determined to be eligible for listing as a Traditional Cultural Property.

2.7 Recreation Resources

Ameren Missouri developed and filed the Osage Project Recreation Enhancement Plan (REP) on April 28, 2008, as required by Article 416 of the new license, and FERC approved the REP on May 14, 2009. On March 31, 2015, Ameren filed the Recreation Enhancement Plan 2014 Monitoring Report as required by Article 416. FERC approved the report on May 20, 2015. The REP documented the location of existing public recreational facilities and any proposed public recreational facilities and presents provisions for monitoring recreational use in the project area to ensure that existing facilities are meeting public recreation needs. Ameren Missouri was also required to establish and maintain a scenic viewing area at Willmore Point, as well as continue support and maintenance of several recreational facilities. Ameren Missouri provided financial support, in the amount of \$2.1 million, to the MDNR to improve facilities and environmental resources at Lake of the Ozarks State Park. These improvements have included new restrooms, campsite renovations, and wastewater and utility construction. Under the REP, Ameren Missouri will perform a recreation assessment for the project no sooner than 15 years into the new license term (after 2022).

This discussion of recreation resources includes information based on data collected during relicensing and for the 2014 Monitoring Report (Ameren Missouri 2015) about facilities and use, carrying capacity, navigation, and public safety.

2.7.1 Facilities and Use

Ameren Missouri catalogued the quantity, location, and ownership of Lake of the Ozarks facilities in its recreation study for the Lake of the Ozarks conducted from May 2001 through June 2002 (AmerenUE 2002d). The overall estimated recreation visits to 12 of the public access areas on the Lake of the Ozarks during the primary recreation season (June through October 2001) were 207,419. Visitors to public access areas participated in a variety of recreational activities, and the most frequent primary activity was motor boating (20.7 percent). The second most popular primary activity was picnicking (16.4 percent). The other activities with 10 percent or more participating, were bank/pier fishing (11.5 percent), sightseeing (10.9 percent), boat fishing (10.8 percent), swimming/sunbathing (10 percent). Fourteen public access sites are well utilized, however the results of the 2001 to 2002 study showed that during weekdays, the average use is 7 to 20 percent of capacity; weekends averaged 16 to 51 percent of capacity, with the exception of Brown Bend, which reached 91 percent of capacity; and holiday weekends averaged between 23 to 81 percent of capacity, with the exception of Pa He Tsi, which reached 110 percent of capacity. With the exception of Brown Bend on weekends, and holidays, most sites rarely reach 50 percent of their total parking capacity, and will be able to absorb additional use if demand continues to grow.

The 2014 REP Monitoring Report (Ameren Missouri 2015) concluded that public recreation facilities at the Osage Project are providing adequate capacity for current demand, with the exception of some MDC fishing access sites that may experience demand above capacity when fishing conditions are favorable, which occurs seasonally and attracts anglers to the sites. Outside of these peak fishing events, MDC sites operated below capacity. MDNR State Park facilities that experience heavy use may be influenced by statewide campaigns to encourage use. Ameren Missouri will report on use of public recreation facilities again in 2020.

Private resorts and marinas provide boat rentals, boat launching, and boat housing facilities for a great number of individuals. In 2007, there were approximately 73 marinas in operation on Lake of the Ozarks and 200 total lodging and resort establishments at the Lake of the Ozarks, 63 of which were lakefront. In 2001 and 2002, marinas averaged close to nine boats launched per day on weekends, and lakefront resorts averaged approximately eight boats launched on weekend days (The Louis Berger Group, Inc. [Berger] 2004). There are more than 25,000 individual private docks on the Lake of the Ozarks, which indicates that private homeowner use of the lake is a large part of the recreation use.

Facilities and Use Conditions and Requirements

- The public has access to the entire shoreline within the project boundary for activities such as fishing, walking, wildlife viewing, etc.
- Appendix B, *Lake of the Ozarks Permit Requirements*, outlines requirements for boat dock placement and boat dock specifications, bank stabilization guidelines, pier guidelines, excavation/fill guidelines, lake fluctuation policy, application processes, and fee guidelines. Ameren Missouri established these requirements to ensure protection of the Osage Project shoreline for recreational access.
- Ameren Missouri included a map in the REP showing the location of all existing and any proposed public recreational facilities in the project area that border the project boundary.

- Ameren Missouri included a program for monitoring or obtaining recreational use information for the public recreation facilities in accordance with Article 416 of the new license, which will be included in a monitoring report that will be filed with the Commission every six years for the license term in conjunction with the scheduled filing of the FERC Form 80, after consultation with the MDC and MDNR.
- Ameren Missouri will conduct a recreational assessment study in accordance with the SA agreed to with the resource agencies no earlier than the fifteenth year of the new license. The study will be similar in scope to the study that was conducted for the relicensing program in 2001 - 2002. The assessment will include reporting on the available public recreational facilities, as well as monitoring their use.

2.7.2 Carrying Capacity, Navigation, and Public Safety

Ameren Missouri developed watercraft carrying capacity density maps from a peak season (Memorial Day through Labor Day 2001) recreation use study examining the level of watercraft use on the Lake of the Ozarks. Study methods utilized a combination of physical (aerial photographs) and social (visitor use surveys) information to estimate the carrying capacity and corresponding visitor perceptions of crowding and safety on these water bodies. These maps are useful for understanding spatial and temporal trends in watercraft use and resultant public safety.

Areas with the heaviest use over all types of days were Horseshoe Bend and Shawnee Bend (AmerenUE 2002*d*). The Grand Glaize Arm experienced the highest use on weekends and holidays. The Gravois Arm and Niangua Arm received relatively low levels of use as compared with the rest of the lake. Incorporation of MSWP boat accident information into the maps indicated that the average density for areas with accidents was higher than the average densities of areas where no accidents occurred. Ameren Missouri found that, on average, areas with accidents had boat densities that were approximately double the areas without accidents.

Public access users' and landowners' perceptions of crowding and safety were identical for weekday use but differed for weekend and holidays (Berger 2004). Mean perceptions of crowding on weekdays for both groups indicate that they do not feel that the lake is crowded. In addition, the mean observation of safety on weekdays for both groups indicates that there is a perception that the lake is "safe" during weekdays. The mean perception of crowding of public access users indicates that individuals felt the lake was not crowded on weekend/holidays. Conversely, the mean perception for landowners indicates the lake is "moderately" to "very crowded" during the same times with the exception of the "Uplake" area. Perceptions of safety followed a similar pattern as crowding.

The 2000 MSWP Activities and Statistics Annual Report contain statistics on accidents, violations, regattas, dive team activity, and budget-related items of the department. Information pertaining to the Lake of the Ozarks is included in the report within MSWP Districts 1 and 2. Boating accidents recorded by district indicate the type and number of accidents, injuries, fatalities, estimated cost of damage, and any involvement of alcohol. The MSWP recorded 178 accidents on the Lake of the Ozarks in 2000, of which two were fatal, and its statistics indicate that 20 percent (445) of all violations resulted from operating a watercraft while under the influence of alcohol.

Aside from the number of accidents and violations, public safety also can be measured from visitor perceptions. Non-resident perception surveys reveal that visitors do not perceive that the lake is crowded (AmerenUE 2002*d*). However, residents perceive the lake as crowded more often than non-residents do on both holiday/weekend days and midweek days (AmerenUE 2002*d*).

Ameren Missouri reports fatal and serious water-related incidents that occur at the Osage Project to FERC on a quarterly basis. Incident reports for the period 2010-2014 were compiled for the REP 2014 Monitoring Report (Ameren Missouri 2015) to report on public safety conditions at the Project. For the 2010–2014 period, annual fatalities ranged from six in 2012 to 11 in 2014. Of the 11 fatalities in 2014, two victims were wearing personal flotation devices. Incidents and serious injuries have been documented starting in 2013. There were 36 incidents and 35 serious injuries in 2013 and 45 incidents and 43 serious injuries in 2014.

The Water Patrol Division of the Missouri State Highway Patrol (WPD), successor to MSWP, has the state-mandated authority to enforce watercraft speed laws and no-wake areas. The water patrol helps increase safety on the Lake of the Ozarks, and the speed limits and no-wake regulations reduce watercraft-induced waves which helps protect the shoreline from erosion.

The MSWP implemented a number of programs on the Lake of the Ozarks. During the summer of 2002, the MSWP implemented a no-wake zone in the vicinity of the Grand Glaize Bridge based upon safety and congestion concerns in the area; it will continue to monitor the effectiveness and necessity of the no-wake zone. Beginning January 1, 2005, Missouri law mandates that operators of vessels on the lakes of the state born after January 1, 1984, must take a boating safety education course that is approved by the National Association of State Boating Law Administrators. It further will require boaters of any age convicted of certain offenses such as boating while intoxicated, reckless, and negligent operation to take a course and not operate a vessel until the course is passed and recorded with the WPD. Operators that fall under the requirements will have to carry onboard a card issued by the WPD proving they have met the requirements of the law.

The U.S. Coast Guard Auxiliary (USCGA) flotilla at the Lake of the Ozarks conducts several additional public information and boating safety programs. The USCGA regularly conducts free safety inspections and provides feedback to boat owners on proper safety equipment and operation. Boating safety courses held each year in the Lake of the Ozarks area, as well as a comprehensive lake mile marker signage project, complement the inspection program. Ameren Missouri has worked closely with the USCGA and the more than 30 member Adopt-the-Shoreline (ATS) Advisory Board in compiling proper boating safety and procedures for more than 800 ATS volunteers. Ameren Missouri also partnered with the USCGA in financially supporting the comprehensive mile marker project.

As noted above, Article 416 in the new license for the Osage Project requires that Ameren Missouri implement various recreational measures to enhance public use of project waters and to monitor the use over the course of the new license. The REP includes, among other items the following:

- a monitoring plan to ensure that existing facilities are meeting public recreation needs;
- an assessment of water safety issues, including any measures that may be implemented to address any identified problem; and
- provisions for monitoring recreation use in the project area to ensure that (a) existing facilities are meeting public recreation needs, and (b) project lands and waters remain safe.

As noted above, Ameren Missouri will conduct a recreational assessment study in accordance with the SA agreed to with the resource agencies no earlier than the fifteenth year of the license term. The study, envisioned to be similar in scope to the study conducted during relicensing, will be developed in consultation with MDNR, and will include an assessment of the capacity of the recreational facilities versus their monitored use, an assessment of the boating carrying capacity on the lake and a review of the reported accidents versus location on the Lake of the Ozarks.

Carrying Capacity and Navigation and Public Safety Conditions and Requirements

- By state law, the WPD implements safety measures on the Lake of the Ozarks, including establishing no-wake zones, installing buoys, setting speed limits, patrolling the lake, and educating the public about safe boating (see <http://www.mshp.dps.missouri.gov/MSHPWeb/WaterPatrol/> for more details on the WPD's activities).
- As part of the implementation of the REP, Ameren Missouri will acquire accident data from the WPD on an annual basis and update its GIS with the most recent accident data. Ameren Missouri will continue to share these maps with the WPD.
- As part of the implementation of the REP, Ameren Missouri will meet with WPD on an annual basis to review safety and navigation issues on the Lake of the Ozarks.
- As part of the implementation of the REP, Ameren Missouri will continue to meet annually with the USCGA in its effort to promote safety with its ATS volunteer effort. Ameren Missouri also will continue to support the community-wide efforts of the USCGA in promoting public boating safety at the Lake of the Ozarks.
- Ameren Missouri's monitoring reports to be filed every six years will include a discussion on the adequacy of the recreational facilities to meet recreation demand, the potential need for any new facilities and an assessment, in conjunction with the WPD, of water safety at the project.
- Ameren Missouri will complete a recreational assessment study no earlier than the fifteenth year of the new license term similar to the recreational assessment study conducted for the relicensing program in 2001 - 2002 to be developed in consultation with MDNR. The study will assess facility capacity, boating capacity, and water safety among other items.

