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# MARK TWAIN LAKE MASTER PLAN

## CLARENCE CANNON DAM AND MARK TWAIN LAKE MONROE CITY, MISSOURI

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### CHAPTER 5 RESOURCE PLAN

#### 5.1 INTRODUCTION

The Mark Twain Lake Master Plan provides guidance for the orderly development, use and management of Project resources. Resource planning takes into consideration authorized Project purposes, public interests, regional needs, and opportunities and constraints that influence development and management. All proposed development is designed to be compatible with the project's natural and cultural resources. Project planning and land classification deals with several factors: seasonal flooding, soils, ecological conditions, existing and projected recreation demand, state and local participation and interest, and applicable laws, regulations and policies.

#### 5.2 RESOURCE PLANS – GENERAL

Implementation of resource management objectives is dependent upon land classification, anticipated concurrent use, and upon innumerable environmental, geologic, and topographic variables. The Operational Management Plan (OMP) subdivides the identified classification into management units based upon land use objectives, and natural and constructed delineations, and provides comprehensive stewardship guidance and establishes achievable goals to sustain or improve ecological conditions and outdoor recreational experiences. Paragraphs 5-3 thru 5-6 identify the overall management policy and applied intensity per land classification unit.

Each area description includes a listing of existing facilities and proposed future actions. Proposed future actions are intended to be completed within ten years or by the next scheduled update.

The Mark Twain Lake Land Classifications are:

- Project Operations
- Recreational Lands
- Environmentally Sensitive Areas (ESA)
- Multiple Resource Management
- Flowage Easement Lands

The management plans identified are presented in broad terms. A more descriptive plan for managing these lands can be found in the Mark Twain Lake OMP. Management tasks described

in the OMP must support the Resource Objectives, Land Classifications, and Resource Plan set forth in this Master Plan.

**5.3 RESOURCE PLANS - PROJECT OPERATIONS.** The objective of this resource allocation is to provide adequate land for safe and efficient operation and management of the project land and water resources for all authorized purposes. Lands zoned in this category include the main dam, the powerhouse, the outlet channel, the re-regulation pool and dam, and lands required for administrative and maintenance needs. Environmental stewardship management activities will be permitted when it does not conflict with intent of authorized purposes and operational requirements. The OMP contains further details on this land resource allocation and use. Seven areas are classified in this allocation and are depicted on Plate 2 and in Table 5-1 below.

**TABLE 5-1  
ACREAGE-PROJECT OPERATIONS**

Area	Area No.	Acreege	Plate No.	Environmental Stewardship	Recreation
Main Dam/Saddle Dam/Management Office	O-1	260	2	Moderate	Minimal
Clarence Cannon Wholesale Water Commission Treatment Facility	O-2	5	2	Minimal	Minimal
Mark Twain State Park North Extension Sewage Treatment Facility	O-3	5	2	Minimal	Minimal
Indian Creek Sewage Treatment Facility	O-4	26	2	Minimal	Minimal
John F. Spalding Sewage Treatment Facility	O-5	20	2	Minimal	Minimal
Re-Regulation Pool	O-6	1766	2	Intensive	Minimal
Re-Regulation Dam	O-7	10	2	Minimal	Minimal
<b>Total Operations</b>		<b>2092</b>			

**Main Dam/Saddle Dams and Outlet Works/Corps Management/Maintenance Complex.**

The Clarence Cannon Dam, powerhouse and outlet works are located in this area of approximately 260 acres. The Clarence Cannon Dam was built in two sections consisting of an earthen embankment approximately 1,100 feet long and a concrete monolith structure measuring approximately 845 feet in length. The concrete section includes the powerhouse substructure and a gated spillway section with four 50 feet by 39 feet tainter gates used for flood control. To the extent practical, all releases are directed through the hydroelectric generator turbines rather than the tainter gates. The crest of the dam embankment is at elevation 653 feet NGVD.

The project administrative area is located just north of the main dam. Facilities include the project office, a maintenance complex, a fenced vehicle compound, material storage, fuel tanks, weather station, and employee/visitor parking areas.

Located downstream of the main dam, in the Warren G. See North Spillway Recreation Area, is the electrical switchyard owned and maintained by Northeast Missouri Power Cooperative in Palmyra, Missouri on lands leased from the Corps. The switchyard directs electrical power generated by the Clarence Cannon Power Plant to Northeast Power Cooperative transmission lines located east of the dam.

Two small earthen saddle dams with a total area of approximately four acres are located north of the Frank Russell Recreation Area.

**Water Treatment Plant, Clarence Cannon Wholesale Water Commission.** This regional water treatment plant is located four miles west of Florida, Missouri off of State Highway U. This facility was constructed in 1991 and 1992. The production and sale of water to members began on June 16, 1992.

The Clarence Cannon Wholesale Water Commission (CCWWC) entered into a three party contract with the US Army Corps of Engineers and the State of Missouri to purchase water storage space in Mark Twain Lake. The contract allows for removal of a maximum of 16 million gallons of raw water per day with an allowance for a failure rate of 2 years out of every 100 years for not being able to supply the full 16 million gallons per day. The CCWWC owns the rights to 5.0 million gallons of storage space, while the remaining 11.0 million gallons of water per day are available to them through contract with the State of Missouri.

The CCWWC facilities consists of a 4.5 million gallons per day surface water treatment plant, which uses flocculation, sedimentation, and filtration to purify raw water to acceptable standards for drinking purposes. In addition to the main facilities, the infrastructure consists of 325 miles of transmission mains, four booster pumping stations, a raw water intake structure located on the North Fork Branch of Mark Twain Lake, and daily storage space for 4.5 million gallons of drinking water.

The CCWWC currently serves potable water for use by 15 cities, 14 counties, 9 water districts and 72,942 people. Expansion is underway to serve additional customers.

**Land Irrigation Type Sewage Treatment Facilities, North Extension of Mark Twain State Park.** Operated by the Missouri Department of Natural Resources, the acreage comprised by the facility is included in the acreage figures for the state park lease with the Corps of Engineers for recreational purposes.

