DESIGN MEMORANDUM NUMBER 1C

MASTER PLAN

FOR

DEVELOPMENT AND MANAGEMENT

OF

B.A. STEINHAGEN LAKE

AND

TOWN BLUFF DAM

NECHES RIVER, TEXAS

U. S. ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

December 1971

Supplement March 2003

CESWF-OD-R

05 Jun 2003
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RECEIVED
JUN - 9 2003

MEMORANDUM FOR CESWF-OD

SUBJECT: Master Plan, B.A. Steinhagen Lake

1. References:

a. Chapter 3, ER 1130-2-550, 15 November 1996, Recreation Operations and Maintenance Policies.

b. Chapter 3, EP 1130-2-550, 15 November 1996, Recreation Operations and Maintenance Guidance and Procedures.

2. In accordance with references above, with your approval, the enclosed Master Plan is submitted as supplemented. In an effort to take advantage of new technology and to prevent confusion over various versions and supplements of the master plan, the plan including the changes has been merged into one document.

3. NEPA Compliance: It was determined that supplementation of the master plan will not have significant effects on the quality of the human environment and was thus categorically excluded from further NEPA documentation.

4. Coordination and Public Involvement: Supplementation of the B.A. Steinhagen Master Plan is a product of the B. A. Steinhagen Master Plan Project Delivery Team. This team consisted of members from the Piney Woods Project, Sam Rayburn and Town Bluff Project, and the Natural Resources and Recreation Branch of Operations Division.

Comments were solicited from various natural resource agencies. A listing of the agencies and summary of changes proposed to the master plan are attached.

Public comment was solicited via a news release and through the Fort Worth District internet web site. There was one comment received concerning the master plan supplement. The letter and the response are attached.

5. Staffing: Recommend technical review and concurrence by the following staff elements and approval by Chief, Operations Division.

Encls

WILLIAM H. COLLINS
Chief, Natural Resources
and Recreation Branch

CESWF-OD-R
SUBJECT: Master Plan, B.A. Steinhagen Lake

CESWF-OD-SR concur (✓) nonconcur ( ) _____ Date 6/19/03

CESWF-RE-M concur (✓) nonconcur ( ) _____ Date 9/9/03

CESWF-RE concur (✓) nonconcur ( ) _____ Date 7/10/03

CESWF-OD Approval (✓) Disapproved ( ) _____ Date 7/14/03

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DESIGN MEMORANDUM NO. 1C

B.A. STEINHAGEN LAKE

NECHES RIVER, TEXAS

DECEMBER 1971

REVISIONS

March 2003 Master Plan Supplement

Replaced the Following Sections:

Introduction
I. Background
II. Land And Water Allocation And Classification (previously named *Land and Water Use Planning*)

Deleted from Plan of Development section

Chart 2, Wind Rose Index
Tables 12-17, Detailed Estimate of Cost for Additional Recreational Facilities
Table 18, Summary of Facilities Planned for FY73
Table 19, Total Existing and Planned Facilities
Table 20, Unnamed
Table 21, Funds Required for Operation and Maintenance
Plates 3.1, C-1 through C-11

Sections Deleted
Summary and Conclusion
Appendix A Project Resource Management Plan
Appendix B Vegetative Management Plan
Appendix C Fire Protection Plan
Appendix D Project Safety Plan

INTRODUCTION

The Master Plan is the basic document guiding Corps of Engineers responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters and associated natural and man-made resources. The Master Plan provides direction for project development and use. It deals in concepts, not in details of design or administration, and is a continuing and dynamic document. Detailed management and administration functions are addressed in the Operational Management Plan, which translates the concepts of the Master Plan into operational terms.

I. BACKGROUND INFORMATION

1-01 Pertinent Data

During construction and early development of B.A. Steinhagen Lake.

A. Authority

TYPE	AUTHORITY	DATE
1. Project	River & Harbor Act	2 Mar 1945
	changed to Town Bluff Dam and B. A. Steinhagen Lake (Public Law 90-46)	4 Jul 1967
2. Recreation	Sec 4 Flood Control Act (Public Law 534) 78th Congress, 2nd Session	22 Dec 1944
	Amended by: Flood Control Act (Public Law 526) 79th Congress, 2nd Session	24 Jul 1946
	Sec 209 Flood Control Act	3 Sep 1954
3. Fish & Wildlife	F&WL Coordination Act Amended by Public Law 85-624 (72 Stat 563)	1958
4. Land Acquisition	Approved Public Law 14	2 Mar 1945
	Design Memo approved OCE to SWD	30 Sep 1948
5. Permits	SWDR 1130-2-7	25 Sep 1968
	FWDR O&M Manual ER 405-1-830	24 Mar 1964
6. Leasing	ER 405-2-835	24 Mar 1964
	Amended	9 Nov 1964
	Amended	30 Aug 1965
	ER 405-1-830	24 Mar 1964
7. Cost Sharing	Implementation of the Federal Water Project Recreation Act Public Law 89-72	2 Aug 1965
8. Vegetation	Public Law 86-717	6 Sep 1960

B. History

1. Definite Project Report:

The report presenting the definite project plan for B. A. Steinhagen Lake (previously called Dam B Dam and Reservoir) was transmitted to the Chief of Engineers, Department of the Army, Washington, D. C. by letter dated 22 September 1947, subject: “Neches and Angelina Rivers, Texas, Definite Project Report". This report is in agreement with the design approved by the Board of Consultants and is based on the assumption that Sam Rayburn Reservoir (previously called McGee Bend Reservoir) would be built prior to or concurrently with B. A. Steinhagen Lake. However, this report does not present the current design of B. A. Steinhagen Lake which is based on a subsequent decision to enlarge and build Town Bluff Dam first in order to meet more quickly the immediate water needs of the lower Neches River Valley area.

2. Master Plan:

The initial Master Plan for “Recreational and Land Use, Dam “B” Dam and Reservoir, Neches River, Texas”, was transmitted to the Chief of Engineers, by letter dated December 1951, and was approved by the Chief of Engineers, dated 16 July 1952. The Master Plan was later updated in January 1972.

3. Status of Project:

Construction of B. A. Steinhagen Lake was started on 22 March 1947 and deliberate impoundment was started on 16 April 1951. Construction of the dam was completed in June 1953. On 4 July 1967, as directed by Public Law 90-46, the title Dam “B” Dam and Reservoir was changed to Town Bluff Dam and B. A. Steinhagen Lake.

C. Scope

1. Project Purpose

The authorized purposes of B.A. Steinhagen Lake are to regulate the intermittent power releases from Sam Rayburn Lake, provide water for the production of hydroelectric power, and provide water storage from which water will be released for the benefit of rice culture, salinity control, pollution abatement, navigation, and municipal and industrial uses. Hydroelectric power is marketed as a run-of-the river power plant. No water control decisions are made for hydropower production. Access and facilities are provided for recreation but water is not controlled for that purpose.

2. Purpose of the Master Plan

This Master Plan describes the general principles that guide the management of B.A. Steinhagen Lake and associated project lands. A more detailed description of the resources and implementation practices are found in the Operational Management Plan (OMP).

D. Regional Characteristics

1. Region Served

East Texas is the major area which attracts visitors to B. A. Steinhagen Lake.

2. Transportation

The primary mode of transportation of visitors to the lake is vehicular.

3. Population

See 3-06, A, for population data.

4. Economy

The areas within the two zones of influence (50 and 100 mile radii) are devoted primarily to lumbering and agricultural pursuits. The area is rich in natural resources, the more

important being petroleum, petroleum by-products, timber, water, iron ore, gravel, and brick clay.

5. Related Recreation Areas and Points of Interests

There are four National forests, four state parks, including Martin Dies, Jr. State Park, the Big Thicket National Preserve, and several privately owned forests and lakes within the 100 mile radial zone of influence. See Table 2 and Plate 1.1 at the end of this section. Sam Rayburn Reservoir, a very popular recreation site, is located approximately 15 miles northeast of the project.

A state operated fish hatchery is located off FM 1747 between B. A. Steinhagen Lake and Sam Rayburn Reservoir. The major species raised are indigenous game fish including bass and catfish.

6. Local Recreation Habits and Interest

A recreation survey taken in 1969 indicated that the main recreational activity on the lake is fishing, followed by sightseeing, camping, picnicking, and swimming, in that order. Other occasional activities include pleasure boating, water skiing and hunting.

1-02 Project Description

A. General

1. Location and Physical Data

B. A. Steinhagen Lake is located on the Neches River in the east-central and west-central portion of Tyler and Jasper Counties, respectively. The dam site is about 113.7 river miles above the mouth of the Neches River and 12.4 river miles below the confluence of the Neches and Angelina Rivers, approximately 0.5 mile north of Town Bluff, Texas.

2. Accessibility

a. Roads

U. S. Highway 190, extending in an east-west direction, crosses the lake area approximately 4 miles above the dam site between Woodville and Jasper, Texas. State Highway 92 from Silsbee, Texas, passes in front of the project office at the west end of the dam.

b. Railroads

A branch line of the Texas and New Orleans Railroad passes through Woodville approximately 14 miles west of the dam site. A branch line of the Gulf, Colorado, and Santa Fe Railroad passes through Jasper about 17 miles to the northeast of the lake.

c. Air

Jasper County Airport is located approximately 9 miles east of the dam site off U. S. Highway 190.

3. Lake Watershed Provisions

The drainage area above the Town Bluff Dam is approximately 7,585 square miles. The water level at B. A. Steinhagen Lake will be maintained at elevation 82.5, as far as practicable. With the water surface at elevation 83.0, the width of the lake near the dam is about 1 mile and gradually increases to a maximum width of approximately 4 miles about 5 miles above the dam. At this elevation, the shoreline is approximately 160 miles. For additional information see Table 1, below, and Pool Elevation-Probability and Duration Curves, page 8.