2.8 Land Use

The Osage River Basin and the Lake of the Ozarks area have undergone major changes in land use within the last 300 years (AmerenUE 2002*b*). From the early European settlers' displacement of the Osage tribe of Native Americans to the construction of Bagnell Dam on the Osage River, the river basin has experienced dramatic shifts in land use. The creation of Lake of the Ozarks has been a primary factor changing land use from rural agriculture to vacation and

recreation development. The shoreline surrounding the project area contains industry catering to the recreation and tourism trades as well as an agricultural industry; however, agriculture is generally not located close to the Lake of the Ozarks or the Osage Project boundary.

The majority of the lands immediately adjacent to the Lake of the Ozarks shoreline are privately owned, and Ameren Missouri has no direct control of development outside the project boundary. Direction over these lands is contained within Chapter 64 of the Missouri Revised Statutes, which provides for the establishment of planning and zoning districts bordering the lake. The County Commission of any county that borders the Lake of the Ozarks can create a planning and zoning district, and towns have adopted their own planning and zoning regulations. Those towns located along the Lake of the Ozarks shoreline that have adopted zoning regulations include Warsaw, the city of Osage Beach, city of Lake Ozark, and village of Four Seasons. Camden County has formed the Camden County Shoreline District Planning and Zoning Commission.

Land Use Conditions and Requirements

- Ameren Missouri as licensee has control over activities, uses, and construction within the project boundary along the shoreline, but not on the private land that lies outside the shoreline area, as noted above. The activities and construction that are permitted within the project boundary influence adjacent land uses. Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B) specify the activities that are allowed on the Ameren Missouri owned or controlled lands within the Osage Project boundary.

2.9 Aesthetic/Visual Resources

The Lake of the Ozarks shoreline offers a diverse range of aesthetic/visual resources from steep 60-foot cliffs to state park forested lands to areas of residential and commercial docks and waterscapes. Ameren Missouri has undertaken various efforts to protect and maintain the aesthetic resources within the project boundary. A major source of impacts on the aesthetic resources of the Lake of the Ozarks stems from the degradation of dock materials, specifically flotation materials. Ameren Missouri attempts to minimize these impacts through permit building materials guidelines and four programs (see Section 3.0 for descriptions of these programs):

- the Certified Dock Builders Program;
- the Derelict Dock Removal Program;
- the Adopt-the-Shoreline Program; and
- the Ameren Missouri Shoreline Protection Hotline.

In addition, Ameren Missouri conducts lake-wide compliance inspections in implementing its permitting program. This effort not only ensures compliance with issued permits, but also ensures that derelict docks and other compliance issues are identified and addressed. Beginning in 2007, Ameren Missouri staff began an annual visual inspection of the lake's shoreline. Originally started to document compliance with the ban on non-encapsulated flotation, this assessment expanded to include documentation of all lakeside accessory structures within the project boundary. These inspections include documentation and notification to property owners with derelict structures or structures in violation of permit conditions.

Aesthetic/Visual Resources Conditions and Requirements

- The state of Missouri controls 85.3 shoreline miles around the Lake of the Ozarks. With the exception of facilities for recreational access, these shoreline areas are free of development and protected by the state.
- Development on Ameren Missouri-owned project lands with high aesthetic values not protected by the state are covered by the permit/review process as contained in Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).

3.0 SHORELINE MANAGEMENT PROGRAMS AND GUIDELINES

Throughout the history of shoreline management at the Lake of the Ozarks, Ameren Missouri has instituted a number of policies, programs, and actions that have enhanced its ability to protect the shoreline resources for project operations, the recreating public, and the environmental resources. This section describes Ameren Missouri's efforts.

3.1 Shoreline Development Permit Program

Ameren Missouri implemented shoreline management measures in 1983 with the start of its permit program. The program was established to monitor the construction of residential boat docks, seawalls, and other activities along the shoreline through a permit-review process. The program was developed in accordance with the FERC license to operate the Osage Project (Article 41 of the 1981 license). The permit program grew to require permits for activities such as the development of commercial docks, dredging/excavation, decks, patios, piers, walkways, and other activities within the project boundary. The Lake of the Ozarks Permit Requirements can be found in Appendix B and on the web at: www.amerenmissouri.com/lake

Ameren Missouri will continue to implement this permit program under this SMP. The Commission's "standard land use article" (Article 419 of the Osage License) and the shoreline use classifications presented in Section 3.2 will be used to determine the level of review and approval required for any proposed shoreline uses. Table 4 identifies the uses that are allowed in each shoreline use classification and the level of notification and approval required for each use. Some shoreline uses are allowed after Ameren Missouri approval, while others require resource agency notification or Commission approval. Appendix B presents detailed information on the permit review process.

Under this SMP, beginning on January 31, 2012, and every year thereafter, Ameren Missouri will file an annual report with the Commission that summarizes the extent and location (including latitude/longitude point data) of all large docks and commercial marinas, including fuel facilities, breakwaters, and dredging and excavation permitted within the project boundary permitted under this SMP without prior notice to or approval by the Commission.¹

To facilitate the review of a permit application, Ameren Missouri developed a process for assessing future shoreline development (Figure 1). This process enables Ameren Missouri to assess submissions for shoreline development based on resource inventories of the Lake of the Ozarks shoreline and its shoreline requirements and programs.

In cases where development has occurred without proper permitting, Ameren Missouri has a review process to assess the shoreline development that may include removal of structures at the owner's expense and/or an enforcement fee. Figure 2 shows Ameren Missouri's review process for such after-the-fact permits.

¹ Per FERC Order July 26, 2012, Ordering Paragraphs C and D.

TABLE 4
PERMIT REVIEW PROCESS SUMMARIZED BY SHORELINE USE CLASSIFICATIONS, ALLOWABLE USES, AGENCY NOTIFICATION, AND FERC APPROVAL REQUIREMENTS

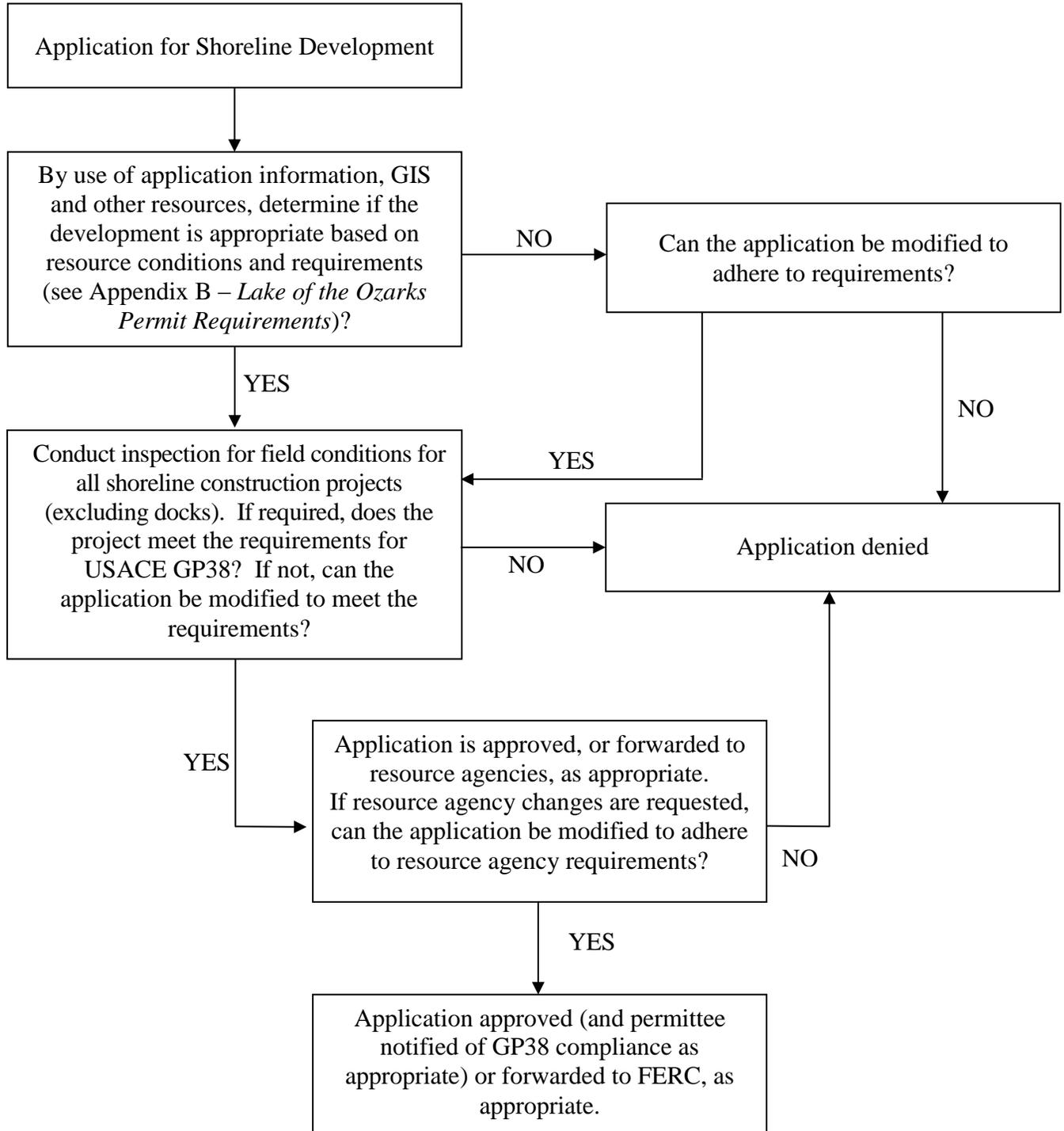
Shoreline Use	Shoreline Use Classification									
	Commercial	Multi-Family Residential	Single-Family Residential	Public Recreation	State Protected	Undeveloped/ Island	Undeveloped - Wetlands	Undeveloped - Historic Properties	Undeveloped - Head of Cove	Undeveloped - Areas of Woody Debris
Dock, up to 10 slips, decks, patios, and walkways	AM*	AM	AM	AM	AM	AM	No	Agency ¹	AM	Agency
Dock, 11-50 slips	Agency ¹	Agency	Agency	Agency	Agency	Agency	No	Agency	No	Agency
Docks, 51 slips or more ²	FERC	FERC	FERC	FERC	FERC	FERC	No	Agency	No	Agency
Marina ²	FERC	FERC	FERC	FERC	FERC	FERC	No	Agency	No	Agency
Dredging or excavation	Agency	Agency	Agency	Agency	Agency	Agency	No	Agency	Agency ⁴	Agency
Shoreline stabilization - seawall	AM	AM	AM	Agency	Agency	AM	No	Agency	No	Agency
Shoreline stabilization - vegetation	AM	AM	AM	AM	AM	AM	AM	Agency	AM	Agency
Shoreline stabilization - riprap	AM	AM	AM	AM	AM	AM	Agency	Agency	AM	Agency
Breakwater	AM	AM	AM	AM	AM	AM	No	Agency	No	Agency
Vegetation removal ³	AM	AM	AM	AM	AM	AM	No	Agency	No	AM
Boat ramps, landings	AM	AM	AM	AM	AM	AM	No	Agency	No	Agency
Boat fueling	Agency	Agency	Agency	Agency	Agency	Agency	No	Agency	No	Agency
Landscape plantings	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Walkways and piers	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Storm drains and water mains	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Water intake or pumping facilities withdrawing less than 1 million gallons per day	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Water intake or pumping facilities withdrawing 1 million or more gallons per day ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC
Food plots and other wildlife enhancements	AM	AM	AM	AM	AM	AM	AM	Agency	AM	AM
Replacement, expansion, realignment, or maintenance of bridges or roads	Agency	Agency	Agency	Agency	Agency	Agency	Agency	Agency	Agency	Agency
Sewers that do not discharge into project waters (including toilets and showers)	Agency	Agency	Agency	Agency	Agency	Agency	No	Agency	No	Agency

Shoreline Use	Shoreline Use Classification									
	Commercial	Multi-Family Residential	Single-Family Residential	Public Recreation	State Protected	Undeveloped/Island	Undeveloped - Wetlands	Undeveloped - Historic Properties	Undeveloped - Head of Cove	Undeveloped - Areas of Woody Debris
Minor access roads	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Telephone, gas, and electric utility distribution lines	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less)	AM	AM	AM	AM	AM	AM	Agency	Agency	Agency	Agency
Construction of new bridges or roads ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC
Sewer or effluent lines that discharge into project waters ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC
Pipelines that cross project lands or waters but do not discharge into project waters ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC
Non-project overhead electric transmission lines that require erection of support structures within the project boundary ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC
Other uses ²	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC	FERC

* "AM" indicates that only Ameren Missouri review and approval is required.

