

ORDPD-R (24 Dec 84) 1st Ind

SUBJECT: Design Memorandum 4c, Updated Master Plan, East Lynn Lake,
Twelvepole Creek, West Virginia

DA, Ohio River Division, Corps of Engineers, P.O. Box 1159, Cincinnati, OH
45201-1159 8 February 1985

TO: Commander, Huntington District, ATTN: ORHPD-R

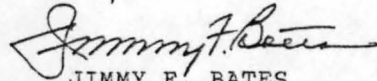
Approved, subject to the comments in the attached review memorandum.

FOR THE COMMANDER:

wd all cys
Added 1 Incl
Review Memo

CF:

DAEN-CWO-R (5 cys)



JIMMY F. BATES
Chief, Planning Division

Review Memorandum
East Lynn Lake, Twelvepole Creek,
West Virginia; Design Memorandum No. 4c
Updated Master Plan

1. Chapter 2, Coal Lands, pages 12 and 13. Acquisition of coal interests noted in the text and Table 2-1 was accomplished through rights of eminent domain. Therefore, unless results of a trial in Federal courts or other earlier settlement arrangements alter these circumstances, the Federal Government now owns these mineral interests. The report should reflect the status of the coal interests when the master plan is revised.
2. Lick Creek Day Use Area, page 88. The proposed beach development at Lick Creek must meet the criteria expressed in ORDR 1130-2-24, 25 May 1984. The report describes the beach as proposed and not one which is in need of upgrading or is being relocated, therefore, cost sharing as prescribed in Public Law 98-72 is required.
3. Table 11-2, Cost Estimates. The construction of additional picnic shelters ~~are~~^{is} permissible on the basis that they result in increased user fee revenues as discussed (DAEN-CWO-R multiple letter, 4 October 1984, subject: Corps Policy on Utilization of Special User Fee Revenues). Additional recreation items proposed e.g. signs, gates, landscaping and access road rehabilitation are routine O&M functions and may be funded as budget allocations permit.



DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO
ATTENTION OF:

ORHPD-R


24 December 1984

SUBJECT: Design Memorandum 4c, Updated Master Plan,
East Lynn Lake, Twelvepole Creek, West Virginia

Commander, Ohio River Division
ATTN: ORDPD-R

1. Enclosed for your review and approval are eight copies of Design Memorandum 4c, East Lynn Lake Master Plan Update, Twelvepole Creek, West Virginia.
2. This document supersedes Design Memorandum 4b, Recreation Site Plan, Part of the Master Plan, East Lynn Lake, Twelvepole Creek, West Virginia, dated 20 May 1969, and its supplements. It has been approved to guide the development, enhancement, and management of the project's recreational and fish and wildlife resources so as to provide maximum public use benefits within the bounds of appropriate Government responsibilities and authorities.
3. Population, visitation, and demand computations will be updated at the time specific construction is scheduled.

8 Encls

 J7AJ
for ROBERT B. WILSON
Colonel, Corps of Engineers
Commanding

DESIGN MEMORANDUM NO. 4c

MASTER PLAN UPDATE
FOR
EAST LYNN LAKE

TWELVEPOLE CREEK, WEST VIRGINIA

FINAL

AUGUST, 1984

This report prepared by:

WOOLPERT CONSULTANTS
2324 Stanley Avenue
Dayton, Ohio 45404

Under Contract No. DACW69-81-C-0135

EAST LYNN LAKE
TWELVEPOLE CREEK, WEST VIRGINIA

PREFACE

In today's growing recreation market, our natural reserves, especially those which offer water related activities, must begin to be fully utilized to meet the growing demands placed on them by the public. This need, however, must not be satisfied at the expense of protection and conservation efforts which presently guard our resources from over-development or from the destruction of natural habitats.

It is this delicate balance, tempered by the present fiscal climate, which this report attempts to strike in formulating the continued management enhancement and development strategies for East Lynn Lake. Every effort has been made in preparing this Master Plan Update to orchestrate management objectives, recreational needs, and environmental constraints into a comprehensive plan which will lead East Lynn Lake successfully into the future.

SUMMARY

It is the purpose of this Master Plan Update to review the current state of operations at East Lynn Lake and to make recommendations which better assure that these resources are developed, managed, and environmentally protected within the best interests of the Project. Existing developmental practices and management guidelines were evaluated and updated to coincide with the preservation of the quality of the land base and water resources, as well as the various existing recreational facilities.

The plan for recreational development represents the product of a thorough on-site inspection of existing and proposed facilities; an analysis of proposed user recreation demands; the collection and synthesis of all pertinent cultural, historical, and ecological data; and coordination with other concerned agencies. The results of this research and evaluation effort became the basis for this Master Plan Update in which all Project water and Land resources were allocated to best meet recreational needs while preserving the environmental integrity of Project lands.

Existing recreation facilities were evaluated for their continued ability to provide recreation opportunities. Efforts are concentrated at improving on expanding existing sites which received a total of 493,599 visitors in 1983.

This plan specifically recommends: providing an identification sign at the project headquarters and landscaping adjacent to the maintenance yard and sewage treatment plant; providing 3 picnic shelters, playground equipment, and a pedestrian bridge in the tailwater; adapting the spillway for open area recreation; providing an entry sign, gate, and landscaping at the Laurel Creek Camping Area; upgrading the pedestrian overlook, constructing 2 picnic shelters and circulation pathways, providing a 7-car parking lot and fisherman trail at the Overlook and Day Use Areas; upgrading the access road to the Group Use Area and providing a beach and additional parking at Lick Creek; providing a shoreline fishing trail and additional landscaping at the Lake Side Boat Launching Area; providing additional signage at the East Fork Swimming Area; and providing additional landscaping and shoreline protection in the East Fork Camping Areas.

Costs to implement these proposals are \$1,010,300.

A license was signed by the West Virginia Department of Natural Resources to use and occupy 22,928 acres of the project for fish and wildlife management. This license is in effect for twenty-five years commencing 1 November 1983. Through this document WVDNR licensed all lands except acreage needed for project operations and the existing recreation areas.

This plan has been fully coordinated with Federal, State, and legally recognized local entities having jurisdiction over lands within the region.

EAST LYNN LAKE
TWELVEPOLE CREEK, WEST VIRGINIA

PERTINENT DATA

1. Authority for Project: East Lynn Lake was authorized by the Flood Control Act of 28 June 1938, HR 10618, Public Law No. 761, Seventy-fifth Congress, third session.
2. Project Purposes: The East Lynn Lake Project consists of the operation of a dam and its other facilities and provides for flood control, recreation, and fish and wildlife conservation.
3. Location of Project: East Lynn Lake is located in Wayne County, West Virginia, on the East Fork of Twelvepole Creek, ten miles upstream from its confluence with Twelvepole Creek, and 42 miles above the confluence of Twelvepole Creek and the Ohio River. The project is six air miles south-southeast of the Town of Wayne.
4. Drainage Area: 133 square miles.
5. Reservoir Data:

Pool	Surface Elevation (Ft. m.s.l.)	Surface Area (Acres)	Net	
			Storage Capacity (Acre-Feet)	(Inches)
Minimum				
Winter	656.0	823	11,705	1.6
Seasonal	662.0	1,005	5,485	0.8
Flood Control				
Summer	701.0	2,351	65,310	9.2
Winter	701.0	2,351	70,795	10.0

6. Dam and Appurtenances:

a. Stream Bed Elevation at Dam Site: 609'

b. Embankment:

Type:	Rolled earth fill.
Top Length:	652'
Top Elevation:	731'
Top Width:	32'
Maximum Height (Above Stream Bed):	113'
Base Width:	765'

c. Spillway:

Type:	Uncontrolled saddle spillway.
Crest Elevation:	701'
Width:	230'

d. Outlet Works:

Location:	Right abutment
Selective Withdrawal:	three 5'-8" x 10' hydraulically operated slide gates.
Tunnel:	circular; 625' long

7. Land Acquisition:

a. Fee: 24,821 Acres (526 Surface Tracts)

b. Flowage Easement: 95 Acres

8. Relocations:

a. Highways:

Abandonment:	35 miles
Relocation:	9.5 miles (SR 37)
New Construction:	6.2 miles (Project Recreation)

b. Highway Bridges: 2

c. Utilities:

Power Lines:	
Abandonment and removal:	28.35 miles
Construction:	6.08 miles

Telephone Lines:

Abandonment and removal: 24.43 miles
Construction: 18.56 miles

Gas Lines:

Abandonment: 19.2 miles
Construction: 12.62 miles

d. Cemeteries: 26 cemeteries; 1,203 graves

e. Schools:

Abandonment: 6 Buildings - Total of 9 Classrooms
Construction: 2 Buildings - Total of 8 Classrooms

9. Land Clearing: Trees and brush were removed from the lake between elevation 651 feet and elevation 665 feet. An exception to the clearing plan provided that certain embayments were left uncleared.

EAST LYNN LAKE
TWELVEPOLE CREEK, WEST VIRGINIA
DESIGN MEMORANDUM NO. 4c
MASTER PLAN UPDATE

AUGUST, 1984

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CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1-01. Project Authorization.

Development of East Lynn Lake was authorized by the Flood Control Act of 28 June, 1938, HR 10618, Public Law No. 761, Seventy-fifth Congress, third session.

1-02. Project Purposes.

East Lynn Lake is presently operated to provide flood control, general outdoor recreation, and fish and wildlife preservation and enhancement.

1-03. Purpose of the Master Plan Update.

The purpose of the Master Plan Update is to provide revised and current information relative to guiding the use and development of the Project resources. The plan provides overall Project and site specific resource analysis, planning, and design. The update also provides for the optimum economic and public management of existing and proposed Project resources. Paramount to the proper management of Project resources is the minimization of the affects of adverse development on the existing natural resources.

1-04. Prior Pertinent Design Memoranda.

The following list of previously issued Design Memoranda pertain to the East Lynn Project:

Table 1-1

PREVIOUSLY ISSUED AND SCHEDULED DESIGN MEMORANDA

DM No.	Title	Approval Date
1	Relocations-SR 37, P-I, Dam Access and Public, Use Access	June 1, 1964
2	Site Selection	March 11, 1964
3	General Design Memorandum	January 25, 1965
4a	Preliminary Master Plan	April 28, 1965
4b	Recreation Master Site Plan - Public Access and Access Road	May 20, 1969
5	Real Estate	December 14, 1969
6	Geology and Soils	June 2, 1965
7	Dam, Spillway, and Outlet Works	July 15, 1965
7-s	Dam, Spillway, and Outlet Works	April 25, 1966
8	Concrete Aggregates	
9	Relocations - Highway SR 37	April 12, 1965
10	Real Estate - Reservoir Part II	July 19, 1965
11	Real Estate - Reservoir Part III	June 6, 1967
12	Relocations - Utilities, Power, and Telephone	December 22, 1967
13	Relocations - Schools	August 26, 1966
14	Reservoir Clearing	March 18, 1966
15	Relocations - Gas Lines	November 6, 1968
16	Proposed Reservoir Sedimentation Ranges and Investigations	March 31, 1977

1-05. Partial List of Applicable Public Laws.

- a. Flood Control Act of 1944 (Public Law 78-534). The Department of the Army is authorized to provide for recreational use of lakes under its control by Section 4 of the Flood Control Act, approved 22 December 1944; as amended by Section 4 of the Flood Control Act, approved 24 July 1946; as further amended by Section 209 of the Flood Control Act, approved 3 September 1954; and as further amended by Section 207 of the Flood Control Act of 1962, approved 23 October 1962.

- b. Fish and Wildlife Coordination Act of 1958 (Public Law 85-624: as amended). This Act provides that fish and wildlife conservation shall receive equal consideration with other Project purposes and be coordinated with other features of water resources development programs.

- c. Federal Water Project Recreation Act of 1965 (Public Law 89-72). Although East Lynn Lake was authorized prior to enactment of this legislation, the provisions of the law have been administratively applied. Briefly, this act requires sharing of financial responsibilities in joint Federal/ non-Federal development and enhancement of recreation and fish and wildlife resources of Federal water projects with no more than one half of the cost being borne by the Federal government. It reaffirms the traditional policy of the U.S. Army Corps of Engineers to encourage non-Federal participation in the administration of recreational opportunities provided at Corps projects by entering into licenses or leases which permit state and local development and administration of recreational areas.

Therefore, any proposed development of new areas or expansion of existing areas are subject to cost-sharing.

1-06. Scope of Report.

This Master Plan Update has been developed to provide for the continued management and development of the resources available at East Lynn Lake. The land and water resources of the Project, including existing and potential public use areas, have been carefully studied and analyzed to determine the potential for and capability of meeting present and future demands which will be placed upon the area. This analysis has resulted in an updated plan that will assure the continued wise and orderly, yet limited development and upgrading of East Lynn Lake. The Master Plan Update will serve as a guide enabling the Corps of Engineers to continue to provide recreational opportunities for public enjoyment, as well as maintain proper management and utilization of all Project resources.

CHAPTER 2

PROJECT DESCRIPTION

CHAPTER 2

PROJECT DESCRIPTION

2-01. Location.

East Lynn Lake is located in Wayne County, West Virginia on the East Fork of Twelvepole Creek ten miles upstream from its confluence with Twelvepole Creek and 42 miles above the confluence of Twelvepole Creek and the Ohio River. The Project is six air miles south-southeast of the Town of Wayne, as shown on Exhibits 1 and 2.

2-02. Project Data.

a. Hydrologic and Climate Summary. The climate of the Twelvepole Creek Basin is temperate and includes the usual seasonal variations in temperature. The entire basin is affected by frontal air-mass activity and is subject to both continental, polar, and maritime tropical air masses. Frequent and rapid changes in weather occur due to the passage of fronts associated with general low-pressure areas. The prevailing wind direction is from the southwest.

The normal annual precipitation is uniform over the basin, averaging approximately 43.5 inches. The average annual snowfall over the basin is about 21.0 inches and represents only a minor portion of the total annual precipitation. The temperature varies from a minimum of approximately

-24°F. to a maximum of approximately 108°F. Seasonal variations in temperature range from an average of about 36°F. in January to 75°F. in July. The growing season, or the period between the last killing frost of spring and the first frost of autumn, averages about 6 months, usually from early May to mid-October. The basin lies directly in the path of extensive meteorological disturbances which, in winter and spring, generally travel from southwest to northeast.

Two distinct types of storms are prevalent in the basin, summer and winter. The summer-type storms usually occur during the period of May to October, and are characterized by rainfall of high intensity, short duration, and relatively small areal extent. The winter-type storm usually occur during the period of December to March, and are characterized by less intense rainfall of extended duration and large areal extent, often affecting several States. The winter-type storms are generally caused by the interaction of cold air masses originating in the region of Alaska, with warm moist air masses sweeping northward from the Gulf of Mexico and the southern Atlantic Ocean. Occasionally stagnation and stationary development produce prolonged precipitation. Snow cover, saturated or frozen ground, or combinations thereof, may greatly increase runoff rates and volumes.

Flood occurrences of Twelvepole Creek are not limited to any month, although winter and spring floods are more frequent. Summer-type storms

have occurred over the basin, producing local floods without affecting adjacent areas. The upper portion of Twelvepole Creek Basin is subject to headwater floods; whereas, the lower portion is subject to backwater from Ohio River floods, as well as headwater floods, or a combination of both. Ohio River floods, which inundate lands as far as 23 miles upstream from the mouth of Twelvepole Creek, are usually caused by the more widespread winter-type storms which occur between December and April. Winter storms are generally of longer duration, lasting up to three weeks. The topography of the basin, consisting of winding, narrow-crested ridges and deep, narrow valleys, is conducive to rapid concentration of runoff resulting in fast fluctuation of stream flows.

Floods on Twelvepole Creek are of short duration, seldom remaining above flood stage for more than 24 to 36 hours, unless flooding in the lower reaches is prolonged by backwater from the Ohio River. The maximum flood of record (at the U.S.G.S. gaging station, Wayne, West Virginia) on Twelvepole Creek occurred on 4 February 1939 with a discharge of 22,000 c.f.s. The gage height was 31.03 feet. The duration of flooding above the damage stage of 16.0 feet was 1.5 days. During the February, 1939 flood, major damage occurred to residences, schools, churches, highways, and bridges. On the average and without the East Lynn Project in operation, flooding on Twelvepole Creek above the damage stage of 16.0 at Wayne, West Virginia,

would be expected to reach or exceed 25 feet once in 5 years, to reach or exceed 27.5 feet once in 10 years, to reach or exceed 29 feet once in 20 years, to reach or exceed 30.6 feet once in 50 years, and to reach or exceed 32.2 feet once in 100 years.

b. Shoreline Length and General Character. East Lynn Lake has a shoreline of approximately 45.8 miles at the seasonal pool elevation of 662 feet m.s.l., and inundates 1,005 acres. At seasonal pool elevation, the mean depth of the lake is approximately 17.1 feet, and the maximum depth is approximately 48 feet.

The lake basin is situated in the Kanawha section of the maturely dissected Appalachian Plateau physiographic province. Water erosion has reduced this plateau to slope. The streams are now following in deeply cut "V"-shaped valleys. Numerous ridges and hills ranging in elevation from 800 to 1500 feet above mean sea level, capped with resistant rock strata, remain as remnants of this ancient plateau.

Drainage is characteristic of a well detailed dendritic pattern. The East Fork of Twelvepole Creek flows generally northwest. The regional dip of the rock is generally in a northwest direction; however, due to the in-

fluence of the Parkersburg syncline and the Doane anticline, the dip at the dam site is to the southwest.

The existing flood plains near the dam site are generally narrow strips of sandy soil which alternately widen to clayey soil deposits as the stream meanders. The widened sections of the flood plains are usually terraces of an earlier depositional condition which result in a clayey soil deposit. These terraces are slightly elevated above the more recent narrow sandy deposits adjacent to the stream. It appears that the high terraces were subsequently eroded by stream action and later sandy soils were deposited, during flood stages, at lower elevations.

c. Project Structures (Operational). The Project includes a dam of rolled earth fill construction. The dam is 652 feet long and rises 113 feet above the streambed. The dam is 32 feet wide at the top and 765 feet wide at the base.

d. Real Estate Land Acquisition. In the Survey Report dated 8 December 1961, the proposed real estate acquisition consisted of: (1) fee title to all lands inclosed by a line measured 300 feet horizontally from the top of the seasonal pool elevation of 663, an area of 2,635 acres; (2) flowage easements below a tentative guide taking line at elevation 695 (5 feet above flood control pool elevation 690) on any lands extending beyond the fee

purchase, an area of 1,330 acres; (3) fee title to lands where access is severed, an area of 4,000 acres; and (4) fee title to additional land needed for public access, an area of approximately 125 acres for a grand total of 8,090 acres. Fee title to all mineral rights, including coal, was contemplated during preparation of the survey report.

During preparation of the General Design Memorandum, dated 6 October 1964, new topographic mapping was available and the dam site was changed. It was determined that to retain the same amount of flood control storage in inches of runoff as planned in the survey report, an adjustment in pool levels had to be made. Maximum flood control pool was raised from elevation 690 to elevation 701 and the seasonal pool was lowered to elevation 662. In addition, criteria for fee acquisition was changed to measurement from maximum flood control rather than seasonal pool. As a result, the upper guide taking line for flowage easement was established at elevation 706, which includes 5 feet of freeboard above spillway elevation 701. The surface lands proposed to be acquired in fee comprised approximately 28,600 acres in 455 tracts. The proposed taking was based upon the then current real estate policy and included all lands required for construction sites, designated public use areas, rights-of-way for relocated highways, and a large block of land which would be isolated by the proposed plan of highway relocation. This block alone accounted for approximately 11,000 acres.

With regard to coal lands, it was proposed to acquire the coal at the dam site and in areas where the merchantable coal seam outcropped below maximum flood control pool level. Coal lands in the entire area were damaged by the loss of main valley access routes since economic mining required movement of coal to market along direct routes in a downstream direction. A large block of coal in the above described isolated area was deprived of economical and direct transportation routes with resultant increased operational costs and indefinite extension of the deferred mining period. In such areas the cost of subordination of coal lands approached fee value; hence, it was considered in the best interest of the Government to acquire fee to that coal. In areas where existing primary access remained even though subject to more frequent flooding, coal lands were subordinated. Consequently, it was proposed to acquire fee title to coal at the dam site, isolated coal lands, and coal below flowage comprising approximately 16,000 acres and to subordinate the remaining 12,600 acres of coal lands.

Real Estate Design Memoranda Nos. 10 and 11, dated 14 May 1962 and 10 November 1966, defined the acquisition plan for both surface and mineral for either fee or subordination for the lands as described in the General Design Memorandum. ORHRE-PP letter, subject: "East Lynn Lake, Twelvepole Creek, West Virginia; Documentation of Proposed Mineral Acquisition Plan," dated 2 December 1970, covered the final mineral acquisition plan for the project. The above mineral acquisition plans were based on the 1962 Joint Land Acquisition Policy in which the minerals in certain areas were to be reserved with subordination to project purposes.

In Real Estate Design Memorandum Supplement to Design Memoranda Nos. 10 and 11, dated 7 June 1974, it was noted that experience at other Huntington District projects has shown that subordination of minerals, particularly coal, to project purposes has not produced the envisioned compatibility between Project development and operation and coal extraction. The characteristics of the East Lynn Lake project area are strikingly similar to those at Fishtrap and R.D. Bailey Lakes, except there is presently no active coal mining within the authorized boundary at East Lynn Lake. The approved subordination estate for use at East Lynn Lake was patterned from the General Form Subordination Estate of the Fishtrap Lake Project, without the provision to prohibit strip mining. The adverse experience with coal mining operations at Fishtrap Lake has revealed the necessity for stringent control of such activities. The mineral situation at East Lynn Lake is similar to what the situation was at Fishtrap Lake during the acquisition phase. If the estates, which were patterned from the Fishtrap estates but without the prohibition of strip mining provision, approved for East Lynn were to be used, similar problems could develop, i.e., extensive deep mining and excessive sedimentation largely from access and haul roads. Accordingly, rigid control over coal extraction within the East Lynn acquisition area was found to be necessary to minimize project degradation. It was proposed to acquire in fee the coal in the areas that were previously authorized to be subordinated to project purposes.

As a result of the above actions, all coal lands within the East Lynn Lake project are to be acquired in fee with the exception of about 1,296 acres which are to be left outstanding with no incumbrances.

Table 2-1

EAST LYNN LAKE
(REAL ESTATE SUMMARY)

1. Survey Report (8 December 1961)
 - a. 300-foot horizontally from top of seasonal pool in fee 2,635 ac.
 - b. flowage easement below guide taking line (5' above FC pool)- 1,330
 - c. fee title to lands where access is severed - 4,000
 - d. fee title to public access lands - 125

8,090 ac.
 2. GDM (6 October 1964)
 - a. 300-foot horizontally from full (FC) pool - 28,600 ac.
 - b. Coal lands:
 - (1) Fee (dam site, isolated lands, below flowage) - 16,000 ac.
(5' above FC pool)
 - (2) Subordination of coal lands and interest - 12,600 ac.
 3. RE/DM Nos. 10 (14 May 1965) and 11 (10 November 1966)

300 foot horizontally from full pool - 28,600 ac.

Minerals: subordination 4,184 ac.
outstanding 1,296 ac.
 4. RE/DM Supplement to DM Nos. 10 & 11 (7 Jun 74)

Proposed fee acquisition of certain areas previously
authorized to be subordinated to project purposes. - 4,184 ac.
-

2-03. Lake Operation.

- a. Pool Elevations. Three major pool elevations have been provided for in the design of East Lynn Lake to help control floods. The maximum flood control pool is located at elevation 701 feet m.s.l. A seasonal pool is

maintained at elevation 662 feet m.s.l. during the summer months. The minimum pool has been established at elevation 656 feet m.s.l.

b. Storage Capacity. The lake has a net storage capacity of 70,795 acre-feet at maximum flood control pool. At the spillway crest elevation (701 feet m.s.l.), the net storage capacity is 65,310 acre-feet.

The surface area and gross and net capacities of the lake at various pool elevations are displayed in Table 2-2. The maximum flood control pool provides a net storage capacity of 1,005 acre-feet when the lake is at seasonal pool elevation. During the winter, the flood control pool provides for 70,795 acre-feet of net storage, or 10.0 inches of run-off from the net drainage area of 133 square miles.