TABLE 1

POOL ELEVATIONS, AREAS, AND STORAGES

	Elevation Feet NVGD	Lake Area (acres)	Lake Capacity (acre-feet)
Top of Dam	95.0*	30,800	365,500
Top pool at design water surface	93.0	28,210	306,400
Overflow weir crest and top of gates	85.0	16,830	124,700
Normal pool	83.0	13,700	94,200
Gate sill	50.0		
Average pool elevation during peak recreation season	81.0		
5 Year pool level	83.0		
10 Year drawdown	78.5		

* on right bank

4. Climate

B. A. Steinhagen lake lies in a region characterized by comparatively hot, humid summers and moderate winters. Winter temperatures are generally mild with cold periods seldom prevailing for more than a few days. The mean annual temperature over the watershed is about 67 degrees Fahrenheit. January, the coldest month, has an average minimum daily temperature of 40 degrees. August, the warmest month, has an average maximum daily temperature of 94 degrees. Temperatures in the watershed have ranged from 112 degrees to minus 8 degrees Fahrenheit. The prevailing winds are from the south during the spring, summer, and fall months. Northerly winds prevail during the winter months. The average length of the growing season between killing frost is approximately 250 days. The mean annual precipitation over the upper watershed is 49 inches.

B. Project Features

1. Parks

Six Corps parks and one state park (three units at different locations) are located at B. A. Steinhagen Lake. In addition there are 14 primitive campsites located outside the parks on the east side of the Angelina River and on the west side of the Neches River.

2. Structures

B. A. Steinhagen structures comprise the following principal features:

a. Gated Spillway

Concrete apron and gate sills

Stilling basin right and left spillway abutments

Six tainter gates and operating machinery

Spillway catwalk

b. R. D. Willis Hydropower Powerhouse

Two, 3.7 megawatt horizontal axis generating units

c. Non-Overflow Section of Earth Dam

The non-overflow section of the dam between the face of the spillway abutment and the bank of the stream has been constructed to elevation 95.0.

d. Submersible Dike

The left spillway abutment is flanked on the east by a submersible dike extending across the flood plain for a distance of 6,100 feet.

C. Resources Objectives

The resources, both natural and man-made, at B.A. Steinhagen Lake will be managed on an ecosystem basis to obtain the greatest possible benefit through meeting the needs of the public and protecting and enhancing the resources. Ecosystem management is the integration of ecological, economic, and social principles to manage biological and physical systems in a manner safeguarding the long-term ecological sustainability, natural diversity, and productivity of the landscape. The primary goal of ecosystem management at B.A. Steinhagen Lake is to develop and implement management that conserves, restores, and maintains the ecological integrity, productivity, and biological diversity of the public lands.

D. Resources Analysis

1. General

B.A. Steinhagen Lake is located in the Piney Woods Region of east Texas. This region is part of a much larger area of pine-hardwood forest that extends into Louisiana, Arkansas, and Oklahoma. The Piney Woods Region is characterized by pine and pine-hardwood forests, with scattered areas of cropland, planted pastures, and native pastures. Timber and cattle

production are important industries in the region. Farms and ranches are relatively small in size compared to the state average.

Longleaf pine forests once dominated the rolling terrain of the Piney Woods. A few pockets of longleaf pine remain in the southeastern part of the region. Mixed pine-oak forests occur to the west and north of the longleaf pine area. Upland forested sites are dominated by loblolly pine, blackjack oak, and post oak. Bottomland forested sites are dominated by sweetgum, magnolia, tupelo, elm, ash and water oak. In addition, interspersed pockets of American beech and southern magnolia combine to form a mesic community. Swamps are common in the southern part of the pine-oak forest.

Virtually all virgin timber in the Piney Woods forests was logged by 1930, and much of the second-growth and third-growth forests that emerged were often displaced by human development or converted into commercial pine plantations.

2. Resources

a. Vegetation

Forested areas comprise approximately 95% of the vegetative component of the land at B.A. Steinhagen Lake. Grass areas comprise the remainder of the area.

Forest Resources - The major forest cover types include closed canopies of pine, pine-hardwoods, mixed hardwoods and cypress-tupelo gum. The vegetative forest resources of B.A. Steinhagen Lake will be managed in a manner consistent with ecosystem management principals (and relevant laws and regulations) to insure the health and vigor of the forest, while enhancing wildlife habitat, protecting cultural resources, insuring water quality, maintaining aesthetic values, and returning tangible benefits to the project. The forest management program is designed to protect and sustain individual species, communities and

natural processes of the area. Management efforts include the use of prescribed burning, timber harvesting, reforestation, boundary line clearing and marking, disease and pest control, and non-native species control.

The management of forest resources will be performed in all areas of the lake including parks. Special care and coordination with park managers will be an integral part of all management activities to insure aesthetic values, visitor safety and forest health are maintained.

Forest management practices in outgranted areas will be coordinated with the outgrantee to assure mutual understanding of the goals and concerns of the various managing entities.

Aquatic Vegetation – Aquatic vegetation is a dominant component of the water system at B.A. Steinhagen Lake. Aquatic vegetation provides habitat, refuge, and food for a wide variety of organisms including fish, invertebrates, and waterfowl. Due to relatively shallow water at the lake, a long growing season, high rainfall and nutrient in-flow, aquatic plants (exotic and native) can and have grown to nuisance levels. Over-abundant aquatic plants restrict use of swimming areas, boat ramps, and fishing piers, as well as restricting boat access to portions of the lake and backwater areas. Over-abundant aquatic vegetation may stunt growth of game fish by providing excessive cover for forage fish such that predatory species have difficulty locating them. Also dense mats of aquatic vegetation decrease dissolved oxygen.

Lake personnel will use appropriate measures to control the populations of noxious aquatic vegetation. Management of aquatic plants will be accomplished in a manner consistent with the latest management standards and in accordance with applicable Federal, state, and local rules and regulations.

b. Minerals

On real estate tracts in which the Corps purchased the mineral rights, the Bureau of Land Management (BLM) manages the Federally owned minerals. The Texas Resource Management Plan (RMP) provides the BLM a framework for managing the Federal minerals. Under various Federal Mineral leasing laws, regulations and programs, the Corps, as the surface management agency, must grant consent to mineral leasing and subsequent mineral development prior to the BLM offering areas for lease. The Corps retains all authority to manage the programs and surface resources while management of the mineral estate is vested with the BLM.

On tracts in which the Corps owns no mineral rights the geophysical operations within Texas are not controlled or authorized by the BLM. The Corps, as the surface owner but not the minerals rights owner, shall provide stipulations and conditions for surface uses which include access for geophysical exploration activities. These stipulations allow directional drilling from outside an identified area where occupancy is allowed. Written authorization shall be obtained by oil and gas operators who wish to occupy, use, or enter fee or easement lands to develop oil and gas interests that are privately owned.

c. Soils

B.A. Steinhagen Lake is located in the western part of the Gulf Coastal Plain Physiograhic Province. Project lands surrounding the lake are located in the Neches River basin and are characterized by a flat topography with poor drainage. Shoreline slopes around the lake are generally less than 5 percent. Project lands north of U.S. Highway 190 contain many sloughs and low areas that are generally inundated during the wet months of the year.

Soil series found within the B.A. Steinhagen area include Urbo, Mantachie, Segno, Wrightsville, Enro, Woden, Art, Corrigan and Rayburn, which are generally characterized as fine sandy loam with slow permeability.

The Wagram and Tehran soil series are located on the east side of the lake above Highway 190 and are characterized as loamy sands having moderate to moderately rapid permeability.

The Garner and Susquehanna soil series are located on the west side of the lake from above Highway 190 south to within Campers Cove Park. These soils are characterized as having a high clay content with very slow permeability.

For a summary of the soil types see Table 3 at the end of this section.

Project lands are not subject to large amounts of erosion due to the generally flat topography and dense vegetative growth covering most of the land area. However, due to frequent lake water level fluctuations, some soils along the shoreline have eroded. Construction of bulkheads and other erosion protecting structures have helped to reduce damage to facilities and other resources.

d. Water

Surface waters should be suitable for water body contact sports and recreation activities. Water quality will be monitored in accordance with applicable rules and regulations.

Areas of the lake will be periodically evaluated to determine if restrictions are necessary to protect the safety of the public, to preserve ecological features and/or provide security to facilities. Areas will be marked by appropriate means to facilitate control measures.

Shoreline Management – The storage and/or mooring of houseboats, boats, barges, and other vessels on lake waters will be confined to areas leased to concessionaires.

Other shoreline use permits will be issued in accordance with current regulations and addressed in the OMP.

e. Fish And Wildlife

B.A. Steinhagen Lake supports a variety of fish species. Common gamefish include largemouth and spotted bass, crappie, catfish, and sunfish. Texas Parks and Wildlife Department (TPWD) has the primary responsibility for managing the fisheries within the lake. Therefore, all management measures for fisheries will be conducted in cooperation with TPWD. Sportfishing is allowed on the lake in accordance with state fishing regulations.

Wildlife species in the area are typical of the southern Piney Woods and include a variety of game and non-game mammals, birds, reptiles and amphibians. Wildlife provides both consumptive (hunting) and non-consumptive (nature walks, birding, etc.) uses. Wildlife management is conducted using ecosystem principles which entails managing for habitat to support a wide-range of species. Specific management measures are described in the OMP.

Approximately 13,000 acres of land is licensed to TPWD as part of the Angelina-Neches/Dam B Wildlife Management Area (WMA). Hunting on this land is managed by TPWD through their public hunting program. Habitat management performed by the Corps in the WMA is done in cooperation with TPWD.