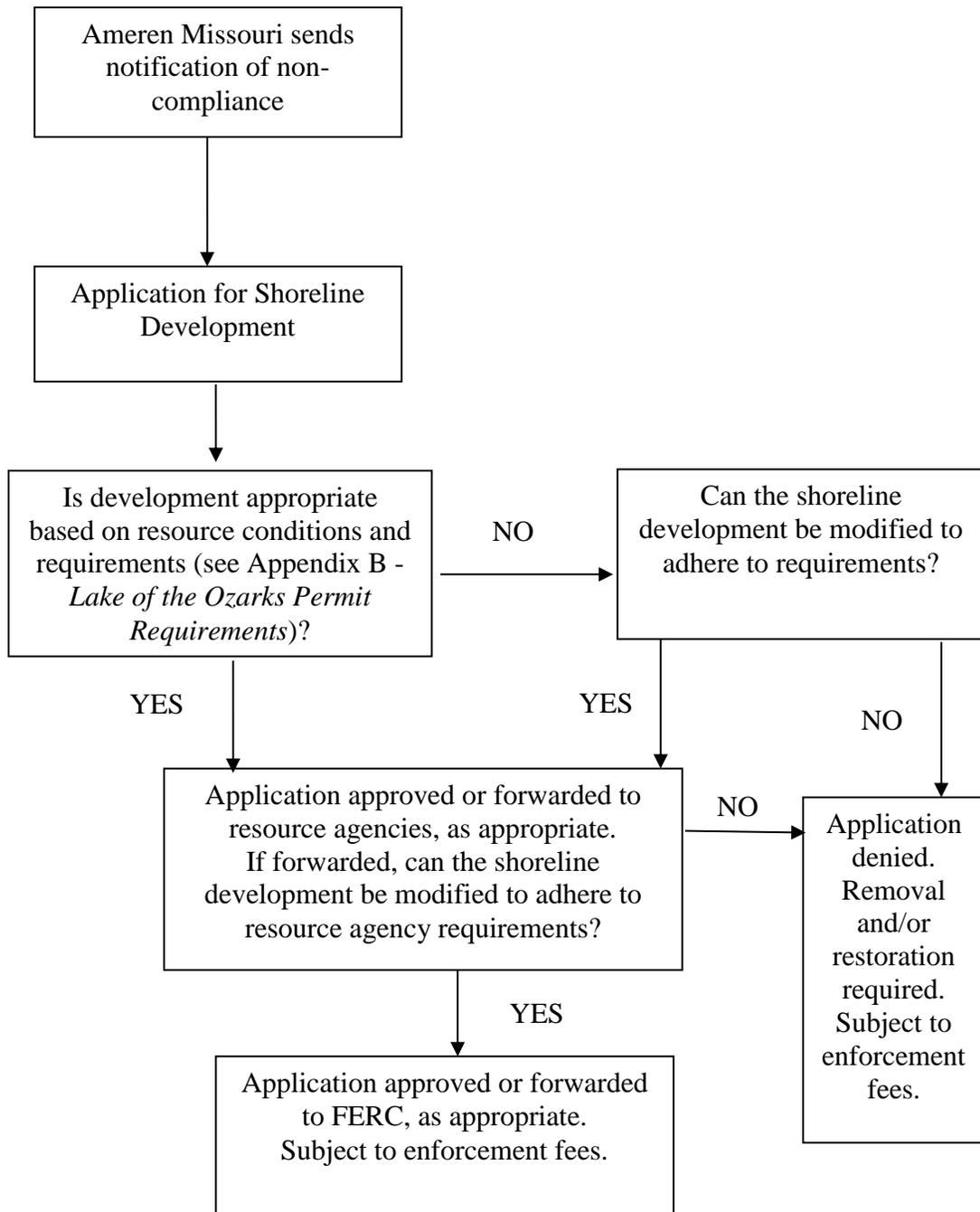
- 1 The use of the "Agency" throughout this table indicates that relevant agencies will be notified of the proposed shoreline use and their input will be requested before Ameren Missouri makes the permitting decision. "Agency" indicates that the MDNR (including the State Historic Preservation Office), the MDC, the USFWS, or other agencies may be notified. The agency notification listed in this table does not describe or replace discrete regulatory authorities that these same agencies have over some of these activities. These regulatory authorities are presented in more detail in Appendix B.
- 2 "FERC" indicates that Federal Energy Regulatory Commission approval will be required, in addition to agency notification.
- 3 Removal of wetland vegetation or native trees greater than 1.5 inches in diameter within Ameren Missouri lands.
- 4 Dredging/excavation will not be permitted in Undeveloped Head of Cove, except at existing permitted structures where dredging may be permitted as allowed in the Dredging-Excavation /Fill Guidelines in Appendix B. "Existing permitted structures" shall include any dock appropriately located and permitted prior to March 30, 2007.

**FIGURE 1
PERMIT REVIEW PROCESS**



Note: If at any time in the process it is discovered that shoreline activities require permits from other agencies (i.e., land disturbance permitting) or violate the requirements of MDNR, MDC, or USACE, the agency contact will be notified and approval will be required by that agency before the project can be approved by Ameren Missouri.

FIGURE 2
REVIEW PROCESS FOR AFTER-THE-FACT NON-PERMITTED ACTIVITIES



3.2 Lake of the Ozarks Resource Protection Guidelines

Certain areas along the shoreline are worthy of an additional level of protection that is not afforded to all of the lands covered by the Lake of the Ozarks Permit Requirements (see Appendix B). These areas are identified along undeveloped shoreline with the following resources present: wetlands, heads of coves, historic properties, and areas of woody debris. These areas are of special concern to resource agencies and Ameren Missouri. Within these areas, an increased level of assessment, consultation and/or protection will be required, as appropriate.

Development may occur in these areas but the resources must be afforded protection. Within the individual areas, there may be certain aquatic or terrestrial resources or habitat characteristics that need complete protection to avoid adverse impacts. Development within these areas will be carefully reviewed by Ameren Missouri and resource agencies, to ensure resource protection. Identification of these areas are derived from known and modeled resource areas and given a resource-specific buffer as appropriate.² The extent of the resource area or buffer will be field verified on a case-by-case basis by Ameren Missouri in consultation with resource agencies.

Any proposed disturbance in these areas must include a plan that contains measures to avoid, minimize, or mitigate impacts on important environmental features within the area. Approval of the proposed activities and the plan to avoid, minimize, or mitigate the impacts will be decided on a case-by-case basis.

In addition to the above guidelines, there are restrictions in areas of wetlands, historic properties, heads of coves, islands, and woody debris, as described in the following sections.

3.2.1 Wetlands

Wetlands were once a significant component of Missouri's natural heritage, accounting for 11 percent of surface area. Historical wetland losses in Missouri have been significant, approaching 90 percent. Federal and state agencies have been directed to implement a policy of “no net loss of wetlands” in permitting and certification work. Therefore, wetland impacts should be avoided or minimized if possible or, if not, appropriate mitigation based on the requirements developed in the State of Missouri Aquatic Resources Mitigation Guidelines (MDNR undated) and the State of Missouri Stream Mitigation Method (USACE 2013) should be implemented. The USACE strictly controls wetlands in accordance with the rules and regulations established in Section 404(B) of the Clean Water Act (CWA) of 1977. In addition to other local, county, state and federal permit certifications, any development that impacts wetland areas is subject to the terms of the CWA and requires a 404 permit approved by the USACE and 401 water quality certification as approved by the MDNR.

² Wetlands will be field verified to avoid inaccuracies inherent in the mapping process; undeveloped heads of cove areas will also be field verified and are defined as the portions of any cove, regardless of size, which lie landward of a perpendicular line drawn across the cove, this line being located at the point at which the natural stream channel bottom (flooded by the lake water) is at the 652-foot elevation (if no natural stream channel can be identified, the perpendicular line will be located at the point farthest in to the cove where a 652-foot elevation is found); historic properties are known locations and receive a 300-foot buffer; and field-verified areas of woody debris are defined by the area occupied by the debris as determined by Ameren Missouri in conjunction with the MDC.

All facilities must comply with all applicable local, state, and federal regulations. The applicant must obtain all necessary governmental permits or approvals and written authorization prior to beginning any activity/construction within the project boundary. All land disturbing and construction activities must not occur within these areas during the months of March, April, May, and June to protect aquatic and terrestrial resources related to fish spawning habitat. Disturbance of land upland of wetlands (above project boundary) have the potential to damage the wetlands and the public will be guided by applicable state and federal regulatory requirements. Additionally, all construction activities below the water surface are prohibited between the spawning season at the Lake of the Ozarks that runs from March 15 – June 15 annually, except for the placement of riprap that is allowed under Ameren Missouri's General Permit 38.

The following activities will not be permitted within a wetland area:

- Dredging.
- Seawalls (located lakeward of 659.5 elevation), (boat) ramps, and similar improvements requiring excavation. Erosion must be evident to inspectors for favorable consideration of stabilization landward of 659.5 elevation.
- Shoreline stabilization other than native plant species, riprap, or other habitat enhancing methods. Erosion must be evident to inspectors for favorable consideration of stabilization landward of 659.5 elevation.
- Removal of wetland vegetation and native trees exceeding 1.5 inches in diameter within Ameren Missouri owned land.
- Facilities with toilets, showers, or any other type of device that could cause any wastewater to be discharged into the lake.
- Boat fueling facilities.

The floating portions of boat docks are permitted within wetland areas provided that installation of the dock and access to the dock can be achieved without adversely impacting the wetland.