Table 2-2

LAKE AREA AND CAPACITY

Surface Elevation Ft. m.s.l.	Surface Area (acres)	Net Capacity (acre-feet)	Gross Capacity (acre-feet)
Minimal Pool:			
656 (Winter)	823	11,705	11,705
662 (Seasonal)	1,005	5,485	17,190
Flood Control Pool:			
701 (Winter)	2,351	65,310	82,500
701 (Summer)	2,351	70,795	82,500

c. Flooding. The majority of the flooding affecting the Project occurs during the spring months. Summer flooding of the land above seasonal pool elevation is possible but infrequent and does not affect adjacent areas. The probable frequency and duration of flooding for the lake is shown in Table 2-3.

Table 2-3

FREQUENCY AND DURATION OF FLOODING

Exceedence Interval (Years)	Pool Elevation (Feet - m.s.l.)	Average of No. of Days per Year
5	675.0	1.5
10	678.0	0.8
50	687.0	-
100	691.0	-
Flood Control Pool	701.0	-

d. Drawdown. Lowering the elevation of the lake is necessary to help maintain water quality, to enhance downstream fisheries, and to allow for the containment and gradual release of seasonal flood waters. The seasonal pool is maintained from approximately 1 April through 1 October and is subject to drawdown (as needed to meet minimum release requirements) from 1 October through 3 November.

Table 2-4

MONTHLY AND ANNUAL RUNOFF
EAST FORK OF TWELVEPOLE CREEK
AT EAST LYNN LAKE

Month	Normal average flow (c.f.s) (inches)		Maximum average flow (c.f.s) (inches)		Minimum average flow (c.f.s.) (inches)	
January	255	2.21	669	5.80	13.8	0.12
February	359	2.81	677	5.31	64.4	0.51
March	340	2.95	677	5.30	112.0	0.97
April	266	2.23	575	4.82	73.0	0.61
May	169	1.47	515	4.47	19.4	0.17
June	83	0.70	452	3.79	2.86	0.02
July	57	0.49	177	1.53	8.31	0.07
August	26	0.23	66	0.58	0.554	0.005
September	34	0.29	412	3.46	0.286	0.002
October	21	0.18	120	1.04	0.415	0.004
November	67	0.56	343	2.88	0.286	0.002
December	156	1.36	493	4.27	2.77	0.02
ANNUAL	152	15.48	292	29.83	59.4	6.06

2-04. Existing and Projected Visitation

- a. Existing Visitation. A relatively stable number of users have been visiting the Project during the three year period from 1981 through 1983.

Project visitation averages 542,855 visitor days per year with 542,930 in 1981, 582,738 in 1982, and 502,897 in 1983. The decline in visitation in 1983 is attributed to abnormal weather conditions (numerous rainy weekends in the Spring and extremely hot July and August).

b. Projected Visitation. Projections of future use indicate a steady increase in the number of users to the year 2020. An increase to 554,115 visitors annually in 1985 is projected and increases to as many as 740,097 visitors in 2020.

CHAPTER 3

OPERATING PROJECT STATUS

CHAPTER 3

OPERATING PROJECT STATUS

3-01. Project Development and Operation Chronology.

- a. General. East Lynn Lake was authorized by the Flood Control Act of 28 June 1938.

Since completion of the Project, a number of recreation areas have been developed around the lake. The Corps of Engineers has developed facilities for camping, picnicking, boating, sightseeing, and other related activities. Approved water supply and sanitary facilities also have been provided. Additional facilities have been planned for and will be constructed as demand for various recreation activities increases, and cost share partners are obtained.

A list of previously issued design memoranda appears on page 2 of this report and serves as a chronology of existing data on East Lynn Lake.

- b. Real Estate. A real estate tract map for East Lynn Lake is included in this report as Exhibit 3. Real Estate Design Memoranda Nos. 5, 10 and 11

provide descriptions of the acreage and previous ownership of each acquired tract.

3-02. Expenditures.

The estimated construction funds to date (through June, 1983) at East Lynn Lake are \$36,975,800. A breakdown of these costs is shown in Table 3-

1. Operation and maintenance expenditures through 30 September 1981 were \$4,526,700.

3-03. Concessionaire.

The Lake Side Marina, a leased concession, is operated by a private individual. This operation is subject to the terms in the lease agreement between the marina owner and the Corps of Engineers. This marina is discussed in detail in Chapter 5 of this Master Plan Update.

Table 3-1

EXPENDITURE OF FUNDS AT EAST LYNN LAKE* - June 1983

Real Estate	\$ 13,232,100.00
Relocations	\$ 8,487,700.00
Clearing	\$ 439,900.00
Dam Construction	\$ 5,201,800.00
Access Road	527,100.00
Recreation Facilities	\$ 3,740,900.00
Buildings, Grounds, and Utilities	\$ 461,300.00
Permanent Equipment	\$ 201,300.00
Engineering and Design	\$ 2,736,400.00
Supervision and Administration	\$ 1,930,500.00
Other	\$ 16,800.00
	<hr/>
TOTAL	\$ 36,975,800.00

* All figures have been rounded off to the nearest hundred dollars.

CHAPTER 4

RECREATIONAL AND ENVIRONMENTAL
RESOURCES OF THE PROJECT AREA

CHAPTER 4

RECREATIONAL AND ENVIRONMENTAL RESOURCES OF THE PROJECT AREA

4-01. Physiography and Geology.

a. General. East Lynn Lake is located in the Appalachian Plateau physiographic province. The maturely dissected plateau is characterized by deeply cut "V"-shaped valleys underlain by sedimentary strata of the Pennsylvanian Age.

b. Structural Geology. Outcroppings of sedimentary bedrock date from the Pennsylvanian Period (about 300 million years ago). From top to bottom the names of the various bedrock layers are Conemaugh, Allegheny, and Kanawha. These bedrock layers consist of shale, siltstone, sandstone, limestone, and coal.¹ Most of the bedrock layers beneath East Lynn Lake (1450 to 2300 feet below the land surface) contain proven reserves of natural gas. The Haney-Cove Creek gas field (number 232) in the Project Area vicinity is a small part of a larger field that has an estimated reserve of 300 billion cubic feet of natural gas. The Columbia Gas System leases about 500,000 acres in the State of West Virginia for gas production and has active gas wells on the Project. The Industrial Gas Corporation also leases land for gas production in the East Lynn Lake drainage area (Cardwell, 1981).

Wayne County is one of the minor coal producing counties of West Virginia. A preliminary report by Spencer (1972) investigated the availability of low-sulfur coal in Wayne County. Four columnar sections of the Allegheny and Kanawha bedrock are described in this report from recent investigations and compared to investigations performed in the first decade of this century. A commercially valuable coal deposit known as the No. 5 Block is located between the Allegheny and Kanawha formations in the bedrock. The coal bed must be at least 28 inches or more in thickness to be considered an economically viable coal resource. Spencer (1972) notes that within a three-mile radius of the Village of East Lynn, the No. 5 Block ranges in thickness from 30 to 65 inches. The recoverable coal resources (based on 50% recovery) were estimated by Krebs (1913) at 317,800,000 tons, most of which is located in the central part of Wayne County. The sulfur content of the No. 5 Block in this area ranges from 0.88% to 3.90% and averages 1.66%. This sulfur content is low to medium for this bituminous coal. Mining of this coal seam in the East Lynn Lake drainage area has been limited to scattered drift mines. The commercially recoverable coal in the East Lynn area is about one-third of the estimated 0.9 billion tons of recoverable coal reserves in Wayne County.

There are a number of abandoned drift mines within the Project Area, many of which are found on hillsides overlooking the lake (U.S.G.S., 1975).

Unlike the eastern counties in West Virginia with their extensive cavern systems (Davies, 1965), there are no caverns within Wayne County.

c. Appalachian Geosyncline. The principal structural feature of the Appalachian Plateau is the Pittsburgh Basin. This basin is part of the Appalachian Geosyncline, which extends from southwestern Pennsylvania to southwestern West Virginia and into Kentucky. Horizontal pressure was exerted on the shallow-water and marine sediments deposited in the Pittsburgh Basin, forming gentle anticline-syncline folded topography, stretching from the northeast to the southwest quadrant. These folds exist in the East Lynn Lake area as the Coane Anticline and the Parkersburg Syncline. No faulting is known to have occurred in the area.²

4-02. Archeology.

Pre-historic cultures were present within the East Lynn Lake area beginning with Paleo-Indian hunters 14,000 years ago and ending with the Fort Ancient people around A.D. 1700. There were several other cultures in this area at various pre-historic times between these early and late cultures. Ten archeological sites were found by Edward V. McMichael and Oscar L. Mairs (McMichael and Mairs, 1965) in the East Lynn Lake area in 1965. The National Park Service was satisfied with this 1965 survey and recommended no further investigations.³ McMichael and Mairs, however, recommend that a

systematic archeological survey be undertaken to locate unrecorded sites and to evaluate these sites for placement on the National Register of Historic Places.

The ten archeological sites that were located in the reservoir area include four camp sites, two rockshelter sites, three stone mounds, and one combination stone mound and camp site. Several of these sites were field checked and tested, but very little diagnostic material was recovered.

A listing of the archeological sites at East Lynn Lake appears in Table 4-1.

Table 4-1

LISTING OF ARCHEOLOGICAL SITES

Site No.	Name	Type of Site
46 WA 1	Frazier Heirs	Camp
46 WA 2	Fry Cemetery Cairns	Stone Mounds
46 WA 4	Fry Site	Camp
46 WA 5	Soldiers Cave	Rockshelter
46 WA 6	Merit Site	Camp
46 WA 7	Rock Cairn	Stone Mound
46 WA 8	Maynard Mound	Stone Mound
46 WA 9	Lowe Site	Camp
46 WA 10	Finley Mound	Stone Mound/Camp
46 WA 14	Maynard Rockshelter	Rockshelter

McMichael and Mairs (1965) indicated that sites 46 WA 1 and 46 WA 7 have potential for further investigation even though they had no opportunity to field check these sites. Two other sites that have potential for further investigation are 46 WA 9, a camp site where two grit tempered pottery sherds and a glass bead fragment were found, and 46 WA 10, a camp and stone mound where 12 clay tempered pottery sherds were found.

4-03. History.

Created from Cabell County, Virginia on January 18, 1842 by the Virginia Acts of 1842, the East Lynn Lake area was originally a part of Fincastle County, Virginia. Wayne County was named after U.S. General "Mad" Anthony Wayne, a renowned general during the Revolutionary War.

White men first entered the Wayne County area during the Big Sandy Expedition of 1756 (Rice, 1951). These white men were sent from the Colony of Virginia by Governor Dinwiddie to make war with Shawnee Indians.

United States President George Washington and several other men conducted the first land survey of what is now Wayne County in 1772.

Settlers began entering Wayne County in substantial numbers after about 1805. The first white settler built his cabin on the banks of Twelvepole

Creek in 1802, and by 1807 six other cabins had been erected. Most of the current residents are descendants of the original settlers.⁴

The community of East Lynn, for which the reservoir is named, was originally known as Twin Creek because it stood where Little Lynn and Camp Creek flowed into Twelvepole Creek only a short distance apart. Twin Creek became East Lynn sometime after the Civil War when a post office was established there. The first settler is unknown, but a store was being operated in the area by Eldridge Smith in the early nineteenth century. In 1879, the first schoolhouse was built; later the East Lynn Coal Company tipple replaced the schoolhouse on the site (Comstock, 1976).

Historically, coal mining has been the main industry of the region. East Lynn was the center of the mining industry on the Left Fork of Twelvepole Creek (Porter, 1944). By 1913, the West Virginia Geological Survey maps listed 73 mine openings within the present boundaries of the East Lynn Lake Project (Krebs and Teets, 1913). During the first three decades of the twentieth century, East Lynn was a thriving coal town dominated by the family of Captain A.J. Perry of Alabama, owners of the East Lynn Coal Company. At one time the coal company had about 15 houses, a company store, a tipple, a spur railroad line and over 200 employees. Most of the company houses were three-room frame structures; eight of them were

built on the bottom land of Little Lynn Creek. Residents of East Lynn could buy food and other necessities at the company store; but, they were not forced to patronize it since other stores were available (Massie, 1981).

Captain Perry took an active interest in the people of East Lynn. He built his house, 'a showplace of Southern hospitality, on a hillside above Twelvepole Creek. The Perry family complex had a separate dance hall and recreation room where miners and their families attended parties. Perry donated the land and much of the money for the construction of a Methodist Church, where his daughters taught Sunday School. Unlike many coal operators of his time, A.J. Perry is remembered for the benefit he provided the community of East Lynn before the Depression forced him to sell his business to the Fry family of McDowell County. Today the coal operation is closed down (Massie, 1981), but remnants of several early mines can be found on the Project.

4-04. Ecology.

a. Vegetation. East Lynn Lake lies within the Eastern Deciduous Forest Province. The mixed Mesophytic Forest Section is dominant at East Lynn Lake on the lower parts of the north-facing slopes and in moist coves. Typical canopy tree species include: Beech, Tulip-poplar, Basswood, Sugar

Maple, Sweet Buckeye, Red Oak, White Oak, and Hemlock. Understory trees include: Flowering Dogwood, Magnolia, Sourwood, Striped Maple, Red Bud, American Hornbeam, Eastern Hop-Hornbeam, Holly, and Serviceberry. The remaining forested area (52% of all of East Lynn Lake's forests) consists of Oak-Hickory Forest. The Mockernut Hickory, White Oak, Red Oak, Butternut Hickory, Chestnut Oak, Black Oak, Scarlet Oak, Blackgum, American Beech, Virginia Pine, Pitch Pine, and Shortleaf Pine are the most common tree species.

Forest stands at East Lynn Lake are classified by age as young, intermediate, old, and old growth-residual. About 11,000 acres of the approximately 22,000 total acres of forest and open land are covered by intermediate growth trees (7.0 to 10.9 inches diameter at 4.5 feet above ground for over 50% of the trees in the stand). About 9,000 acres are covered by young growth stands and the remainder consist of old growth and old growth-residual (understory stands containing trees 1.0+ inches in diameter left from previous logging operations). As previously mentioned, 52% of the total forest ecosystem at East Lynn Lake consists of Oak-Hickory stands. Open lands cover a small acreage and are included in the young growth classification.⁵

Herbs common to the area are Witchhazel, Maple-Leaf Viburnum, Greenbrier, Grape, Virginia Creeper, Poison Ivy, and Buffalo Nut. Most

noteworthy for their recreational value are the spring and summer wildflowers. These include various Trilliums, Violets, Lady Slippers, Dogstooth Violets, Spring Beauties, and Baneberry. Ferns are also quite common.⁶

b. Insect and Disease Vectors. The land surrounding East Lynn Lake is generally well drained and there has been no breeding of mosquitos reported or observed. Should any ponding occurring from reservoir operations result in mosquito breeding, the area will be drained.⁷

c. Fish and Wildlife. A total of 22,928 acres have been licensed to the West Virginia Department of Natural Resources for fish and wildlife management (1,005 lake surface acres). Most of the Project Area can therefore be considered a natural area with suitable habitat available for wildlife species normally intolerant of permanent human populations.

East Lynn Lake is a warmwater fishery. The water, which is fairly soft, has an excess of dissolved iron, and the dissolved oxygen levels decrease to less than 5mg/L below 15 feet in the summer. Aquatic plant life primarily consists of unicellular phytoplankton, which gives the water its blue-green tint. Major sport fish include the Walleye (stocked),

Muskelunge (stocked), Largemouth and Smallmouth Bass, Bluegill, Black Crappie, and Channel Catfish. Bluegill, Crappie, and Bullhead Catfish are the most common species harvested by sport fishermen. Rainbow Trout are stocked below the dam.⁸

The second growth forest of primarily young and moderate-sized trees, and the occasional openings in the forest which are found along pipelines, transmission lines, and at abandoned houses, provide suitable habitat to support moderate populations of most common game species. Non-game species of birds, herptiles, and mammals are also moderately abundant. These species include Timber Rattlesnake and the Northern Copperhead. Wetland habitat is almost entirely lacustrine and riverine, with little palustrine (bog, marsh, etc.) habitat.⁹

Populations of threatened or endangered plant and animal species have not been reported in the Project Area.¹⁰ The lack of any records of endangered or threatened plant and animal populations does not, however, rule out their presence in such a large area. A list of endangered (State and Federal status) plants and animals reported to inhabit western West Virginia is provided by the U.S. Army Corps of Engineers (1977).

There are populations of plants and animals in the Project Area that are uncommon. For example, three uncommon birds observed within the last decade at East Lynn Lake are the Great Blue Heron, the Osprey, and the Parasitic Jaeger. An Osprey nesting site was observed on a steep slope near Rich Creek and the Peter Cave area in February of 1975. As noted in the 1977 Fish and Wildlife Plan for East Lynn Lake¹¹, the management practices that favor terrestrial game species and aquatic sport fish also favor uncommon non-game species and any rare, threatened, or endangered species that might inhabit the Project Area.

The small drift mines in the Project Area might provide suitable habitat for winter hibernation of bats. There are three bat species in southwestern West Virginia that are not common and that might utilize these drift mines. The management of these drift mines for the safety of park visitors should allow access for bats if this access is compatible with safety considerations.

4-05. Environmental and Scenic Qualities.

a. Topography. East Lynn Lake is located in the Kanawha section of the maturely dissected Appalachian Plateau physiographic province. Elevation above mean sea level ranges from 660 feet at the lake surface to about

1,100 feet atop the tree-covered ridges. Twelve perennial streams and several intermittent streams drain a 133-square mile area, which includes the Project Area. These streams follow deeply cut "V" shaped valleys and are characterized by a detailed dendritic pattern.

b. Soils. The three major soils in the Project Area are the Gilpin, Upshur, and Vandalia series.¹² Moderate (12% to 18%) to severe (18% to 50%) slopes are the major limitations of these soil types. These soils are most suitable for grassland or woodland over the wide range of slopes (3% to 35%, generally). Soil testing would be necessary in the Project Area since a detailed survey of Wayne County soils has not been completed.

c. Landscape Considerations. Forested hills dominate the landscape of the reservoir area. Open land (old field vegetation), which provides contrast and relief from the woodland views, are scattered throughout the land area. Most are associated with abandoned home sites, graveyards, transmission lines, pipelines, and existing recreation areas. Open fields are maintained as such in some areas for the benefit of upland game and non-game wildlife that feed and live in this type of habitat.¹³

The lake is usually a pleasing blue-green color because of the presence of unicellular algae which inhabit soft water lakes and ponds. The shoreline is not particularly attractive when water levels are low and the former lake bottom is exposed. The upper reaches of the reservoir pool have some wetland (marsh) characteristics.

Most of the visitors to East Lynn Lake have high expectations concerning the scenic quality of the area. It is, therefore, important that the visual impacts of any management activities reinforce this image or mental picture.

4-06. Recreation.

Existing facilities provided at the Project include picnicking, camping, boating, fishing, swimming, hunting, hiking, children's recreation, and sightseeing. These facilities are located at four areas around the lake: Lake Side, Lick Creek, East Fork, and at the dam and tailwater.

Further development of the area will be based upon continued public use of existing facilities, increases in demand, and recognition of new activity needs which can be accommodated within the Project.

LIST OF REFERENCES.

1. West Virginia Geological and Economic Survey, 1968.
2. U.S. Army Corps of Engineers, 1974.
3. Ibid.
4. Ibid.
5. U.S. Army Corps of Engineers, 1977.
6. U.S. Army Corps of Engineers, 1974 and 1977; U.S. Department of the Interior. 1979.
7. U.S. Army Corps of Engineers, 1974.
8. U.S. Army Corps of Engineers, 1977.
9. U.S. Army Corps of Engineers, 1974 and 1977.
10. West Virginia Department of Natural Resources, 1982.
11. U.S. Army Corps of Engineers, 1977.
12. Soil Conservation Service, 1979.
13. U.S. Army Corps of Engineers, 1977.

CHAPTER 5

**FACTORS INFLUENCING AND CONSTRAINING
RESOURCE DEVELOPMENT AND MANAGEMENT**

CHAPTER 5

FACTORS INFLUENCING AND CONSTRAINING RESOURCE DEVELOPMENT AND MANAGEMENT

5-01. General.

There are a number of factors that must be evaluated in relation to the existing and future development of recreational facilities at East Lynn Lake. The purpose of this Chapter is to discuss how the resource characteristics described in the previous Chapter influence facility development and the preservation of the area for current and future generations.

5-02. Demographic Factors.

a. Population and Growth Trends. The population of the Stonewall Magisterial District, in which East Lynn Lake is located, was 3,732 persons in 1980.¹ This figure represents a 25.8% increase in the District's population since the previous decennial census, when the population was determined to be 2,966.

The population of Wayne County experienced a similar increase between 1970 and 1980. The 1980 population of 46,021 represented a 22.5% increase over the 1970 population of 37,581.²

Population projections devised by the West Virginia Department of Health and based upon the 1980 census enumeration and the latest information on births and deaths in the County, indicate that the population of Wayne County is expected to increase 20.2%, to a total population of 55,305, by the year 1990. By 1998, the population is projected to increase to 63,038 persons, representing a 37% increase over the number of Wayne County residents in 1980. These figures represent a significant increase in population, which is mainly attributable to Wayne County's ranking as having the eighth highest rate of net in-migration in the State of West Virginia (out of 55 counties).

The median age of the population residing in Wayne County in 1980 was 30.1 years; 7.7% of this population was under 5 years of age, 23% were 5 to 17 years of age, 58.8% were between the ages of 18 and 64, and 10.5% were over 64 years old.³ The April 1970 to April 1980 average birth rate was 15.4 per 1,000 persons, and the death rate was 8.4.

Census data reveals that the number of housing units in the County increased by 36.2% or 4,472 units over the 1970 to 1980 decade. Within the Stonewall Magisterial District the number of housing units also increased substantially with an additional 361 units, which represents a 38.1% increase since 1970. The 1980 Census of Population and Housing found the total number of housing units in Wayne County to be 16,829. According to

1975 revisions indicated on U.S.G.S. topographic maps of the East Lynn Lake vicinity, most of the new home construction since 1962 has occurred along existing State and County routes.

b. Income. Per capita income in Wayne County is slightly lower than the per capita income for the State of West Virginia. In 1979, the average per capita income in Wayne County was \$6,567 compared to the Statewide average of \$7,402.⁴ Among the 55 counties in the State, Wayne County ranked twenty-sixth in average per capita income.

c. Economy and Major Industries. The most current unemployment statistics available for Wayne County show that the average unemployment rate was 9.0% in December of 1981.⁵ During the same month, the Statewide unemployment rate was 7.8% and the rate for the entire United States was 8.3%. Wayne County's highest unemployment rate in 1981 occurred in May, when the average rate was 12.2%. The average unemployment rate for the entire year of 1981 was 9.5% in Wayne County, 8.0% in West Virginia, and 7.5% in the United States.

In 1979, the County's labor force was distributed as follows: government, 25%; manufacturing, 21%; construction, 11%; mining, 4%; agriculture, 1%; transportation and utilities, 11%; and other trades and services, 27%.⁶

d. Land Use. Of the 328,345 acres of land that comprise Wayne County, only about 5% is developed.⁷ Forest land is the predominant land use (92%). Cropland and pasture cover about 5.2% of the County. Urban or built-up land comprises only 2.1% of the County land area, and about 70% of this land is residential.⁸ Less than one-half of the County's developed land is estimated to be within municipal boundaries.⁹

e. Climate. Average weather conditions recorded from 1941 to 1970 in nearby Huntington, West Virginia show the area as having a mean annual temperature of 55.2°F.¹⁰ Minimum temperatures of below 0°F occur occasionally during the winter months, and summer maximum temperatures occasionally reach or exceed 100°F.

Precipitation averages 39 inches annually, including an average of 23 inches of snowfall. The area is characterized by an average of 139 days per year with precipitation of 0.01 inches or more. During the summer months, rain is often in the form of intense, localized thunderstorms of short duration.