The Corps manages several hunting areas south of U.S. Highway 190 totaling approximately 875 acres. Hunting in these areas is allowed in accordance with Federal and state hunting regulations as well as other requirements published in the Fort Worth District, Corps of Engineers, Public Hunting Guide.

f. Threatened And Endangered Species

A variety of Federally and state listed threatened and endangered species occur in Jasper and Tyler Counties. A current listing is located in the OMP. All proposed management tasks will be reviewed for the potential to impact threatened and endangered species. Coordination with U.S. Fish and Wildlife Service (USFWS) and TPWD will occur to ensure compliance with the Endangered Species Act.

g. Cultural Resources

The management of cultural resources is an equal and integral component of resource management at B.A. Steinhagen Lake. Numerous Federal laws, regulations, and Executive Orders require the preservation and management of archeological, architectural, engineering, traditional cultural properties, sites of significance to Native American Indian tribes, and paleontological resources. The policy and guidance provided in Engineer Regulation and Engineer Pamphlet 1130-2-540: Chapter 6 provides the basis for cultural resource management responsibilities. Appropriate land management activities will only be conducted after considering all of these applicable statutes and concerns.

The cultural resource management program supporting B.A. Steinhagen Lake has been developed to ensure all cultural considerations are being met and that all consultation requirements are being completed as part of a standard operating procedure. The cultural resource program manager will coordinate closely with the lake and project personnel during task planning and execution to ensure cultural resource considerations are being met.

Archeological resources comprise the majority of cultural resources known to exist on B.A. Steinhagen Lake fee lands. Careful planning and coordination help avoid impacts to known resources. Ongoing inventory efforts will continue to identify additional resources that

will also be managed accordingly. Any unavoidable impacts will be mitigated according to plans prepared in consultation with all consulting parties.

TABLE 2
REGIONAL RECREATIONAL AREAS

Name	County	Approximate Distance from B.A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities				
					Fishing	Swimming	Boating	Picnicking	Camping
Water Oriented									
Houston County Lake	Houston	100 SW	Houston County W.C. & I.C. No. 1	Municipal Industry	X	X	X	X	X
Houston Lake	Harris	80 SW	City of Houston	Municipal, Industry Irrigation, Mining Recreation	X	X	X	X	X
Jacksonville Lake	Cherokee	100 NW	City of Jacksonville	Municipal Recreation	X	X	X	X	X
Livingston Lake	Polk/San Jacinto Trinity/Walker	55 W	City of Houston Trinity River Authority	Municipal Industry Irrigation	X	X	X	X	X
Murvaul Lake	Panola	80 N	Panola County Fresh Water Supply Dist. 1	Municipal Industry Recreation	X	X	X	X	X
Sam Rayburn Reservoir	Jasper/Angelia/Sabine Nacogdoches/San Augustine	15 NE	Corps of Engineers	Flood Control Power Municipal Industry Irrigation Recreation	X	X	X	X	X
Striker Lake	Rusk/Cherokee	90 N	Angelina & Nacogdoches W.C. & I.C. No. 1	Municipal Industry	X	X	X	X	X
Toledo Bend Reservoir	Newton/Panola/Sabine Shelby	40 NE	Sabine River Authority	Municipal Industry Irrigation Power Recreation	X	X	X	X	X
Big Thicket National Preserve	Tyler/Angelia/Polk Hardin/Orange/Liberty		National Park Service	National Preserve Globally Important Bird Area UNESCO Biosphere Reserve	X		X	X	X
Land Oriented									
Anahuac National 18 Wildlife Refuge	Chambers	90S	United State Fish & Wildlife Service	Wildlife Refuge			X		
Angelina National 1 Forest	Angelina/Nacogdoches San Augustine/Jasper	30 N	United States Forest Service	Multi-Purpose	X	X	X	X	X
Chicot State Park 2	Evangeline	130 E	State of Louisiana	Recreation	X	X	X	X	X
Davy Crockett National Forest 3	Houston/Trinity	80 WNW	United States Forest Service	Multi-Purpose	X	X	X	X	X

TABLE 2 (con't)
REGIONAL RECREATIONAL AREAS

Name	County	Approximate Distance from B.A. Steinhagen Lake Miles Miles	Administering Agency	Purpose	Available Recreational Facilities				
					Fishing	Swimming	Boating	Picnicking	Camping
Fort Jessup State Park 5	Sabine	100 NE	State of Louisiana	Historic	X	X	X	X	X
Huntsville Sat State Park 6	Walker	90 WSW	State of Texas	Recreation	X	X	X	X	X
Jim Hogg State Park 7	Cherokee	110 NW	State of Texas	Historic				X	
Kisatchie National Forest 8	Vernon/Rapides/Grant Winn/Nacogdoches	60-100 NE	United States Forest Service	Multi-purpose				X	X
Laccassine National Wildlife Refuge 16	Cameron	100 SE	United State Fish & Wildlife Service	Wildlife Refuge	X		X		
Mansfield Battle State Park 14	DeSoto	95 NNE	State of Louisiana	Historic					X
Martin Dies Jr. State Park 15	Jasper	0 E	State of Texas	Recreation	X	X	X	X	X
Mission Tejas State Park 4	Houston	100 WNW	State of Texas	Historic				X	X
Sabine National Wildlife Refuge 17	Cameron	90 S	United State Fish & Wildlife Service	Wildlife Refuge	X				
Sabine National Forest 10	Shelby/San Augustine/Sabine	60 N	United States Forest Service	Multi-purpose	X	X	X	X	X
Sam Houston National Forest 11	San Jacinto/Walker Montgomery/Liberty	70 SW	United States Forest Service	Multi-purpose	X	X	X	X	X
Sam Houston Jones State Park 12	Calcasieu	70 SE	State of Louisiana	Recreation			X	X	X
Cameron Prairie Wildlife Refuge 18	Cameron	95 SE	United State Fish & Wildlife Service	Wildlife Refuge					

TABLE 3

LIMITATIONS OF SOILS FOR RECREATIONAL DEVELOPMENT

Soil Association	Dominant Soil & Proportion of Association	Septic Tank Filter Field	Picnic Areas	Camp Sites	Playground	Paths & Trails	Woodland	50 Year Growth
1 Susquehanna-Garner-Houston		Severe very slowly permeable	Moderate slow wetness	Moderate permeable wetness	Moderate permeablility limiting factor 0-6% slopes	Moderate Wetness	Shortleaf Loblolly	70' 80'
2 Tehran-Wagram	Tehran 50%	None to slight	Moderate texture of surface	Moderate texture of surface	Severe surface texture	Severe texture of surface	Loblolly / Shortleaf	80' / 50'
	Wagram 30%	Moderate slopes	Moderate texture of surface	Moderate texture of surface	Severe slopes	Severe texture of surface	Loblolly / Shortleaf	88' / 77'
3 Enro-Woden-Wrightsville	Enro 30%	Severe permeability high water table	Slight to moderate wetness	Moderate wetness & permeablility	Moderate wetness & permeablility	None to slight	Loblolly / Shortleaf	90' / 80'
	Woden 25%	None to slight	None to slight	None to slight	None to slight	None to slight	Loblolly / Shortleaf Sweetgum	90'/80'/90'
	Wrightsville 20%	Severe slowly permeable	Severe wetness	Severe wetness	Severe wetness	Severe wetness	Loblolly / Shortleaf Sweetgum	80'/80'/80'
4 Segno	Segno 55%	Severe moderately slowly permeable	None to slight	None to slight	None to slight 0-2% slopes Moderate 2-6% slopes	None to slight	Loblolly / Shortleaf Longleaf	90' / 77' 76'
5 Bienville-Cart-Wrightsville		Slight moderate if subject to flooding	Moderate poor traction when dry	Moderate poor traction when dry areas may flood	Moderate - subject to blowing when dry	Moderate poor traction when dry	Loblolly / Shortleaf Longleaf	90' / 77' 76'
6 Corrigan-Rayburn		Severe wetness and permeability	Severe wetness and permeability	Severe wetness and permeability	Severe wetness and permeability	Severe wetness and permeability	Shortleaf Longleaf	70' 60' to 70'
7 Garner-Susquehanna	Garner 50%	Severe slowly permeable	Severe wetness clay texture	Severe wetness clay texture	Severe wetness clay text.	Severe wetness clay text	Shortleaf / Longleaf	65' / 70'
	Susquehanna 30%	Severe slowly permeable	Moderate slope & wetness	Moderate permeability & wetness	Moderate 0-6 Severe over 6	Moderate wetness	Loblolly / Shortleaf	80' / 70'
8 Urbo-Mantachie	Urbo 50%	Severe slowly permeable subject to flooding	Moderate wetness and flooding	Severe permeability and flooding	Severe permeability and flooding	Moderate wetness and flooding	Oak Sweetgum	99' 98'
	Mantachie 40%	Severe high water table & flooding	Moderate wetness and flooding	Severe flooding	Severe flooding	Moderate wetness and flooding	Loblolly Sweetgum	98' 100'

VALUES FOR RATING DEGREE OF LIMITATION OF SOILS FOR SPECIFIED USES:

None to slight:	The soil has no limitation or no more than some limitation. The limitation is not serious and is easy to overcome.
Moderate:	The soil has moderate limitation to use. The limitation neeess to be recognized, but it can be overcome or corrected by means that in general are practical.
Severe:	The soil has severe limitation. Use of the soil is questionable because the limitation is difficult to overcome.

II. LAND AND WATER ALLOCATION AND CLASSIFICATION

2-01 General

The basic objective of land use planning is to provide proper stewardship of the land and its resources through protection, development, and management. To help meet present and future needs in consonance with the land capability and aesthetics of the area, lands will be classified as changing needs and priorities dictate. All current Federally owned project lands are considered necessary to meet the current and future needs of the project.

2-02 Land Allocation

The following is a description of the land allocation for B.A. Steinhagen. Lands were allocated (purchased) in accordance with the authorized purposes for which they were acquired and are as follows:

A. Type I – Operations

All lands at B.A. Steinhagen were acquired in accordance with the authorizing documents for operation of the project, i.e. to provide water for the production of hydroelectric power, and water storage from which water will be released for the benefit of rice culture, salinity control, pollution abatement, navigation, and municipal and industrial uses.

B. Type II – Recreation – Not used

Separable lands acquired in accordance with authorizing documents for public recreation.