**Land Irrigation Type Sewage Treatment Facilities, Indian Creek Recreation Area.** These sewage treatment facilities comprise approximately 26 acres and serve the Indian Creek campground, picnic area, group use area, and Indian Creek Marina. This facility is a no

discharge storage and irrigation system comprised of a two-cell aerated lagoon with an aerated vault waste tank and a 16.9-acre irrigation area.

**Land Irrigation Type Sewage Treatment Facilities, John F. Spalding Recreation Area.**

These sewage treatment facilities comprise approximately 20 acres and serve the facilities located at the Ray Behrens Recreation Area, Blackjack Marina, M.W. Boudreaux Visitor Center, John C. "Jack" Briscoe Group Use Area, Frank Russell Recreation Area, Mark Twain Lake Project Office, Clarence Cannon Dam, and the John F. Spalding Recreation Area. This facility is a no discharge storage and irrigation system comprised of a two-cell aerated storage lagoon with a fourteen-acre irrigation area.

**Re-Regulation Pool.** A total of approximately 1,766 acres of land and water located downstream from the dam are designated for project operations. These lands lie along both sides of the re-regulation pool over most of its 9.5-mile length. This area is in the historic floodplain of the Salt River and was primarily acquired to enable operation of the re-regulation pool for hydropower operations. The re-regulation pool is used to store and regulate large releases of water from the generation of hydroelectric power and to store water for the potential use of the pump-back feature of the hydropower plant. This area was evaluated for wetland development as part of the North American Waterfowl Management Plan and contains developed wetlands constructed through the authorities of this plan and project resource use objectives.

The area along the re-regulation pool is also used for low density recreational activities including fishing, boating, hunting, hiking, and nature study. Gravel roads, hunter/fisherman lots and two boat ramps provide visitors access to the area. A paved two-lane boat-launching ramp with an associated paved parking area is located just below the main dam in the Warren G. See South Spillway Recreation Area and provides visitor access to the western portion of the pool. A second one-lane paved ramp and associated Hunter/Fisherman Lot # 70 is located upstream of the re-regulation Dam and provides access to the eastern portion of the pool. Hunter/Fisherman Lot #71 is also upstream of the re-regulation Dam and provides walk-in access to the pool, several wetlands and a wildlife viewing tower.

**Re-Regulation Dam.** The re-regulation dam is located 9.5 miles from the main dam, and is in the Bluff View Recreation Area. It consists of a compacted earth embankment, a gated concrete spillway, a sluice, and an operating house. The dam and its associated structures comprise approximately 10 acres. The total length of the dam is 1,550 feet.

**5.4 RESOURCE PLANS - RECREATIONAL LANDS.** The objective of this zoning classification is to allocate lands, by virtue of location and natural resources, to intensive recreational use. Park and recreation lands are developed to provide for the intensive recreational activities of the visiting public. Factors such as road access, natural resources, recreational facility design, and management practices make these lands conducive to accommodating public use. Lands in this classification include areas for existing, proposed and future commercial concessions, recreational development, and group use. Environmental stewardship management techniques may be implemented within intensive use recreation areas to sustain and enhance biological communities and ecosystems, to prevent vector and disease

problems, and to promote the scenic qualities of the area. Any agricultural use must comply with applicable soil conservation practices.

A description of all recreational development at Clarence Cannon Dam and Mark Twain Lake is presented in this section. A summarization of development at these areas, including existing, previously approved, proposed, and future, are presented below. The following subparagraphs describe recreation areas in a clockwise order around the lake as shown on Plate 2, "Land Classification Map" and in Table 5-2 below.

Proposed facilities are those facilities that may be completed within a ten-year period following the update and approval of this Master Plan.

The future plans provided in the area descriptions describe what may occur in the area beyond the ten-year time frame. All developments are subject to current rules and regulations applicable at the time of development.

**TABLE 5-2  
ACREAGE-RECREATION LANDS**

Area Name	Area No.	Acres	Plate No.	Environmental Stewardship	Recreation
M.W. Boudreaux Recreation Area	1	268	3	Moderate	Intensive
Ray Behrens Recreation Area	2	858	4	Minimal	Intensive
Robert Allen Recreation Area	3	1083	5	Moderate	Intensive
South Fork Recreation Area	4	176	6	Moderate	Intensive
Mark Twain State Park	5	1073	7		Intensive
Stoutsville Recreation Area	6	486	8	Minimal	Intensive
North Fork Recreation Area	7	703	9	Intensive	Minimal
Mark Twain State Park – North Extension	8	486	10		Intensive
Shell Branch Recreation Area	9	377	11	Intensive	Minimal
Sandy Creek Recreation Area	10	594	12	Intensive	Minimal
Indian Creek Recreation Area	11	2775	13, 14	Moderate	Intensive
John F. Spalding Recreation Area	12	506	15	Intensive	Intensive
Frank Russell Recreation Area	13	578	16	Minimal	Intensive
Warren G. See Spillway Recreation Area	14	226	17	Moderate	Intensive
Bluff View Recreation Area	15	45	18	Minimal	Moderate
<b>Total Recreation Areas</b>		<b>10,234</b>			

**M. W. Boudreaux Recreation Area.** This 268-acre multi-use area is located on the east shore of the lake, just south of the main dam on Missouri State Highway J. The area is divided into two distinct sub-areas, one featuring the M. W. Boudreaux Visitor Center and the other a group use development.

The northern portion of this area contains the M. W. Boudreaux Visitor Center, which was replaced in 2010 with a Class B Visitor Center that includes two overlooks; a visitor lobby, an exhibit room and a 75-seat multi-purpose community room. The Mark Twain Lake Visitor and Education Resource Center Committee (MTLVERCC), a Cooperating Association, operates a

book store inside the visitor center. Other features include the Northeast Missouri Vietnam War Memorial, an outdoor education amphitheatre, a universally accessible waterborne comfort station, an accessible nature trail with two overlooks, and a paved parking area. Currently, four picnic sites have been developed for public use, with authority for up to 14 sites. Authority to install additional sites must be commensurate with need, fiscal availability, and mission requirements.

Previously approved plans, but not yet executed include installation of a play facility at the Visitor Center area.