3.2.2 Historic Properties

Each application will be reviewed to determine if the proposed development is located within 300 feet of a historic property. If it is determined that the proposed development is located within 300 feet of a historic property, Ameren Missouri will notify the owner that the area has been designated as an historic property and that consultation and signoff from the SHPO will be required before a permit can be issued. Ameren Missouri will follow the documented recommendations from the SHPO. Further, if historic property remains, i.e., artifacts or human remains are encountered during construction of any permitted facility, all construction must cease. The owner should contact Ameren Missouri and the SHPO and notify them of any unanticipated finds or new discoveries related to Historic Properties. Also, the owner should immediately contact the local law enforcement agency and the SHPO in accordance with RSMO-Section 194.400-410 Missouri Revised Statutes should human remains be encountered. Ameren Missouri will consult with the SHPO and any tribes that might attach religious or cultural significance to the discovered materials, to determine what steps need to be taken to evaluate the discovery and, if found to be eligible for the National Register of Historic Places, to

mitigate any adverse effects. The permittee shall not resume work at the site until notified by Ameren Missouri.

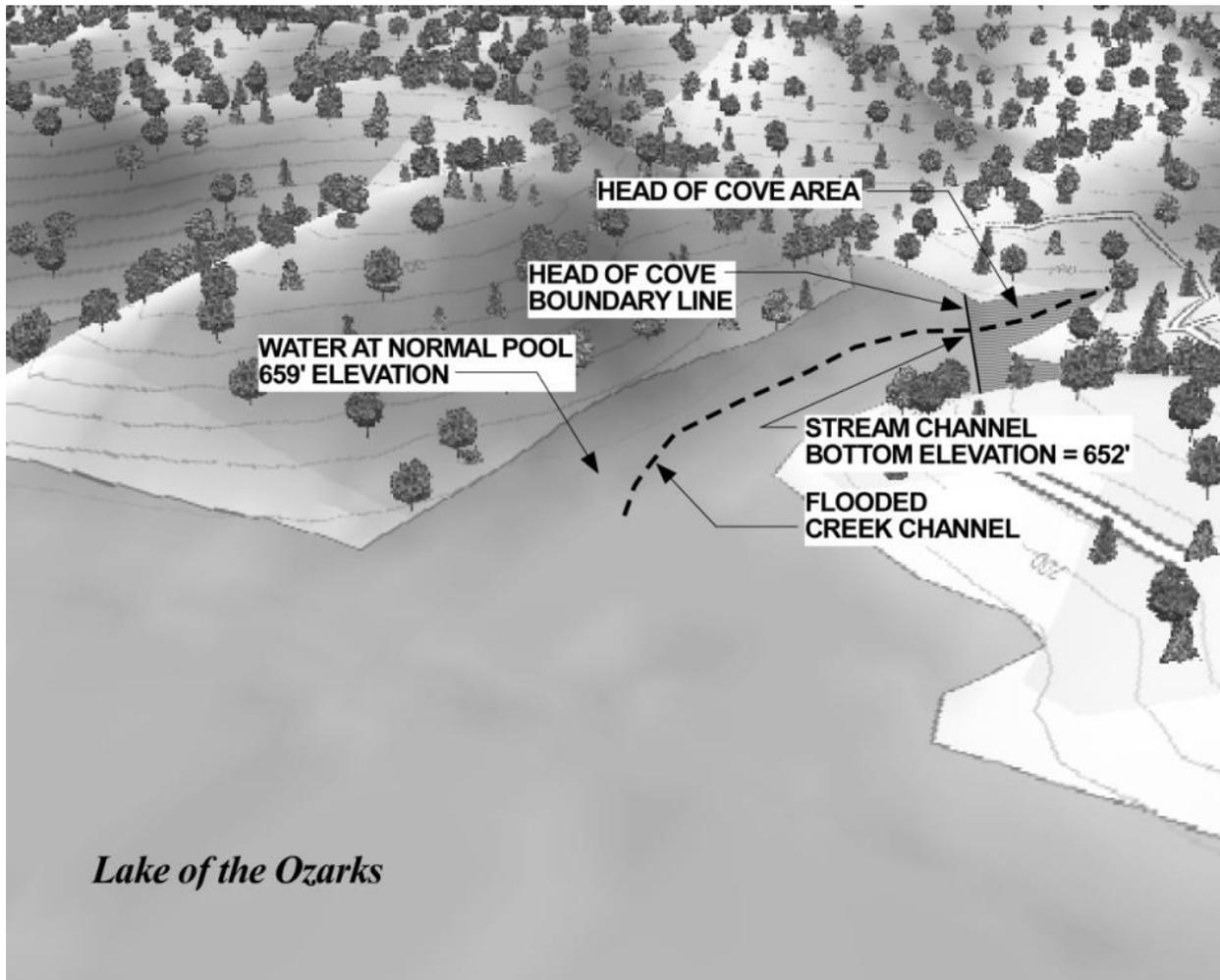
3.2.3 Heads of Coves

The quality of the recreational fishery, one of many facets upon which the tourism industry is dependent, is directly dependent on the survival of small young fish. Shallow water habitat and food resources are crucial for spawning, feeding, and avoiding predation. Shallow water habitats exist along much of the shoreline but are concentrated in the shallow end of the coves, referred to as the Head of Cove. Dredging eliminates shallow water habitat and extensive covering of this habitat type with structures can degrade it to levels which will negatively impact fisheries. Because of the importance of shallow water habitat to the recreational fisheries added protection is required.

The Head of Cove definition to be used for implementing habitat protection measures is:

That portion of any cove, regardless of size, which lies landward of a perpendicular line drawn across the cove, this line being known as the Head of Cove boundary line. The Head of Cove boundary line is located at the point at which the natural stream channel bottom (flooded by the lake water) is at the 652-foot elevation. If no natural stream channel can be identified, the perpendicular line will be located at the point farthest in to the cove where a 652' elevation is found. See Figure 3 Head of Cove Illustration.

**FIGURE 3
DEPICTION OF HEAD OF COVE**



There may be instances in determining the head of cove where the cove is exceptionally shallow; resulting in the elevation-based designation of head of cove encompassing the majority or all of an individual cove. In these instances, Ameren Missouri will review permit requests on a case-by-case basis. Ameren Missouri may allow certain uses within these coves provided no prohibited uses (listed here) are proposed in the back 1/3 of the cove; determined as the area defined behind a perpendicular to a center line extending from the back of the cove 1/3 of the total distance of the length of the cove. If an exemption is allowed, dredging will be limited to the footprint of the structure. Access dredging will be limited to a lateral from the structure to the central channel of the cove.

Developed and undeveloped head of cove areas have been identified throughout the project and additional resource protection is required within these settings as provided below.

The following activities will not be permitted within a **Head of Cove** regardless of development:

- Dredging, except at existing permitted structures where dredging may be permitted as allowed in the Dredging-Excavation /Fill Guidelines in Appendix B. “Existing permitted structures” shall include any dock appropriately located and permitted prior to March 30, 2007.
- Dredging will be limited to 900 square feet under docks properly located after March 30, 2007.

The following activities will not be permitted within an undeveloped Head of Cove area:

- Docks greater than 10 slips and Marinas.
- Dredging, except at existing permitted structures where dredging may be permitted as allowed in the Dredging-Excavation /Fill Guidelines in Appendix B. “Existing permitted structures” shall include any dock appropriately located and permitted prior to March 30, 2007.
- Seawalls (located lakeward of 659.5 elevation, (boat) ramps, and similar improvements requiring excavation. Erosion must be evident to inspectors for favorable consideration of bank stabilization landward of 659.5 elevation.
- Shoreline stabilization other than native plant species, riprap, or other habitat enhancing methods. Erosion must be evident to inspectors for favorable consideration of bank stabilization landward of 659.5 elevation.
- Removal of wetland vegetation and native trees exceeding 1.5 inches in diameter within Ameren Missouri owned land.
- Facilities with toilets, showers, or any other type of device that could cause any wastewater to be discharged into the lake are prohibited.
- Boat fueling facilities.

3.2.4 Island Development

There are several islands throughout Lake of the Ozarks. These islands were formed when high points in the ridgeline were disconnected from the mainland as the lake filled. Many islands may be connected through an underwater saddle which provides unique aquatic habitat. Some islands may be periodically inundated and contain wetland habitat. Due to the isolated environment, island vegetation has been largely undisturbed for more than 80 years, which also creates aesthetic value for these islands.

Project lands on undeveloped islands shall be designed as **low intensity development**. Island development should be designed, configured, and developed to minimize damage to ecological functions even when the island is fully built out. Development on these areas should be designed to prevent cumulative impacts associated with storm water runoff, wastewater disposal systems, introduction of pollutants, and vegetation clearing. New island development should be designed to minimize vegetation removal to the greatest extent feasible.

The construction of causeways or bridges to access islands is prohibited. Docks servicing islands will be limited to 2,000 square feet, with at least 200 feet of shoreline between docks. Ameren Missouri may consider community docks in favor of individual docks where placement of a community dock results in significant areas of shoreline left undisturbed.

3.2.5 Woody Debris

Ameren Missouri prohibits the removal of existing submerged woody debris from the lake, unless such debris constitutes a navigational or public safety hazard. Ameren Missouri must approve removal of such woody debris from the lake. Woody debris that falls into the lake as a result of storms or natural occurrence should be left in place unless such debris constitutes a navigational or public safety hazard. Woody debris that has broken loose from submerged trunks and is floating in such a manner that constitutes a navigational or safety hazard may be relocated to an undeveloped section of shoreline and securely fastened in place to waterlog and sink, or removed from the lake. In the placement and construction of new docks, these facilities should be placed to minimize removal of woody debris. Property owners may be required by Ameren Missouri and/or resource agencies to mitigate at a 2:1 ratio for removal of woody debris from the lake in nearby areas, depending upon the type and age of submerged woody debris. Such mitigation may include, but is not limited to, the design and construction of enhancement or mitigation measures for fish habitat.

3.3 Land Disturbance Education

On June 3, 2005, the MDNR issued a water quality certification for the Osage Project that included nine conditions. One of those conditions required that Ameren Missouri prepare a Storm Water Pollution Prevention Plan (SWPPP) that could be used to aid in educating property owners and developers about the best management practices to control storm-water runoff and non-point source pollution. Ameren Missouri filed the SWPPP with the MDNR in December 2005 and with FERC on June 28, 2007. The Commission approved the SWPPP by Order dated June 16, 2009.

In conformance with the SWPPP, Ameren Missouri sponsors annual seminars in coordination with the MDNR to educate developers and builders as to the best management practices to control storm-water runoff from development and measures to prevent and control non-point source pollution from development around the Osage Project, such as maintaining vegetative buffers and properly disposing of yard waste. The materials for the seminars are developed with input from MDNR. Ameren Missouri is also an active member of the Lake of the Ozarks Watershed Alliance and routinely joins them in presenting water quality issues around the community.

3.4 Certified Dock Builders Program

Ameren Missouri implemented a Certified Dock Builders Program in 2004 to encourage that all docks constructed for the Lake of the Ozarks meet a standard of craftsmanship that prevents sub-standard docks from appearing on the lake. The program's goal is to minimize poor construction techniques and use of sub-par materials that could fall apart, float away, and become hazards and nuisances on the lake negatively affecting the aesthetic and recreation resources as well as public safety. In conjunction with this program, Ameren Missouri implemented a plan for eliminating the use of all non-encapsulated foam in boat dock construction by December 31, 2008.