C. Type III – Fish and Wildlife – Not used

Separable land acquired in accordance with authorizing documents for fish and wildlife management.

D. Type IV – Mitigation – Not used

Land acquired or designated in accordance with authorizing documents to offset losses associated with development of the project.

2-03 Land Classification

Allocated lands are further classified to provide for development and resource management consistent with the authorized project purposes and the provisions of applicable Federal laws. Allocated use takes precedent over any classification categories. Land classifications are reflective of those enumerated in EP 1130-2-550, Chapter 3, dated 15 Nov 96.

A. Class 1 - Project Operations

This classification category includes those lands required for the structure, operations center, office, maintenance compound and other areas used solely for project operations. This classification also includes all lands below elevation 83 ft (NGVD).

B. Class 2 – Recreation

This classification includes lands developed or planned for intensive recreational activities by the visiting public, including areas for concessions. Although intensive recreational use will be the primary focus in these areas, management activities including but not limited to those listed under Class 5 – Multiple Resource Management may also be implemented as deemed necessary in order to perpetuate and/or augment the natural resources.

C. Class 3 – Mitigation – Not used.

D. Class 4 - Environmental Sensitive Area (ESA)

This classification includes lands or areas in which scientific, ecological, cultural or aesthetic features have been identified. Only limited development and low density recreation activities will be allowed in this area. The area will be managed to ensure it is not adversely impacted. Management of the natural resources will be conducted according to the needs of

specific tracts. Management of the area will range from no intervention to limited management activities, when perpetuation of desirable forest and vegetative cover species or wildlife habitat cannot otherwise be effectually maintained. Such activities may include prescribed fire, limited salvage harvesting, limited timber harvesting, tree planting, wildfire prevention measures, boundary clearing and maintenance, and wildlife habitat enhancement.

E. Class 5 - Multiple Resource Management

This classification includes lands managed for one or more of, but not limited to, the following activities (to the extent that they are compatible with the operations allocation). Within licensed areas all management activities will be conducted after coordination with the licensee.

1. Recreation – Low Density

This sub-classification includes areas managed for low density recreation activities such as hiking, primitive camping, wildlife observation, hunting, or similar low density recreational activities.

2. Wildlife Management

This sub-classification includes areas managed for the protection, development, and enhancement of wildlife populations. These areas may be located within larger recreation and/or vegetative management areas and may include such features as wildlife food plots or water control structures and impoundments, as well as general habitat management schemes favoring specific species of wildlife (such as endangered, threatened, or sensitive species).

3. Vegetative Management

This sub-classification includes areas managed for the protection, development, and enhancement of forest and vegetative cover according to ecosystem management principals.

4. Inactive and/or Future Recreation Areas – Not used.

Recreation areas planned for the future or that have been temporarily closed. These lands will be classified as multiple resource management in the interim.

F. Class 6 - Easement lands

Flowage Easement - Lands for which the Corps holds a flowage easement interest. These lands are not held in fee title and were purchased so that waters could occasionally overflow, flood, and submerge the property.

2-04 General Recreation Planning

A. Water Areas

Special use water areas are designated to minimize safety hazards while allowing maximum utilization of available water areas.

1. Swimming Areas

All authorized swimming areas will be identified by project signs and buoys. Only swimming and related activities will be allowed in these areas.

2. Restricted Areas

Water areas near the gated structure and powerhouse are restricted from public use and are so marked.

3. Low Speed Boating Areas

Areas around boat ramps, beaches and other areas where high speed boating and the associated wakes create a potential for accidents or property damage are designated as low speed boating areas and are so marked.

B. Parks

Conceptual plans are shown on individual park plates. Description of the areas, indicating their usage and existing and proposed development - is shown on the page proceeding each individual park plate in Section III, Recreation Plan of Development. Detailed facility management plans are located in the Operational Management Plan.

C. Outgrants

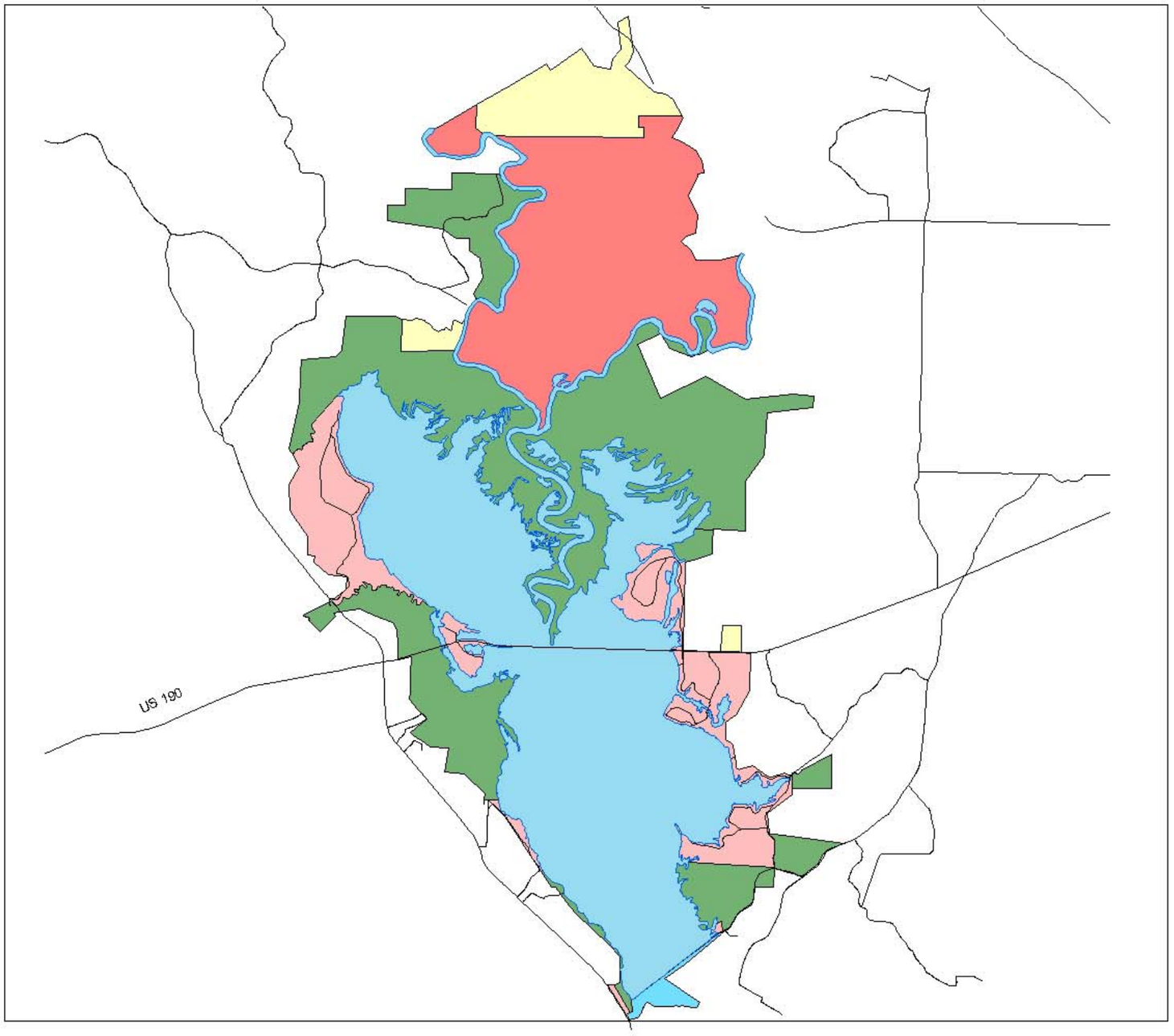
The Resource Manager will maintain an up-to-date listing of all outgrants and their locations which will be readily available at the Project office. All outgrants, including easements for roads and utility lines, are granted only when there is no practical alternative to utilizing government lands. Outgrants will be located where they have the least impacts. Appropriate mitigation for damages and losses will be negotiated prior to the issuance of any outgrant. Proposed outgrants which would adversely impact existing or planned facilities within recreation areas will be avoided.

TABLE 4

LAND AND WATER USE CLASSIFICATION

USE	REFERENCE CLASSIFICATION	ACRES
Project Operations		
Land Area	1	177
Water Use Area	1	13700*
Recreation	2	1,928
Environment Sensitive Area	4	3,390
Multiple Resource Management	5 a,b,c	2,564
	Total Fee Acreage	21,759
Flowage Easement	6	1,041
Total Acreage		22,800

* Acreage shown is in accordance with GSA Form 1166, dated 30 June 1971.



Land Classifications

B.A. Steinhagen Lake Master Plan

Legend

Class 1 - Project Operations

- Project Operations - Land Area
- Project Operations - Lake Area

Class 2 - Recreation

- Intensive Recreation with Wildlife and Vegetative Management

Class 4 - Environmentally Sensitive Area

- Wildlife and Vegetative Management with Low Density Recreation

Class 5 - Multiple Resource Management

- Wildlife and Vegetative Management with Low Density Recreation

Class 6 - Easement

- Flowage Easement

US Army Corps of Engineers

N

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Plate 1

III. PLAN OF DEVELOPMENT

3-01 General

The plan is designed to be flexible enough to meet variable conditions and changing needs. It is to serve as a guide for the comprehensive management and development of the lake through sound planning principles and basic site design criteria. Appropriate provisions are included in the plan for providing recreational facilities for current and projected design loads. It is also proposed to provide sufficient services to meet the visitors' needs and demands within the desired carrying capacity of the resource.

3-02 Ecological Considerations

Areas designated for public use as well as those designated for other land uses should be continually observed by project personnel to detect ecological imbalances, for example: soil erosion, vegetative wear due to heavy foot and/or vehicular traffic. Areas in question should be referred to qualified personnel at project level or District level as appropriate.