There are no proposed or future plans for the Visitor Center area.

The southern portion of this area was renamed the John C. "Jack" Briscoe Group Use Area and is developed for group use activities. Facilities in the group use area include 20 campsites with electric hookups, a shower building, a group picnic shelter, a nature trail, a playground, two combination fountain/hydrants, and a group fire ring.

Previously approved plans, but not yet executed include replacement of the play facility at the Group Use Area.

Proposed plans for the group use area include improving individual campsites from 30 Amp to 50 Amp service and conversion of campsites to full service. Additional future plans include the addition of group campsites and a playfield.

A site plan that illustrates all development at the M. W. Boudreaux Recreation Area is presented on Plate 3.

**Ray Behrens Recreation Area.** This 858-acre multi-use recreation area is the most highly visited area on the lake and provides a diverse range of facilities for boaters, picnickers, hikers and campers. The area is located on the south shore of the lake approximately eight miles north of Perry. The area features 165 campsites with 50 Amp electric hookups (43 full service sites), a full service marina, a four lane boat launching ramp with an associated fish cleaning station and parking area, a courtesy boat loading dock, a 15-site picnic area that includes a group picnic shelter and the Lick Creek Trail Head with parking for trailers. Support facilities include four playgrounds, a potable water supply distribution system consisting of fountain/hydrant units, two overlooks/tri-lateration stations, an outdoor amphitheatre with fire ring, four shower buildings, four waterborne comfort stations, one waterborne comfort/changing station, a trailer dumping station, a fee booth, three nature trails, and a paved parking area for 156 cars and 170 car-trailers. An additional 240 car parking spaces are located adjacent to the full-service marina in this area and is operated and maintained by Blackjack Marina.

An area near Blackjack Marina was identified as a cultural sensitive area and was protected.

Development approved in previous supplements but not yet constructed includes conversion of three campground comfort stations to shower buildings, and conversion of seven existing campsites to full service hookup sites (43 of the original 50 authorized have been completed).

Additional approved items include consolidation of buildings in the Deer Run Camp loop into one large shower building, modification of the Ray Behrens Boat Ramp to reduce congestion and improve operation/maintenance issues, add three additional parking spaces at each comfort station and shower building, convert five existing campsites into ADA campsites (one completed), replacement of wooden playground equipment and a floating breakwater for Blackjack Marina to be funded by others.

Proposed facilities include a two-lane high-water boat ramp, and converting 50 existing campsites into full service sites.

Future plans for the area include expanding the campground by 65 campsites with electric hookups and providing support facilities, i.e., three shower buildings, a playground, fountain/hydrants and 30 parking spaces. This campground expansion was previously approved and proposed in previous master plans. Due to current visitor use and trends, this area was selected over the Indian Creek Campground as the preferred location for additional camping development. Approximately 160 acres located in the northwest portion of this area is held in reserve for the potential development of resort concession facilities. Additional future plans include a boat ramp and ancillary parking located near the western side of the recreation area if project utilization warrants additional facilities. Implementation methods may require partners to fund these developments.

A site plan that illustrates all development at the Ray Behrens Recreation Area is presented on Plate 4.

**Robert Allen Recreation Area.** This 1,083-acre area located on the south side of the lake about midway along the main body of the pool area has been developed as a multi-use area. Recreational developments include a four-lane boat-launching ramp, two courtesy boat loading docks, a two-lane high-water boat launching ramp for use at 625 feet NGVD and above, a vault toilet, and parking spaces for 160 car-trailers and ten cars. Included in the parking space total are 60 car-trailer spaces located in an overflow parking lot. Currently, one picnic site is available for public use, with authority for up to three sites. Authority to install additional sites must be commensurate with need, fiscal availability, and mission requirements.

Future plans include the addition of group facilities, fish cleaning station, and a vault toilet.

Approximately 207 acres located on the western most peninsula of the Robert Allen area north of Missouri State Highway 154, is being held in reserve for the potential development of a resort concession.

A site plan that illustrates all development at the Robert Allen Recreation Area is presented on Plate 5.

**South Fork Recreation Area.** This 176 acre multi-use recreation area is located at the northeastern point of the South Fork of the Salt River as it joins the main body of the lake. Facilities located here include a four-lane boat launching ramp, two courtesy loading docks, a vault toilet, and a 120 car-trailer and 15-car spaces parking lot. Currently, one picnic site is

available for public use, with authority for up to three sites. Authority to install additional sites must be commensurate with need, fiscal availability, and mission requirements.

Proposed development includes enlarging the parking lot by 30 spaces. Future plans include installation of a fish cleaning station.

The area also has the potential to accommodate an additional commercial concession marina.

A site plan that illustrates all development at the South Fork Recreation Area is presented on Plate 6.

**Mark Twain State Park.** Recreation Area 5, an area of approximately 1,073 acres, comprises the central portion of the 2,700-acre Mark Twain State Park and is leased to the Missouri Department of Natural Resources. The State Park contains 1,559 acres leased from the Corps of Engineers, while the remaining acreage is owned in fee title by the State of Missouri. Recreation Area 8 (Mark Twain State Park – North Extension) forms the northern portion of the park, while an area owned by the State of Missouri forms the southern boundary of the park. Existing development in Recreation Area 5 is shown on Plate 7, which includes a paved access road, a four-lane boat launching ramp, a 100-car and 145-car/trailer parking area, and a vault toilet. A visitor contact station is also proposed for development on state park property at the intersection of Highway 107 and Route U.

An area of land south of Recreation Area 5 is owned in fee title by the State of Missouri and is operated as part of Mark Twain State Park. This portion of the park contains a 103-site campground, a one-lane boat ramp, an overlook, 20 picnic sites, one playground, six miles of hiking trails, two picnic shelters, two washhouses, five vault toilets, one amphitheatre, a scout camping area, fish cleaning station and a boat ramp parking lot.

Development proposed for this area includes four to six cabins in the existing campground, construction of a fee booth, development of 50 additional campsites, an additional washhouse, installation of electric service to campsites that currently do not have electric service and development of mountain bike trails in open areas and hiking trails in wooded areas just south of State Route U.