The area's growing season normally extends from mid-April to mid-October.

f. Summary. Both the Stonewall Magisterial District and Wayne County have experienced significant increases in population, and are expected to continue to experience this growth through the year 1998. This is mainly due to the area's traditionally high rates of in-migration and natural increase. Most of the growth has occurred along the area's State and County routes outside of incorporated areas. The County remains very rural, with only 2.1% of the land area considered urban or built-up.

Unemployment rates in 1981 averaged slightly higher than the State and nationwide averages, and per capita income was slightly lower than the State average. Over one-third of the County's residents were engaged in mining, construction, and manufacturing, which traditionally have been the employment sectors most affected by economic fluctuations.

5-03. Topography, Geology, and Soils.

a. Topography. The general topographic character of the area is a major limiting factor in the provision of recreation facilities at East Lynn Lake. The steep terrain restricts development and access to the flat valley areas which are generally long and narrow. Existing recreational development has followed this pattern and any future development will need to be sensitive to this siting constraint.

b. Geology. The soft and easily weathered bedrock characteristic of the area is subject to minor rock slides. Road cuts and other developments that expose the bedrock could result in rock slide hazards. Abandoned drift mines, which were dug by former residents of this area to supply personal coal needs, are also a hazard to park visitors.

c. Soils. The major soil limitations in the Project Area are slope, slow permeability, and depth to bedrock. The degree of limitation will depend on the type and extent of development proposed. Steep slopes reduce the type of uses which would be practical for development because of cost and potential erosion and maintenance problems. Generally, trails are the most compatible use for these areas. Depth to bedrock will limit the installation of underground utilities and possibly the ability to sustain plant material in shallow soils. Soil slippage is an important factor to assure development occurs on stable soils, to ensure durable facility development, and to site features where long-term maintenance is not a problem.

5-04. Accessibility.

West Virginia State Route 37 (two lanes, improved) and U.S. Route 152 (two lanes, improved) provide access to the East Lynn Lake area. Access in the immediate vicinity of the Project is afforded by State Route 37, which connects with U.S. Route 52 near the Village of East Lynn to the North and

State Route 10 to the East. U.S. Route 152 links the reservoir with the City of Huntington, West Virginia and the City of Ironton, Ohio.

Regional access is provided by Interstate Route 64 (east-west) and Interstate Routes 77 and 79 (north-south), which intersect at Charleston, West Virginia.

The road network serving the East Lynn Lake Area is shown on Exhibit 1 and 6. As can be seen in these Exhibits, a considerable portion of the Project Area is inaccessible. This factor makes development of these areas generally impractical because of cost.

5-05. Market Area.

a. Geographic Location and Distance to Major Population Centers. East Lynn Lake is located in Wayne County, West Virginia and generally serves the immediate area. Major population centers served include Huntington, West Virginia; Ashland, Kentucky; and Ironton, Ohio. Portions of nearby counties also are served, including Lincoln, Mingo, Logan, and Cabell Counties, in West Virginia.

The following table denotes distances between major population centers and East Lynn Lake:

Table 5-1

DISTANCES FROM EAST LYNN LAKE TO MAJOR POPULATION CENTERS

City (1980 Population)	Approximate Road Miles
Wayne, WV (1,495)	10
Louisa, KY (1,832)	18
Huntington, WV (63,684)	25
Ceredo, WV (2,255)	30
Kenova, WV (4,454)	31
Catlettsburg, KY (3,005)	36
Ashland, KY (27,064)	45
Ironton, OH (14,290)	47
Russell, KY (3,824)	50
Flatwoods, KY (8,354)	51
Williamson, WV (5,219)	55
Charleston, WV (63,968)	60
South Charleston, WV (15,968)	60
St. Albans, WV (12,402)	63
Dunbar, WV (9,285)	64

b. Length of Recreation Season. The normal length of the area's recreation season is six months, beginning April 1st and extending through the month of September. Recreation activities during April and May consist primarily of fishing, although recreational fishing occurs year round. During the peak months of June, July, and August, family recreation vacations are the primary use. Visitation begins to decline during September, when the major recreation activities turn to fishing, hunting, and sightseeing.

c. Related Recreation Areas. There are several water-oriented recreation resources in the area. These resources are identified in Table 5-2. Competitive recreation facilities are identified in Section 5-06(b) of this Chapter.

d. Overall Demand Within the Area. The Statewide Comprehensive Outdoor Recreation Plan for West Virginia (1981) has identified the five most popular outdoor activities according to various community attitude surveys distributed randomly throughout the State. The results showed swimming, picnicking, camping, boating, and sport and playfield activities as the most popular outdoor activities.

5-06. Marina Concessions.

a. Location and Description. The marina, located at the Lake Side area, is the only commercial concession at East Lynn Lake.

Facilities which have been provided in the concession area include a concessionaire manager's headquarters, a 4 lane concrete boat launching ramp and 152 boat slips. The marina also provides fuel, fishing equipment, bait, boat rentals, and a snack bar.

Table 5-2

WATER RELATED PUBLIC OUTDOOR RECREATION AREAS NEAR
EAST LYNN LAKE

Name	Approximate Road Miles From East Lynn Lake	Acres of Water	Location
Dewey Lake - Jenny Wiley State Resort Park	60	1,100	Floyd and Pike Counties, KY
Burnsville Lake	140	968	Braxton County, WV
Grayson Lake State Park	45	1,510	Carter County, KY
Carter Caves State Resort Park	80	44	Carter County, KY
Fishtrap Lake	95	1,131	Pike County, KY
Kanawha State Forest	75	1	Kanawha County, WV
Greenbo Lake State Resort Park	55	225	Greenup County, KY
Beech Fork Lake	20	725	Wayne County, WV
Sutton Lake	125	1,440	Braxton County, WV
Summersville Lake	110	2,790	Nicholas County, WV
Laurel Creek Public Hunting and Fishing Area	35	29	Mingo County, WV
Bluestone Lake	90	2,040	Summers County, WV

b. Locations and Characteristics of Competitive Facilities. A number of marina facilities are located near the East Lynn Marina. These competing facilities are included in Table 5-2, and are briefly described below.

(1). Dewey Lake (Jenny Wiley State Park). There are two marinas at this park, which is located approximately 60 miles southwest of East Lynn Lake, near Prestonsburg, Kentucky. Combined, these marinas contain 200 open slips, 40 covered slips, several boats and motors for rent, a motor repair facility, and a tackle shop with food service. There are also several supporting facilities in close proximity, including a 48-room lodge, several rental cottages, a 900-seat outdoor amphitheater, a golf course, two outdoor pools, a beach, a riding stable, and several developed camping, picnicking, and playground sites.

(2). Grayson Lake State Park. There is one marina at this park, which is located approximately 45 miles west of East Lynn Lake, near Grayson, Kentucky. Other facilities include 130 car-trailer campgrounds, 53-unit picnicking area, and interpretive trails.

(3). Greenbow Lake State Resort Park. Greenbow Lake State Resort Park is located approximately 55 miles northwest of East Lynn Lake. This

3,300 acre park is operated by the Kentucky Department of Natural Resources and consists of a number of water-oriented recreation facilities. One marina contains 105 open boat slips, a tackle shop, rental rowboats, motor boats, pedal boats, and pontoons. There is a 36-room lodge with a dining room, and there are 63 developed campsites. Other facilities include a beach, an outdoor swimming pool, a miniature golf course, a privately-owned riding stable, playground, shuffleboard courts, tennis courts, and facilities for hiking and picnicking.

(4). Beech Fork Lake. Located 20 miles north of East Lynn Lake, this project consists of approximately 12,608 acres. Beech Fork Lake is a 725 acre lake with approximately 31 miles of shoreline. Portions of the project lands have been leased to the West Virginia Department of Natural Resources to be included in the Beech Fork State Park. Recreational opportunities provided at Beech Fork Lake include limited horsepower boating, hunting, fishing, picnicking, hiking, camping and swimming. Beech Fork Marina, located near the dam, provides visitors with docking facilities, motorboats, canoes, paddleboats, pontoon boats, fishing supplies, a snack bar and lifejackets. The marina also conducts tours of the lake. A small marina is also located at the State Park campground. This facility rents row boats, paddle boats and canoes without motors.

(5). Laurel Creek Public Hunting and Fishing Area. Laurel Creek Public Hunting and Fishing Area is a 12,900 acre state facility located

in Mingo County, West Virginia. The site has a 29 acre lake used for swimming and fishing. Recreation facilities also include a 25-unit campground. Hunting is a major recreational activity at Laurel Creek.

5-07. Lake Plan of Operation.

East Lynn Lake is operated under a plan which is intended to provide the maximum net project benefits. The pool is held at an elevation of 662 feet above mean sea level (m.s.l.) until 1 November. The lake level is lowered to 656 feet m.s.l. generally beginning on 1 November and completed by 30 November. This lake level is maintained until 1 April, subject to lake operation for flood control, water quality control, and minimum release. Flood control pool elevation is 701 feet above m.s.l.

Maintaining the seasonal pool until November extends the recreation season several weeks, thereby increasing the annual benefits attributable to recreation.

Fluctuations in the seasonal pool are minimal at East Lynn Lake, and have little or no effect on public use of the recreation facilities. Minimum lake fluctuation, particularly during the major recreation season, is favorable since it allows full utilization of boat ramps, the marina, and the swimming beaches.

5-08. Siting of Road, Cemetery, and Utility Relocation

During the initial project construction, the relocation of many existing site improvements was necessary. These relocations consisted of re-aligning 9.5 miles of highway and abandoning an additional 35 miles of roadway; relocating two highway bridges; removing 28.35 miles of powerlines and subsequently constructing 6.08 miles of new power lines; abandoning and relocating 24.43 miles of telephone line; constructing 12.62 miles of gas lines; relocating 26 cemeteries containing 1,203 graves; and, abandoning six schools and constructing two new ones.

5-09. Water Quality of Pool and Tailwater.

a. General. Water quality in the Lake is generally poor to fair. Runoff from surrounding forest land is generally fair quality. The water is somewhat soft and there are no known pollution problems created by acid mine drainage.

b. EPA Survey. Past water quality is provided in the Final Environmental Statement.¹¹ Impoundment water quality problems noted in this document are low pH (5.5 - 6.7 range), and low dissolved oxygen (less than 5.0 mg/L) at depths of 10 to 15⁺ feet. The low dissolved oxygen is most

noticeable during thermal stratification of lake water in July, August, and September. Dissolved iron is usually present in quantities greater than the 1.0 mg/L recommended for aquatic life by the U.S. EPA (1976). Most measured levels of dissolved iron in the lake at various depths, and in the streams that flow into the lake, are also higher than the 0.3 mg/L recommended by the U.S. EPA (1976) for drinking water. Measurement of other water quality variables indicate low turbidity and low hardness (<50 mg/L except tailwaters). Otherwise the water quality is good (U.S. EPA Standards not exceeded).

5-10. Adaptability of Spillway and Other Project Structures.

The project area consisting of the dam, emergency spillway, intake structure, outlet works, and project operations headquarters provides the greatest opportunities for day-use recreational activities at East Lynn Lake. This is due to the large tracts of flat open spaces which exist in the area. These flat open landforms are the result of the construction methods and physical requirements of building an earthen dam. Because of the steep terrain existing throughout the majority of the Project, these flat open areas become critical to the development of both passive and active recreational opportunities.

Existing recreational development in the tailwater area is oriented toward the day-use types of activities. The primary recreational activity is fishing. In 1982 there were 2.5 fishermen for every picnicker in this area. Site development and facilities include an access road, a parking lot, a restroom, picnic tables, and various pieces of playground equipment.

The emergency spillway, located to the west of the dam, offers great potential for more active day-use recreation such as sport fields. The steepness of the existing roadway does not allow easy vehicular access and is the major constraint toward developing this area. The area, therefore, is proposed to be accessible by pedestrians from the day-use areas below the dam.

The area that offers the greatest potential for development is the new day-use area located to the south of the dam. This area is the earth-borrow site used in construction of the dam. A wide variety of recreational facilities and activities are presently integrated into this area and include a picnic shelter, picnic tables, a restroom, a playground, two scenic overlooks, a fishing pond, and paved trails. Due to its size, diversity of landform, and accessible location, this area can absorb additional recreational facilities. These proposed improvements are discussed in Section 7-06(c).

5-11. Pre-Project Exploitation of Mineral and Timber Resources

Although timber and mineral removal has occurred in and around the Project, these areas either have recovered or are sufficiently buffered so that they will not affect public use and enjoyment.

5-12. Project Visitation.

a. General. An analysis of past visitation at East Lynn Lake may be used to determine future recreation needs and priorities. Visitation estimates have been obtained by periodically surveying recreation activity use and traffic entering the Project. These surveys are designed to account for seasonality, weekend and weekday use, and recreation area use.

b. Procedures for Determining Visitation. The product of the vehicles actually entering the facility for recreation purposes times the average number of persons per vehicle provides an estimate of the total number of visitors to the Project. A further breakdown by activity is then applied to this number in order to arrive at an estimate of usage for each activity. Estimates of visitor usage for 1981, 1982, and 1983 are shown in Table 5-3.

Table 5-3

ESTIMATES OF RECREATIONAL USE
AT EAST LYNN LAKE:

HISTORIC AND PROJECTED

HISTORIC											
Year	Camp	Picnic	Boat	Fish	Hunt	Sight See	Water Ski	Swim	Other	Activity Days	Recreation Days
1981	13,176	70,510	38,263	128,816	21,193	214,829	2,540	36,213	17,384	542,930	530,634
1982	14,737	72,260	39,534	146,862	22,660	229,005	3,065	36,615	18,000	582,738	571,963
1983	15,136	60,662	30,614	116,057	26,837	182,954	2,951	24,956	16,276	502,897	493,599
AVG. BASE CONDITION	14,350	67,811	36,137	130,578	23,563	208,929	2,852	32,595	17,220	542,855	532,065
AVERAGE PROJECTED											
1985	14,638	68,723	37,354	132,755	24,037	212,412	2,919	33,250	17,566	543,654	532,994
1990	15,385	71,056	40,579	138,356	25,263	221,374	3,093	34,946	18,462	568,514	547,367
2000	16,995	75,963	47,888	150,278	27,906	240,450	3,476	38,602	20,393	621,951	609,756
2020	20,737	86,817	66,694	177,293	34,050	283,674	4,386	47,102	24,884	745,637	731,017

Note: A visit by one individual to a recreation site, area, or project for recreation purposes during all or any portion of a 24-hour day is a recreation day. Each activity the individual participates in is counted as an activity day. The average ratio of activity days to recreation days at East Lynn Lake for 1981, 1982, and 1983 was 1.02. This ratio was used to calculate recreation days for 1978, 1979, and 1980, and the projected years 1985, 1990, 2000, and 2020.

Source: Based on data obtained from Outdoor Recreation in America: An Economic Analysis, Appendix A of the 1973 Nationwide Plan for Outdoor Recreation prepared by the U.S. Department of the Interior, Bureau of Outdoor Recreation.

By averaging activity use estimates taken in 1981, 1982, and 1983, a base condition was created in order to project estimates of future use. Estimates made for the years 1985, 1990, 2000, and 2020 also are shown in Table 5-3. They were derived by using a straight-line interpolation of the Bureau of Outdoor Recreation data (now a part of the National Park Service). Annual rates of increase for recreation activities are given in Table 5-4.

Table 5-4

ANNUAL PERCENTAGE RATE OF INCREASE
FOR RECREATION ACTIVITIES

Activity	Rate of Increase* Per Year
Camping	1.00
Picnicking	0.67
Boating	1.67
Fishing	0.83
Hunting	1.00
Sightseeing	0.83
Water Skiing	1.17
Swimming	1.00
Other	1.00

*Rates of increase were derived from Outdoor Recreation in America: An Economic Analysis, Appendix A of the 1973 Nationwide Plan for Outdoor Recreation prepared by the U.S. Department of the Interior, Bureau of Outdoor Recreation.

c. Design Load and Facility Needs. The design load is defined as the projected visitation which will occur on an average weekend day during the peak month of the recreation season. To calculate the design load for an average weekend day in 1985, the following methodology was used:

$$DL = \frac{D \times \%PM \times \%WE}{N}$$

Where: DL = Design Load
 D = Demand (actual attendance from Table 5-3)
 %PM = Percent of Demand Occurring in a Peak Month (16%)**
 %WE = Percent of Peak Month Use Occurring on Weekends (68%)*
 N = Number of Peak (weekend) Days in a Month (8)

Therefore: $\frac{543,654 \times .16 \times .68}{8} = 7,394$ (total maximum project visitation during an average weekend day in 1985)

*Compiled from the West Virginia Statewide Comprehensive Outdoor Recreation Plan.

**Adjusted to 52% for Hunting.

The complete list of projected peak weekend visitation is displayed in Table 5-5.

Table 5-5

TOTAL PROJECTED VISITATION
 ON AVERAGE WEEKEND DAY DURING PEAK MONTH

Year	Projected Visitation	Visitors on Average Weekend Day During Peak Month
1985	543,654	7,394
1990	568,514	7,732
2000	621,951	8,459
2020	745,637	10,141

The Design Load is utilized to calculate day loads for individual activities. In order to establish the activity design loads, participation rates must be established. Table 5-6 lists the participation rates for East Lynn Lake.

Table 5-6

PARTICIPATION RATES

Activity	Percent of Participation
Camping	2.7
Picnicking	12.7
Boating	6.8
Fishing	24.5
Hunting	4.4
Sightseeing	39.3
Water Skiing	0.5
Swimming	6.1
Other	3.2
TOTAL	100.2*

*A total percentage greater than 100 percent indicates that visitors often engage in more than one activity while at the lake.

Table 5-7 illustrates the design load for each activity based upon projected annual total use. These figures were calculated by computing the product of design load and the individual participation rates.

At this point, the total number of facility units needed to meet projected demand can be calculated through a formula based on maximum one-day use, average group size, and turnover rates. The average group size and turnover rates for East Lynn Lake are presented in Table 5-8.

Table 5-7

PROJECTED ACTIVITY DEMAND

Activity	Participation Rate	x Design Load				=	Projected Activity Demand			
		1985	1990	2000	2020		1985	1990	2000	2020
Camping	.027	7,394	7,732	8,459	10,141		200	209	228	274
Picnicking	.127	7,394	7,732	8,459	10,141		939	982	1,074	1,288
Boating	.068	7,394	7,732	8,459	10,141		503	526	575	690
Fishing	.245	7,394	7,732	8,459	10,141		1,812	1,894	2,072	2,485
Hunting	.044	24,029	25,128	27,490	32,957		1,057	1,105	1,210	1,450
Sightseeing	.393	7,394	7,732	8,459	10,141		2,906	3,039	3,324	3,985
Swimming	.061	7,394	7,732	8,459	10,141		451	472	516	619

Table 5-8

AVERAGE GROUP SIZE AND TURNOVER RATES

Activity	Average Group Size	Turnover Rate
Camping	4	1
Picnicking	4	2
Boating	4	40 launches per day
Fishing	3	40 launches per day
Hunting	1	2
Sightseeing	4	5
Swimming	4	2

The formula used to calculate facility needs for maximum one-day use is as follows:

$$FN = \frac{D}{XG \times TR}$$

Where: FN = Facility Needs
D = Demand (as shown in Table 5-7)
XG = Average Group Size (as shown in Table 5-8)
TR = Turnover Rates (as shown in Table 5-8)

The results of this formula, along with a list of existing facilities, are shown in Table 5-9. By subtracting the projected demand from the existing supply, the quantity of needs or surplus can be determined.

Table 5-9

SUMMARY OF MAJOR FACILITY NEEDS

Facility Type:	Camping Units	Picnic Tables	Boat Launch ¹ (Lanes)	Swimming ² (Sq. Feet)	Hunting (Acres)	Sightseeing (Parking Spaces)						
Existing Supply:	187	140	10	11,600	545	545						
Year	FN*	Need (-) Surplus (+)	FN	Need (-) Surplus (+)	FN	Need (-) Surplus (+)	FN	Need (-) Surplus (+)	FN	Need (-) Surplus (+)	FN	Need (-) Surplus (+)
1985	50	+137	117	+23	11	-1	11,275	+ 325	8,984	+13,944	145	+400
1990	52	+135	123	+17	11	-1	11,800	- 200	9,392	+13,536	152	+393
2000	57	+130	134	+ 6	13	-3	12,900	-1,300	10,285	+12,643	166	+379
2020	68	+119	161	-21	14	-4	15,475	-3,875	12,325	+10,603	199	+346

FN = Facility Needs

1. Includes lanes needed for boating and fishing. Estimates 50% of fishing will be from boats and 50% from shore.
2. Parking spaces were converted to square feet of swimming beach by multiplying the number of parking spaces by 4 persons per vehicle x 50 square feet per person.

d. Capabilities and Recommendations. As can be seen from the information shown in Table 5-9, the Project is deficient in boat launching lanes and will be deficient in square feet of swimming beach by 1990. Before recommending additional facilities, however, a comparison must be made between projected visitation and capacities of the lake. The result of this comparison identifies problem areas or discrepancies between facility supply and demand, and resource capacity. Future facility development at East Lynn Lake will be determined on the basis of (1) what the project resources can support, (2) relative demand (which is reflected in the participation rates for various recreation activities), and (3) State projections of regional recreation needs. The visitation projections calculated previously will not be used as sole determinants for the number of facilities to be provided.

(1). Maximum Practical Use. Maximum Practical Use (M.P.U.) is defined as an estimate of annual recreational use which is proportional to a level of water surface acreage. For this reason, M.P.U. is dependent on the amount of water-oriented recreation, expressed as a function of an upper limit on the number of boats which the lake can support, given a density factor. Attainment of this upper limit proportionately inhibits other non-water-oriented activities. Therefore, to compute M.P.U., it is necessary to identify the upper limit of boaters and ap-

ply the resulting figure to an upper limit of the facility design-day load, which is further projected as an estimate of maximum annual attendance.

The following methodology is utilized to compute the Maximum Practical Use:

1. Identify upper bound boaters which the lake will support.
2. Apply to upper bound one facility design-day load (which is an estimate of maximum annual attendance).

1. Upper Bound on Boaters = B max.

$B \text{ max.} = (S \times R_b) \times (W/w)$
 S = Average size of party (4 persons)
 R_b = Turnover Rate (1)
 W = Total water surface acres at summer pool (1,005)
 w = Area requirement (acres) per boat (4)

$B \text{ max.} = (4 \times 1) \times (1,005/4)$
 $= 4 \times 251$
 $= 1,004 \text{ persons (or occasions)}$

2. Facility Design - Day Load Upper Bound = L max.

$L \text{ max.} = \frac{B \text{ max.}}{(pb) + pf}$
 pb = proportion of visitation for pleasure boating including water skiing
 pf = proportion of visitation for fishing

$L \text{ max.} = \frac{1,004}{(.072 + .24)}$
 $= \frac{1,004}{.312}$
 $= 3,218$

3. Maximum Practical Use = M.P.U.

$$M.P.U. = \frac{(L \text{ max.} \times D)}{(P \times E)}$$

D = Average # weekend days in peak month (8)

P = Average proportion in peak month (percent demand occurring in peak month)

E = Proportion (WE) (percent peak month use occurring on weekends)

$$\begin{aligned} M.P.U. &= \frac{(3,218 \times 8)}{(.16 \times .68)} \\ &= \frac{25,744}{.1088} \\ &= 236,618 \text{ occasions} \end{aligned}$$

It is apparent (based on a projected annual attendance of 553,654 in 1985) that the Maximum Practical Use will be exceeded, since the M.P.U. is less than the water-related annual use expected. However, due to the large land base of the Project and the Project's ability to accommodate existing use (542,855 visitors in base year 1983), it is felt that a Maximum Practical Use of 543,654 in 1985 is realistic. Areas existing or proposed for the Project have and will be able to support intensive use.