3-03 Environmental Statement

Reference is made to the requirement set forth in the National Environmental Policy Act of 1969 (Public Law 91-190). Environmental Impact Statements are not required by law but are to be prepared in the future in accordance with SWD and OCE guidance previously received.

3-04 Methodology

Factors considered in selecting the areas for recreational development as presented in this Revised Master Plan are as follows:

A. Access to existing roads.

B. Topography of the area.

C. Scenery.

D. Location of the area with respect to the usable exposure of water for recreational activities.

E. Degree of shelter for protection.

F. Water depths in coves where marinas are located or proposed.

G. Existing land use.

H. Drainage.

I. Soils surveys.

J. Wind - velocity and direction.

3-05 Recreation Facilities

The following concepts were used in this plan:

A. Provide adequate facilities to handle the annual visitation - present and future.

B. Limit the development of recreational facilities to the ultimate carrying capacity of the area for protection of the resources.

3-06 Analyses

Analyses were conducted to determine visitation projection, desired carrying capacity, ultimate carrying capacity, and facilities required.

A. Visitation Projection Analysis

In formulating the estimated recreation visits, the population within the day-use market area was projected through the year 2020. The population projections for B. A. Steinhagen Lake are based on a Series C population projection. The day-use market area (the geographical area from which 80 percent of the daytime users originate) was determined to be 100 miles. The population projections for the market area are as follows:

POPULATIONS PROJECTIONS FOR THE MARKET AREA
(SERIES C POPULATION)

1970	1980	1990	2000	2010	2020
2,249,228	2,901,857	3,585,843	4,310,260	5,112,156	5,983,976

The per capita use rates for B. A. Steinhagen's 100 mile zone were computed for 1970 and were adjusted through 2020. The per capita use rates are as follows:

Zone	Radius (mile)	Existing per capita Use Rate
I	0-10	4.30
II	11-20	4.02
III	21-30	1.07
IV	31-40	.28
V	41-50	.17
VI	51-75	.35
VII	76-100	.07

* The per capita rate factors used to adjust the per capita use rate through 2020 are listed below:

1970	1.00
1980	1.22
1990	1.42
2000	1.62
2010	1.80
2020	1.96

* Project Area Evaluation 1/ by Recreation Section, Sacramento District, dated November 1968.

The per capita use rate was then applied to the population projections to arrive at the estimated visitation expected to originate from the day-use market area. Then, by adding the additional projected visitation which originates beyond the day-use market area, which amounts to 20 percent of the total visitation, the total projected participation demand was computed.

The projected annual visitation at B. A. Steinhagen Lake, based on the above population projections and per capita use participation rates, are as follows:

Year	Projected Annual Visitation
1972	720,400
1976	800,000
1980	884,338
1990	1,193,370
2000	1,517,541
2010	1,934,391
2020	2,352,890

1,500,000 = Maximum capacity

B. Ultimate Carrying Capacity:

A combination of related aspects which concern the ability of the project resources to sustain intense use were studied to determine an ultimate carrying capacity. This ultimate capacity is estimated to be 1,500,000. This figure is a reflection of the aspects of size, location, sustained ecological balance, and other characteristics of the project. At B. A. Steinhagen Lake,

the projected participation demand is far greater than the carrying capacity of the project resources.

C. Desired Carrying Capacity

The lands adjacent to the lake have a definite capacity for recreational use. The impact of influencing factors on each site should be evaluated in accordance with the following guidelines:

1. Access
2. Slope
3. Existing vegetation
4. Ecological consideration
5. Existing land use
6. Esthetics
7. Views
8. Drainage and soil types
9. Orientation - sun and wind (See Wind Rose Index)
10. Social Interaction Zones

D. Facilities Analysis

Current and projected recreation visitation was broken into the following activities:

1. Design day load
2. Picnicking
3. Camping
4. Boat ramps for boating, fishing, and skiing
5. Beaches for swimming

For facility requirement computations see the following: Tables 5, 6, 7, 8, 9, and 10, pages 33 through 38.

TABLE 5
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 720,400 1972

Design load computations: 7,314

Design day load

720,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 190,185 total number of weekend users. Total number of weekend users (26 weekend days = 7,314 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 48 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 420 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles. Number of vehicles x .20 of vehicles with boats = number of boats. Number of boats of- 60 launchings per day = 8 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .17 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .17 acres water surface required.

10% of swimmers need no additional land.

TABLE 6
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 740,400 1973

Design load computations: 7,517

Design day load

740,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 195,465 total number of weekend users. Total number of weekend users (26 weekend days = 7,517 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 5 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 432 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles. Number of vehicles x .20 of vehicles with boats = number of boats. Number of boats of- 60 launchings per day = 8 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .17 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .17 acres water surface required.

10% of swimmers need no additional land.

TABLE 7
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 760,440 1974

Design load computations: 7,721

Design day load

760,440 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 200,756 total number of weekend users. Total number of weekend users (26 weekend days = 7,721 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 51 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 443 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles. Number of vehicles x .20 of vehicles with boats = number of boats. Number of boats of- 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .17 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .18 acres water surface required.

10% of swimmers need no additional land.

TABLE 8
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 780,400 1975

Design load computations: 7,924

Design day load

780,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 206,025 total number of weekend users. Total number of weekend users (26 weekend days = 7,924 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 53 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 455 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles. Number of vehicles x .20 of vehicles with boats = number of boats. Number of boats of- 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .18 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .20 acres water surface required.

10% of swimmers need no additional land.

TABLE 9
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 800,500 1976

Design load computations: 8,128

Design day load

800,500 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 211,332 total number of weekend users. Total number of weekend users (26 weekend days = 8,128 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 54 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 467 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats of- 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .18 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .18 acres water surface required.

10% of swimmers need no additional land.

TABLE 10
FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 1,500,000 (ultimate)

Design load computations: 15,230

Design day load

1,500,000 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 396,000 total number of weekend users. Total number of weekend users (26 weekend days = 15,230 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities (. turnover rate of 2 (3 persons per unit = 100 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers. Number of campers (4 persons per unit = 875 camping units required.

Boat Ramps

Design day load (load factor of 3 = number of vehicles. Number of vehicles x .20 of vehicles with boats = number of boats. Number of boats of- 60 launchings per day = 17 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users .;. turnover rate of 3 = number of users on beach at anyone time.
Number of users on beach at same time x 50 square feet of beach per person = .34 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water + turnover rate of 3 = number of swimmers in water at anyone time.
Number of swimmers in the water at anyone time x 100 square feet of water surface per user = .34 acres water surface required.

10% of swimmers need no additional land.

3-07 Development

A. General Planning Considerations

1. Selection of Areas

New areas were selected and some old areas were designated or redesignated for camping, picnicking, and other uses based on site characteristics, recreation demands, and resource management objectives. These objectives include but are not limited to:

a. Control visitor use.

b. Separate non-compatible uses (day use - overnight use).

c. Define activity – areas.

d. Manage and control each area as a separate unit.

e. Utilize screened or buffered areas.

2. Road Developments

New area circulation roads have been proposed while some existing roads are scheduled to be deleted. The objectives in constructing new interior circulation roads and deleting some of the old roads are:

a. To provide uniform and defined traffic flow.

b. To provide vehicular access to existing and proposed camp or picnic units via means of individual pullouts.

c. To prevent excessive through-traffic.

The area circulation roads should be laid out in the field. The centerlines of these roads are secondary in importance to the preservation of existing tree cover.

3. Sanitary Facilities

To conform with state sanitation codes, all existing concrete vault type toilets are scheduled to be converted to water borne facilities. Additional sanitary facilities are proposed to meet visitor needs and demands. Criteria used in determining the number of sanitary facilities considered two basic concepts

a. Anticipated visitor use of each area.

b. Accessibility by visitors within an area.

4. Additional Picnic and Camp Units

The number of additional picnic and camp units were based on the recreation analysis in conjunction with a five year development program with respect to the desired carrying capacity of the lake resource. Each area's site characteristics and existing development were considered before any additional units were scheduled. The number of units proposed is lower than that required by the visitation computations, due to site characteristics and the influencing social interaction zone.

5. Traffic Control Gates

Traffic control gates are proposed at strategic locations. These gates are to be used as a management tool and have the following functions:

a. Define and separate areas.

b. Provide visitors direction and control.

c. Provide a means of closing areas during construction, revegetation, and revitalization periods.

6. Courtesy Docks

Courtesy docks have been incorporated in the development of public use areas. These facilities are to be located adjacent to boat launching sites and at selected sites within

activity areas. Courtesy docks are to be used only for loading or unloading passengers and gear. No boats will be allowed to anchor to the piers except when loading. Appropriate signs will be placed at the piers informing visitors of this restriction.

7. Boat launching Sites

One new boat launching site is proposed as part of development in this revised plan. Some existing boat launching sites are proposed to be deleted because of poor site characteristics and their relationship to adjacent areas or if these particular sites could better be used for other activities. Proposed development in this revised plan includes additional launching lanes at sites having optimum characteristics.

8. For conceptual drawings, see Facilities Design Concepts drawings, Part C, 3.b (3), page 71.

B. Project Works Area

No new development is planned for this portion of the Master Plan.

C. Parks

1. General Description

There are six Corps parks and one state park at B. A. Steinhagen Lake, encompassing 1,695 acres adjacent to approximately 40 percent of the lake's 160 mile shoreline. All parks are characterized by a gently rolling terrain with a dense growth of forest. These parks were designated with consideration given to the factors listed in Part 3-04.

2. Specific Parks

The following pages illustrate public use areas indicating planned development, present status and future requirements of each park. An updated Master Plan for Martin Dies Jr. State Park is not available at the present time; however, the Texas Parks and Wildlife

Department's existing development was taken into consideration during this revision. The state's Master Plan will be incorporated within this Master Plan when it is made available.

The location of a planned management area is specified by a numbered bubble. No specific facility locations are shown because environmental, vegetation, and visitation conditions change constantly. However, planned development has been determined based on field reconnaissance and studies to assure that the proper site can accommodate the planned facilities. Specific locations will be laid out on the site by qualified personnel prior to construction.