Future plans include a cabin development east of the Route U boat ramp.

**Stoutsville Recreation Area.** This 486-acre multi-use recreation area has been developed for day-use recreational activities. The area is located on the North Fork Branch of Mark Twain Lake. A portion of the area has been developed for intensive recreational use while the remainder of the area is held in reserve for future development. Facilities located here include a four-lane boat launching ramp, two courtesy boat loading docks, a high water boat launching ramp for use at 625 feet NGVD and above, one vault toilet, one fish cleaning station, and 35 car and 145-car/trailer parking spaces. Currently, one picnic site is available for public use, with authority for up to three sites. Authority to install additional sites must be commensurate with need, fiscal availability, and mission requirements.



There are no proposed plans for this area.

Future development planned for this area includes expanding the picnic area and support facilities. The area also contains a potential marina-concession site.

A site plan that illustrates all development at the Stoutsville Recreation Area is presented on Plate 8.

**North Fork Recreation Area.** This 703-acre area is located on the North Fork Branch of the Salt River adjacent to the southeastern portion of the Stoutsville Recreation Area. The area is zoned for recreational use with most of the site reserved for future development. Existing development is limited to a gravel access road, a 20 car-trailer parking lot, and a four-lane boat-launching ramp.

Development previously approved for this area includes a vault toilet.

There is no proposed development for this area.

Future development planned for this area includes a paved access road, group picnic shelter, picnic sites, vault comfort station, and additional car and car/trailer parking spaces.

A site plan that illustrates all development at the North Fork Recreation Area is presented on Plate 9.

**Mark Twain State Park-North Extension.** This area includes 486 acres of land leased to the Missouri Department of Natural Resources which comprises the northernmost portion of the Mark Twain State Park. Existing recreational facilities are shown on Plate 10, and include a four-lane boat launching ramp, 150-car and 120-car/trailer space parking area, 1 vault toilet, fish cleaning station, 13 picnic sites and a swimming beach with an associated changing house. Other facilities include the "Si" Colborn Group Camp with four barracks-style cabins, a washhouse, a kitchen and dining hall, an office/infirmarary, swimming facility, play areas, and land irrigation sewage treatment plant.

This location was approved for marina development in 1995 at the request of the MDNR, but no marina development occurred. In 1998, the MDNR requested that the area be re-designated as a swimming beach and it was re-opened as such in 2000.

Proposed development includes an equestrian trailhead and parking area to tie into the Corps of Engineers Joanna Multi-use Trail, an equestrian campground, restroom facilities, associated parking, and a beach shower facility near the Rt. 107 boat ramp. Also proposed is the completion of the Camp Colborn area to include four sleeping cabins, a washhouse, and a recreation hall.

There are no future developments planned for this area.

**Shell Branch Recreation Area.** The developed portion of this 377-acre area features a four-lane concrete boat launching ramp, a 15 car-trailer parking lot and a courtesy boat dock.

There is no proposed development.

Future development includes a day use area with picnic sites, a picnic shelter, vault toilet, a large car/trailer parking area and a paved access road.

A site plan that illustrates all development at the Shell Branch Recreation Area is presented on Plate 11.

**Sandy Creek Recreation Area.** Current recreational development in this 594-acre area includes an access road, a hunter/fisherman parking lot, a recreational fishing pond and a nursery pond.

A number of undisturbed Indian burial mounds were discovered in this area by a University of Missouri archaeological survey team and they are now known as the Crigler Mound Group Archeological Site. The site is listed in the National Register of Historic Places as provided by the Historic Preservation Act of 1966, Public Law 89-665.

There is no proposed or future development planned for this area.

A site plan that illustrates all development at the Sandy Creek Recreation Area is presented on Plate 12.

**Indian Creek Recreation Area.** This 2,775-acre multi-use area is the largest recreational area on the lake. Located on a large peninsula in the east central portion of the north shore of the lake, the area is accessed from Missouri State Highway HH and an off-project county connector road. Several day use areas, a full service marina, a major campground, boat ramp, amphitheater/day use area, and a group camping facility are all located within this recreation area.

The main campground at Indian Creek features 190 campsites with 50 Amp electrical hookups (65 full service sites), 20 hike-in tent camping sites, a single lane boat-launching ramp, and a beach. Support facilities include five shower buildings, four waterborne comfort stations, two playgrounds, a campground fee booth, two vault toilets, a system of hydrant/fountains, a fish cleaning station, a camp loop and beach connector trail system, and two trailer dumping stations.

A group camping area located outside of the main campground provides 25 trailer camping sites, one shower building, one waterborne comfort station, a group picnic shelter, combination hydrant/fountains, and a playground.

Day use areas located within Indian Creek Recreation Area feature a four-lane boat launching ramp with an associated fish cleaning station, two courtesy boat loading docks, a high water boat launching ramp for use at 625 feet NGVD and above, a waterborne comfort/changing station, a waterborne comfort station, a playground, a nature trail, 12 picnic sites, a full service marina, a group picnic shelter, an outdoor amphitheatre with an associated fire ring, combination

fountain/hydrants and a recreational fishing pond. A land irrigation sewage treatment plant and parking for 370 cars and 207 car-trailers support the entire Indian Creek Recreation Area. The marina area also features a 150-car parking lot and a two-lane boat-launching ramp that is operated and maintained by Indian Creek Marina.

Development plans previously approved for the Indian Creek Recreation Area include adding showers to three campground comfort stations, upgrading electrical service to individual campsites from 30 to 50 Amp (primary campground upgrade is complete, the group camp remains), convert five existing campsites to ADA accessible campsites (one has been completed), up to three additional parking spaces at each comfort station and shower building, phases three and four of the Indian Creek Trail System, and relocation of the west boat ramp comfort station out of the flood pool.

Proposed development in this plan includes converting up to 50 existing campsites to full service sites, development of a vault comfort/changing station near the existing Indian Creek beach, a playground, and a universally accessible fishing pier at Henderson Lake. Implementation methods may require partners to fund these developments.