3.5 Large Docks

The popularity of the lake, coupled with increasing development pressures for lakefront property has led to the installation of many large docks along the shores of the lake. Large docks are defined as proposed docks, or the cumulative total of existing and proposed slips being 11 or more slips. Ameren Missouri recognizes the impact such docks can have on existing development and the natural environment. Proposals for large docks in which the cumulative total of existing and proposed slips is at least 11 and no more than 50 slips, are subject to review by the MDNR, MDC, WPD, and any other appropriate agency deemed necessary by Ameren Missouri and set forth in Appendix B, *Lake of the Ozarks Permit Requirements*, under the section titled *Large Docks and Marinas*, to ensure that such docks do not adversely affect the lake, navigation on the lake, public safety, public recreation, and the natural environment. Large dock proposals in which the cumulative total of existing and proposed slips is 51 or more must also be reviewed and approved by FERC before a permit will be issued. During review of Large Dock applications, consideration will be given to compatibility with Commission-approved management plans, project operations and purposes, applicable license requirements, and Ameren Missouri's Permit Requirements. Ameren Missouri, resource agencies, and FERC will consider the potential impacts to vegetation, shoreline stability, significant resources, existing land uses, and water quality.

3.6 Sewer Effluent Lines that Discharge into Project Waters

Individual wastewater systems are not permitted within the Ameren Missouri project boundary unless specifically approved by Ameren Missouri after written recommendation from the County Health Department and/or the MDNR. Ameren Missouri will also seek FERC approval for any systems which are proposed to discharge into project waters. City/County Health Departments and the MDNR must approve all other marina effluent removal systems facilities within the project boundary. Unauthorized systems within the project boundary shall be removed at the offending party's expense.

3.7 Derelict Dock Removal Program

Ameren Missouri created the Derelict Dock Removal Program in 1994 to conserve the aesthetic resources of the shoreline by removing docks in poor condition from the Lake of the Ozarks (see Appendix C). In an effort to promote responsible use and disposal of docks at the Lake of the Ozarks, Ameren Missouri worked with the WPD to pass legislation making it illegal to abandon a dock on the Lake of the Ozarks. Ameren Missouri makes every attempt to identify the owner of a derelict dock and enforce their responsibility to observe timely and proper disposal methods. In the event that it cannot locate the responsible party, Ameren Missouri may suspend or revoke permits and will ultimately order removal and disposal of the derelict dock and then seek reimbursement from the owner and/or responsible party.

3.8 Dock Electrical Safety Program

Beginning in 2006, lake area Fire Protections Districts and other authorities having jurisdiction (AHJ) began establishing electrical standards for boat docks within their jurisdictional boundaries. These standards require inspection and approval by the Fire District or AHJ for all

electrical systems on new docks, existing docks being modified, or a dock being moved to a new location. These programs were supplemented in 2013, when some Fire Districts and AHJ's enacted ordinances requiring inspection of a dock's electrical system when a property changes ownership. Ameren Missouri supports these efforts by requiring documentation from all permit and permit transfer applicants showing compliance with the Fire District or AHJ's electrical requirements.

3.9 Adopt-the-Shoreline Program

The ATS program (see Appendix D) was developed in 1994 and was modeled after the Adopt-a-Highway program. Today approximately 90 groups have adopted roughly 704 miles (about 50 percent) of the Lake of the Ozarks shoreline. The mission of the program reads: "...to assume a leadership role in creating and maintaining a shoreline clean of debris and litter, thus enhancing the quality of life at the Lake of the Ozarks and increasing public awareness of the importance of keeping the lake clean." Nearly 450 volunteers participate in the spring clean up, and another 75 volunteers participate in the fall clean up. Membership is derived from civic clubs, neighborhood groups, individuals, marinas, resorts, and businesses. The annual shoreline cleanup has evolved from the early years of the program when removing hundreds of tons of discarded dock flotation was the mainstay of the annual cleanup efforts. With the ban on non-encapsulated flotation in 2008, discarded dock flotation is no longer the emphasis of the cleanup effort. Today's volunteers remove between 25 to 30 tons of primarily recreational debris that accumulates annually.

3.10 Shoreline Protection Hotline

Ameren Missouri established the Shoreline Protection Hotline to provide lake residents with a single, local telephone number (573-365-9203) for reporting any concerns or problems that affect the Lake of the Ozarks. This system helps lake-area residents focus on a single entity (Ameren Missouri) to ensure that their concerns are addressed by the agency that has jurisdiction over their issues. Ameren Missouri either addresses the matter brought up by the callers to the hotline, or routes callers to the appropriate entity(s) to address their concerns.

3.11 Flotation Program

Ameren Missouri established a deadline date of December 31, 2008, for eliminating the use of all non-encapsulated foam in boat dock construction on the Lake of the Ozarks. The elimination of the non-encapsulated foam is intended to reduce the amount of dock foam that breaks free and deposits on the shoreline of the lake.

In 2007, Ameren Missouri began collecting information on compliance with the ban on non-encapsulated flotation through annual visual inspection of the Lake shoreline. These inspections have confirmed that all docks have been converted to encapsulated flotation.

3.12 Public Education

Ameren Missouri uses a wide range of methods to educate the public about shoreline management and the importance of protecting the Lake of the Ozarks. Ameren Missouri hosts a

website (www.amerenmissouri.com/lake) where visitors and homeowners can find information about lake levels, shoreline management policies, guidelines, and information about the permit program for all shoreline development. This site also includes instructions and downloadable application forms.

Ameren Missouri also uses billboards and local magazines to highlight public safety on topics such as dock electric safety and lifejacket campaigns. Other methods to inform the public about upcoming events and guidelines include news releases, media interviews, and monthly radio talk show appearances. Shoreline Management Staff actively engage the public through presentations to civic groups, businesses, volunteer organizations, and local trade shows. Ameren Missouri distributes newsletters, brochures, and flyers and maintains interpretive exhibits at Willmore Lodge visitors' center, the Bagnell Dam Overlook, and the Bagnell Dam Observation Area.

3.13 Geographic Information System

Ameren Missouri established and maintains a state of the art GIS that includes permit information, county parcel information, and ownership information. Ameren Missouri shares the information contained in the GIS with the WPD and other agencies. This data sharing aids each of the organizations involved to respond more quickly to any issues that arise. The most recent maintenance to the GIS system included integrating new flight photography into the system in 2011 and updating the GIS software in 2005, which allows existing databases to be combined into one system.

3.14 Shoreline Condition Assessment

During the summer and fall of 2002, Ameren Missouri completed an as-is assessment of the entire shoreline of the Lake of the Ozarks. Ameren Missouri collected information about every dock and shoreline stabilization activity along the Lake of the Ozarks shoreline. The information that was collected included, but was not limited to, number of boat slips, condition of the dock, amount of freeboard, and proper posting of permit number. Ameren Missouri utilizes this information in conjunction with GIS information to process permit applications and enforce Ameren Missouri's guidelines.

This initial shoreline assessment has been supplemented by an annual visual inspection of the Lakes shoreline since 2007. Ameren Missouri staff using laptop computers and other mobile devices verify existing structures are in compliance and documented in GIS. Additionally, these inspections are used to ensure no new structures are constructed within the project boundary without authorization.

3.15 Lake of the Ozarks Office and Staff

Ameren Missouri opened an office at the Lake of the Ozarks in 2003 and located shoreline management activities to that office. This provides Ameren Missouri staff more immediate access to individuals at the lake and an added presence at the lake to ensure that the shoreline management programs and policies are implemented efficiently. In addition, the Shoreline Management Supervisor provides oversight of all of the shoreline management programs and policies from a central location. In 2012, shoreline management staff was increased to 10 with

the addition of a second Environmental Compliance Specialist. In 2014, the shoreline management staff moved into a new building located adjacent to Willmore Lodge. The office is located at 3 Willmore Drive, Lake Ozark, MO 65049. The office is open to the public on weekdays from 9 am until 4 pm.

3.16 Mile Marker Project

Ameren Missouri provided a grant to the Mile Marker Project to provide 100 marker signs along the Lake of the Ozarks shoreline. The project's goal is to provide mile marker signs for the entire shoreline, beginning with the Osage arm of the lake. Mile markers are important to navigation and safety, because they help boaters pinpoint their location. The markers also serve as a directional landmark for businesses and residents.

3.17 Vegetative Cover Policy

Vegetation is important to the aesthetic qualities and environmental health of the Lake of the Ozarks. In addition to enhancing the natural beauty of the lake, terrestrial and aquatic vegetation helps prevent water pollution and provide habitat for birds, mammals, and fish. These policies are intended to provide property owners with the opportunity to use Ameren Missouri owned or controlled property appropriately, while protecting the environmental characteristics of the shoreline.

Although Ameren Missouri uses the Lake of the Ozarks for electric power generation, the lake is also heavily used as a national tourist and vacation home area. Decades of lakeside landscaping and heavy shoreline usage have largely removed the natural vegetation that can help to reduce sediment and nutrient run-off in the developed portions of the lake.

It is important to enhance the natural beauty, water quality protection and habitats of the shoreline. Ameren Missouri believes it is in the best interest of both the long-term health of the lake's water quality and the value of adjacent property owned by its neighbors that an area of natural vegetation exist on its property adjacent to the shoreline. This "shoreline buffer zone" consists of trees, shrubs, and ground cover of native plants and understory. State and federal resource agencies support the buffer zone concept for the purpose of protecting the lake environment, water quality and providing wildlife habitat.

These policies encourage proper management of this vegetative buffer zone on Ameren Missouri owned and controlled land, which extends from the shoreline up to Ameren Missouri's project boundary. Most lakefront property owners at the Lake of the Ozarks own to the 662-foot contour elevation, and in some cases the elevation of ownership is higher than the 662-foot contour, as noted above in the description of the project boundary. The land that is located below that level, or higher, is owned or controlled by Ameren Missouri. This property line (contour line) should be determined and established in cooperation with Ameren Missouri prior to any vegetation installation or removal for lakefront properties.

Ameren Missouri will inform property owners of the water quality and aesthetic benefits of the vegetative buffer zone including maximizing the use of its existing outreach programs and projects. The company will also provide guidance to Lake of the Ozarks property owners or

property owner groups who seek assistance in developing vegetation management plans for existing or planned subdivisions that support maintenance or replacement of effective shoreline vegetative buffer zones in areas that lie outside of Ameren Missouri's control.

Vegetation within the project boundary must be preserved, or replaced if disturbed. Vegetation should only be removed in line with the policies outlined in this section of the SMP.

A property owner may modify the existing vegetative cover subject to the policies below by removing vegetation to:

- provide for reasonable view of the water;
- construct access paths to the shoreline and/or dock;
- construct erosion control measures along the shoreline; or
- perform general maintenance to the vegetated area.

These modifications to the existing vegetative buffer zone on Ameren Missouri property must be approved by Ameren Missouri as part of the permitting process.

The following policies regarding vegetation modification and land disturbance apply to shoreline property owned by Ameren Missouri adjacent to the Lake of the Ozarks.

- Ameren Missouri prohibits removing any tree larger than 4 inches in diameter unless it is threatening safety or property, or any dogwood, redbud or serviceberry tree regardless of size, without replacing each with a suitable native tree of a minimum diameter of 1.5 inches or larger. Replacement trees shall be planted within 25 feet of the shoreline and within the disturbed area where possible. Location of replacement trees may be managed to provide appropriate view-scapes. Except for an access path and/or recreational use area, native ground cover should be preserved or established. Ameren Missouri encourages residents to use native grasses and perennial plants in this shoreline zone, or allow it to develop into natural forest, for shoreline protection.
- Ameren Missouri reserves the right to plant vegetative materials within the project boundary. Ameren Missouri may require, at the property owner's expense, the removal of any unauthorized improvements and restoration of Ameren Missouri land to a natural state.
- Ameren Missouri requires landscaping with native species for all plantings within Ameren Missouri's project boundary. The use of non-native, invasive species for planting (for example, Bradford Pear, bush or Japanese honeysuckle, Russian buckthorn or autumn olive trees, sericea lespedeza, crown vetch or other problem weeds) is prohibited. Appropriate trees include dogwood, redbud, serviceberry, persimmon, mulberry, native Missouri oaks or hickories, sugar maple and green or white ash. Suitable native grasses and perennial plants include big and little bluestem, Indiangrass, switchgrass, fescue and the full assortment of wildflowers, sedges and ferns that are native to Missouri.
- Removal and/or replacement of vegetative cover within Heads of Coves shall only occur in line with the SMP's policies on vegetative materials and only after Ameren Missouri review and approval of a vegetative management plan, which may include consultation with the state resource agencies and any appropriate federal agency.