EAST END PARK

(25 Acres)

This area, divided into two parcels, is located on the project access road which serves the east side of the dam. One part is located immediately upstream from the east end of the submersible dike. This area is well suited for camping, picnicking, primitive camping, and hiking. The proposed primitive area is an area of seclusion and solitude for nature's best offerings.

The second part is located downstream from the dam and adjacent to the stilling basin. Frequent flooding of this area makes the construction of an access road or other facilities undesirable. This area (accessible only by trail) is planned for bank fishing, canoe launching, hiking, and nature studying.

The East End Park attendance has increased from year to year based primarily upon the excellent bank fishing, both below the dam and along the east shore of the lake. The terrain is gently sloping to flat, covered with dense to very dense hardwoods.

EAST END PARK

(25 Acres)

Area	5-Year Improvement Plan	Existing Facilities
1	Overnight Use Area	
	6 camping units w/shelters	6 tables w/shelters
	6 paved pullouts	6 cookers or grills
	Convert existing toilet to waterborne	1 masonry pit toilet
	Remove existing boat ramp	1 single lane boat ramp
	1 one lane boat ramp	1 water well (artesian)
	Channel excavation, buoys	2 drinking fountains
	Pressurize existing artesian well	
	3 drinking fountains	
2	Overnight Use Area	
	0.4 mile hiking trail	None
	1 campfire circle	
	4 fireplaces	
	8 tent pads	
	2 frame toilets (concrete vault)	
3	Day Use Area	None
	(Bank fishing)	

Additional Supporting Facilities (Total)

1,888 square yards paved parking	0.21 mile gravel road
0.3 mile pave existing gravel road	
0.1 mile gravel road	
0.1 paved park road	

East End Park

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

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March 2003

Plate 2

BLUFF VIEW PARK

(16 Acres)

This area is located adjacent to and north of the headquarters area and consists of about 11 acres which includes the area known as Bluff View 0bservation Point in the original Master Plan, plus about 5 additional acres which is well situated for recreational development. The terrain is gently sloping to flat. The tree cover within the park has been cleared except for those surrounding picnic units and some on the east side of the park area. State (Farm-Market) Highway 92 borders the entire west side of the park and access to the park ground is provided at five points along this highway. This park has been developed.

To prevent the destruction of vegetation and erosion of the soils, the existing gravel roads and parking areas are proposed to be paved. By paving these areas, dust will be controlled making picnicking more pleasant and uniform use of the park will occur. Safety within the park will be enhanced as paved roads are safer.

This park is limited in size. However, it is very popular because of its scenic view and its access to the water above and below the dam.

BLUFF VIEW PARK

(16 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	Day Use Area	17 tables 11 table shelters 12 cookers or grills 1 masonry waterborne toilet 1 water well (pressure) 1 drinking fountain
Additional Supporting Facilities (Total)		
	666 square yards paved parking 0.2 mile pave existing gravel road	827 square yards paved parking 3,426.3 square yards gravel parking 0.1 mile paved park road 0.16 mile gravel road

Bluff View Park

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

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March 2003

Plate 3

CAMPERS COVE PARK

(81 Acres)

This area is located on the west shore of the lake about two miles north of the dam and about two and one-half miles south of U.S. Highway 190. It is accessible by two gravel county roads which connect to State (Farm-Market) Highway 92, paralleling the west side of the park at a distance of about one-half mile. These gravel roads are especially bad on steep slopes.

Limited access into this park is due to the steep slope on the west side which furnishes a natural barrier from wind and seclusion from private development. These factors, as well as the readily available commercial facilities, and its scenic beauty contribute to this park's high use rate as a camping site. However, space for development is limited due to the steep slopes. Access to the water's edge at its normal pool elevation is good; but during periods of low water, access to the water's edge needs to be improved. For this reason, channel excavation is proposed.

CAMPERS COVE PARK

(81 Acres)

Area	5-Year Improvements	Existing Conditions
1	Overnight Use Area	
	4 camping units w/shelter	17 tables w/shelter
	4 paved pullouts	16 grills or cookers
	Convert existing toilet to Waterborne	1 masonry pit toilet
	1 service building w/showers	1 water well (artesian)
	Pressurize existing artesian Well	1 one lane ramp
	1 additional launching lane	
	1 courtesy dock	
	Channel excavation	
	Extend existing boat ramp	
	1 waste disposal plant	
	1 traffic control gate	11 electrical hookups
	3 drinking fountains	2 drinking fountains
2	Overnight Use Area	
	10 camping units w/shelters	8 tables w/shelters
	10 paved pullouts	8 cookers or grills
	1 group shelter	l one lane ramp
	1 traffic control gate	1 drinking fountain
	1 sanitary dump station	4 electrical hookups
	Remove existing ramp	
	3 drinking fountains	
Additional Supporting Facilities (Total)		
	1,343 square yards paved parking	451 square yards paved parking
	0.4 mile area circulation road	0.95 mile paved park road
	0.8 mile pave existing gravel road	0.77 mile gravel road

Campers Cove Park

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

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March 2003

Plate 4

MAGNOLIA RIDGE PARK

(570 Acres)

This area is located on the west shore of the lake about two miles north of U.S. Highway 190. The terrain is gently sloping to flat. Tree cover, predominately pine, is fairly dense to very dense resulting in a very attractive area. At present, access is by a county road which connects to U.S. Highway 190. This park will be developed primarily for camping. An additional 176 acres will be redesignated as park land.

The day use area is readily accessible and is protected from other activities by a natural barrier of pines and hardwoods. Adjacent to this area are:

1. a free flowing creek which will be developed for a nature trail, and
2. an open area to the west which is adaptable for open sport recreation such as baseball, touch -football, badminton, volleyball, etc.

The overnight use area will be developed primarily for land oriented recreation. Due to the serene atmosphere, enhanced by scenic aquatic and land vegetation, the dense stands of hardwoods and pines, and the limited access to the lake as a result of the shallow water with numerous stumps and drifts; this area lends itself to primitive type development. When the lake is at or above conservation pool elevation 83, this area is one of the better fishing areas on the lake.

MAGNOLIA RIDGE PARK

(570 Acres)

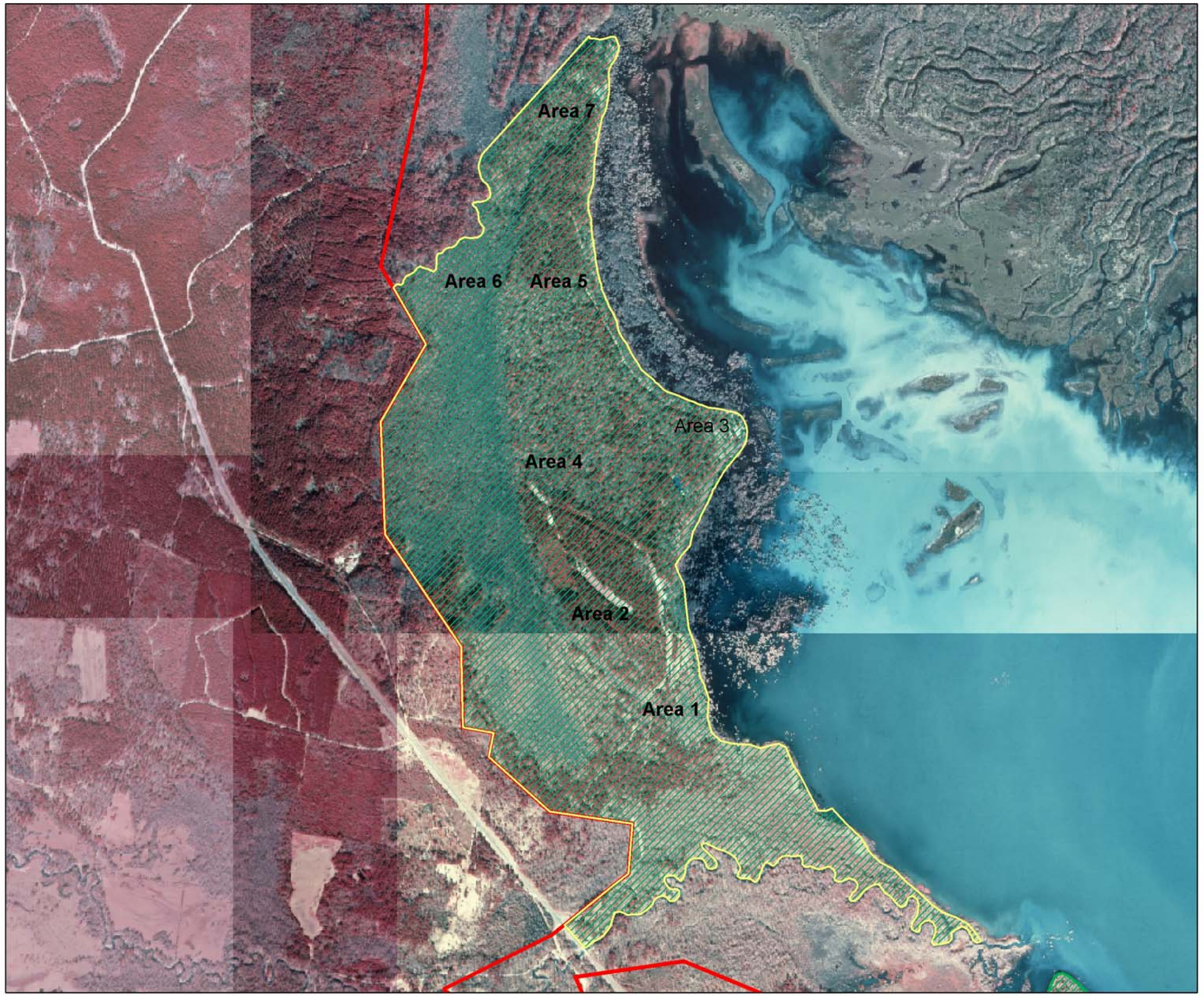
Area	5-Year Improvement Plan	Existing Conditions
1	Day Use Area	
	0.2 mile hiking trail	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 traffic control gate	l one lane ramp
	1 drinking fountain	6 tables
		5 shelters
		6 cookers or grills
		3 electrical hookups
		3 drinking fountains
2	Day Use Area	
	None	1 sanitary dump station
3	Overnight Use Area	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 additional launching lane	1 lane ramp
	1 group shelter	14 tables
	1 courtesy dock	11 shelters
		14 cookers or grills
	Pressurize existing artesian Well	1 water well (artesian)
		3 drinking fountains
		8 electrical hookups
4	Overnight Use Area (2 Primitive Camp Units)	
	2 campfire circles	None
	8 fireplaces	
	16 tent pads	
	2 wood vault type toilets	