Future development plans for the area include the expansion of the concession area with overnight accommodations and an additional expansion of the campground. Additional future plans include expansion of the Indian Creek Campground by 75 trailer sites. This plan was proposed and approved in Supplement No. 7, *Additional Recreational Facilities Design Memorandum No. 9, The Master Plan, 1982*. Support facilities for the campsite development will include two shower buildings, one waterborne comfort station, nine combination hydrant/fountains, a playground, and an additional campground fee booth. If traditional campground expansion becomes necessary due to visitor trends and preferences, priority will be given to developing a newly proposed 65 campsite expansion at the Ray Behrens Campground. Implementation methods may require partners to fund these developments.

A site plan that illustrates all development in the Indian Creek Recreation Area is included on Plates 13 and 14.

**John F. Spalding Recreation Area.** This 506-acre multi-use recreation area is located eight miles north of the main dam on the northeastern end of the lake. Missouri State Highway J provides the primary access to the area. The area has been subdivided into two use categories; Operations and Recreation. The recreation area features a boat ramp and parking area, picnic facilities and a swimming beach. A project operations area, O-5, that includes a wastewater land treatment site and saddle dam is located in the easternmost portion of the Spalding area. The wastewater land treatment site provides services to all facilities on the eastern end of the lake.

A four-lane concrete boat-launching ramp with paved parking area for 40 cars and 155 car-trailers is featured in a portion of this area. A gravel parking lot with a 20 car-equestrian trailer capacity and an associated universally accessible loading ramp provides access to the Joanna Multi-purpose trail that meanders through the western portion of the area. Support facilities at the boat ramp include two courtesy boat loading docks, a fish cleaning station, a two-lane high

water boat launching ramp for use at 625 feet NGVD and above, a combination fountain/hydrant, a small waterborne comfort station, and a waterborne comfort/changing station.

Facilities for the swimming beach and picnic area include two picnic shelters, one picnic shelter with waterborne comfort station, one waterborne comfort station, one waterborne bathhouse, one playground, 33 picnic sites, and parking for 430 cars and 30 car-trailers.

Development plans previously approved for this area include relocation of the bathhouse out of the flood plain.

There are no proposed plans for this area.

Future plans include setting aside a portion of the recreation area, approximately 200 acres in size, as a potential resort site.

A site plan that illustrates all development at the John F. Spalding Area is located on Plate 15.

**Frank Russell Recreation Area.** This 578-acre recreation area lies adjacent to the northern abutment of the dam and has been developed primarily for camping. Currently the area contains 72 campsites with electrical hook-ups (65 sites have 30 ampere service and seven equine campsites have 50 Amp service), a fee booth, one centrally located shower building, two vault toilets, two playgrounds, an amphitheatre, a trailer dumping station, and parking for ten vehicles. Other development within the recreation area includes a horse corral/shelter with access to the Joanna Trail, a universally accessible fishing pond with a fishing pier, picnic shelter, environmental demonstration area, and trail.

Approved actions from previous supplements include replacing existing vault-toilets with new vault toilets, convert three existing campsites to ADA accessible campsites, replace wooden playgrounds, install eight new equine campsites with 50 Amp electric (seven completed with partnership implementation), and an archery range.

Proposed actions include the replacement of existing vault-toilets with water borne comfort stations, upgrading of electrical service to 50 Amp at individual sites and water and sewer hookups for 40 campsites.

A portion of the Frank Russell Recreation Area is proposed as a potential resort site. Approximately 467 acres is available for the development of a resort facility featuring hotel accommodations, formal/casual dining, boat mooring facilities, conference center, and on/off season recreational opportunities.

Future development plans for the area include additional campsites with electrical service, a shower building and comfort stations.

A site plan that illustrates all development at the Frank Russell Recreation Area is presented on Plate 16.

**Warren G. See Spillway Recreation Area.** This 226-acre recreation area lies contiguous to Clarence Cannon Dam along the north and south sides of the re-regulation pool and is accessed by Highway J. The Corps administration and maintenance compound form the northern border of the area. The area features opportunities for many day use recreational activities including fishing, picnicking, boating, shooting and special event activities.

Facilities on the north side of the re-regulation pool are in the Warren G. See North Spillway Recreation Area and include one water borne comfort station, 57 parking spaces, five universally accessible parking spaces and a playground. A parking area is provided for visitors to the Cannon Dam Power Plant Exhibit Area.

Recreational facilities on the south side of the re-regulation pool are in the Warren G. See South Spillway Recreation Area and include a two-lane boat launching ramp, a water borne comfort station overlook, several combination fountain/hydrants, a playground, 45 parking spaces, seven universally accessible parking spaces, 104 car/trailer parking spaces, a shooting range, and two group picnic shelters and a multi-purpose building with a no-discharge waste water infiltration system. This area is utilized as a special event activities area by a variety of groups and organizations.

The shooting range has been named in honor of the late Assistant Operations Manager, David C. Berti. The shooting range will be known as the David C. Berti Shooting Range and consists of 25, 50 and 100 yard ranges.

Development plans previously approved for this area include universally accessible fishing piers, shelter, and replacement of wooden playground facility.

There are no proposed plans for this area.

Future plans for the area include development of a clay target shooting area and picnic sites.

A site plan that illustrates all development at the Warren G. See Spillway Recreation Area is presented on Plate 17.

**Bluff View Recreation Area.** This 45 acre recreation area is located downstream of the Re-regulation Dam and is developed for a variety of day use activities. Improvements in the area include a one-lane boat launching ramp, a group picnic shelter, one vault toilet, a playground, and parking spaces for 71 cars and seven car-trailers. Currently, one picnic site is available for public use, with authority for up to 14 sites. Authority to install additional sites must be commensurate with need, fiscal availability, and mission requirements.

There are no proposed development plans for this area.

Future development plans for this area include a fish cleaning station.

A site plan that illustrates this development is presented on Plate 18.

**5.5 ENVIRONMENTALLY SENSITIVE AREAS (ESA).** Lands classified as environmentally sensitive areas contain significant scientific, ecological, cultural or esthetic features. These areas are normally located within one of the other classification categories and must be taken into consideration by management to insure the integrity of the environmentally sensitive areas are not adversely impacted due to conflicting management activities or objectives. Environmental Stewardship management objectives and techniques may be implemented within environmentally sensitive areas with full consideration for protecting the ecological or cultural aspect of these areas. Limited or no development of public use is generally contemplated on land in this classification. Eight areas are classified as environmentally sensitive areas. Of these, four are considered ecological areas (ES-1, etc.) and four areas considered cultural areas (CS-1, etc.).