(2). Lake Capacity. In order to compare the ability of East Lynn Lake to accommodate the maximum number of boating occasions identified previously, it is necessary to perform an additional calculation. If it is assumed that a minimum of four acres of water is provided for each boat, and that 100% of the lake is available for boating (based on summer pool), the lake capacity may be determined as follows:

Where: $\frac{\text{Surface Acres} \times \text{Average Group} \times \text{Turnover} \times \text{Constant}^*}{5 \text{ Acres/Boat}}$

$$*(\text{Constant} = \frac{\text{No. of Weekend Days in Month}}{\%PM \times \%WE} = \frac{8}{.16 \times .68} = 73.53)$$

$$\frac{1,005 \times 4 \times 1 \times 73.53}{4} = 73,898$$

Therefore: The lake capacity is 73,898 annual occasions.

Facility capacity for launch (11 lanes) = 129,413 annual occasions.*

*(11 x 4 x 40 x 73.53 = 129,413 annual occasions)

Although the lake capacity is 73,898 annual occasions, visitation is anticipated to be 543,654 in 1985. Assuming a 31.2% boating participation rate, the expected boating occasions are 169,620 (includes boats at marina). This rate surpasses the lake capacity and will create a carrying capacity problem. For this reason, the construction of additional boat ramps to satisfy the expected demand is not recommended. It is felt that the addition of the boat ramps will degrade the lake and lessen user satisfaction. An additional swimming beach is recommended if a suitable area can be found.

5-13. Application of Public Law 89-72.

The Federal Water Project Recreation Act of 1965 (P.L. 89-72) established recreation as a full project purpose similar to flood control, navigation, and water supply. Prior to 1965, the normal Corps practice was to install and operate recreational facilities with 100 percent Federal

funding. Public Law 89-72 established a policy to share the costs of recreation development with non-Federal public interests. In appropriate cases, the Corps may cost share in the construction of recreation facilities. Federal funds may not, however, be applied toward the development of caretaker quarters, maintenance and operation facilities, or revenue producing facilities such as golf courses and marina development. Non-Federal interests are required to bear 50 percent of the construction and all of the operation and maintenance costs of recreation developments. Concerning the non-Federal sponsor's obligation to fund at least 50 percent of the development's cost, the only approved method of payment is up front financing. All Corps of Engineers participation in further recreation development at East Lynn Lake is subject to the requirements of P.L. 89-72.

5-14. Environmental and Ecological Features.

a. General. Optimal development and management of East Lynn Lake is dependent upon the recognition of the unique environmental features offering the potential for development, as well as possible limitations to successful use of the area. While these features have been discussed in a previous Section of this Chapter, the most significant features and their effects on constraining development are discussed below.

b. Topography. Topography is probably the major constraining factor to recreational development. The majority of the useable areas are currently developed and suitable undeveloped areas are not accessible because of the steep terrain.

c. Water Quality. Water quality is poor to fair but should not present any major limitations on water use for fishing and swimming activities.

d. Fish and Wildlife. Populations of fish and wildlife are generally acceptable but the fishery resource potential is hindered due to poor to fair water quality. Fish habitat is in need of improvement in shoreline areas. Food plots are in current use within the Project providing a method to maintain and increase wildlife. Lake fertilization experiments for fishery production are currently being conducted by the West Virginia Department of Natural Resources.

e. Soil Types. The major soil types occurring within the Project area limit the type, intensity, and location of possible development. Caution must be exercised to site and plan development in a manner which will assure a long lasting facility with a minimum of maintenance problems.

f. Vegetation. Proposed vegetation for development areas should be hardy to the area and be able to survive under minimal maintenance conditions. In addition, where depth to bedrock is shallow, earth fill berms will be necessary to permit planting and assure enough soil base to support plant life.

LIST OF REFERENCES.

1. U.S. Bureau of the Census, 1981.
2. Ibid.
3. West Virginia State Census Data Center, 1982.
4. U.S. Department of Commerce, 1981.
5. West Virginia Department of Employment Security, 1982.
6. U.S. Department of Commerce, 1981.
7. Region II Planning and Development Council, 1981.
8. McCulloch and Lessing, 1980.
9. Region II Planning and Development Council, 1981.
10. National Oceanic and Atmospheric Administration, 1977.
11. U.S. Army Corps of Engineers, 1974..

CHAPTER 6

COORDINATION WITH OTHER AGENCIES

CHAPTER 6

COORDINATION WITH OTHER AGENCIES

6-01. General.

Direct coordination with Federal, State, and local agencies, as well as citizen interest groups was an ongoing process in the preparation of this Master Plan Update.

The following public agencies and officials were notified of the updating process:

6-02. Federal Agencies.

- a. Environmental Protection Agency*
- b. U.S. Fish and Wildlife Service*
- c. U.S. Forest Service
- d. National Park Service
- e. U.S. Soil Conservation Service
- f. Appalachian Regional Commission
- g. Federal Energy and Regulatory Commission

6-03. State Agencies.

- a. State of West Virginia Department of Culture and History*
- b. State of West Virginia Department of Natural Resources*

6-04. Local Agencies and Citizens Groups.

- a. Region Two Planning and Development Council*
- b. Wayne County Commissioners
- c. Mayor City of Wayne

*The asterik indicates those agencies that submitted comments.

6-05. Comments This section addresses the major comments received in the review of this document. Additional written comments of those that responded are found in Appendix I and have been incorporated into the text where appropriate.

U.S. Fish and Wildlife Service

Comment: According to Photo Map, Exhibit 9 and Page 135 of your report, the proposed swimming beach and parking area will require relocation of a small stream. This Service discourages stream channelization. Alternatives to relocating the stream should be carefully analyzed.

Response: The term "stream to be relocated" is misleading since the channel is an intermittent drainage swale of which less than 200 feet will be impacted. It should be noted that development of the beach at Lick Creek is a future consideration and will only be constructed if a cost share sponsor can be secured. Should this project be funded, the Corps will make every effort to minimize disturbance of this area. Mitigation will be performed as appropriate.

U.S. Environmental Protection Agency

Comment: It is essential that all wetlands and exceptional wildlife habitat areas in reasonable proximity to recreation areas be identified and appropriate procedures be developed to avoid, or substantially mitigate, any adverse impacts to the areas.

Response: Preservation or enhancement of wetlands and exceptional wildlife habitat areas is always a major consideration during the development of Corps recreation areas. These natural resources will receive consideration during the site design process.

Comment: If a hydroelectric generating unit is proposed at the dam, we would expect your detailed analysis of that proposal.

Response: At this time, no proposals for a hydroelectric power generating unit have been proposed for the dam. However, should a proposal materialize, your agency will have the opportunity review and comment on all documents.

West Virginia Department of Natural Resources

Comment: The master plan does not include the new lease agreement between the Wildlife Resources Division of this department and the Corps.

Response: The final draft was being printed while this agreement was being negotiated. Exhibits and text in this final edition have been corrected to reflect this agreement.

Comment: The discussions of water quality and fishing resources are misleading. The former hinders the fishing potential of the lake and should be stated to justify measures that may alleviate such problems.

Response: The text has been revised to state that from a fishery standpoint, water quality of the lake is poor to fair.

Comment: The West Virginia Department of Natural Resources recommends that features for handicapped citizens be included in the foot bridge design.

Response: The Corps attempts to design for use by all visitors, not only the handicapped, but also for people pushing children in strollers.

CHAPTER 7

PHYSICAL PLAN OF DEVELOPMENT

CHAPTER 7
PHYSICAL PLAN OF DEVELOPMENT

7-01. Introduction.

In formulating the physical plan of development for this Project, a planning process was followed which included the analysis of the natural, cultural, and economic baseline data for the Project Area, as presented in Chapters 4 and 5 of this report. Based on the synthesis of this information, Resource Use Objectives were identified in order to determine which facilities were to be provided. It is the purpose of this Chapter to translate these objectives into a physical plan of development.

7-02. Resource Use Objectives.

Resource Use Objective were developed in accordance with ER 1105-2-167 which establishes guidelines for developing project Resource Use Objectives. The following Resource Use Objectives have been identified for East Lynn Lake.

Objective 1. To provide an upgrading of existing facilities for the purpose of increasing the quality of the user's recreational experience.

Objective 2. To provide increased opportunities for swimming given the projected demand for this activity.

Objective 3. To improve recreational opportunities within the capability of the responsible agency(s) to perform adequate operations and maintenance.

Objective 4. To improve the scenic and aesthetic quality of existing recreational facilities.

Objective 5. To provide increased opportunities for shoreline fishing.

Objective 6. To minimize expansion of recreational facilities based on visitor demand projections.

Objective 7. To conserve the natural resources of the project through the use of a coordinated land management program.

7-03. Land Use Plan.

a. General. A physical plan of development for the allocation of Project lands was formulated as a result of the evaluation of the data recorded in Chapters 4 and 5. Land allocations are in accordance with categories set forth in ER 1120-2-400. Each allocation of land is defined (as shown in Table 7-1) and its application discussed below. Exhibit 5 illustrates the various land use applications.

Table 7-1

EAST LYNN LAKE
LAND ALLOCATION CATEGORIES
(Total Fee Acres)

Project Operations	1,809 acres
Operations: Recreation-Intensive Use	79 acres
Operations: Wildlife Management	22,927 acres
Group-Use Area	5 acres
<hr/>	
TOTAL ACRES ABOVE SEASONAL POOL	24,821 acres

b. Project Operations. Lands in this category are allocated to provide for operational safety and efficiency within the project and are separate from lands allocated for recreation or fish and wildlife management. These lands include the dam, intake and outake structures, spillway, personnel quarters, maintenance facilities, and storage yards.

c. Operations: Recreation - Intensive Use. These project areas are those allocated to contain all recreational activities which rely heavily on support facilities. Recreational activities to be found in intensive use areas include: camping, picnicking, boating, fishing, swimming, sport fields, play areas and overlooks, as well as concession and quasi-public

facilities or those operated and maintained by public agencies. Agricultural uses are permitted only on an interim basis.

Intensive use areas for which improvements are proposed within the East Lynn Lake Master Plan Update include: the Dam and Tailwater Areas, Day-Use and Overlook Area, Laurel Creek, Lick Creek, East Fork Day-Use Area and East Fork Camping Areas 1-6.

d. Operations: Wildlife Management. Wildlife areas include those allocated as fish and wildlife habitats or for lands used for their propagation. Selection of wildlife management areas was based upon the known locations of particular species, existing habitat variety, and management potential. Additional considerations ranged from topography, soils, and vegetation characteristics to the size of individual parcels to be protected. Passive recreational programs such as ecological workshops and forums along with nature and hiking trails are compatible activities for these sensitive areas.

e. Group-Use Areas. This category includes lands designated for group-use activities appropriate to the resources involved and in response to an existing demand for such activity. Types of group activities considered appropriate for Project lands include day-use, short-term camping, and special educational uses such as an outdoor laboratory or classroom.

As indicated on Exhibits 5 and 9, the only existing Group-Use Area is west of the Lick Creek Boat Launch and consists of approximately 5 acres. Because of its limited size and location, this area is presently used as a group camp. No additional group-use areas are proposed for East Lynn Lake at this time.

7-04. Water-Use Plan.

a. General. A plan for allocation of waters within the project boundaries was formulated in accordance with ER 1165-2-400 and ER 1120-2-400. Exhibit 6 illustrates the various categories of water-use in the Water Use Plan which are defined and discussed below.

b. Unrestricted Water. Unrestricted waters are allocated to meet the needs of those water-related activities requiring relatively large areas for safe and efficient operation, specifically power boating, waterskiing, and sailing. All water-oriented activities are permitted in these areas, except SCUBA and skin diving. At East Lynn Lake, the main body of the East Fork of Twelvepole Creek from the restricted zone at the dam to the mouth of Cove Creek has been allocated as unrestricted water.

c. Boat Exclusion Areas. These areas are off-limits to all boating activity and are designated as such by anchored bouys. Boat Exclusion Areas are located to the south of the dam facilities, at the existing beach facilities at East Fork, and upstream from the marina on Bartrom Branch.

d. Controlled Areas. Controlled Areas include No Wake Zones. These zones have been established to limit speed in small coves, shallow areas, or other potentially unsafe situations where high speeds may create environmental problems or safety hazards. No-wake zones comprise all of Lick Creek, Brushy Creek, Rich Creek, Blue Lick Creek, Cove Creek, and the portion of the East Fork of Twelvepole Creek to the south of Cove Creek, the portion of Lick Creek above Back Branch, and the area around the marina. SCUBA and skin diving are usually permitted in no-wake zones.

7-05. Project Structures.

The dam at East Lynn Lake is a rolled-earth fill type, 652 feet long and 113 feet high (elevation 731 feet m.s.l.). The dam has a base width of 765 feet tapering to a crown of 32 feet. The uncontrolled saddle spillway is 230 feet wide and approximately 750 feet long and is located in the left abutment. The intake structure, located in the right abutment is a 13 foot diameter, concrete lined, tunnel having an overall length of 625 feet (including the tunnel, outlet monolith, and transition). Flow is regulated by three 5'-8" x 10'-0" hydraulically operated slide gates and the low flow

system consists of two 4'x 3' inlets, one with an invert elevation of 658 feet and the other having an invert elevation of 649 feet. The capacity of each low-flow inlet at the seasonal pool level ranges from 132 to 154 c.f.s. and discharge is controlled by a 30 inch hydraulically operated gate valve. The stilling basin is concrete lined, of jump type design, 4 feet deep, 51 feet long, and 32 feet wide.

The operations headquarters (Exhibit 7) sits atop the east bank of the East Fork overlooking both the dam spillway and the lake. The complex consists of one (1) dwelling for the resource manager; the maintenance and Project Headquarters and garage, shops, storage yard, and parking lot for park vehicles and equipment; and a sewage treatment plant.

7-06. Recreation Area Plans.

a. General. Chapters 2 and 4 of this Master Plan Update have examined the existing physical, ecological, and cultural characteristics of the Project area. In Chapter 5, Tables 5-3 through 5-9 depict the existing facilities; turnover and participation rates for the various activities provided; and the Project's anticipated future demands, user needs, and participation rates for the years, 1985, 1990, 2000 and 2020. This analysis serves as

the basis for evaluating the various recreation areas, ultimately recommending either additional facilities or improvements to existing facilities, and identifying new sites which are suitable for development.

East Lynn Lake presently has a total of 13 developed recreation areas. These include the Dam and Tailwater Area, Overlook and Day Use Areas, Laurel Creek Camping Area, Lick Creek Day-Use Area, Lake Side Marina, East Fork Swimming Area, East Fork Day-Use Area, and East Fork Camping Areas 1-

6. Descriptions of the existing facilities and recommendations for site and facility improvements for each of these areas are discussed below.

b. Dam and Tailwater Area (Exhibit 7). This recreation area is located in the general vicinity of the dam and consists of 3 major areas of development.

(1). East Lynn Dam. This 10 acre site includes the dam, intake and outlet structures, operations headquarters and visitor center, maintenance facilities and service yard, resource manager's house, and a sewage treatment plant. Besides the dam and support facilities there is an overlook which consists of an eight car paved parking lot and a

paved esplanade providing the visiting public with views of the dam outlet works and the Lower Dam Recreation Area. East Lynn Dam is situated a half mile from State Route 37 via an asphalt access road.

Proposed improvements to this site consist of providing an identification sign at project headquarters and screening the maintenance yard and sewage treatment plant through the use of appropriate plant materials.

(2). Tailwater Area. This 15 acre site is located below the outlet works on the west bank of Twelvepole Creek and extends downstream approximately 2,000 feet. Access is provided by the utilization of old Route 37 via State Route 37. Existing facilities include 44 picnic units, 5 pieces of playground equipment, 29 paved parking spaces, 2 fountains, 1 bulletin board, 1 dusk to dawn light, 1 waterborne restroom, and a septic system.

In that this is one of the most popular day use areas at East Lynn Lake, improvements are recommended to enhance both the support facilities for existing user activities and the visual quality of



PICTURE 7-1

Outflow channel below the Dam during late November

the site. Additional facilities proposed include 3 picnic shelters and an organized playground which will combine the existing play equipment with new creative wood play apparatus. The additional playground facilities will better cater to childrens' play while easing parental supervision. A barrier-free pedestrian footbridge is proposed to span Twelvepole Creek, approximately 600 feet below the outlet structure, in order to expand the picnic grounds and provide access for fishermen to the eastern bank of the outflow channel. One of the 3 proposed shelters is to be constructed in this expansion area.



PICTURE 7-2

Typical playground equipment existing in Project recreation sites



PICTURE 7-3

Existing playground equipment in need of improvement in
Dam and Tailwater Day-Use Area

Vehicular access to the site is to be limited to the parking lot. The existing gravel road which presently continues south of the lot is to be reduced to a pedestrian width of 5 feet, repaved, and extended to the foot bridge, picnic shelters and the gravel trail which leads to the shoreline fishing on the west side of the dam. Plant materials are to be used to provide screening and privacy at the proposed picnic shelters and to screen the parking lot.

(3). Emergency Spillway Area. This 2-acre site is comprised of the spillway and the adjacent shore of East Fork.

Proposed improvements center around adapting this flat open area to active recreational activities such as softball, football, and soccer. Because of size limitations in the area, the nature of these open field sports must be informal. No designated fields or other structures are being proposed.

Due to the construction requirements of the spillway, highwalls were created during the excavation of the site. These highwalls present a safety hazard to potential users due to the possibility of falling rock

from the unstable cliff faces. Alternative methods for protecting the users from these dangers have been considered including, wrapping the face of the highwalls with a chain link fabric and stabilizing the surface faces of the highwall with a mortar like sealant. Both proved to be too costly in terms of benefits derived. The proposed solution, therefore, is to create a buffer zone at the base of the highwalls which would keep users away from the face. The buffer would consist of an area of unmowed grass 30 feet in width which would physically and visually prohibit the visitor from approaching the cliff face. The open play fields in contrast, will require periodic mowing to allow them to be used for field sports. As an additional safety measure, highly visible warning signs will be secured along the face of the highwalls.

Due to the steepness and condition of the existing access road leading to the site, only pedestrian access will be allowed. This will be provided along a proposed trail coming from the tailwater picnicking areas.

In addition, a gravel trail is proposed along the base of the spillway at the lake's edge. This gravel trail is to provide access to a proposed area for shoreline fishing. These shoreline fishing improvements are shown in Figure 8-15.

c. Laurel Creek Camping Area (Exhibit 15). This "no fee" camping area is located just off State Route 37, about 200 feet north of the access road which leads to the dam and operational headquarters. The small two acre camp lies on the west bank of Laurel Creek and consists of a gravel access road, 15 primitive tent camp sites, and 2 vault restrooms.

Proposed improvements to this camping area include the addition of an entry sign and gate, as well as additional landscaping in and around the camp to provide shade and privacy for campers using the facility. The Laurel Creek Camping Area will be closed, however, if the requirement to provide a free camping area is eliminated.

d. Overlook and Day-Use Areas (Exhibit 8). This site occupies approximately 10 acres of peninsula-like land which juts into the reservoir and offers outstanding views in three directions of the dam, reservoir, and surrounding landscape. The overlook area is immediately to the south of the dam site and is accessible by a two-lane, paved, access drive which dead ends into the main access road from operational headquarters to the main gate on State Route 37.

Existing facilities include 27 picnic units, a picnic shelter, a playground and a basketball court, a softball field, an overlook, one water-

borne restroom, an interpretive center, a water storage tank, and 39 parking spaces. The eastern portion of the site is a former earth borrow area, consisting of open fields. Sections of this field are presently used for wildlife food plots and a storage yard. There are also existing farm ponds on the southeast portion of the site.

Like its tailwater counterpart, improvements to the day-use area were proposed to augment the existing activities while taking advantage of the site's inherent visual location. The peninsula can be divided into 3 distinct land form areas, the flat open plateau, the steep heavily forested hillside between the plateau and the reservoir, and the pond.

(1). The Plateau. The Plateau is currently disorganized in its use areas. It is the objective of the proposed improvements to organize these facilities into recognizable activity zones. Picnicking is to be centered around the existing picnic shelter on the western edge of the plateau and the 2 proposed shelters on the eastern edge. The two picnic zones will be separated by the existing playground and basketball courts and the proposed open play field. Plant materials will further define the picnic zones by serving as visual barriers between the playground and open playfield, and will also screen the parking lot.

(2). Hillside Overlooks. An interpretive center has recently been constructed and displays will soon be installed. The displays in this building will be used to educate the public about the Corps' mission and project management objectives. To take advantage of the views provided by the existing landform, the overlook to the southwest is to be upgraded and an additional overlook is to be built on the northern bluff. Improvements to the existing overlook consist of resurfacing the esplanade and adding sitting walls, an information sign, and a staired walkway to the water's edge. The proposed overlook to the northwest is to be handicapped accessible with a paved plaza area, seat walls, interpretive signage, and decorative planting (see Figure 8-9). The existing trail system leading to higher elevations in this area will remain. Both overlooks, as well as the existing picnic shelter, will require selective clearing of plant materials to enhance views. To help alleviate the existing slope erosion problem just to the southwest along the pedestrian walkway, an erosion control area is proposed to stabilize the ground slip through the use of plant materials and railroad tie retaining walls. A paved trail system is proposed to link the parking lot with the proposed picnic shelters, restrooms, play areas, and the proposed overlook landing.

(3). The Pond. Tucked away from the high-use activity areas, the pond sits in a small isolated clearing, just to the southeast of the peninsula beyond the storage yard. Proposed developments are very passive



PICTURE 7-4

Scenic outcropping is in view of existing scenic overlook

in keeping with the existing character of the area and include a fishing trail (accessible by the handicapped) and a 7-car parking lot. A gravel road will connect the pond parking lot with the existing gravel road servicing the storage yard. Plant materials are to be installed on the north side of the pond and completely around the service yard to provide screening. A gate is also recommended at the storage yard entrance.

e. Lick Creek Day-Use Area (Exhibit 9). Lick Creek is a four-acre site located along State Route 37, 5.5 miles from the Dam and 2.5 miles from East Fork beach. This facility is primarily a picnic day-use area consisting of 21 picnic units, a paved 50-car parking lot, one paved boat launching ramp with 2 lanes, a waterborne restroom with septic tank, a well, a drinking fountain, a playground, a bulletin board, and four dusk to dawn lights.



PICTURE 7-5

Existing pedestrian oriented facility in need of improvement

Proposed improvements to this facility include upgrading the gravel access road which leads to the Group-Use Area from the parking lot, installing an identification sign at the Group-Use entrance, and providing shoreline improvements as per Figure 8-15 to accommodate fishing along the East Fork from the Group-Use Area to the boat ramp.

Future development plans call for the installation of a beach at this facility to the south of the main access road and west of State Route 37.

The beach will consist of a sand and grass sunning area, six buoys demarcating the swimming area, and two portable restrooms. Access to the beach from the parking lot will be provided by a paved walkway which will include a 160 foot underpass beneath the entrance drive, and a footbridge across the existing creek.

Additional future site improvements will include expanding the parking lot by 43 spaces, removing six existing car-trailer spaces to improve the circulation pattern created by the new parking lot configuration, and landscaping the site to buffer both the parking and the restroom facilities.

f. Lake Side Marina (Exhibit 10). Lake Side is a 10-acre site which serves as the location for the marina and is located 1.7 miles upstream from the dam and 2.5 miles via State Route 37 from operational headquarters. Access to the marina is provided by a 2-lane paved road from State Route 37.

Facilities at the site include: a marina with 152 slips, a concession building, a four-lane launching ramp, 193 paved parking spaces, a waterborne restroom, a well, a drinking fountain, and a sewage treatment plant.

Just to the north of the marina lies Lake Side's picnic ground. Facilities consist of 22 picnic units, a waterborne restroom, a well, a bulletin board, a drinking fountain, 6 dusk to dawn lights, and a paved parking lot for 16 vehicles.