Any unauthorized clearing of trees or vegetation or failure to restore trees and/or vegetation as outlined above may result in the immediate cancellation of the individual's permit(s), as well as,

possible legal action to require the revegetation of the affected area. Ameren Missouri reserves the right to suspend, revoke and/or limit other requested facilities (i.e., dock slips) for developments that violate the provisions of this policy.

On properties where Ameren Missouri has only easement interests, landowners shall also adhere to the provisions of this section. In these areas, it is recommended that a minimum of 25 feet be maintained as a vegetative buffer from all shoreline and stream tributaries of the lake.

Nothing contained in this policy shall be construed to require the removal of any landscaping or other permitted improvements in existence when the SMP was adopted.

3.18 Yard Waste Disposal Policy

Missouri Clean Water Law specifies that it is a violation for commercial or industrial businesses to dispose of leaves by placing them into waters of the state.

Ameren Missouri discourages shoreline residents from disposing of or burning leaves and other organic material in the lake. The following is a summary of findings based on existing policy, scientific opinion, and resource agency direction that supports Ameren Missouri's policy.

- The MDNR does not approve residential dumping of leaves into waters of the state. Section 644.051.1(1) of the Missouri Clean Water Law states that it is unlawful for any person to cause pollution of any waters of the state or to place or cause or permit to be placed any water contaminate in a location where it is reasonably certain to cause pollution of any waters of the state. Leaves, however, naturally drop into waters of the state and, under normal conditions, do not pose a threat of pollution.
- Nutrient cycling is a dynamic process whereby inputs of organic material into lakes and streams occur naturally, and the system enters a balance between nutrient inputs and uptake (Schueler and Holland 2000).
- MDC sampling results indicate that the Lake of the Ozarks is a mildly eutrophic lake as measured by chlorophyll and nitrogen levels (personal communication with D. Obrecht, Missouri Extension Service, University of Missouri, on October 2, 2003).
- Nutrient movement from lawns to streams has been documented in the book *The Practice of Watershed Protection* (Schueler and Holland 2000). Authors conclude that grass clippings mowed during the course of a year can contain a large amount of nutrients. Meyer (1995) states that clippings can have up to 235 pounds of nitrogen and 77 pounds of phosphorus per acre. Thus, the disposal of grass clippings in the lake has no benefit to the lake and can add to an excessive nutrient loading in the lake, thus causing pollution issues.
- The *Lake Pocket Book* (Phillips et al. 2000) is a guide book with helpful hints for lakefront homeowners that directs people to "Rake and dispose of leaves away from the lake," and "Do not burn leaves near the shoreline; nutrients concentrate in the ash and are easily washed into the lake."

The Lake of the Ozarks already has sufficient nutrients and organic matter. A large amount of organic matter, such as leaves that fall each autumn, makes its way into the lake naturally, and any benefits (habitat or otherwise) to having leaf litter in the lake are achieved through natural processes. Any additional leaf litter may be unnecessary and even negative.

3.19 Mosquito Vector Control Program

Ameren Missouri conducts a program to control mosquitoes in areas of Osage Project influence. During the early 1980s, a study was conducted of mosquito breeding and development in the lake area. In the 1990s, an aerial survey was performed to identify mosquito habitat within the lake area. The results of these studies are the basis for the existing mosquito control program. Mosquito habitat within the lake, up to elevation 660, is sprayed with a bio-larvicide to kill mosquitoes. In addition, areas upland of elevation 660 are treated as needed with floating briquettes containing a sustained release larvicide to control mosquito development in areas with standing water. Residents along the shoreline report areas they feel need mosquito control, and Ameren Missouri investigates and takes action in those areas as needed.

3.20 Individual Breakwater Structures

Citing the impedance of traffic flow and congestion, the MSWP adopted a residential breakwater policy in April 2006. Ameren Missouri has accepted their policy which sets certain limits on the location, size, and setback of individual breakwater structures. Guidelines for commercial and individual non-commercial breakwater structure standards are outlined in Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).

3.21 Non-Conforming Structures

A considerable number of structures have been located within the project boundary along the shoreline of the lake over the last 80 years, some prior to adoption of formal permitting procedures and policies and some since, which do not conform to current shoreline management standards and which, except as noted in this section, could not be permitted under Ameren Missouri's current guidelines or license. These structures are referred to as non-conforming structures. Given the shoreline management responsibilities conferred by the current license and the incompatibility of these non-conforming structures with other permitted shoreline structures and uses, but considering also the potential impacts of the strict application of the current guidelines and license terms to the non-conforming structures, **Ameren Missouri has adopted guidelines to appropriately manage these non-conforming structures. The guidelines are discussed in general terms in this section, and are more particularly set out in Ameren Missouri's *Lake of the Ozarks Permit Requirements* (see Appendix B).**

Under these guidelines, Ameren Missouri requires that non-conforming structures be permitted or registered in writing with Ameren Missouri. As a courtesy, Ameren Missouri has notified property owners who appear to claim ownership of such non-conforming structures, and has registered these structures.

On June 5 and supplemented on June 12, 2013, Ameren Missouri filed an encroachment report identifying 215 non-conforming structures on project lands. This report identified approximately 4,500 additional unpermitted structures that were encroaching into the project boundary. On February 28, 2014, FERC approved the Encroachment Report and directed Ameren Missouri to file a summary report confirming that all existing encroachments have been permitted. On September 26, 2016, Ameren Missouri filed the required summary report with the FERC. During the course of this submittal, an additional 62 non-conforming structures were identified

and 3 previously registered non-conforming facilities have been removed. As of September 2016, a total of 277 non-conforming structures are now registered within the project boundary.

Should a structure be discovered that was inadvertently missed or omitted from the filed encroachment report or summary report covering unpermitted structures, Ameren Missouri will permit or register the structure using the methodology described in Section 5.5 of the Permitting Guidelines in Appendix B.

4.0 SHORELINE MANAGEMENT PLAN ENFORCEMENT

This section presents Ameren Missouri's approach for SMP enforcement. It specifies the activities that require Ameren Missouri's authorization and refers to Ameren Missouri's programs and policies.

Ameren Missouri manages the Osage Project in accordance with the terms of its license and the applicable FERC rules and regulations. This responsibility includes providing adequate public access, public recreation facilities and protecting important natural, environmental, and scenic resources. Along the shoreline, Ameren Missouri manages Ameren Missouri lands, and private entities may apply to Ameren Missouri for permits to "improve" the land within the project boundary. Improvements include, but are not limited to, docks, shoreline stabilization, and marina facilities. For permitted improvements, Ameren Missouri has developed programs and policies (see Appendix B, *Lake of the Ozarks Permit Requirements*). Ameren Missouri allows public access to project lands and waters, so far as it is consistent with the proper operation of the project, for navigation and recreation purposes.

Under its FERC license, Ameren Missouri has the authority to permit and ensure compliance for limited development activities around the shoreline of the Osage Project within the FERC project boundary and to convey certain interests in project lands and waters. As part of Ameren Missouri's commitment under its FERC license, Ameren Missouri works with permittees and resource agencies to ensure that development activities comply with Ameren Missouri's permitting requirements as well as any additional state and federal requirements. However, Ameren Missouri must ensure the protection of public recreation opportunities, aesthetic beauty, environmental features, and power production capability at the project. For those purposes, Ameren Missouri has the continuing responsibility to supervise and control the permitted uses it grants permission for, and to monitor the use of, and ensure the compliance with, any permits it has conveyed under its FERC license.

In granting permits, Ameren Missouri balances the desires of the permit applicants with environmental values, public good, and other project purposes. Each proposed activity is evaluated according to Ameren Missouri's programs and policies. If a construction or activity permit is issued, all work must be done in compliance with the terms of the permit. The applicant is responsible for correcting or removing any unauthorized activity or structures. Changing conditions or other factors may lead Ameren Missouri to revoke an activity permit. If a permitted use or occupancy violates any conditions of Ameren Missouri's FERC license or any other condition imposed by Ameren Missouri for the protection and enhancement of the project's scenic, recreational, or other environmental values, or if the terms of the permit are violated, Ameren Missouri will take the appropriate actions necessary to correct the violation.

Prior to any ground-disturbing activity or the installation or construction of any structure on or affecting project lands owned or controlled by Ameren Missouri, a permit must be issued by Ameren Missouri. This includes any removal of trees or natural vegetation from project lands to facilitate construction or placement of shoreline facilities. Common shoreline activities are:

- (a) **Construction** - construction or modification (reconstruction, replacement, repairs, additions, or expansion) of any structures (breakwaters, ramps, docks, boathouses), roads, or access pathways within the project boundary.
- (b) **Shoreline Stabilization** - construction, installation, and modification of riprap, retaining walls, or other forms of shoreline stabilization measures including vegetation.
- (c) **Shoreline Alteration (Dredging and Fill)** - removal, addition, or alteration of any natural features of the project and the shoreline within the project boundary including sediment, soil, and rock.
- (d) **Private Irrigation Systems** - installation of new systems or transfer of existing irrigation systems.

Removal of floating debris and shoreline litter that poses an imminent threat to life or property, such as floating logs, paper, plastic, and other unnatural forms of trash or debris, does not require Ameren Missouri approval as long as the removal method complies with the other requirements of Ameren Missouri's policies, procedures, and requirements. Fish habitat enhancement, including submerged trees and crappie beds, does not require an Ameren Missouri permit.

Ameren Missouri's GIS takes advantage of digitally corrected aerial photography, and is used to help process permit applications and maintain a visual record of all structures on the lake. Ameren Missouri maintains updated aerial photography for the lake's entire 1,150 miles of shoreline. Ameren Missouri is committed to periodically update various elements of the system, which is essential to ensure compliance with the company's permitting program.

To enforce proper development activities within the project boundary, Ameren Missouri performs annual shoreline inspections and/or random permit audits from the water using its shoreline inventory database. The intent of these inspections is to enforce the guidelines and policies of the permit program and ensure the goals of the SMP are employed along the shoreline. By performing these audits, the effectiveness of the permit program can be evaluated while uncovering areas that are failing under existing programs.

Levels of enforcement action are based on the significance of the violation related to impacts on project resources, public access, navigation, safety, and adjacent property. Violations involving environmental damage and project resources will receive a higher level of penalty than violations of policies or guidelines where modifications can be made to permit the shoreline activity or facility. Where warranted, Ameren Missouri will notify resource agencies and jointly cooperate in achieving compliance with the SMP and other applicable regulations including GP38. A description of potential violations and enforcement fees are outlined in the *Lake of the Ozarks Permit Requirements* (see Appendix B).

5.0 SHORELINE MANAGEMENT PLAN REVIEW AND UPDATE PROCESS

Ameren Missouri reviewed the SMP in 2012 to ensure its conformance with FERC's 2011 orders amending the SMP. This review resulted in the development of SMP Rev.1 dated November 2012.