The following paragraphs describe the areas classified as environmentally sensitive areas (ESA). These areas are described in clockwise progression around the lake beginning at the main dam and are displayed on Plate 2 and in Table 5-3 below. The zoning of cultural sites as environmentally sensitive areas insures their protection.

**TABLE 5-3**

**ACREAGE - ENVIRONMENTAL AND CULTURAL SENSITIVE LANDS**

Area Name	Area No.	Acres	Plate No.	Environmental Stewardship	Recreation
Lick Creek Ecological Sensitive Area	ES-1	1404	2	Moderate	Minimal
Quarry Lake Ecological Sensitive Area	ES-2	10	2, 6	Moderate	Minimal
Indian Creek Ecological Sensitive Area	ES-3	987	2, 13	Intensive	Minimal
Little Indian Creek Drainage Area	ES-4	1232	2, 15	Intensive	Minimal
Hatten Mounds Cultural Sensitive Area	CS-1	*	2	Minimal	Minimal
Pollard Cemetery Cultural Sensitive Area	CS-2	*	2, 7	Minimal	Minimal
Shell Branch Village Site Cultural Sensitive Area	CS-3	*	2, 10	Minimal	Minimal
Crigler Mounds Cultural Sensitive Area	CS-4	*	2, 12	Minimal	Minimal
<b>Total Recreation Areas</b>		<b>3,633</b>			

\*-Acreages for cultural sensitive areas are incorporated into other land classifications.

**ES-1 Lick Creek Ecological Sensitive Area.** The 1,404-acre Lick Creek Ecological Sensitive Area features a variety of natural attributes that make it a unique area in the Salt River Basin. Vegetative and scenic qualities of the area make it an ideal location for ecological study. Extending southward along both sides of Lick Creek, on the east from the John C. “Jack” Briscoe Group Use Area and on the west from the Ray Behrens Recreation Area, the area is easily accessed by hikers and equestrian users. The 7.5 mile Lick Creek Trail currently extends through a portion of the area. The diverse Lick Creek drainage area contains a broad cross section of the plant types found in the Salt River Basin. Of particular note is the Western Wall-Flower (*Erysimum capitatum*), found in 1974 on limestone outcroppings in this area. Many of the limestone bluffs provide scenic vistas of the lake. The area is managed to provide diverse vegetative structure.

**ES-2 Quarry Lake Ecological Sensitive Area, South Fork Salt River.** Located at the northern tip of the South Fork Recreation Area, the Quarry Lake Ecological Sensitive Area comprises 10 acres and features an abandoned quarry that forms a small clear lake. Surrounding the lake, 30-40 feet high vertical walls of limestone are reflected in the very clear water and many forms of aquatic life are visible. Although the lake is man-made, the overall scenic effect is of great interest and charm. Narrow-leaved cat-tail (*Typha angustifolia*), which grows along the edge of the pond, is identified as a Missouri rare and endangered species. The area is managed to provide diverse vegetative structure.

**ES-3 Indian Creek Ecological Sensitive Area.** The 987-acre Indian Creek Ecological Sensitive Area lies along both sides of the Indian Creek Branch of Mark Twain Lake. Ecological features of the area are noteworthy and will be preserved under this designation. The bluffs located in the area are largely wooded and feature a good representative cross section of the flora of this region of Missouri. Another feature of this ecological zone is an unnamed cave, which will be protected under this classification.

The Indian Creek Ecological Sensitive Area contains some of the largest expanses of native prairie grassland on the Mark Twain Lake Project. Prescribed burns and other management techniques are implemented to maintain and provide diverse vegetative structure within the area.

The area lies adjacent to the highly developed Indian Creek Recreation Area and affords visitors excellent opportunities for hiking and ecological study.

**ES-4 Little Indian Creek Drainage Area (Joanna Ridge).** The Little Indian Creek Drainage Area comprises 1,232 acres and is located along the eastern shoreline of the Little Indian Creek Branch that is composed of diverse ecosystems. Scenic limestone bluffs rim the area, while the plateau areas above the bluff feature a glade type ecosystem with post oak, white oak, and red cedar as the dominant species. Open land species include prairie grass, lichens and mosses. The southeastern portion of the area (S 1/2 Sec. 15, Section 16 T 55 N, R 7W) provides an extremely interesting prairie remnant ecosystem of which Big Bluestem and Little Bluestem prairie plants are typical. These large tracts of warm season grass prairies are managed through a prescribed burn program. The area is managed to preserve its diverse vegetative habitat structure. The majority of the Joanna Trail traverses this area.

Previously approved facilities that have been installed in this area include signs and bulletin boards.

**CS-1 Hatten Mounds.** These mounds are located on the South Fork of the Salt River one and a half miles south of State Highway 154. Excavation has been done on both sites and identification indicates occupation since Archaic times (CA. 3,500 years ago). These salvage excavations, conducted by Dr. Dale R. Henning were done between 1960 and 1962 under the auspices of the University of Missouri. The mounds were used by Archaic and Late Woodland peoples.

The hillside is expected to yield further burial sites and evidence of habitation. The location provides a vista over the South Fork area.

**CS-2 Pollard Cemetery.** This site is located east of State Highway 107 and north of the town of Florida. Three identified mounds make up the site. Members of the Pollard family are buried in the larger mound. These mounds are of interest to archaeologists because of their proximity to numerous prehistoric villages. The vista is perfectly located for viewing the lake and provides an opportunity for interpretation of the significance of Native American occupancy.

**CS-3 Shell Branch Village Sites.** The Shell Branch Village Sites are located on the southernmost side of Shell Branch Creek where it enters Mark Twain Lake. Dr. Dale R. Henning (University of Missouri) tested these two sites in 1961. Both sites were extensively occupied, judging from the amount of surface material recovered. Although Archaic (CA 3,500 years ago) materials are found on both, the principal occupations appear to have been by Late Woodland peoples. Evidence of funerary practices, food resource development and house form and use has come from these sites. This site yielded valuable archeological information and is also of great interest to the general public.