PICTURE 7-6

Marina access road affords a dramatic entry view for visitors



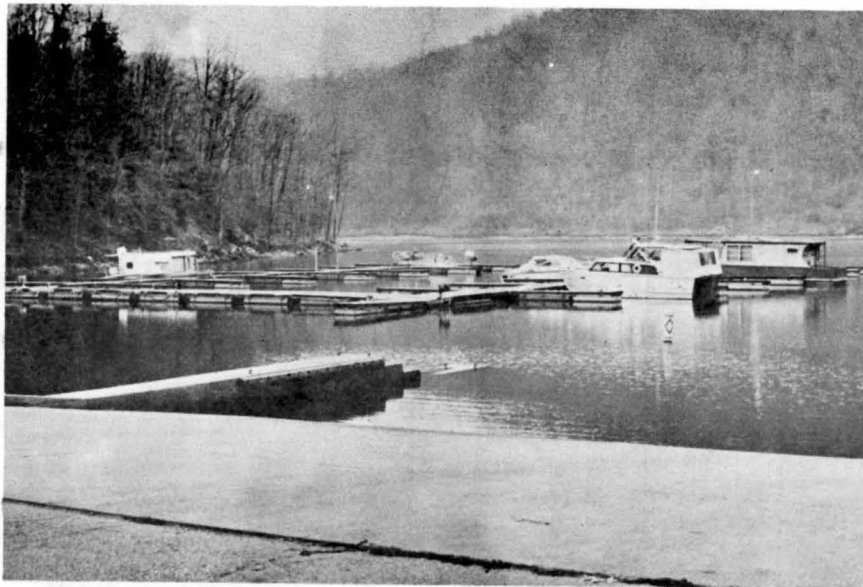
PICTURE 7-7

Existing concessionaire structures at Lake Side Marina

The only proposed improvements for Lake Side are installation of plant materials to (1) help stabilize the banks between the parking lot and marina (2) screen the existing sewage treatment plant, (3) enhance the parking lot by planting in existing traffic islands, and (4) enhance the visual quality in and around the picnic grounds.

Proposed future improvements to Lake Side include providing a shoreline fishing area and access trail. The shoreline fishing area is to be located along the western bank of the East Fork directly south of the marina and the proposed access trail is to connect this designated shoreline with the existing picnic grounds.

If and when the concessionaire at Lake Side marina would wish to expand the facilities, the recommended locations for expansion are shown on Exhibit 10 and include the addition of 32 slips.



PICTURE 7-8

Existing boat ramps and slips at Lake Side Marina

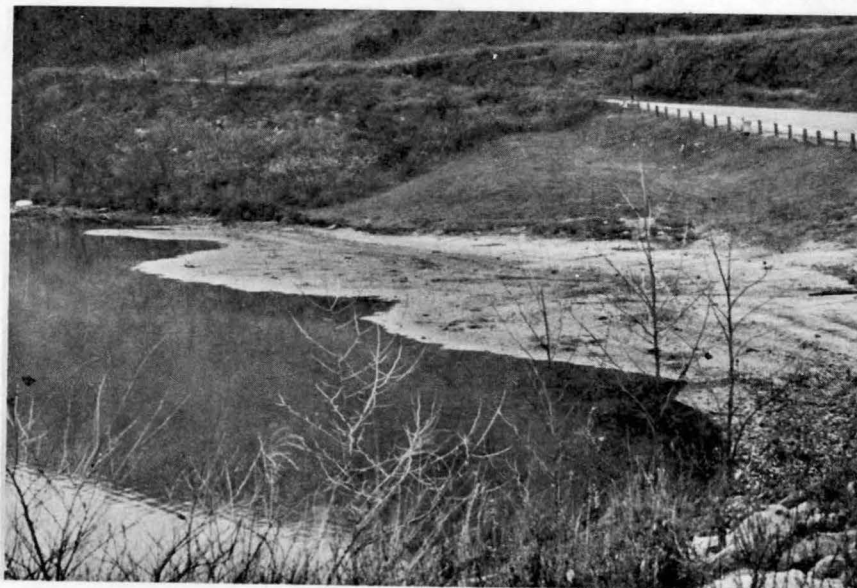


PICTURE 7-9

Existing boat docking facilities at Lake Side Marina

g. East Fork Swimming Area (Exhibit 11). This half acre site occupies the narrow strip of land between the East Fork access road and the East Fork of Twelvepole Creek immediately south of State Route 37. The primary attraction is the beach which dominates this small site. The facility is served by 54 parking spaces which are located along the shoulder of the access road.

Proposed improvements include two facility identification signs to be installed along State Route 37 approximately 1,000 feet on either side of the entrance to the beach and camping areas. A major entry sign is to be located at the intersection of the site access road and State Route 37.



PICTURE 7-10

Existing beach at East Fork during seasonal drawdown

h. East Fork Day-Use Area (Exhibit 12). This 3-acre site is located on the east bank of the East Fork 1.2 miles from State Route 37 utilizing State Route 33. Facilities at the day-use area include two paved parking lots, one for fifty cars and the other for eight cars; a two-lane boat launching ramp; a waterborne restroom and septic tank; twenty-three picnic units; a well; a drinking fountain; 1 bulletin board; and five dusk to dawn lights.

Proposed improvements include stabilizing the shoreline just to the north of the launching ramps and adding plant materials in order to screen the parking lot. This will also reduce the existing erosion problem.

i. East Fork Camping Areas 1-6 (Exhibits 13 and 14). Located approximately 1 mile upstream from the previously discussed East Fork Day-Use Area is the first of six camping areas which have been developed along a two-mile stretch of the right descending bank of the East Fork. The six camping areas comprise a total of 23 acres and have a controlled access attendance booth located just above the first campground. The former State Route 33 serves as the camping areas' access road and all visitors must pass through the attendance booth to gain admittance to the six camping areas. A trailer waste disposal unit is located just inside the gate and

is the only such facility for the six camps. Seventy mooring stanchions are spaced along the river at the various campsites providing visitors with a place to secure their boats.

Proposed improvements for the camping areas on the East Fork consist primarily of stabilizing shorelines where erosion has been a problem and providing landscape plantings along the campsites. The latter was proposed as a means of screening existing eyesores (such as sewage treatment plants) as well as increasing the visual enhancement of the campgrounds while providing shade areas and privacy for visiting campers. Further expansion of these camping facilities were viewed as being detrimental to the existing landscape and totally unnecessary based upon projected use figures compiled in Chapter 5 of this Master Plan Update. Other improvements unique to individual camping areas, as well as descriptions of the existing facilities appear below.

- (1). East Fork Camping Area 1 (Exhibit 13). Camping Area 1 consists of 44 trailer campsites located between the access road and the shoreline. Facilities include a waterborne restroom, 2 drinking fountains, 8 paved parking spaces, and 2 dusk to dawn lights. A playground is also provided at the western edge of the site above the traffic circle. Additional improvements to Camping Area 1 consist of the removal of the 2



PICTURE 7-11

Evidence of the need for additional shoreline fishing facilities



PICTURE 7-12

Existing playground at East Fork Campgrounds

campsites which are presently outside Camping Area 1 since they are accessible immediately from the access road and not from the camp's internal drive. This was determined to be an unwarranted safety hazard as trailers would have to back out directly onto the access road.

(2). East Fork Camping Area 2 (Exhibit 13). Camping Area 2 consists of 25 campsites and is located adjacent to and upstream from Camping Area 1. Facilities include a waterborne restroom with showers, 2 drinking fountains, 8 parking spaces, a one-lane boat launching ramp, 2 dusk to dawn lights, and an amphitheater. A playground is located at the north side of the site above the entrance drive. Additional improvements to Camping Area 2 consist of providing a fishing shoreline as per Figure 8-15, within the campsite limits.

Across the access road from Camping Areas 1 and 2 are the utilities which serve Camping Areas 1, 2 and 3. These consist of a water storage tank, a water treatment plant, and a sewage treatment plant.

(3). East Fork Camping Area 3 (Exhibit 13). The entrance to Camping Area 3 is approximately 0.2 mile upstream from Camping Area 2. This 36

site campground has 1 waterborne restroom with showers, 2 drinking fountains, and 2 dusk to dawn lights. There are no improvements recommended for this area.

(4). East Fork Camping Area 4 (Exhibit 14). Camping Area 4 is 1.1 miles upstream from Camping Area 3 and has 21 campsites, 3 drinking fountains, and 2 dusk to dawn lights. In addition, there is a wash house which contains restroom and shower facilities.

A fishing shoreline area which is proposed for the bank of the East Fork between Camping Areas 4 and 5 is the only additional facility recommended for these two campgrounds.

(5). East Fork Camping Area 5 (Exhibit 14). A tenth of a mile upstream from Camping Area 4 is Camping Area 5. The site consists of 13 campsites, a waterborne restroom, 1 paved launching ramp, a drinking fountain, and 2 dusk to dawn lights.

A sewage treatment plant is directly across the access road from Camping Area 5 and a water storage tank is to the northeast above Camping Area 6. Both of these utilities serve Camping Areas 4, 5, and 6.



PICTURE 7-13

Existing amphitheater at East Fork Camping Area 2



PICTURE 7-14

Existing information kiosk evidences a rustic design theme



PICTURE 7-15

Existing restroom facilities at East Fork Campground
in need of visual enhancement

(6). East Fork Camping Area 6 (Exhibit 14). Camping Area 6 is the last of the campsites and is located directly adjacent to Camping Area 5, approximately 3.7 miles from State Route 37. This area presently has 33 campsites, 1 waterborne restroom with showers, 2 drinking fountains, and 2 dusk to dawn lights.

Proposed improvements consist of removing 3 campsites to provide a playground area and space for parking 3 cars. A gate is recommended to prevent traffic from entering the camping facilities from the south via the closed sections of State Route 33. Entry and identification signage is to be improved for Camping Areas 4, 5 and 6 as well.

7-07. Overlooks.

Presently, there are two overlooks at East Lynn, a pedestrian overlook at the dam and a pedestrian overlook at the Day-Use Area south of the dam. The vehicular overlook (Exhibit 7) is opposite the operations headquarters and visitor center and provides views of the dam, lake, and outlet structure, as well as the Lower Dam Day-Use Area. The pedestrian overlook (Exhibit 8) is on the southwest tip of the day-use area and provides spectacular views of the lake and surrounding foothills.

In addition, a third overlook is proposed for the northern facing bluff of the Day-Use Area. This proposed overlook is to be accessible to the handicapped and is to take advantage of the views of the dam and intake structure.

7-08. Trails.

Present trail development at East Lynn is limited to the existing asphalt path network at the Day-Use Area, south of the dam. These connect the existing restroom with the overlook and the parking lot.

Additional trails are proposed as part of this Master Plan Update in order to help provide recreational opportunities which are diverse as well

as to increase the public's appreciation and enjoyment of the Project and its resources. Two types of trails are proposed for East Lynn Lake: (1) fishing access trails and (2) paved handicapped accessible trails. Sketches of typical design details and accompanying design criteria are found in Chapter 8 of this report. In the cost estimate analysis in Chapter 16, all major trail developments, with the exception of the future fishing access trail at Lakeside are shown as part of the 5-year plan. Actual demand, however, is to dictate the actual construction schedule.

a. Fishing Access Trails. These trails have been included as a response to fishermen who may not have access to a boat, but who have a desire to fish from some of the more attractive shoreline areas. Such trails are designed to be natural in both character and appearance and to offer a range of differing fishing opportunities. A minimum distance between the actual breaks to the water should be maintained to limit the number of sportsmen using the area at any one time while giving each a feeling of privacy. The only fishing trail proposed for immediate development is that shown just above the dam to the east of the emergency spillway (Exhibit 7). A future fishing trail is proposed for Lake Side (Exhibit 10).

b. Handicapped Accessible Trails: These trails are designed to provide park visitors who are handicapped, maximum mobility with a minimum of assistance and effort. While these trails, by being paved, are not natural in appearance, every effort should be made to make them as curvilinear as possible, to make them with grades of less than 8 percent, and to provide handrails where appropriate. Handicapped accessible trails are proposed for the Day-Use Area south of the dam (Exhibit 8) to connect the existing restroom with the playground facilities, open play fields, parking lot, proposed picnic shelters, interpretive center, and the northern overlook. A handicapped accessible fishing trail is also to be provided at the pond area.

7-09. Interpretive Program.

An existing area within the operations headquarters at East Lynn Lake is currently used as a visitor's lounge. Here visitors are provided with an overall view of the historical, cultural, archeological, and geological history of the Project area through the interpretive materials displayed. A new interpretive building is currently under construction in the Day-Use Area south of the Project headquarters.

7-10. Schedule of Development.

Initial development of recreational facilities at East Lynn Lake meets or exceeds existing visitor demand for this area in most categories. A summary of the existing and projected facility needs for the years 1985, 1990, 2000, and 2020, are shown in Table 5-9.

7-11. Cost Estimates.

An itemized total cost analysis for proposed and future development is presented in Chapter 16. All cost estimates were based on current cost sources such as previous bid tabulations supplied by the Army Corps of Engineers and Means 1984 Cost Estimating Catalogue. The degree of development for various recreational facilities was determined according to projected needs and site capabilities that are comparable to those at similar Corps of Engineers projects.

7-12. Cost Increase or Decrease.

Since the inception of the original Master Plan for East Lynn Lake, recreation development concepts have changed considerably. In order to comply with Army Corps of Engineers criteria, existing facilities will need to be upgraded and supplemented with additional facilities. Construction costs for all types of recreation facilities have increased considerably. These increases should be taken into consideration when implementation of the Plan occurs.

CHAPTER 8

FACILITY LOAD AND OTHER DESIGN CRITERIA

CHAPTER 8

FACILITY LOAD AND OTHER DESIGN CRITERIA

8-01. General.

The preceding Chapter of this Master Plan has presented the land and water use plan for East Lynn Lake. The Master Plan was based on developing project resources to their highest and best use as determined by factors and criteria presented in earlier Chapters of this report. The objective of this Chapter is to more clearly define the actual facilities proposed in the Master Plan Update for East Lynn Lake.

As an existing recreational project, East Lynn Lake is already largely developed. As such, the majority of proposed and future improvements relate more to spot site improvements and small new construction rather than to major site development projects.

The design of all proposed and future improvements will be in accordance with current Army Corps of Engineers standards and specifications as outlined in ER 1110-02-400 "Design of Recreation Sites, Areas and Facilities", and EM 1110-2-400 "Recreation Planning and Design Criteria." The

construction of all proposed facilities in this Master Plan will require more detailed drawings before implementation is possible. An intensive on-site investigation should be made to assure that the proposed facilities are properly integrated into the existing design scheme of the Project.

8-02. Siting.

a. General. Since the major portion of the proposed Plan for Development involves improvements to existing recreational facilities, there will be no significant siting criteria. Only the most adaptable land will be used in the siting of the new facilities. Forced sitings will be avoided unless efficient land use or overriding management constraints require minor modifications of existing land forms. Cuts and fills will be limited to locations where no alternative construction is available.

b. Elevation. All major structures and all sanitary and water improvements will be placed above the flood control pool, elevation 701, whenever possible. When it is impractical to meet this standard, structures will be placed above the seasonal pool elevation of 662. If neither of the above standards can be met, the structures shall be designed to withstand flooding.

8-03. Roads.

a. General. No major new roadways are proposed. The only roadway construction will involve improvements being made to existing roadways. All new construction and improvements are based on matching existing Project roadways. All construction should meet the criteria given below.

b. Location/Proposed Improvement.

(1). Dam and Tailwater Day-Use Area. Remove the existing roadway in picnic area.

(2). Project Headquarter's Area. Develop the vehicular turnaround at intersection of circulation road and drive to project housing.

(3). Above Dam Day Use Area. Upgrade the existing gravel road and construct extension of road to the new proposed parking area adjacent to the fishing ponds.

(4). Lick Creek. Upgrade the existing gravel circulation road leading to the group camping area.

c. Alignment. All new roadway construction should have a curvilinear alignment. Long tangents in roadway alignments should be avoided. Intersection with other Project roads should provide adequate sight distances and queuing of cars.

d. Pavement Width. The width of new and improved roadways should match existing roadway widths. All construction shall be based upon the following classification system:

Name	Surface	Pavement Width	Berm	See Figure
Access Road	Asphalt	20'	4'	8-01
Circulation Road	Gravel	18'	2'	8-02
Maintenance Road	Gravel	10'	--	8-03

e. Roadway Surface.

(1). Access Roads. All access roads will be constructed with a compacted subgrade with 8" compacted aggregate base, a prime coat, 1" bituminous concrete base course, and a 1 1/2" bituminous concrete wearing course. The edge of the roadway surface will have a 45' bevel.

(2). Circulation Roads. All circulation roads proposed are either improvements or extensions of existing roadways and will be constructed with 8" compacted aggregate on a compacted subgrade.

(3). Service Roads. All service roads will be constructed of 8" compacted aggregate on a compacted subgrade.