Regular reviews will occur in 2017 and every 10 years thereafter. Any change to any of the provisions of the SMP based on the 10-year reviews will require approval by the Commission. Modifications, if any, will be submitted to the Commission by March 31, 2017, and every 10 years thereafter for the term of the license. Prior to submitting any proposed modification, Ameren Missouri will consult with USFWS; USACE; National Park Service (NPS); MDC; MDNR; and SHPO. The updates will incorporate any revisions that are deemed necessary to protect public recreation opportunities, aesthetic beauty, historic resources, environmental features, and power production capability at the project.

6.0 SHORELINE MANAGEMENT PLAN IMPLEMENTATION

The FERC license requires that the SMP include “provisions for consultation with agencies and other interested parties in the implementation of the shoreline management plan” as well as “an implementation schedule”. Ameren Missouri submitted the SMP to FERC for approval in March 2008. As detailed in Section 7.1, FERC ultimately issued an Order on Rehearing and Amending the Shoreline Management Plan on November 10, 2011. Ameren Missouri revised the SMP based on FERC Orders issued July 26 and November 10, 2011, and filed a conformed SMP Rev. 1 with FERC on November 13, 2012. The schedule for implementation of the SMP proceeding from that date is shown in Table 5.

TABLE 5
OSAGE SMP IMPLEMENTATION SCHEDULE

1. Ameren Missouri reviews and revises SMP as needed, including consultation with USFWS, USACE, NPS, MDC, MDNR, and SHPO regarding any changes to provisions of the SMP	January - March 2017
2. Ameren Missouri submits SMP Rev. 2 to Commission for approval of any changes	On or before March 31, 2017
3. Consultation and revision as needed every 10 subsequent years for the term of the license.	2027, 2037

7.0 CONSULTATION

This section describes the consultation, both required and voluntary, that has occurred over the years to develop, implement, and periodically revise the SMP.

7.1 Consultation Conducted to Develop Rev. 2 SMP Update in 2016 - 2017

In March 2017, Ameren Missouri submitted the second update of the SMP (Rev. 2) to FERC for review and approval. This update of the SMP was developed in consultation with representatives of the agencies identified by FERC in Ordering Paragraph (I) of its Order Modifying and Approving Shoreline Management Plan issued on July 26, 2011³. Documentation of consultation conducted in support of this SMP update is summarized below and provided in Appendix G, except as noted.

- December 21, 2016 – Ameren provides electronic copy of draft updated SMP (Rev. 2) to consulting parties for 30-day review and comment.
- January 18, 2017 – Missouri Department of Natural Resources provides comments to Ameren in letter format.
- January 31, 2017 – The USACE submits comments to Ameren in letter format.
- February 7, 2017 – Missouri Department of Conservation submits comments on SMP Appendix B in MSWord markup format.
- February 8, 2017 - Missouri Department of Conservation submits comments on Body of SMP in MSWord markup format.
- February 15, 2017 - Missouri Department of Conservation submits additional comment on Appendix B Body via email.

Appendix B includes a comment and response matrix explaining how Ameren has responded to comments submitted on the Draft SMP in finalizing this SMP for FERC review and approval.

7.2 Consultation Summary Prior to the Current SMP Rev. 2 Update

In 2001, Ameren Missouri formed a Shoreline Management Team (SMT) to assist in the development of this SMP. In addition, Ameren Missouri has instituted a number of programs that are a part of the SMP with the help of subcommittees and task force teams (e.g., the Task Force on Foam, Dock Builders Program, and Adopt-the-Shoreline program). The SMT met on a number of occasions to discuss relevant information on shoreline management. The SMT consisted of members representing Ameren Missouri; private property owners; chambers of commerce; dock builders; mortgage companies; MSWP; federal and state resource agencies, and federal, state, and county officials.

³ 136 FERC ¶ 62,070 (2001)

In 2004, Ameren Missouri formed a citizen group to look at dock size and placement. From recommendations of this group, Ameren Missouri implemented a new dock length guideline November 1, 2004.

During the spring of 2005, Ameren Missouri incorporated additional policies into the SMP consistent with the filing of the hydroelectric relicensing Settlement Agreement in May 2005. Ameren Missouri solicited comments on the new version of the SMP from state and federal agencies, the SMT, and the public through a series of meetings and information sessions. The National Park Service (NPS), MDNR, MDC, and SMT received a draft that included among a few other items, new Impact Minimization Zone (IMZ) policies and maps, vegetative cover removal policies, 10 slip dock policies, and some editorial revisions on June 29, 2005.

In August 2005, Ameren Missouri submitted a draft of the SMP to FERC for its review and approval. In the meantime, due to public concern that had arisen over provisions of the plan received in January 2006, FERC held two public meetings in March 2006 to solicit public comment on the SMP. As a result of the public input received at those meetings, Ameren Missouri asked FERC to suspend review of the SMP to allow Ameren Missouri time to re-consult with the resource agencies and SMT, and submit a modified SMP to the public. Ameren Missouri completed consultation with the NPS, MDNR, MDC and SMT in September 2006 on a revised draft SMP. Further action on the SMP was suspended at that time pending receipt of the new FERC license for the Osage Project, to make sure that any requirements in the new license were captured in the SMP.

On March 30, 2007, FERC issued a licensing order to Ameren Missouri for the continued operation of the Osage Project. One of the requirements of the license is to develop and implement an SMP for the project in consultation with agencies and other stakeholders with an interest in the project and the resources at Lake of the Ozarks, and submit the SMP to FERC for review and approval. The water quality certification issued by MDNR for the continued operation of the project required MDNR approval of the SMP.

In March 2008, Ameren Missouri submitted the SMP to FERC for review and approval after an extensive effort to develop the SMP in the context of relicensing the Osage Project⁴. The SMP was also provided to MDNR for approval as required by Article 401 of the Project license. Subsequent to the March 2008 submittal, a series of FERC orders, rehearings, and communications clarified and revised certain SMP policies and guidelines. The November 2012 revision of the SMP (Rev. 1) reflects these changes⁵.

⁴ The record of this consultation was presented in Appendix G of the SMP as submitted to FERC in March 2008.

⁵ The record of this consultation was presented in Appendix G of the SMP (Rev. 1) as submitted to FERC in November 2012.

8.0 LITERATURE CITED

- Ameren Missouri. 2015. Recreation Enhancement Plan 2014 Monitoring Report. Submitted to FERC on March 31, 2015.
- Ameren Missouri. 2017. Osage Fish Protection Plan: 2016 Annual Report. Submitted to FERC on March 22, 2017.
- AmerenUE. 2002*a*. Draft Lake of the Ozarks Historical Fishery Data Summary, Prepared by Framatome ANP DE&S, Inc. September.
- . 2002*b*. Draft Report, Phase I Historic property Resources Investigations for The Osage Project. Lake of the Ozarks and Lower Osage River, Benton, Camden, Cole, Miller, Morgan, and Osage Counties, Missouri. (FERC No. 459).
- . 2002*c*. Final Historical Water Quality Study, Osage Project, Revised January.
- . 2002*d*. Recreation Study, Lake of the Ozarks Watercraft Carrying Capacity Study Osage Hydroelectric Project - FERC No. 459. October.
- . 2002*e*. Terrestrial and Wetland Resources for the Osage River Hydroelectric Project FERC Relicensing Study. October 2002. Performed by Zambrana Engineering, Inc.
- . 2003. Biological Assessment of the Effects of the Osage Hydroelectric Project.
- Cowardin, L., V. Carter, and E. LaRoe. 1979. "Classification of Wetlands and Deepwater Habitats of the United States." U.S. Fish and Wildlife Service publication.
- Federal Energy Regulatory Commission (FERC). March 2004. Compliance Handbook, Division of Hydropower Administration and Compliance.
- Federal Power Act (FPA). 1920. Part 1, Section 4.
- Kaiser, M.S. and J.R. Jones. 1999. Analysis of Water Chemistry Data from Lake of the Ozarks, 1980-1998.
- Meyer, S. 1995. What do You Feed a Hungry Lawn? Organic Gardening. May-June 1995:46-48.
- Missouri Clean Water Law. Section 644.051.1(1).
- Missouri Department of Conservation (MDC). 2003*a*. Missouri Department of Conservation, Missouri Rivers and Their Watersheds website, accessed February 2003. [Online] URL: <http://www.conservation.state.mo.us/fish/watershed/mdc40.htm>.
- . 2003*b*. Natural Heritage Database website, accessed February 2003. <http://www.conservation.state.mo.us/cgi-bin/heritage/>.

- . Paddlefish Management. Online URL: <https://huntfish.mdc.mo.gov/fishing/protect-missouri-fishing/fish-management-plans/paddlefish-management>. Accessed November 2016.
- . 2016. Missouri Species and Communities of Conservation Concern – checklist.
- Missouri Department of Natural Resources (MDNR). 1996. Missouri Water Quality Report 1996. MDNR Water Pollution Control Program. Jefferson City, MO.
- . Undated. State of Missouri Aquatic Resources Mitigation Guidelines. Missouri Department of Natural Resources, Water Pollution Control Program. [Online] URL: http://dnr.mo.gov/env/wpp/401/docs/mitigation_guidelines.pdf. Accessed February 2017.
- Phillips, N., M. Kelly, J. Taggart, and R. Reeder. 2000. The Lake Pocket Book. Terrene Institute and U.S. EPA Region 5. pp. 111.
- Schueler, T.R. and H.K. Holland. 2000. The Practice of Watershed Protection. Center of Watershed Protection. pp. 34.
- State of Missouri. 2016. Code of State Regulations, Title 10 - Department of Natural Resources, Division 20 Clean Water Commission, Chapter 7- Water Quality. Code 10 CSR 20-7.031.
- Stoner, G. 2000. Management Plan for Lake of the Ozarks: Camden, Morgan, Miller, and Benton Counties.
- The Louis Berger Group, Inc. 2004. Lake of the Ozarks Recreation Study, Osage Hydroelectric Project - FERC No. 459 Interim Report - 2001 Study Season. Prepared for AmerenUE. June 2004.
- U.S. Army Corps of Engineers (USACE). 1987. Wetland Delineation Manual, Environmental Laboratory, Wetland Research Program Technical Report Y-87-1.
- . 2013. State of Missouri Stream Mitigation Method. Updated April 2013. [Online] URL: http://www.mvm.usace.army.mil/Portals/51/docs/regulatory/May_2013_Missouri_Stream_Mitigation_Method.pdf. Accessed February 2017.
- U.S. Fish and Wildlife Service (USFWS). 2016a. Missouri Federally-Listed Threatened, Endangered and Candidate Species County Distribution. [Online] URL: <https://www.fws.gov/midwest/endangered/lists/missouri-spp.html>. (Accessed November 21, 2016).
- . 2016b. NWI Overview. [Online] URL: <https://www.fws.gov/wetlands/nwi/Overview.html>. (Accessed November 24, 2016).

U.S. Geological Survey (USGS). 2002. National Water Summary on Wetland Resources, USGS Water Supply Paper 2425. [Online] URL: <http://water.usgs.gov/nwsum/WSP2425/>. (Accessed November 24, 2016).

Wilson, J.L., J.G. Schumacher, and J.G. Burken. 2014. Occurrence and origin of *Escherichia coli* in water and sediment at two public swimming beaches at Lake of the Ozarks State Park, Camden County, Missouri, 2011–13: U.S. Geological Survey Scientific Investigations Report 2014–5005, 59 p., [Online] URL: <http://dx.doi.org/10.3133/sir20145005>.

APPENDIX A
OSAGE PROJECT SHORELINE USE CLASSIFICATION MAPS

Note: Shoreline use classification maps can be found with the SMP submitted to the Commission for approval on March 28, 2008. The maps are also included in Revision 1 of the SMP, filed November 13, 2012.