**CS-4 Crigler Mounds.** These Native American burial mounds are known as the Crigler Mound Group Archaeological Site. The site was listed on the National Register of Historic Places in 1974 (Federal Register, Vol. 29, No. 108, June 4, 1974) and is located in Monroe County, Missouri, two miles east of the town of Florida in the undeveloped portion of the Sandy Creek Recreation Area.

The Crigler Mound Group Archeological Site is composed of seven mounds that were investigated by a University of Missouri survey team in 1960. Dr. Dale R. Henning was the field archaeologist in charge of the investigation. The mound group, known locally as “Crigler Cemetery,” is possibly the largest and best-preserved group within the Mark Twain Lake project.

**5.6 RESOURCE PLAN - MULTIPLE RESOURCE MANAGEMENT.** The objective of this zoning classification is to allocate lands to one or more of the following uses based on their location and their natural resources: (a) recreation low density, (b) wildlife management general, (c) vegetative management and (d) inactive and/or future recreation areas. Nine areas are classified as recreation low density, and one area is classified wildlife management. No lands were classified as vegetative management or future recreation.

The following ten areas have been classified as Multiple Resource Management Lands with primary classifications as listed below. These areas are depicted on Plate 2 and shown in Table 5-4 below.

**TABLE 5-4  
ACREAGE-MULTIPLE RESOURCE MANAGEMENT AREAS, LOW DENSITY  
RECREATION AND WILDLIFE MANAGEMENT**

Area Name	Area No.	Acres	Plate No.	Environmental Stewardship	Recreation
Lick Creek Multiple Resource Area	ML-1	560	32	Intensive	Minimal
Pigeon Roost Multiple Resource Area	ML-2	1609	2	Intensive	Minimal
Allen Multiple Resource Area	ML-3	345	2	Intensive	Minimal
North Fork Multiple Resource Area	ML-4	643	2	Intensive	Minimal



Shell Branch Multiple Resource Area	ML-5	614	2	Intensive	Minimal
Crigler Multiple Resource Area	ML-6	242	2	Intensive	Minimal
Sandy Creek Multiple Resource Area	ML-7	259	2	Intensive	Minimal
Indian Creek - Upper Drainage Multiple Resource Area	ML-8	517	2	Intensive	Minimal
Little Indian Creek Multiple Resource Area	ML-9	867	2	Intensive	Minimal
Upper End - Multiple Resource Area	MW-1	14536	2	Intensive	Minimal
<b>Total Recreation Areas</b>		<b>20,192</b>			

**Recreation - Low Density**

**ML-1 Lick Creek Multiple Resource Area (MRA).** The 560-acre Lick Creek MRA forms the southern boundary of public lands lying on Lick Creek adjacent to State Route J, approximately one mile north of the town of Perry, MO. The area is characterized by a small area of bottomlands with steep bluffs or steep banks on the opposing side of the creek. Pool elevations lie within the confines of the historic creek channel. Included within the area is a hunter/fisherman parking lot, the Lick Creek Trail, and a one-lane boat ramp.

The primary vegetative cover of the area is oak-hickory forest, and occupies the upland ridges and slopes. Past land management practices have created a forest of varying size classes, species composition, and conditions. Small pockets of bottomland hardwoods occur in drainage areas, and areas directly adjacent to the Lick Creek river system, and have been detrimentally impacted to repetitive and prolonged inundation. Sustainable forest management practices are implemented in the upland areas.

The open land component of this area, characterized as early to mid succession is managed to provide diverse vegetative habitat. Hunting, trail riding/hiking, and other low density recreation activities are popular pursuits in this area.

**ML-2 Pigeon Roost Multiple Resource Area.** The 1,609-acre Pigeon Roost MRA lies between the Ray Behrens and Robert Allen Recreation Areas, and acts as a buffer zone between these two areas that have been developed for intensive recreational use. The area embraces the Pigeon Roost and Ely Branches, which flow into the lake from the south.

The primary vegetative cover of the area is oak-hickory forest, and occupies 1,100 acres on the uplands and slopes. Past land management practices have created a forest of varying size classes, species composition, and conditions. Small pockets of bottomland hardwoods occur in drainage areas, and areas directly adjacent to the lake, and have been detrimentally impacted to repetitive and prolonged inundation. Sustainable forest management practices are implemented in the upland areas.

The open land component of this area is characterized warm season grasslands, and old field habitat maintained in early to mid succession. These areas are managed to provide diverse vegetative habitat.

The area contains a gravel access road and a hunter/fisherman parking lot with a boat-launching ramp designed for small fishing boats. The lot and boat-launching ramp provide access for low density recreational activities, such as hunting, fishing, hiking, and nature study.

**ML-3 Allen Multiple Resource Area.** The 345-acre Allen MRA lies between Robert Allen Recreation Area and Mark Twain State Park and acts as a buffer zone between these two areas that have been developed for intensive recreational use. Ground elevations range from the top of the conservation pool (El. 606 feet NVGD) to over 690 feet NVGD. The original vegetative cover in the area was forest. The tops of the ridges were cleared and in agricultural production prior to the formation of the lake. These areas are currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. The slopes and drainages are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland areas. Hunting, fishing, boating, and nature study are popular recreational pursuits in the area.

**ML-4 North Fork Multiple Resource Area.** The North Fork MRA comprises 643 acres and lies between the North Fork Recreation Area and the North Extension of the Mark Twain State Park. The original vegetative cover in the area was forest. The tops of the ridges were cleared in agricultural production prior to the formation of the lake. These areas are currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. The slopes and drainages are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland areas. Hunting, fishing, boating, and nature study are popular recreational pursuits in the area.