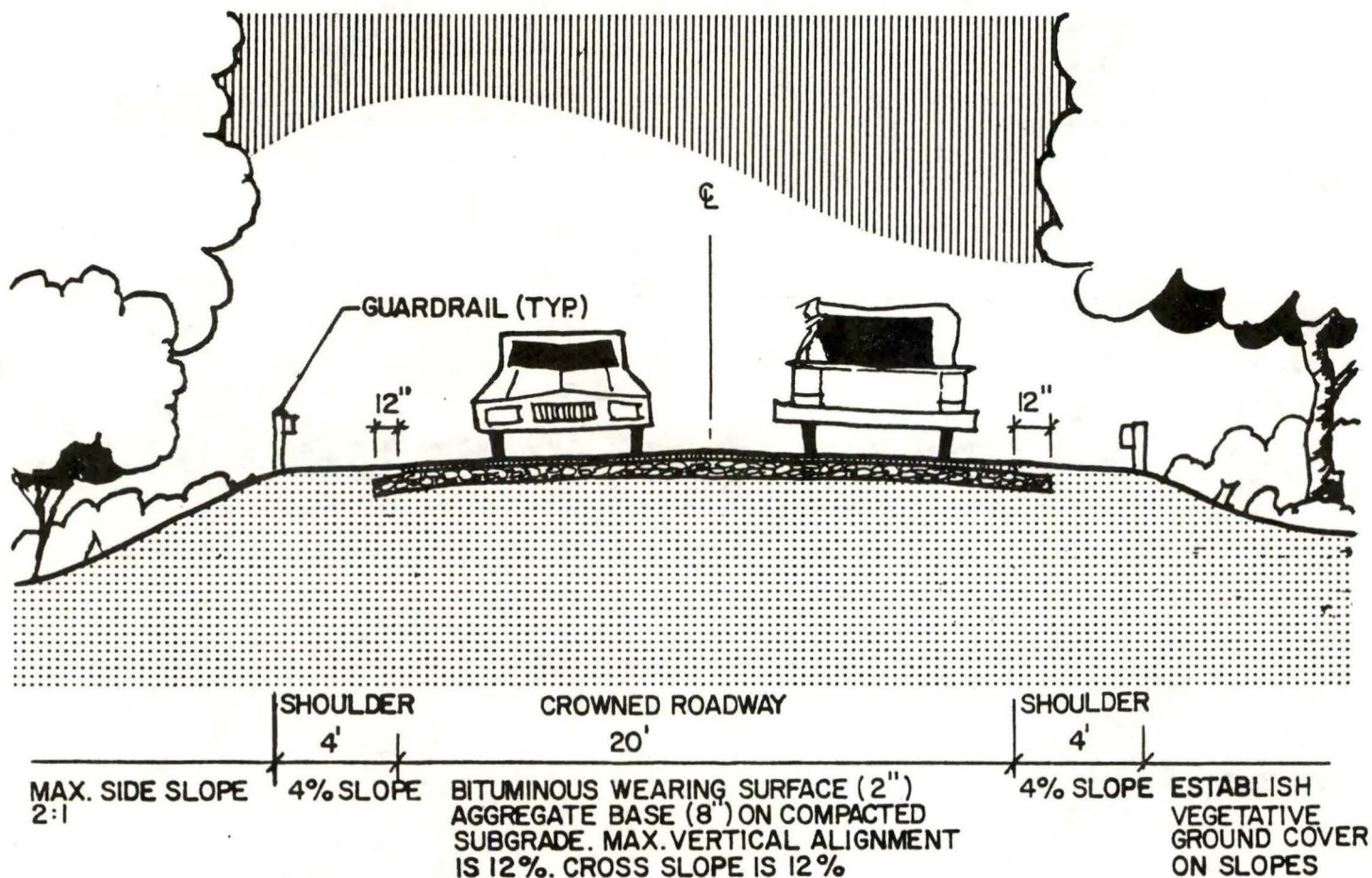


FIGURE 8-1
ACCESS ROAD

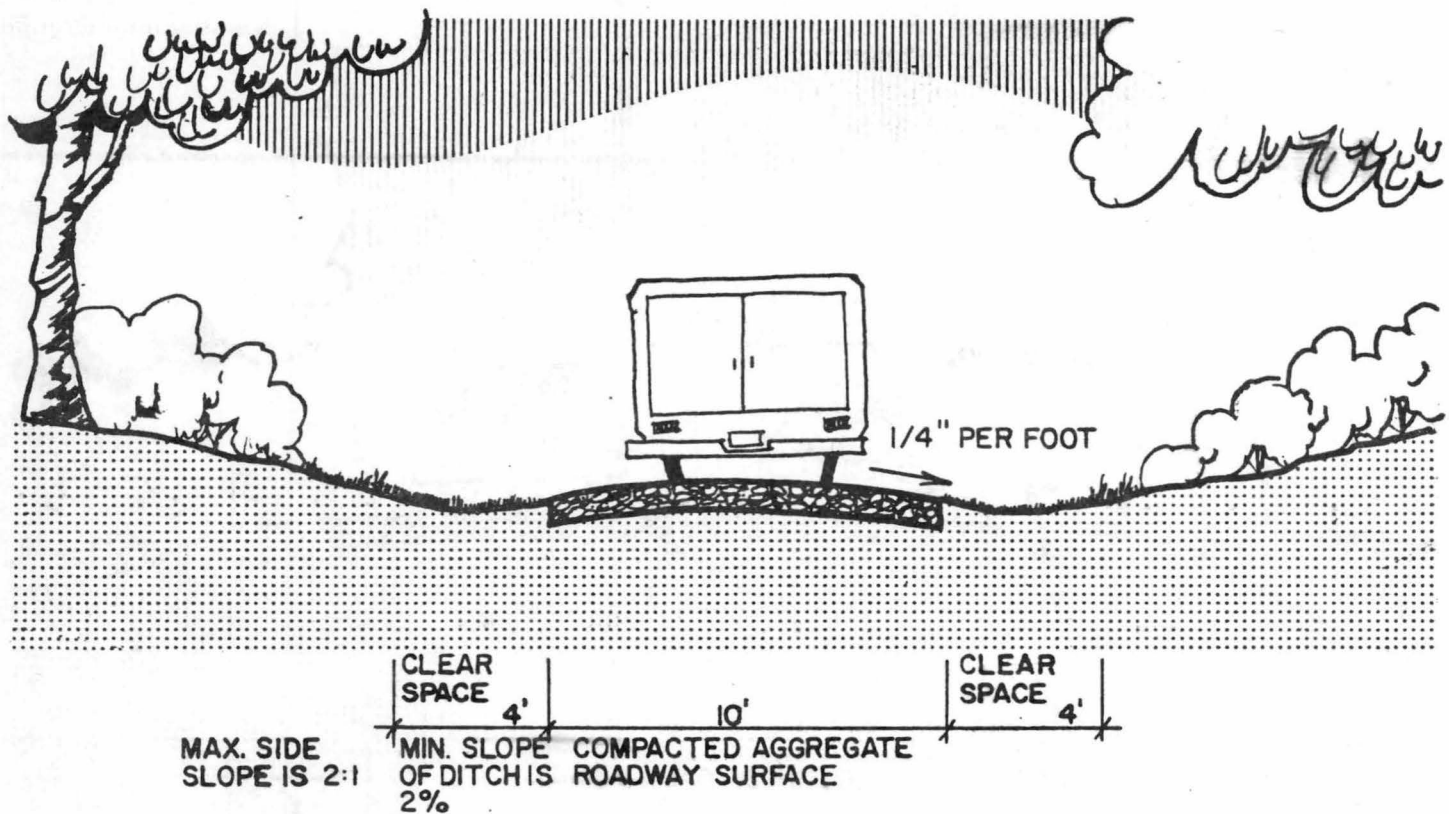


FIGURE 8-3
MAINTENANCE ROAD

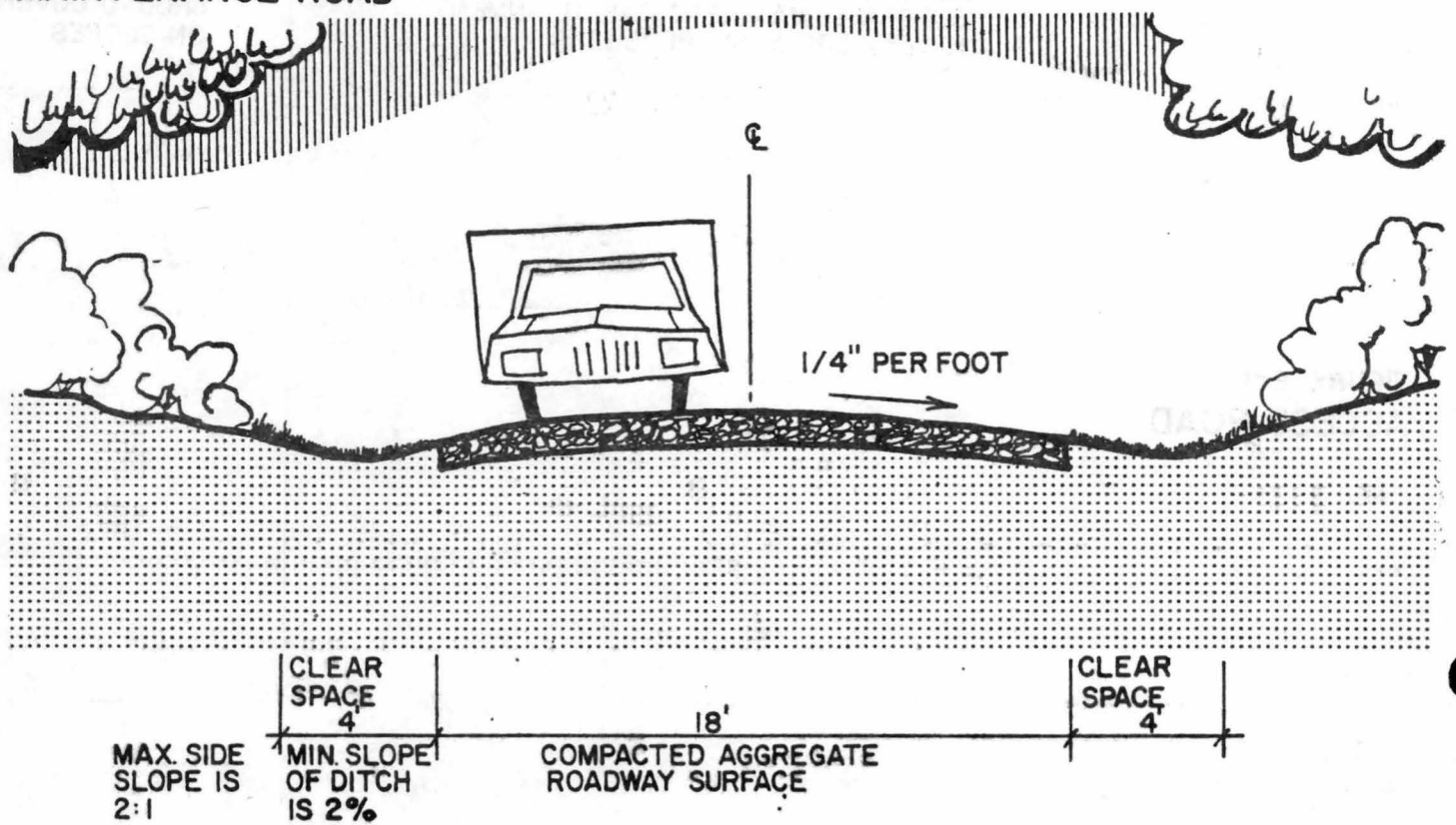


FIGURE 8-2
CIRCULATION ROAD

f. Drainage System.

(1). All subgrade preparation should provide for positive drainage away from the roadway surface.

(2). Site ditches should be provided where necessary to provide positive drainage of storm water away from the roadway surface. To minimize the need for side ditches, all one lane circulation and maintenance roads will be cross sloped. The minimum gradient of ditches should be 0.5 percent. All swales should be lined with grass or other native ground covers to reduce sedimentation and storm water runoff.

(3). Culverts should be minimized in all roadway improvement and construction projects. When corrugated metal pipe is used in culvert construction, it shall be bituminous coated and all end sections shall be flared. When reinforced concrete pipe is used in culvert construction, concrete headwalls will be used.

g. Guardrails. Guardrails will be placed along the outside edge of the berm on roadways where public safety requires such protection. Proposed guardrails will be constructed according to existing project standards and specifications.

h. Striping. Pavement striping of all centerlines will be used on all bituminous concrete roadway surfaces.

8-04. Parking Areas.

a. General. The development of a swimming beach at Lick Creek presents the only major need for new parking facilities at East Lynn Lake. The existing lot will be expanded to include parking for those visitors seeking swimming facilities. Other proposed parking improvements include a three car gravel parking lot adjacent to East Fork Camping Area 6 and a six car asphalt lot in the above Dam Day-Use Area adjacent to the fishing pond.

b. Dimensions. The proposed parking areas are based on the following standard parking dimensions:

Type	Width	Length	See Figure
Car	10'	20'	8-04
Car with Trailer	10'	40'	8-05

c. Surface Treatment. Except for the 3 car parking area in East Fork Camping Area 6, all parking lots are proposed to be paved with 2 1/2" bituminous concrete over an 8" compacted aggregate base. The proposed East Fork Camping Area 6 parking lot will be constructed of 8" of compacted aggregate.

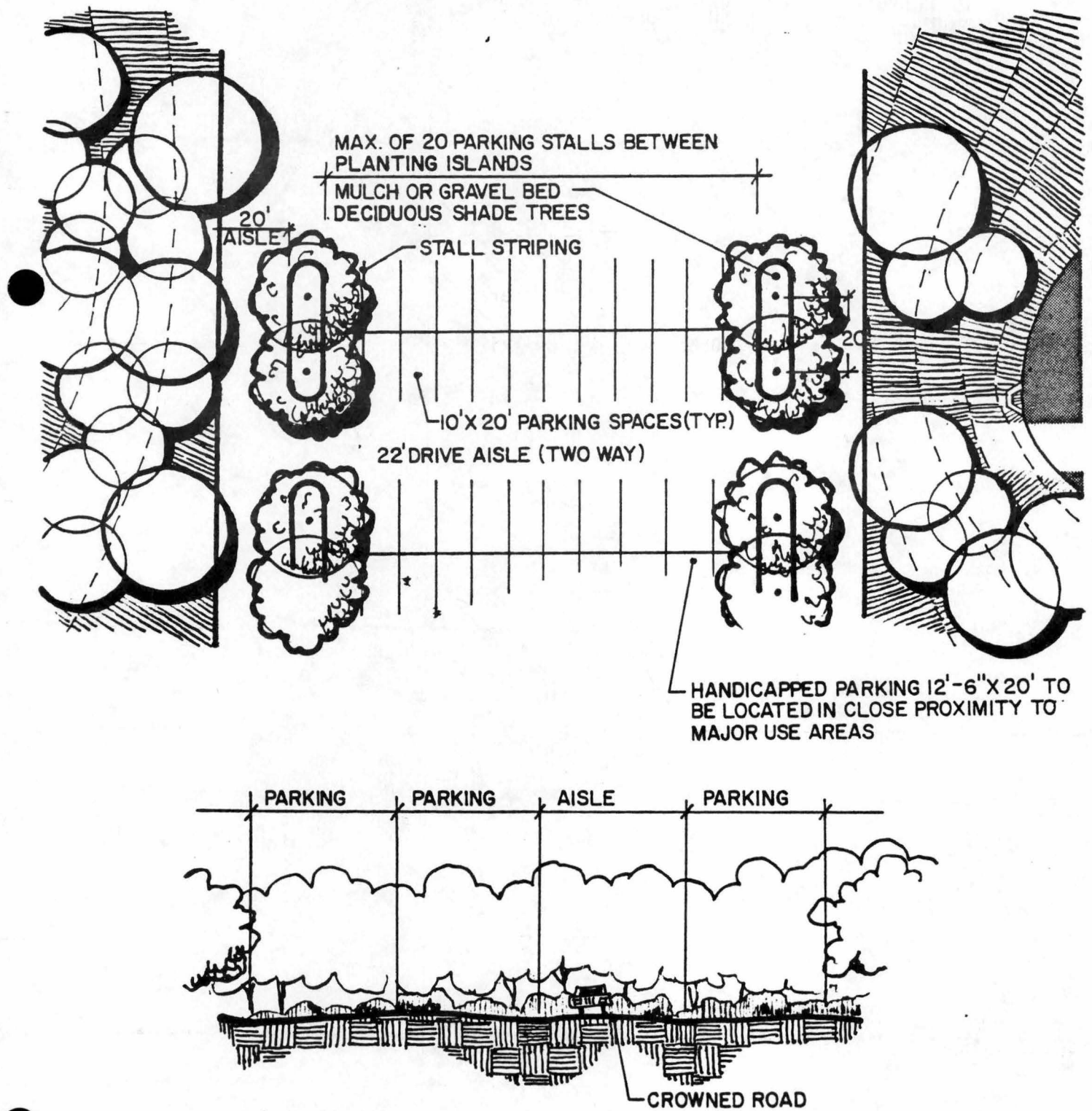


FIGURE 8-4
TYPICAL 90° ANGLE PARKING LOT

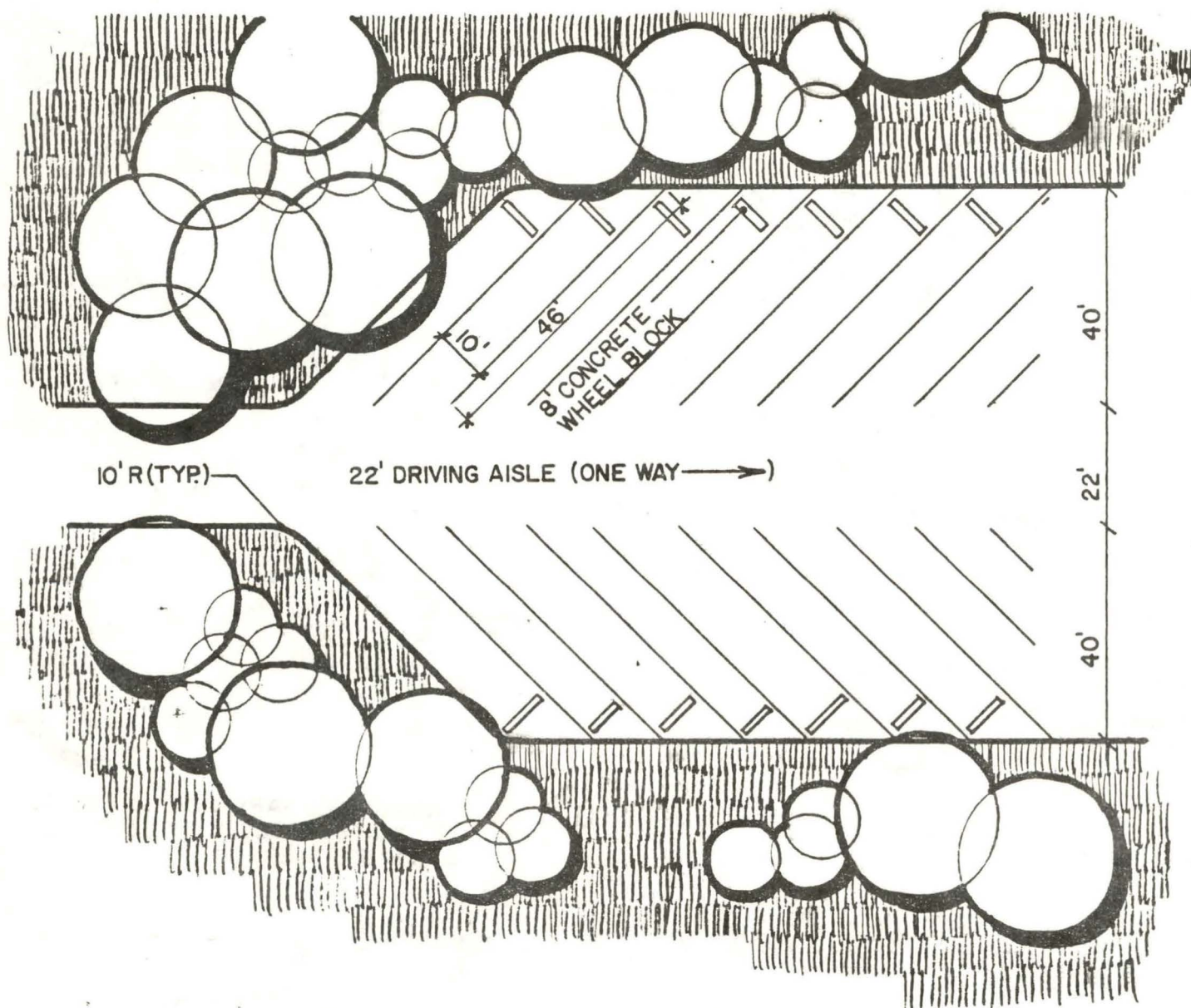


FIGURE 8-5
TYPICAL 45° ANGLE CAR AND BOAT TRAILER PARKING LOT

d. Storm Drainage. All site preparation and construction will provide for positive drainage of surface water off of parking surfaces. Swales and interceptor ditches should be used where required, minimizing the use of culverts. Curbing should not be used except where needed to control vehicular traffic or correct problem drainage areas.

e. Pavement Striping. All proposed bituminous concrete parking surfaces will be striped according to the dimensions given in Figures 8-4 and 8-5.

8-05. Picnic Areas.

a. General. The lack of sufficient day-use picnicking facilities will be a deficiency at East Lynn Lake. To remedy this situation, additional picnicking facilities are proposed in the day-use areas adjacent to the Dam.

b. Locations. The Dam and Tailwater Day-Use Area is the only recreational site proposed to receive new picnic facilities. These will include three new picnic shelters and associated picnic units. The area east of the tailwater channel will be opened for picnicking activities through the use of the proposed pedestrian bridge. One of the new shelters is proposed for the east side.

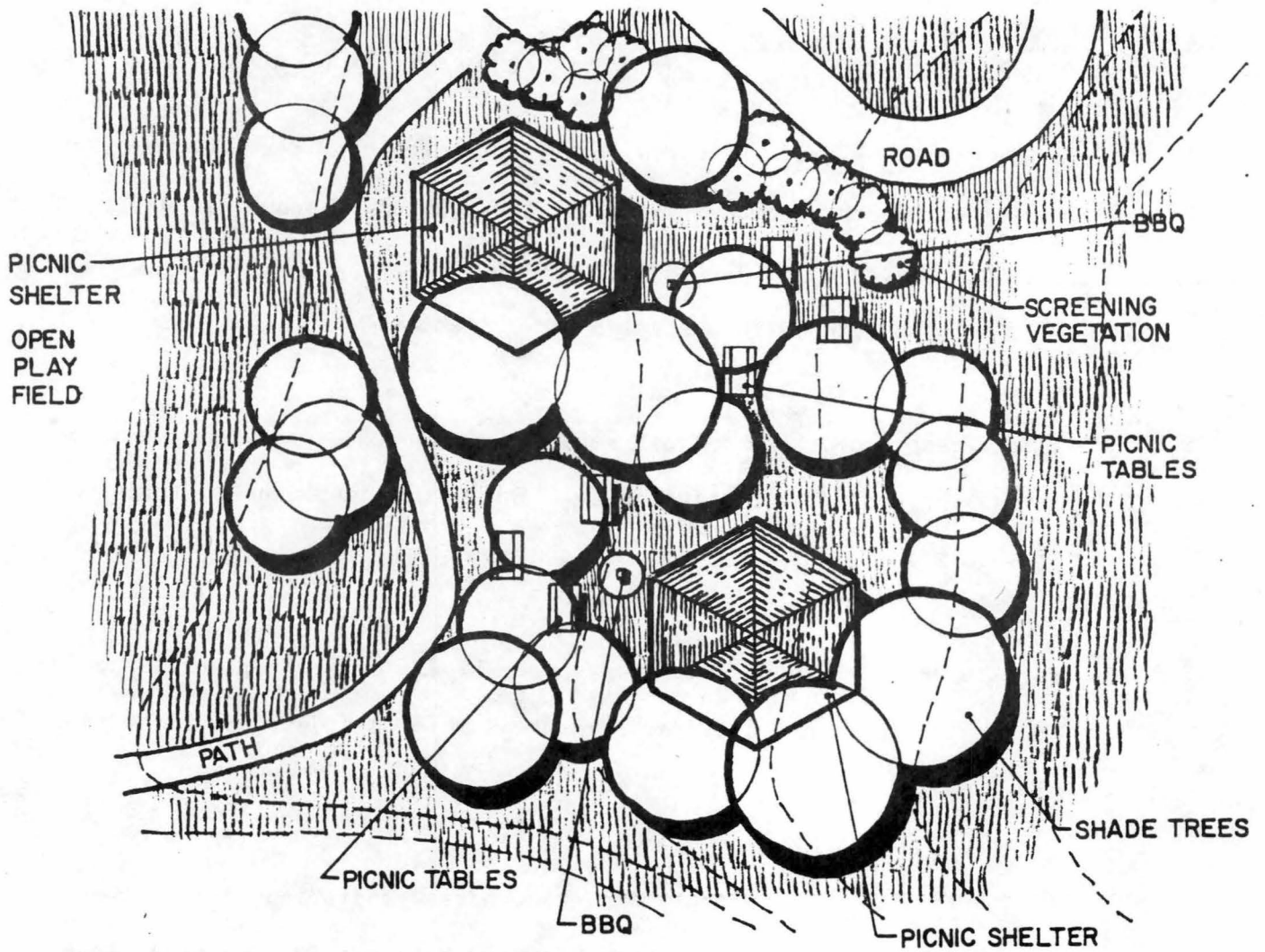
c. Siting. All proposed shelters should be located adjacent to open play areas. Canopy trees should be planted adjacent to shelters to provide additional shade.

d. Facilities.

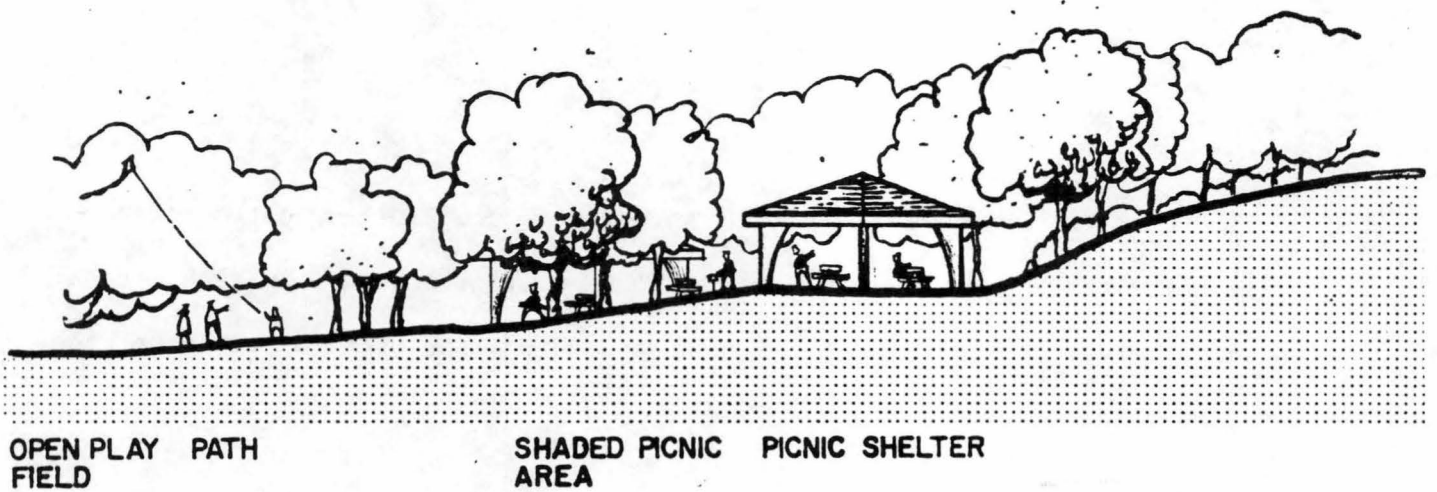
(1). Picnic Shelter. To assure continuity of design, all proposed and future shelters should match the style of existing shelters. The proposed new shelters will be "open" in design and shall include a concrete pad. Other facilities provided with a picnic shelter area include four picnic tables, one group grill, and one trash receptacle.

(2). Picnic Unit. A typical picnic unit consists of two 8 feet long tables, one small grill, and one trash receptacle. Each picnic shelter will have five additional picnic units associated with it.

(3). Picnic Table. Picnic tables will usually be 8 feet long and consist of an integrated bench and table design. The table surface and seating surface of the picnic table should be constructed with treated lumber. All structural members and fasteners should be rust resistant in their design. Painting or staining of tables should not be included so as to reduce maintenance costs.



**FIGURE 8-6
PICNIC AREA-PLAN VIEW**



**FIGURE 8-7
PICNIC AREA- ELEVATION**

(4). Picnic Grills. Elevated, heavy duty picnic grills will be associated with each picnic unit and shelter. A large, group use grill will be located adjacent to all proposed shelters while smaller grills will be associated with every two picnic tables.

(5). Trash Receptacle. Trash receptacles should be provided at a rate of one per every two picnic tables. These containers should match those presently existing within the Project area.

(6). Open Play Field. Wherever space allows, picnicking areas should be located adjacent to large, open areas which are designed for active play.

(7). Playground. In large picnicking areas consisting of more than 35 picnic units, designated playgrounds should be provided. These playgrounds should reflect the inherent natural qualities of the Project.

8-06. Playgrounds.

a. General. Proposed playground improvements are limited to two recreational sites. A minimum of one playground will be provided in each recreational area. Natural materials such as wood will be used to complement the surrounding environment.

b. Locations.

- (1). Dam and Tailwater Day Use-Area.
- (2). East Fork Camping Area 6.

c. Siting. The following general guidelines apply to all playground development.

- (1). Playgrounds will be located near the major use areas within each site in a way that does not conflict with pedestrian or vehicular circulation patterns.
- (2). Playgrounds will be landscaped to provide partial shade if the site does not naturally provide it.
- (3). Open turf areas will be preserved adjacent to playgrounds whenever possible to provide opportunities for field games and free play activities.
- (4). One playground will be provided for each camping area or for each picnic area.

d. Facilities. Playground improvements to be made include the following:

(1). Dam and Tailwater Day-Use Area.

- (a). Relocation of Existing Playground Area.
- (b). New Wood Climbing Apparatus - Large.
- (c). Playground Surface - Wood Chips or Sand.
- (d). Playground Edging Material - Wood.

(2). East Fork Camping Area 6.

- (a). New Wood Climbing Apparatus - Small.
- (b). New Play Equipment.
- (c). Soft Surface - Wood Chips or Sand.

8-07. Swimming Beach.

a. General. One of the major recreational facility needs at East Lynn Lake is additional swimming areas. To meet these recreational needs an additional swimming beach is proposed at Lick Creek. This beach is intended to alleviate the overcrowded conditions existing at East Fork Beach. In addition, it is proposed that sunbathing areas, portable restrooms, and a pedestrian underpass be included in the design.

b. Design Capacity. Ideally, the size of the beach will be 50 square feet of sand or turf per participant with 30 square feet of water for each participant or as allowed by existing limitations of the site. A breakdown of user activity on swimming beaches is as follows: 60% of the total number of participants on the beach, 30% in the water, and 10% at other facilities such as the bathhouse, concession, or parking lot.

c. Facilities.

(1). Portable Restrooms. Self contained, portable restrooms will be provided due to the lack of adequate sanitary treatment facilities. The number of facilities to be provided will depend on demand.

(2). Sunbathing Area. Alternative sunbathing areas will be provided in the form of sandy beaches or grassy lawns. The size of sunbathing areas may have to be limited due to landform constraints.

(3). Buoys. Floatation devices designed to define the limits of available water for swimming activities will be used.