Area	5-Year Improvement Plan	Existing Conditions
5	Overnight Use Area	
	4 camping units w/shelter	6 tables
	1 group shelter	2 shelters
	Convert existing toilet to Waterborne	4 cookers or grills 1 masonry concrete vault toilet
	Pressurize existing artesian Well	1 water well (artesian)
	1 drinking fountain	1 drinking fountain 4 electrical hookups
6	Overnight Use Area (2 Primitive Camp Units)	
	2 campfire circles 8 fireplaces 16 tent pads 2 wood frame vault type toilets 1.7 miles hiking trail	None
7	Overnight Use Area, (l Primitive Camp Unit	
	1 campfire circle 4 fireplaces 8 tent pads 2 wood frame vault type toilets 2 miles hiking trail 1 courtesy dock	5 tables 3 shelters 5 cookers or grills
	Extend existing ramp	l one lane ramp
	1 drinking fountain	3 drinking fountains 5 electrical hookups
Additional Supporting Facilities (Total)		
	543 square yards paved parking 1.0 mile paved park road 1.6 miles circulation road	8,087 square yards paved parking 3.39 miles paved park road 1 mile gravel road 389 square yards gravel parking

MAGNOLIA RIDGE PARK

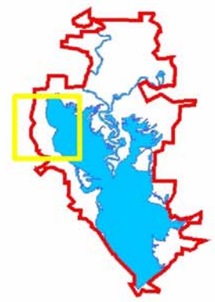
PROPOSED ADDITION

At the present time, government owned lands outside of Magnolia Ridge Park are being utilized for picnicking and other recreational purposes. This parcel of 176 acres, located adjacent to the park and lying along the park entrance road, has three existing picnic tables. The general features are the same as in Magnolia Ridge Park and the area has a moderate to dense tree cover. In order to more easily facilitate proper management of existing park acreage and its use, it is proposed that these 176 acres be redesignated and be included within the limits of Magnolia Ridge Park.



Magnolia Ridge Park

B.A. Steinhagen Lake Master Plan



Legend

Park Area

Government Boundary

US Army Corps of Engineers®

N

March 2003

Plate 5

MARTIN DIES, JR. STATE PARK

CHEROKEE UNIT

(27 Acres)

This unit, primarily used for picnicking and fishing, is located on the north and south sides of U.S. Highway 190 on the west side of the lake. It is readily accessible from U.S. Highway 190 at about the middle of the area. The terrain is flat and tree cover is moderately dense.

5-Year Improvement Plan

Not available

Existing Facilities

0.56 mile paved road
9,468 square yards paved parking
3 boat ramps
2 masonry waterborne toilets
1 water well, pressure
56 picnic units
49 grills or cookers
9 table shelters
2 registration booths
39 buoys
1 swimming beach
Signs
2 piers
Drinking fountains

Martin Dies Jr. State Park

Cherokee Park

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

N

March 2003

Plate 6

MARTIN DIES Jr. STATE PARK

WALNUT RIDGE UNIT

(309 Acres)

This unit lies north of and adjacent to U.S. Highway 190 on the east side of the lake, part of which is on an island. This unit is primarily used for camping, fishing, and boating. The terrain is gently sloping to flat and tree cover is dense.

5-Year Improvement Plan

Not available

Existing Facilities

3.37 miles paved road
1.19 miles gravel road
4~O49 square yards paved parking
547 square yards gravel parking
1 boat ramp
3 masonry waterborne toilets
1 water well~ pressure
120 camping units
52 table shelters
25 other camping units (not masonry)
112 grills or cookers
1 registration booth
25 screened shelters
2 fish cleaning houses
1 fishing pier
1 concession building
Signs
Drinking fountains

Martin Dies Jr. State Park

Walnut Ridge Unit

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

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March 2003

Plate 7

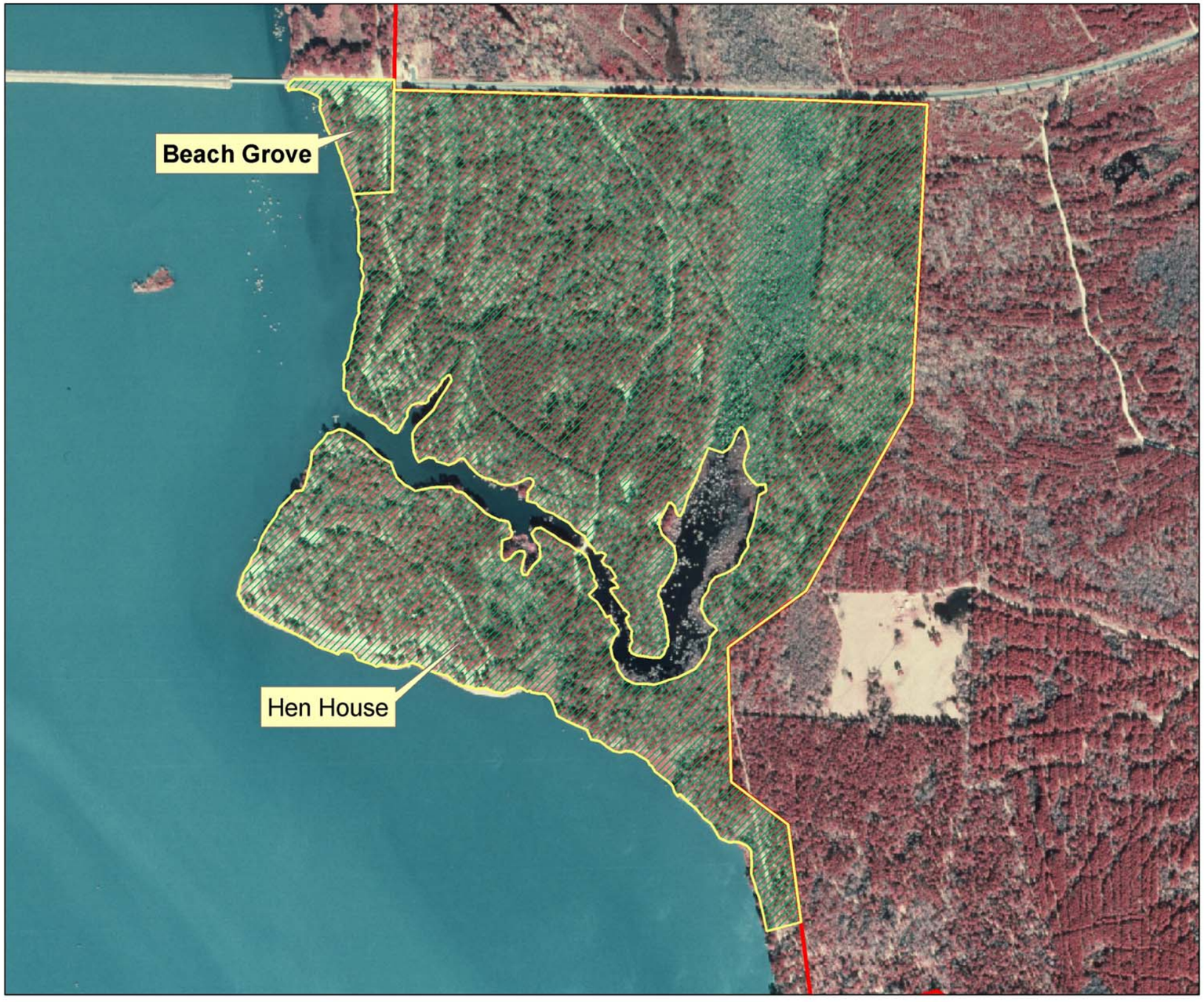
MARTIN DIES, JR. STATE PARK

HEN HOUSE RIDGE AND BEECH GROVE UNIT

(283 Acres)

This area lies south of and adjacent to U.S. Highway 190 on the east side of the lake. In the original Master Plan, this area was under lease to Jasper County; however, Jasper County requested that part of this area be reverted back to the Corps. On 17 April 1964, 283 acres of the County's lease were reverted to the state and this area is now referred to as the Beech Grove and Hen House Ridge Units of Martin Dies, Jr. State Park. The latter two units were consolidated in order to facilitate the administration of the Martin Dies, Jr. State Park license. The park is accessible from U. S. Highway 190 which forms the north side of the area. Tree cover is dense and the terrain is very sloping to flat. The state has developed some very adequate camping areas in the park.

5-Year Improvement Plan	Exiting Facilities
Not available	3.15 mile paved road 0.1 mile gravel road 35 tent and trailer pads 4,480 square yards paved parking 1,063 square yards gravel parking 4 waterborne toilets 1 sanitary dump station 1 water well 121 camping units 121 grills or cookers 1 registration booth 20 screened shelters 2 fish cleaning houses 1 fishing pier Signs Drinking fountains



Martin Dies Jr. State Park

Beach Grove and Hen House Ridge Units

B.A. Steinhagen Lake Master Plan

Legend

- Park Area
- Government Boundary

US Army Corps of Engineers®

N

March 2003

Plate 8

BEECH GROVE PARK

(17 Acres)

It is recommended that this area, previously part of Jasper County Park, be named Beech Grove Park. This area lies south of and adjacent to U.S. Highway 190 on the east side of the lake. Until 20 May 1971 this park was under a third party lease to a concessionaire. This concessionaire presently has a direct commercial concession lease on 2.5 acres with the Corps of Engineers.