**ML-5 Shell Branch Multiple Resource Area.** This 614-acre area lies between the North Extension of the Mark Twain State Park and the Shell Branch Recreation Area. The area acts as a buffer between the eastern edge of the state park and between private lands and the lakeshore. Gravel access roads provide continuous access for hunting, hiking, fishing, boating, and nature study. The Shell Branch MRA also features a cultural resource site consisting of two Indian Village sites. (See description of CS-3.) These sites contain material from the Archaic period through the Woodland period with the principal occupation being in the Woodland Period. The tops of the ridges were cleared and in agricultural production prior to the formation of the lake. These areas are currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. The slopes and drainages are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland areas. Hunting, fishing, boating, nature study, and other low density recreation activities are popular pursuits in the area.

**ML-6 Crigler Multiple Resource Area.** The approximately 242-acre Crigler MRA lies between the Sandy Creek Recreation Area and the Shell Branch Recreation Area. Past land management practices have created a forest of varying size classes, species composition, and conditions. Small pockets of bottomland hardwoods occur in drainage areas, and areas directly

adjacent to the lake, and have been detrimentally impacted to repetitive and prolonged inundation. Sustainable forest management practices are implemented in the upland areas.

The open land component of this area is characterized warm season grasslands, and old field habitat maintained in early to mid succession. These areas are managed to provide diverse vegetative habitat. Autumn Olive intrusion/invasion is a significant problem in this area.

The area contains a minor access site with a gravel road and parking lot, and a trail to the lake. The area is used for hunting, fishing, hiking, and other low density recreational pursuits.

**ML-7 Sandy Creek Multiple Resource Area.** The 259-acre Sandy Creek MRA serves as a buffer between private lands and the Indian Creek Recreation Area. The area consists of a series of former agricultural fields interspersed with forested ridges. The open land component of this area is currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. Autumn Olive intrusion/invasion is a significant problem in these open lands. The peripheral ridges and slopes are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland areas. The entire area is available for the low density recreation activities.

**ML-8 Indian Creek - Upper Drainage Multiple Resource Area.** The 517-acre Indian Creek Multiple Resource area comprises the upper limits of public land on the Indian Creek tributary to the lake. The area is comprised bottomland habitat with the lake being confined to its ancestral channel, except during high water events. The original vegetation was oak-hickory forest on the uplands with bottomland hardwoods in the lower areas and along stream courses. The majority of the upland and bottomland areas was cleared previous to Government ownership, and utilized for agricultural purposes. Management in the open land component of this area is maintaining late stage succession, with planned occupation of native forest species. The ridges and slopes are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland areas.

The area is currently being managed for low density recreation use and contains a Hunter/Fisherman Lot with gravel access.

**ML-9 Little Indian Creek Multiple Resource Area.** The Little Indian Creek MRA lies along the Indian and Little Indian Creek branches of Mark Twain Lake. Comprising 867 acres, the area features plateaus and limestone bluffs dominated by oak-hickory forests. Sustainable forest practices are implemented in these habitats. The upland interior of this area is occupied in warm season grasslands with an interspersion of early succession old fields. These areas are managed to provide diverse grassland habitat. The area is used for hunting, fishing, hiking, and other low density recreational pursuits. A portion of the Joanna Multi-use Trail is located within ML-9.

**MW-1 Upper End Multiple Resource Area.** An area encompassing a total of 14,536 acres, the Upper End MRA encompasses project lands west of the Stoutsville and South Fork recreation areas. The area includes all project lands found along the upper reaches of the North Fork,

Middle Fork, Elk Fork, South Fork and Long Branch tributaries of the Salt River and thus contains a large amount of riparian lands. To facilitate a description of this diverse area, it will be divided into three sub-areas as follows: 1) South Fork and Long Branch Sub-Area, 2) Elk Fork and Middle Fork Sub-Area, and 3) North Fork Sub-Area.

**South Fork and Long Branch Sub-Area.** The South Fork and Long Branch Sub-Area extends southward on both sides of South Fork Branch from the South Fork Recreation Area (Rt. 154) to near the community of Santa Fe, Missouri. It includes the South Fork, Long Branch, and Brush Creek tributaries to Mark Twain Lake. The original vegetative cover in this area was generally forest; however, the tops of the ridges and areas with gentler slopes were cleared and farmed after settlement of the area. The open lands are now in various stages of succession with some areas being managed for native warm season grasses. The flatter areas, which are not susceptible to flooding, are being managed under the agricultural lease program. The peripheral ridges and slopes are occupied with oak-hickory forest. Sustainable practices are implemented in the forested areas. The area is used for low density recreation with hunting, fishing, hiking, and nature study being popular pursuits.

**Elk Fork and Middle Fork Sub-Area.** The Elk and Middle Fork Sub-Area includes the lands along the South and Middle Forks westward of the juncture of the South and Middle Fork branches. The original vegetative cover in the area was forest. The tops of the ridges were cleared and in agricultural production prior to the formation of the lake. These areas are currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. The peripheral ridges and slopes are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland and slope areas, with an objective to maintain the integrity of the riparian zone.

A portion of this area is designated as a seasonal waterfowl refuge. The refuge is comprised of approximately 3,000 acres of land and water that have been set-aside as a resting area for the migrating waterfowl. Waterfowl hunting and boating is prohibited in the area from October 15 through December 31. The area remains open for other recreation pursuits.

**North Fork Sub-Area.** The North Fork Sub-Area includes lands along the North Fork west of the Stoutsville Recreation Area and Mark Twain State Park. It includes the Otter Creek, Crooked Creek, and Buck Creek tributaries to Mark Twain Lake. The North Fork Wetland Restoration Area is located in this area. The original vegetative cover in the area was forest. The tops of the ridges were cleared and in agricultural production prior to the formation of the lake. These areas are currently managed in various grasslands and old field habitats, and provide diverse vegetative habitat. The peripheral ridges and slopes are vegetated with oak-hickory forest. Past land management practices have created a forest of varying size classes, species composition, and conditions. Sustainable forest management practices are implemented in the upland and slope areas, with an objective to maintain the integrity of the riparian zone.

A tract of land (O-2) in the southern most section of this area near Mark Twain State Park is leased to the Clarence Cannon Wholesale Water Commission for operation of a water treatment

plant. This area possesses the pumping facility, pipeline, and maintenance corridor for facility operation.

The remainder of the area is available for low density recreation activities.