8-08. Overlook Landings.

a. General. All proposed improvements aimed at enhancing scenic viewing are directed towards the pedestrian experience.

b. Location/Proposed Improvement. Two locations have been identified for improvement and both occur in the above Dam Day-Use Area. The first, an existing landing occurs to the southwest of the picnicking area. The proposed improvements here include a safety railing, seating elements, an information kiosk, and selective plant clearing to enhance views to the Lake. The second landing will be a new facility to the northwest of the large parking lot. This landing and the access pathway leading to it will be handicapped accessible. The improvements here include a hard surfaced flat viewing platform, a stone seating wall, an information kiosk, selective tree clearing, and landscaping. This facility should be located below the existing scenic walkway and in the same tree clearing path to assure minimum disturbance to existing vegetation.

c. Design Criteria.

(1). Overlook Landing. Structure design and choice of materials should be harmonious with existing site structures. Materials that complement those found naturally within the area are preferred to those that are exotic or highly architectural.

(2). Information Kiosk. This device will serve to point out physical and natural resources in the surrounding landscape. This element should be located in a highly visible and central area of the landing.

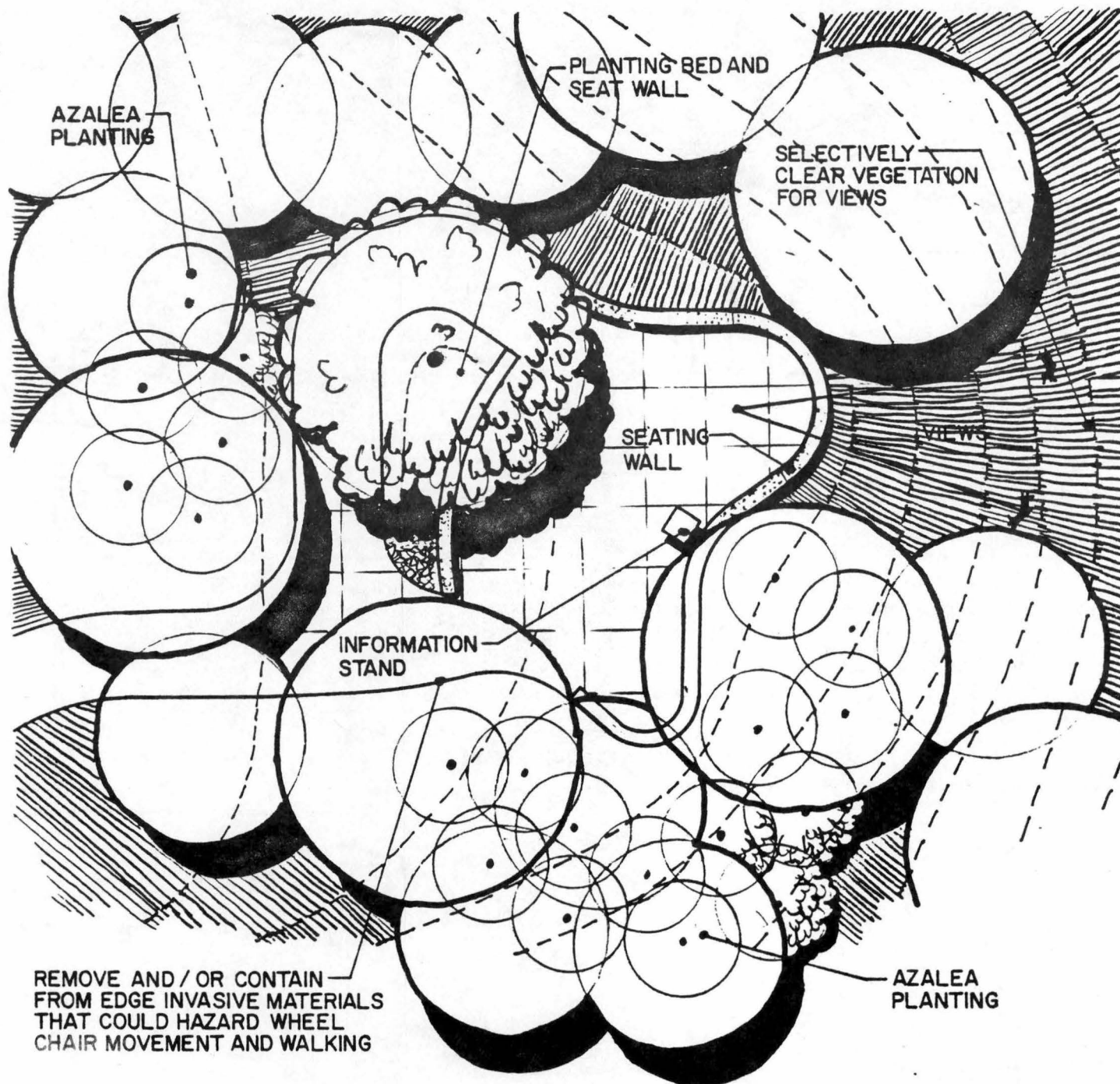


FIGURE 8-8
HANDICAPPED ORIENTED OVERLOOK

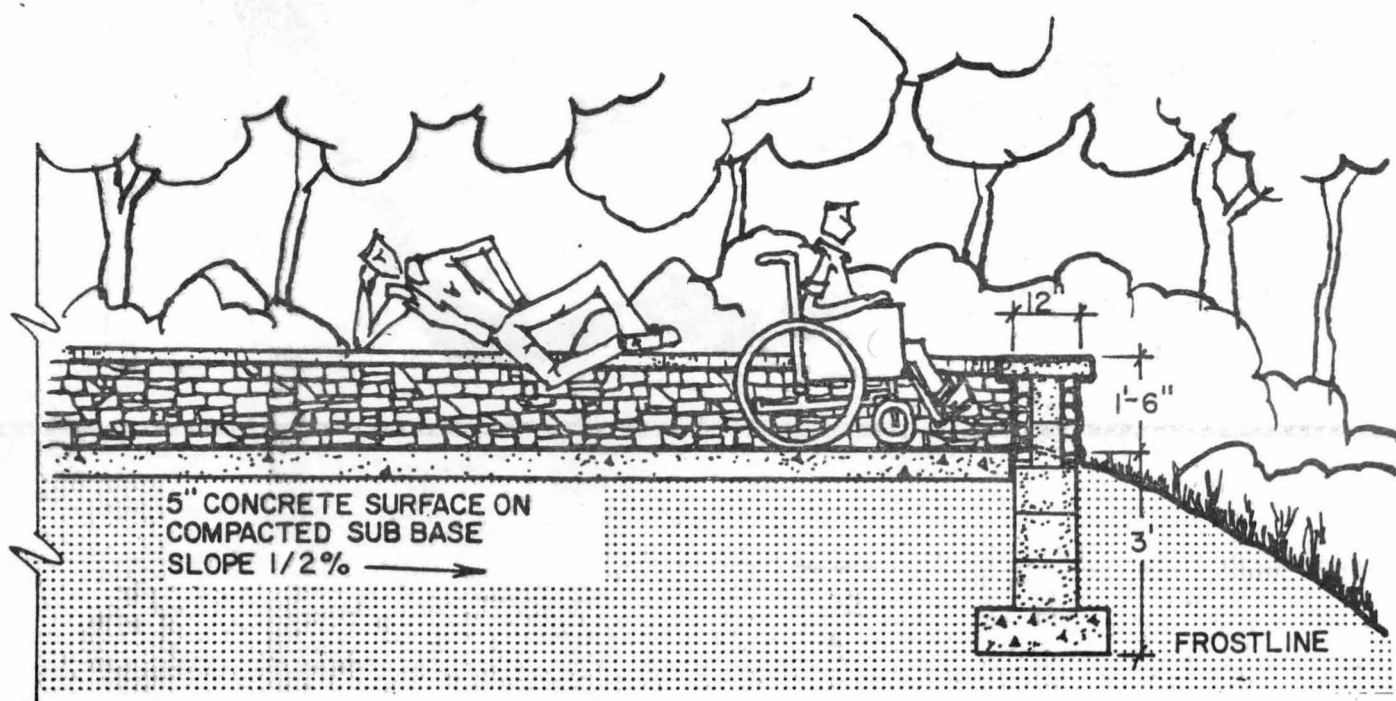
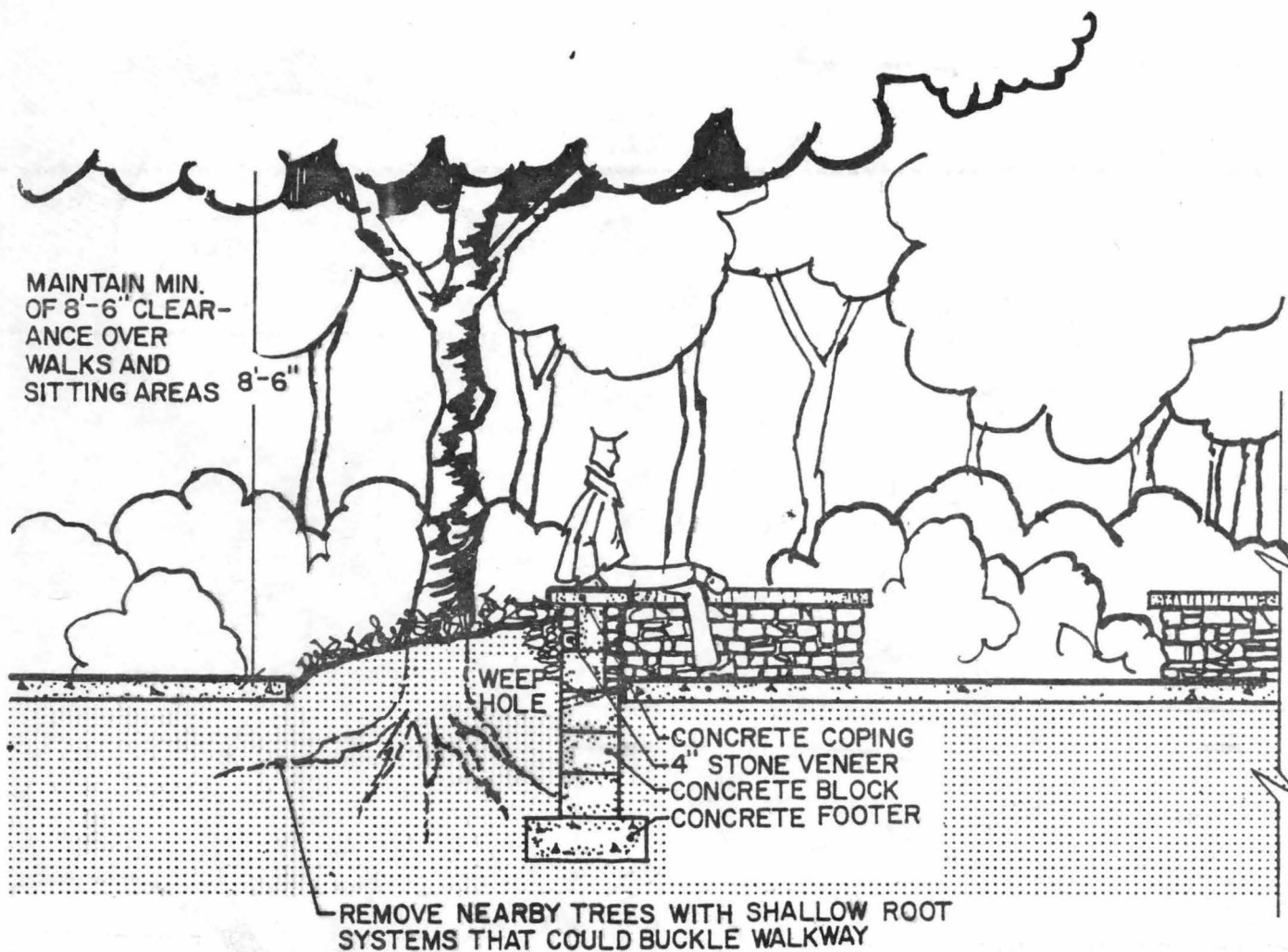


FIGURE 8-9
HANDICAP OVERLOOK – SECTION/ ELEVATION

(3). Benches. Seating elements are to be provided as an integral part of the overlook facility in the form of seating walls or separate free standing elements as appropriate. Heights to the seating element should be between 16" and 18". A flat smooth surface should be provided for the seat surface.

(4). Landscaping. Proposed plant materials should enhance the visual and olfactory experience of the user. Naturally occurring ornamental plant materials will be used to help integrate the overlook into the landscape, while enhancing the potential for scenic views of the lake and other vistas.

8-09. Camping Areas.

No new major campgrounds are proposed in the updated development plan. The only improvements recommended for the camping areas are better signage and the introduction of plant materials.

8-10. Site Structures.

a. General. The addition of recreational oriented project structures at several sites represents a major part of all proposed site improvements.

These structures are recommended to support existing activities within already developed recreational sites. Included in site structures are picnic shelters and portable restrooms.

b. Siting. All proposed site structures will be developed within existing recreational areas. Therefore, no major siting criteria will be required. All proposed structures will need to have detailed drawings prepared and will be based upon the following design criteria:

(1). Structures will be designed for minimum maintenance and operational expenses.

(2). Structures will be constructed of materials that are resistant to vandalism.

(3). The function of the structure and its internal functions will be easily discernable for efficient public use.

(4). The design of all proposed structures should be consistent with the Project's existing design theme.

(5). Where possible, natural lighting and ventilation will be optimized to reduce operational costs and to enhance the appearance of the structure.

(6). Any structures to be constructed within probable flood zones will be constructed to withstand the affects of flooding.

(7). Where practical, all structures will be designed to be accessible by the handicapped and the elderly.

(8). Materials selected for structure construction will be natural in character such as rock and wood.

c. Facilities.

(1). Picnic shelters. One of the major recreational activities presently lacking sufficient support facilities is that of group picnicking. To fulfill that need five picnic shelters are proposed. All five will be located in the recreational areas surrounding the Dam. Two of these shelters will be located southwest of the open playfield in the Above Dam Day-Use Area and three shelters will be located in the Dam and Tailwater Day-Use Area. All proposed shelters will be similar in design and construction and should match the design theme of existing shelters. Each structure will be an open air shelter, 20' x 28', with four picnic tables located underneath the shelter. All shelters will be on concrete or gravel pads measuring 24' x 32'. In addition, at least one group grill and one refuse container will be sited adjacent to the shelter.

(2). Portable Restrooms. Limitations in the capacity of existing sanitary treatment facilities often limits the development of needed restroom facilities. In these cases, and when the demand requires development of these facilities, portable restrooms will be used.

8-11. Boating Areas.

a. General. No major facilities or structures are proposed. Existing boating facilities presently meet the demand for boating activities at East Lynn Lake. One location has been designated to receive docking facility additions. These new facilities would be added on to the existing docking facilities at Lake Side Marina. These improvements shall be implemented on a demand basis as determined by the concessionaire and Project officials. All future additions should meet the following design criteria.

b. Facilities.

(1). Boat Dock Area. Three new bays of boat docks are proposed at the Marina area. Proposed new docks will be consistent in design and construction with the existing facilities. Each dock will accommodate two boats. Floatation will be provided by styrofoam or other similar material. Metal barrels will not be permitted.

8-12. Hiking Trails.

a. General. Hiking trails should be used where they enhance the public enjoyment of the environment and the utilization of fish and wildlife resources. A trail is proposed in the Below Dam Area which, when completed, will link the tailwater with the upstream face of the dam. Major trail development should be considered at a future time when the demand warrants and funds are available. A short trail is proposed near East Fork Camping Area 1.

b. Siting. All trails should be designed and constructed to be sensitive to existing conditions. Factors to consider in the siting of trails include:

- (1). Trail alignment
- (2). Topography/Terrain
- (3). Vegetation
- (4). Points of visual interest
- (5). Dangerous conditions
- (6). Final destinations

The following design criteria will be used in all hiking trail developments:

- (1). All trail construction should be planned to produce the least disturbance to the natural environment.
- (2). Ground covers or native rock materials will be placed on slopes disturbed by construction to prevent erosion problems.

(3). The alignment of hiking trails should be routed around major trees and rocks to avoid unnecessary disturbance to the existing environment.

(4). A trail will provide a variety of sensual experiences along its route. Interaction with different habitat types should be planned in trail design and construction.

(5). Handrails will be provided where appropriate.

(6). Abrupt changes in the direction or grade of hiking trails will be avoided.

(7). A designated parking area will be provided at the terminus or trailhead of each trail.

(8). All hiking trails will include adequate signage and mapping.

c. Facilities.

(1). Trail Surfaces. Where possible, naturally occurring on-site materials will be used to reduce costs of construction and to provide continuity within the environment. Bituminous concrete paving will be considered on trails showing excessive use. All other trails will be surfaced with wood chips, gravel, or other natural surfacing materials.

(2). Signage. To promote efficient use of the hiking trails, adequate signage is necessary to inform, direct, and regulate the use of

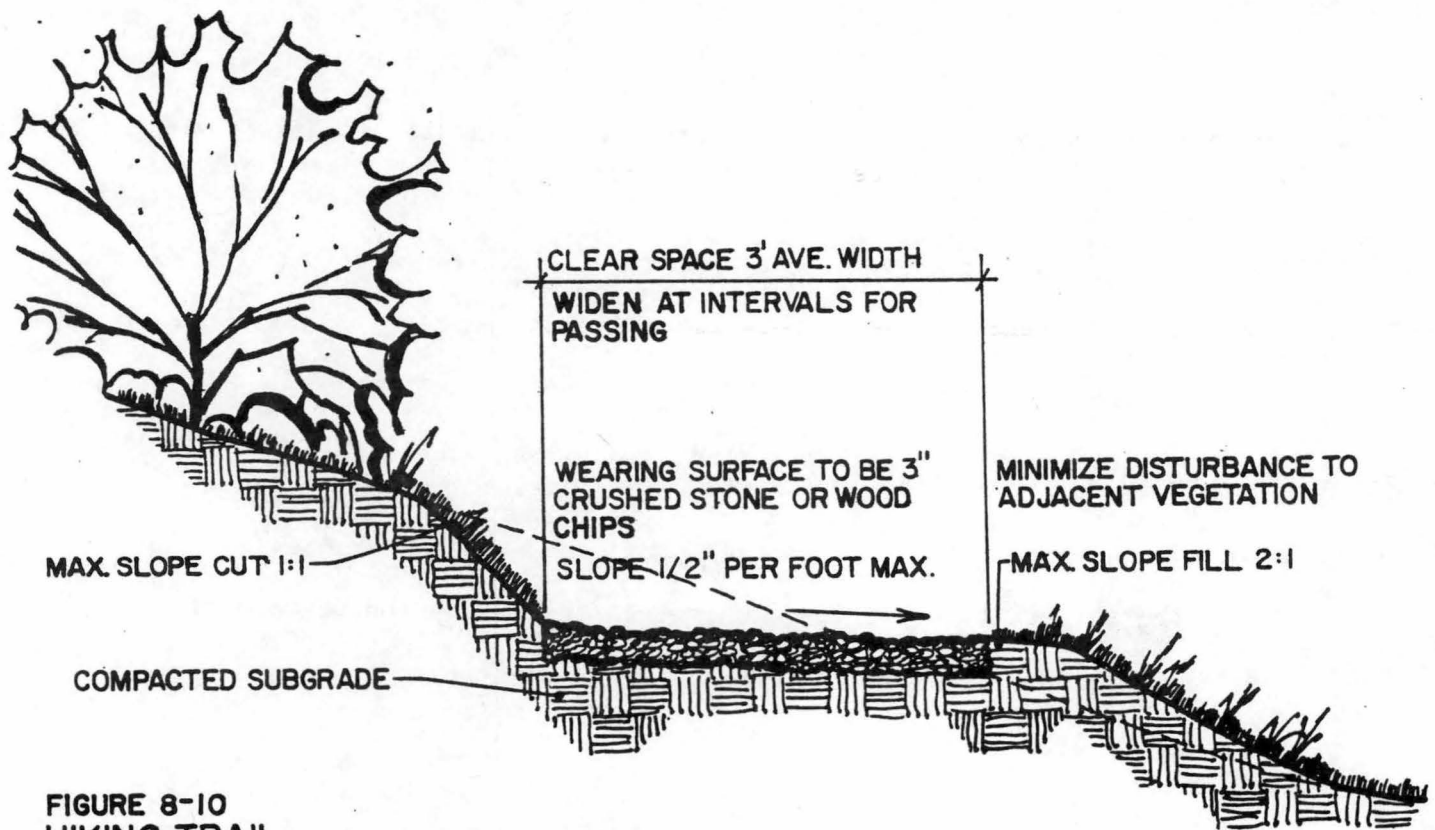


FIGURE 8-10
HIKING TRAIL

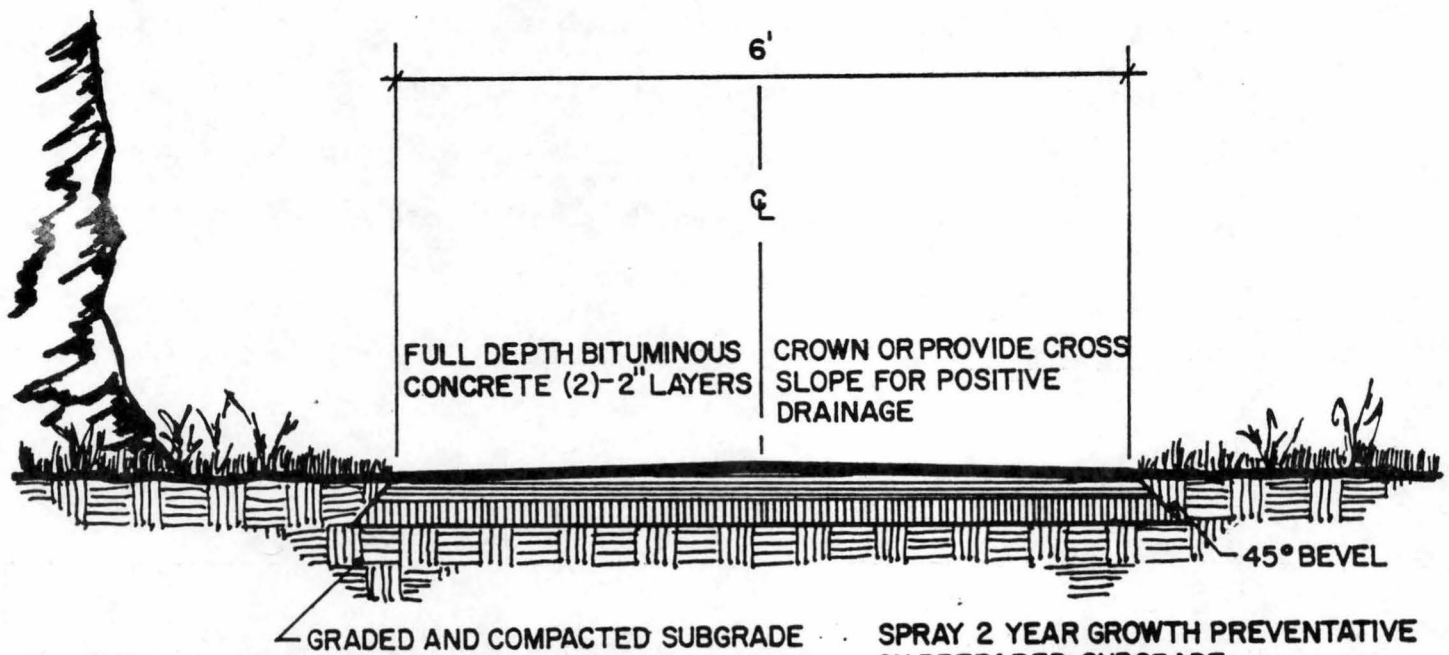


FIGURE 8-11
BITUMINOUS CONCRETE PEDESTRIAN WALKWAY

the facility. Signage will be provided at critical locations along the path of the hiking trails. These locations should include all trail-heads, intersections, special points of visual interest, and at locations where a direction is not readily discernable. In addition, at critical points along the trail, informative maps will be provided that indicate trail network, location, and mileage indicators.

(3). Handrails. At dangerous locations and steep changes of grade, handrails will be provided to protect the safety and welfare of the public. Handrails will be designed and constructed to support a minimum of 250 pounds.