APPENDIX B
LAKE OF THE OZARKS PERMIT REQUIREMENTS

APPENDIX C

DERELICT DOCK REMOVAL

In 1994, Ameren Missouri began a program to have docks that are in poor condition removed from the lake. In many cases, it was discovered that dock owners would abandon their dock if it could not be economically repaired. To stop this abuse, Ameren Missouri worked with the Missouri State Water Patrol (MSWP) to pass legislation that would make it against the law to illegally dispose of a boat dock in the Lake of the Ozarks. This legislation was a part of the boating safety bill passed in 1996.

Whenever Ameren Missouri discovers that there is a dock in derelict condition, the first goal is to identify the responsible party, contact them, and require that party to repair the dock or remove it from the lake. In cases where the responsible party cannot be located, Ameren Missouri will contact a reputable company and pay for dock removal and disposal. Ameren Missouri then makes every attempt to bill the responsible party for the removal and disposal.

Below is a breakdown of the costs Ameren Missouri has incurred associated with the removal of derelict docks from 1997 through 2015.

Year	Number of Docks Removed	Cost
1997	43	\$46,976
1998	37	\$51,301
1999	43	\$58,413
2000	36	\$39,668
2001	49	\$94,515
2002	43	\$57,117
2003	50	\$64,785
2004	54	\$46,422
2005	35	\$46,849
2006	36	\$37,353
2007	69	\$97,804
2008	99	\$106,059
2009	79	\$117,269
2010	17	\$31,359
2011	28	\$23,322
2012	18	\$15,834
2013	26	\$11,723
2014	18	\$15,537
2015	24	\$40,955
Total	804	\$1,003,261

APPENDIX D

ADOPT-THE-SHORELINE PROGRAM

In 1992, a group of volunteers organized the Shoreline Beautification Cleanup program to remove debris that had accumulated along the shoreline of the Lake of the Ozarks. Each spring, volunteers would gather on a specified weekend and remove thousands of cubic yards of dock flotation material and other trash and debris from the shoreline. The expenses to dispose of the material were paid for by Ameren Missouri and other businesses in the area. The lake was divided into 10 zones composed of smaller geographic areas and managed by volunteer zone coordinators. Efforts for clean up were concentrated on the shoreline between Bagnell Dam and the 60-mile marker on the lake, which is the shoreline with the heaviest concentration of development.

In 1994, Ameren Missouri formed the Adopt-the-Shoreline (ATS) program, modeled after the Adopt-a-Highway program. The program began with 9 civic organizations adopting 89 miles of shoreline, and by 1995 had doubled in size to 20 groups with 200 miles of shoreline adopted. Today, approximately 90 groups participate in the ATS program, and the groups have adopted approximately 700 miles, covering 50 percent of the lake's shoreline. Each spring ATS volunteers clean more than 500 miles of shoreline.

An Advisory Board of 24 representatives from the 12 clean-up zones and numerous coordinating agencies, which include Chambers of Commerce, MSWP, Missouri Department of Conservation, MDNR, area real estate boards, area dock builders, and the Marine Dealers Association, meets semi-annually. A mission was established and reads:

The mission of the Adopt-the-Shoreline program is to assume a leadership role in creating and maintaining a shoreline clean of debris and litter, thus enhancing the quality of life at Lake of the Ozarks and increasing public awareness of the importance of keeping the lake clean.

Through the years the following objectives have been established:

- Encourage the adoption of shoreline by businesses, organizations, and individuals,
- Coordinate the annual Spring Beautification cleanup project,
- Organize orientation sessions for volunteers,
- Recognize volunteers for their dedication of time and energy, and
- Create a better understanding and appreciation of the importance of a clean shoreline among residents and visitors.

In 1995 the Missouri Waste Control Coalition (MWCC) selected ATS for an Outstanding Achievement Award. MWCC is a 600-member, non-profit organization that sponsors environmental seminars and distributes information about waste management issues to industry and the general public.

In 1998, the annual clean-up was merged with the ATS program, which Ameren Missouri sponsors, coordinates, and funds. This program is not funded under the dock fee program. Listed below is a 19-year breakdown of costs associated with the ATS program.

Year	Cost
1997	\$33,481
1998	\$63,104
1999	\$86,720
2000	\$94,148
2001	\$95,524
2002	\$117,989
2003	\$68,078
2004	\$53,137
2005	\$81,685
2006	\$87,350
2007	\$64,895
2008	\$62,793
2009	\$101,284
2010	\$57,700
2011	\$42,827
2012	\$71,460
2013	\$71,461
2014	\$58,189
2015	\$45,466
Total	\$1,357,291

Ban on non-encapsulated foam



Nearly 450 volunteers clean up in the spring, and another 75 volunteers clean the shoreline in the fall. Many other community residents loan equipment, pick up debris in their coves, and stack debris for clean-up crews to haul away. One-third of the membership comes from civic clubs and churches, 12 percent are individuals, 11 percent are neighborhood groups, 16 percent are from marinas and resorts, and 18 percent are composed of businesses not located on the water. .

From 1998 through 2006, volunteers removed more than 18,000 cubic yards of debris from the lake’s shoreline. Each year the fall and spring clean-ups result in the removal of 150 to 200 tons of trash. Dock foam comprises 90 to 95 percent of the debris collected.

Beginning in 2009, all docks at the Lake of the Ozarks were required to have encapsulated flotation. The ATS program was instrumental in this requirement. Additionally, the program provided invaluable input into today's dock construction and flotation standards. These changes have led to a lake that is no longer littered by non-encapsulated dock flotation. Although it took a few years to remove the residual non-encapsulated dock flotation from the Lake's shoreline, the effectiveness of these programs and hard work of the volunteers can be seen in the table below.

Year	Groups	Volunteers	Cubic Yards of Debris Collected
Spring 1998	50	437	1,878
Fall 1998	20	158	572
Spring 1999	58	579	2,328
Fall 1999	15	139	685
Spring 2000	54	558	2,186

Year	Groups	Volunteers	Cubic Yards of Debris Collected
Fall 2000	14	117	530
Spring 2001	59	556	2,043
Fall 2001	15	136	596
Spring 2002	63	563	2,313
Fall 2002	17	118	638
Spring 2003	67	846	2,251
Fall 2003	14	121	390
Spring 2004	62	835	2,150
Fall 2004	12	101	362
Spring 2005	59	620	2,085
Fall 2005	8	73	235
Spring 2006	59	927	1,914
Fall 2006	7	55	180
Spring 2007	58	650	2,207
Fall 2007	11	114	383
Spring 2008	48	601	1,675
Fall 2008	21	281	937
Spring 2009	68	864	3,030
Fall 2009	12	168	447
Spring 2010	68	760	1,710
Fall 2010	13	160	343
Spring 2011	69	681	1,091
Fall 2011	11	83	126
Spring 2012	74	626	1,037
Fall 2012	4	58	57
Spring 2013	50	465	578
Fall 2013	20	106	136
Spring 2014	60	488	641
Fall 2014	11	82	98
Spring 2015	66	450	425
Fall 2015	11	63	140
Spring 2016	63	446	688
Total	1,391	14,085	39,085

The ATS Program continues to draw widespread support and annually cleans over 500 miles of shoreline. Since 1998, 13,788 volunteers have supported the program. They have cleaned over 10,000 shoreline miles and removed over 5 million pounds of trash.

APPENDIX E

DUNCAN'S POINT

Duncan's Point Resort is a unique and historic development unlike any other at the Lake of the Ozarks. Duncan's Point is unique because it is only one of two resorts at the Lake of the Ozarks to be started and developed by an African-American, Daniel R. Duncan. Mr. Duncan was a prominent businessman in Kansas City and owner of the Cadillac Hotel. According to Mr. Duncan, in 1949 he was told by an Ozark native about a good fishing hole near Lick Creek. The two of them set off, and Mr. Duncan was hooked on the beauty and potential of the area. For three years, Mr. Duncan negotiated with H. B. Hart, a salesman for Willmore Lake Company, the owner of the property. In 1953, Mr. Duncan finally purchased 71 acres of lakefront property. Six months after his initial purchase, Mr. Duncan acquired an additional 168 acres. On November 24, 1953, the original plat was recorded in the Office of the Recorder of Deeds for Camden County.

Mr. Duncan envisioned a lovely resort community, but initially, at least, no other investor shared his vision. Undeterred, Mr. Duncan single-handedly undertook the development of the property. He faced a formidable task since the land was rocky, hilly, and covered with dense foliage. He faced an even greater obstacle: there was no road to the resort. Mr. Duncan could only access his property by boat or by crossing through his neighbor's property. Eventually, however, Mr. Duncan prevailed and built a road to his resort. This road still exists and is known as the Historic Duncan's Point Road.

In 1955, Mr. Duncan formed a partnership with Mr. Henry Vester, another Kansas City businessman. Over the next 10 years a total of six additions were created in Duncan's Point, 8 miles of road were built, and the community grew to more than 60 homes. The first Lot Owners Association was formed in 1958. The first Association president was Vernon L. Potts, a prominent member of the African-American community. Mr. Potts served as the president for nearly 20 years. Other officers included John L. Miller, Frank E. Jones, Octavia Reaves, Marie Davis, Robert Jackson, and Bud Thomas, all from Kansas City. According to the Association's Constitution and Bylaws, the objectives of the Association were "to form better relations among the lot owners and the resorts of the Lake of the Ozarks and to promote, with justice, the general welfare of our members and secure for ourselves all rights and privileges guaranteed under the Constitution of the State of Missouri and of the United States of America."

Mr. Duncan overcame racial discrimination and physical barriers to develop a viable resort community. Over the years, Duncan's Point has been a haven for its residents and guests, offering a peaceful and relaxing alternative to hectic city life. In August 2002, Duncan's Point hosted a 50-year birthday celebration to commemorate the founding of Duncan's Point and the achievements of Daniel R. Duncan.

Duncan's Point heritage has been recognized by the Missouri Department of Natural Resources, which has determined that Duncan's Point is eligible for inclusion in the National Register of Historic Places.

Mr. Duncan died in 1965, but his resort community and the qualities he exemplified are carried on by the proud residents of Duncan's Point.

APPENDIX F

AMEREN MISSOURI PROCEDURE FOR ADDRESSING CHALLENGES TO SHORELINE MANAGEMENT PLAN MAPPING ACCURACY

1. A private property owner/developer contacts Ameren Missouri with a question on Permit Requirements.
2. Ameren Missouri will review the appropriate (i.e. latest version filed with the Federal Energy Regulatory Commission) Shoreline Management Plan Maps and if necessary make a site field inspection to address any permitting issues.
3. If the private property owner/developer disagrees with the shoreline classification indicated on the map for a particular site, Ameren Missouri makes a second site visit, if necessary, to determine if there is a mapping discrepancy.
 - If Ameren Missouri believes that there is no mapping discrepancy then the classification stands.
4. If Ameren Missouri believes that there is a potential mapping discrepancy, then Ameren Missouri will coordinate with MDNR and MDC, and other agencies as appropriate, to visit the site.
 - If the state agency(s) does not agree that a mapping discrepancy exists then the mapping classification stands.
5. If the state agency(s) confirms that there is a mapping discrepancy, then Ameren Missouri will update the Osage Project Shoreline Use Classification Maps. Updated maps will be filed annually with the Commission, along with a record of the consultation undertaken as described here in Appendix F.

APPENDIX G
CONSULTATION FOR THE SMP REV. 2 UPDATE