Access to Highway 190, and the concessionaire adjacent to this park make it an ideal location for camping. Tree cover is predominately pine with some hardwoods. However, the grass cover is in need of re-vegetation, especially in the heavily used areas near the water's edge. Also, the shoreline is highly adaptable for beach use.

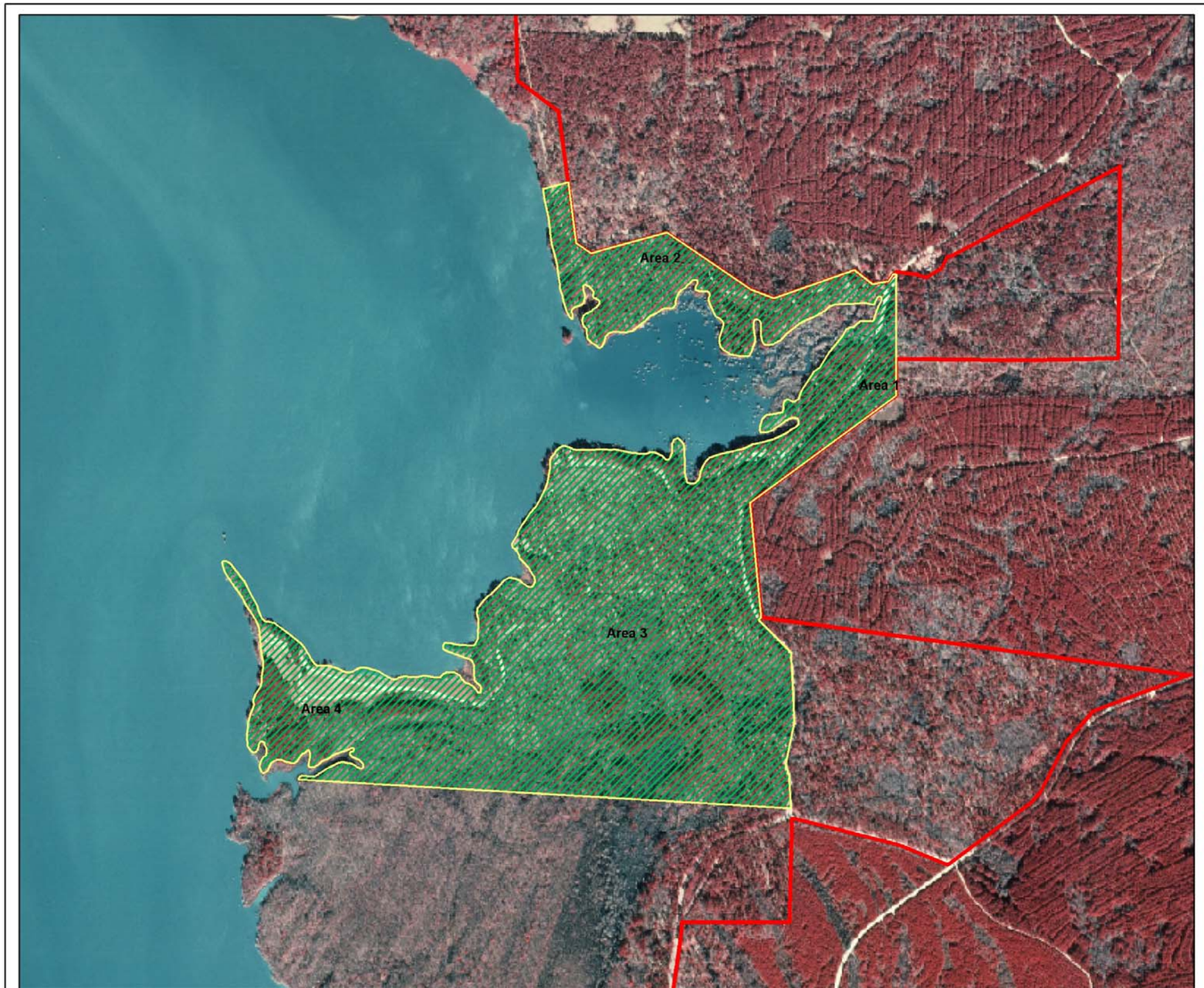
BEECH GROVE PARK

(17 Acres)

Area	5-Year Improvement Plan	Existing Condition
1	16 camping units w/shelters.	
	16 paved pullouts	
	1 masonry waterborne toilet	
	1 sanitary dump station	
	1 courtesy dock	
	1 swimming beach, buoys	
	1 bath house without toilets	
	1 additional launching lane	1 one lane ramp
	Extend existing ramp	
	Channel excavation	
	Pressurize existing artesian well	1 water well (artesian)
	1 traffic control gate	

Additional Supporting Facilities (Total)

	293 square yards paved parking	
	0.3 mile area circulation road	0.2 mile paved park road



Sandy Creek Park

B.A. Steinhagen Lake Master Plan

Legend

Park Area

Government Boundary

US Army Corps of Engineers®

N

March 2003

Plate 10

SANDY CREEK PARK

(395 Acres)

For administrative reasons, the areas referred to in the original Master Plan as Sandy Creek Park and Smithfield Point have been combined to form this park which lies on the east side of the lake near the point where Sandy Creek enters the lake. The terrain varies from fairly steep to flat. It is accessible by a county road which connects to FM 777 and state roads in Jasper County. At present, many visitors are using a private forest road to enter the park because it is shorter and in better condition during wet periods than the designated access road. Because of the poor condition and excessive length of the present access roads, a new road is proposed for access into the park.

The day use area nestled within pines, hardwoods, and a dense understory, is a popular bank fishing area – especially since Sandy Creek flows into the lake within this area.

The overnight use areas are located near the shoreline monopolizing on the exposure and scenery of the lake. All but the southern portion of the park contains a good stand of hardwoods and pines.

At present, this park has the best year-round launching facility. Also, this park includes natural areas, which facilitate hiking, nature study, and open play area activities.

SANDY CREEK PARK

(395 Acres)

Area	5-Year Improvement Plan	Existing Condition
1	Day Use Area	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 courtesy dock	2 drinking fountains
		14 tables w/shelters
		14 cookers or grills
		8 electrical hookups
2	Overnight Use Area	
	1 waterborne toilet	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	27 camping units w/shelters	10 tables w/shelters
	1 group shelter	10 cookers or grills
	1 courtesy dock	
	1 swimming beach, buoys	
	Pressurize existing well	1 water well (artesian)
	6 drinking fountains	3 drinking fountains
3	Overnight Use Area	
	6 camping units w/shelters	11 tables w/shelters
	1 group shelter	11 cookers or grills
	1 service building	1 one lane ramp
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	27 camping units w/shelters	10 tables w/shelters
4	Overnight Use Area	
	Swinming beach	10 tables w/shelters
	1 bath house without toilets	10 cookers or grills
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	Pressurize existing well	1 water well (artesian)
		11 electrical hookups
	2 drinking fountains	2 drinking fountains

Additional Supporting Facilities (Total)

3,646 square yards paved parking
1.1 miles area circulation road
1.0 mile pave existing gravel road
1.7 miles paved park road

948 square yards paved parking
304 square yards gravel parking
3.05 miles paved road
0.24 mile gravel road

3-08 Coordination With Other Agencies

Coordination with interested agencies is imperative during the plan of development and the management planning at B. A. Steinhagen Lake. This effort enables both interested agencies and the Corps to exchange thoughts aimed at developing and managing the project resources in the best interest of the public. Below is listed the organizations contacted and a summary of their contribution to this Master Plan.

A. National Park Service

Prior to construction of the dam, the National Park Service submitted a report -- “Recreational Use and Development - Dam B Reservoir Project" -- which was incorporated in the Definite Project Report as Appendix VIII-C, Exhibit 1. The Golden Eagle Fee Program was implemented and later dissolved.

B. Federal and State Health Services

In June 1946, the U. S. public Health Service and the Texas State Board of Health submitted a cooperative report -- "Reconnaissance Malaria Survey Report" -- which was incorporated in the Definite Project Report as Appendix VIII-B. Within recent years, the Environmental Protection Agency has inspected all sanitary facilities and has found them to be adequate.

The Texas State Health Department makes a monthly water sample check for bacteriological matter. They perform a chemical analysis annually or bi-annually according to the source (surface waters are analyzed bi-annually, while well waters are analyzed annually). They also approve all sanitary facilities designs.

C. Texas Committee on Environmental Quality

The Texas Committee on Environmental Quality regulates the issuance permits for all sewage systems. The Corps supplies to them the quantity of ground water pumpage on the

project lands.

D. Texas A & M Extension Service

The Corps coordinates with Texas A & M Extension Service regarding insect and rodent control.

E. Texas Forest Service

The Corps coordinates with the Texas Forest Service regarding the control of the Southern Pine Beetle and the fire control plan. The Corps pays for implementation of beetle control work.

F. Department of Agriculture

The Corps coordinates with the Department of Agriculture regarding weed control. The Soil Conservation Service provided the Corps with soils maps and pertinent information used as an aid in development of Corps parks and lands.

G. Federal Aviation Administration

The Corps coordinates with the Federal Aviation Administration for approval of all aerial applications for weed control.

H. Texas Parks and Wildlife

The Texas Parks and Wildlife has leased 14,264 acres of land and water at this project. All request for development of the parks within this lease must be sent to the Resource Manger for his approval or for District approval. They conduct annual test-nettings checking for fish imbalances and contact the Corps for assistance if any problems occur.

I. Texas Department of Public Safety

The Corps coordinates with the Texas Department of Public Safety concerning law enforcement problems and practices.