8-13. Pedestrian Circulation.

a. General. Improved pedestrian access to recreational sites is a major component of the plan for development. Proposed walkways will provide better access to existing recreational facilities and open new undeveloped areas for recreational development. All walkway improvements proposed in the development plan occur in either the Above Dam Day-Use Area or the Dam and Tailwater Day-Use Area and generally coincide with picnicking activities.

b. Design Criteria. Where feasible, all proposed walkways will be designed and constructed according to the following standards:

(1). Surface Material. All walkways proposed in this section will be surfaced with full depth bituminous concrete. Full depth walkway construction will consist of a compacted base, a 2" leveling course of bituminous concrete, and a 2" wearing course of bituminous concrete.

(2). Siting. Pedestrian circulation will take the form of walkways where the grade is less than eight percent. From eight percent to twelve percent, circulation will take the form of ramps. Above twelve percent, stairs will be required. All proposed walkways will be curvilinear in their alignment with a width determined by pedestrian demand.

(3). Stairs. Stairs will be provided wherever the grades are greater than twelve percent. When stairs are required, not less than two risers should be used. The optimal tread to riser relationship should be two risers plus one tread equals 27 inches. Handrails will be provided adjacent to stairs where no other handhold is available or where more than three risers are used. A flat landing area at the top and bottom of the flight of stairs will be provided. The design of stairs throughout any recreational area will be consistent in riser and tread relationship.

(4). Ramps. Ramps will be used to provide pedestrian circulation where grades are between eight and twelve percent. Where handicapped access is desired, the maximum length of ramps will be 30 feet with

landings provided at the top and bottom. These landings will not be less than 6 feet in length. Handrails will be used on at least one side of all ramps and on two sides where situations demand. All ramps will be surfaced with non-slip bituminous concrete.

(5). Handrails. Handrails will be used on all ramps and stairs to provide for safety. The design and construction of handrails will support a minimum of 250 pounds. The height of handrails will be 42" with midrails provided when handicapped use is anticipated, or safety conditions dictate.

(6). Drainage. The design and construction of all pedestrian circulation walkways, ramps, and stairs will provide for positive drainage. All walkways will be crowned or sloped to shed surface water away from the paved facility.

(7). Handicapped Provisions. The following criteria will be considered to provide the handicapped person with maximum mobility and a minimum of assistance and effort:

- (a). Contrasting shoulder material in texture and color should be provided.
- (b). Provide handrails where appropriate.
- (c). Avoid abrupt changes in direction and grade.

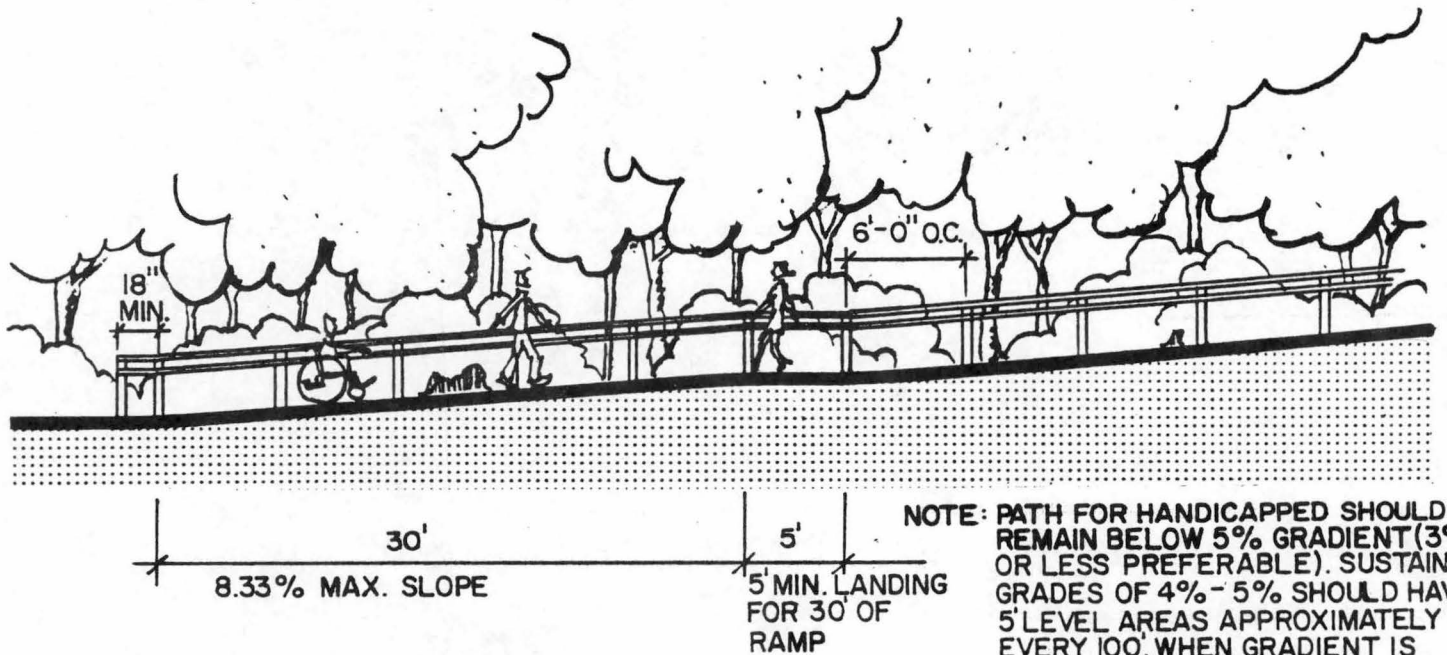


FIGURE 8-12
HANDICAPPED RAMP - ELEVATION

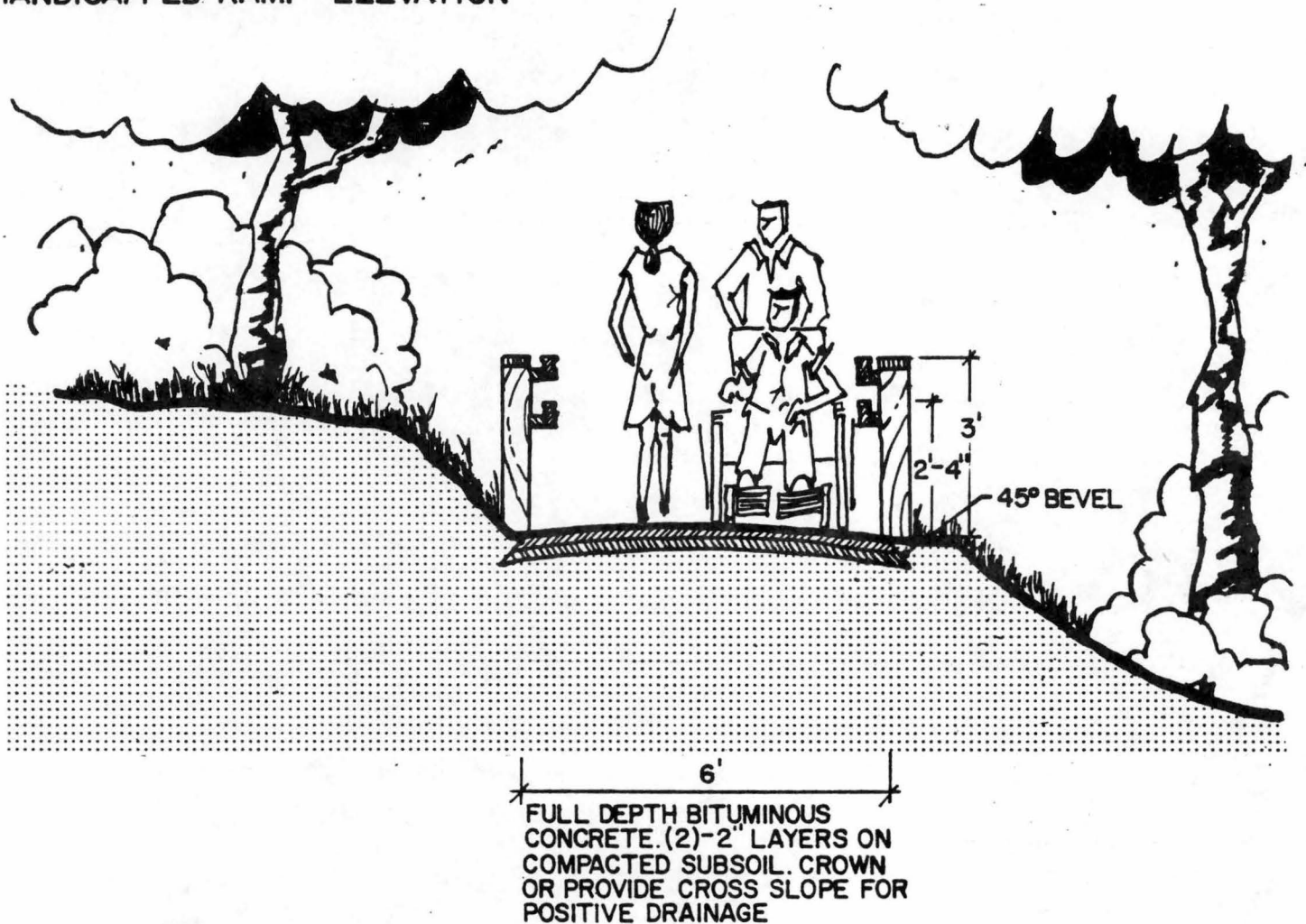


FIGURE 8-13
HANDICAPPED RAMP - SECTION

8-14. Circulation Structures.

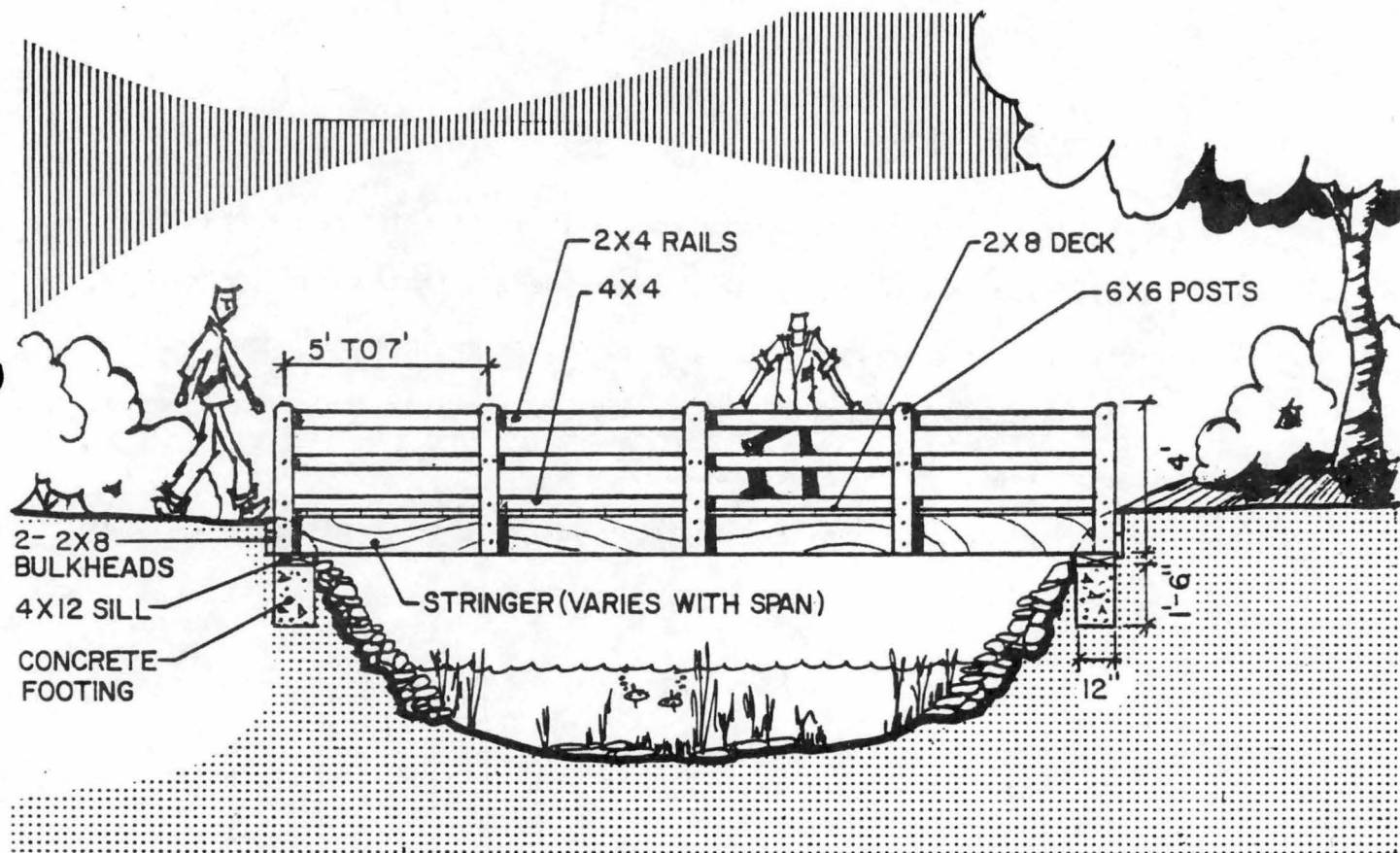
a. General. In the plan for development, several additions at existing areas are proposed to be developed for recreation purposes. To allow for convenient and safe pedestrian circulation into these areas, several special structures are required.

b. Location/Proposed Improvement.

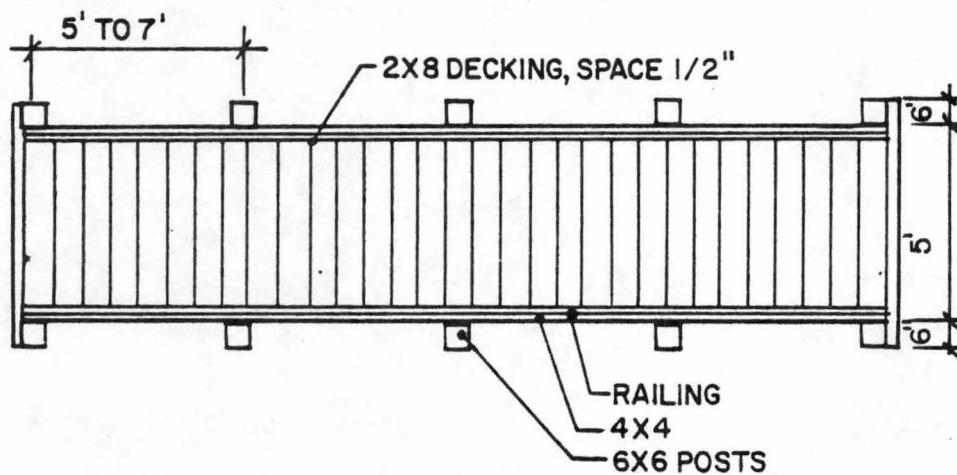
(1). Dam and Tailwater Day-Use Area. A single span pedestrian bridge is proposed over the existing discharge channel in the Dam and Tailwater Day-Use Area. The proposed structure will allow for the expansion of picnicking activities to the east side of the channel. The bridge will be approximately 100 feet in length.

(2). Lick Creek. To allow for convenient and safe access to the proposed beach, a pedestrian tunnel is proposed beneath the existing roadway. The tunnel will be approximately 120 feet in length and be constructed of corrugated metal pipe, with paved walkway surface.

(3). Lick Creek. Due to the location of the proposed parking lot the existing drainage swale is to be relocated. A pedestrian footbridge approximately 30 feet in length is required to provide access over the existing swale and into the proposed swimming beach area. The structure will be constructed of natural materials and designed to blend into the existing landscape.



ELEVATION



PLAN

FIGURE 8-14
PEDESTRIAN WOOD BRIDGE

8-15. Landscape Planting.

a. General. To enhance the aesthetic qualities of existing recreational facilities, landscape plantings are recommended. Plant materials recommended will provide screening of objectionable views; reduce undesirable wind, dust, and erosion; define use areas; and separate conflicting recreational activities. Proposed landscaping will be indicative of naturally occurring plant species that are suitable for the environmental and visual characteristics of each site.

Because each recreational site has varying physical and aesthetic requirements for landscape plantings, it is impossible to prepare detailed planting plans at the Master Plan level. Therefore only mass plantings are shown on the recreational site plan drawings. Consideration should be given to the character of each recreation site before detailed site planning documents are prepared.

8-16. Shoreline Fishing.

a. General. The introduction of vegetation and other fish attracting elements will help to develop fish habitat areas. Also included in the development of the fish habitat areas is the implementation of an access walkway and natural seating elements such as large rocks and logs.

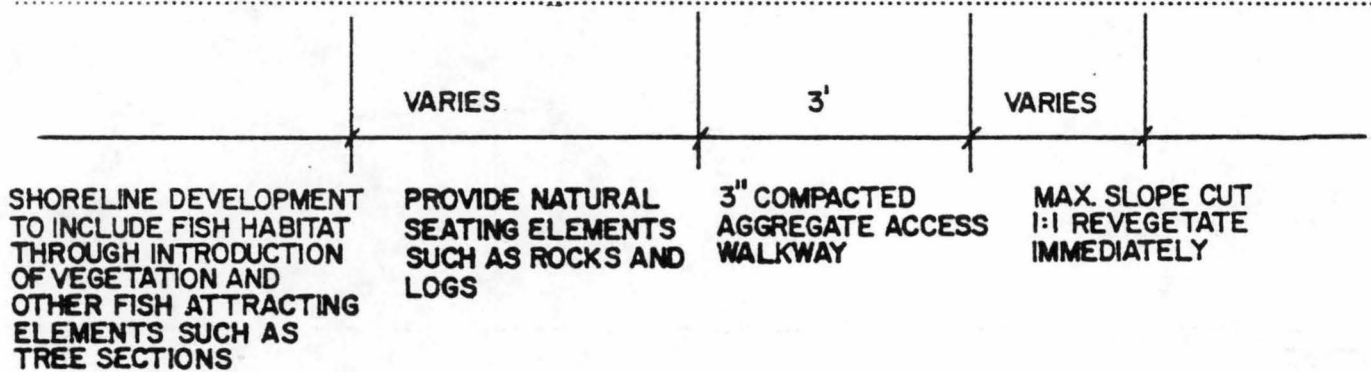
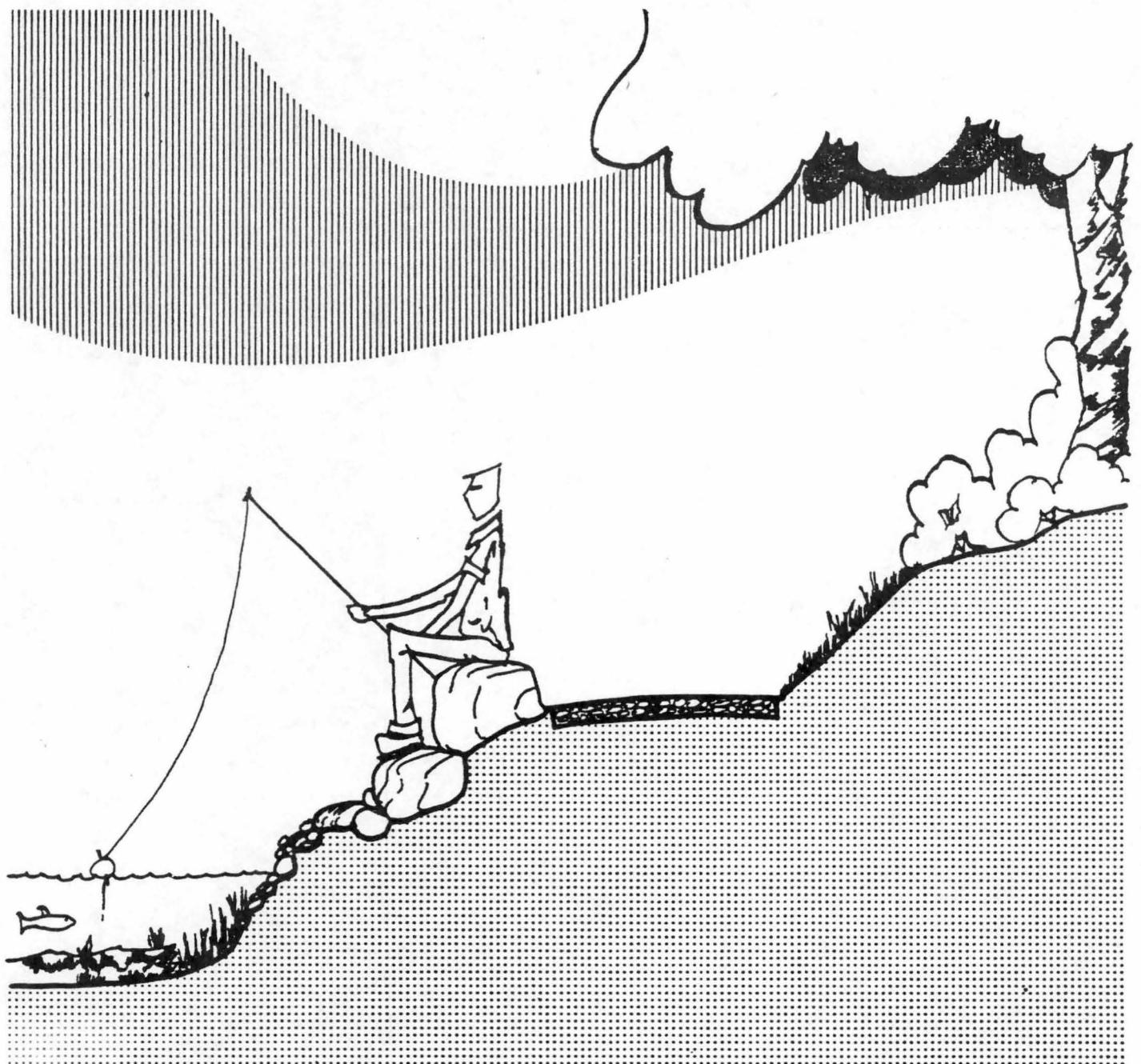


FIGURE 8-15
SHORELINE FISHING HABITAT DEVELOPMENT

CHAPTER 9

SPECIAL PROBLEMS

CHAPTER 9

SPECIAL PROBLEMS

9-01. Introduction.

As with a good portion of government agencies, the present climate of budget cuts is being reflected in an austerity program consisting of belt tightening and the postponement of new construction. At East Lynn Lake this equates not only with the elimination of many of the proposed improvements for existing recreational facilities, but with the plans for the future development of additional facilities, as well. These special problems are further defined and discussed below.

9-02. Operations and Maintenance.

Due primarily to fiscal policy decisions beyond the control of the Corps of Engineers, the scope of duties and responsibilities performed by the Corps have been reduced at the Project. Since the planning and implementation of major capital improvements for both existing and proposed recreational facilities is no longer financially feasible, the Corps has concerned itself with preserving the status quo. Yet, there are a number of maintenance and operational problems that the Corps of Engineers need to address in the near future.

a. Vandalism. The most serious offense against any park project is the malicious destruction of park property such as the burning of the restroom facility at East Fork Camping Area 6. This type of vandalism is an economic burden both in terms of replacing the facility and in terms of lost revenues due to the disruption of the utilization of the Camping Area during peak summer months.

The problem at East Fork is somewhat unique in that the Camping Area's location is easily accessible from secondary roads off Project property while simultaneously being in a remote area from the standpoint of Project surveillance.

To remedy this situation, it is recommended that the State of West Virginia vacate the dedicated State Route 33 from State Route 37 to State Route 35 where it crosses Project lands and buffer the Camping Area by any means available to deter non-visitor trespass from the south.

Educating the public through programs conducted at the interpretive center will hopefully help alleviate some of the vandalism problems. Such programs will help the visitor understand the reasoning behind certain Corps management policies and thus understand why certain roads are barricaded or certain areas off limits to specific uses.

b. Overcrowding at East Fork Beach. Overcrowding at East Fork Beach is reaching epidemic proportions in terms of its inability to safely support the number of visitors currently using the resources. Parking is not only grossly inadequate, but is also presenting a dangerous circulation problem to both through traffic on State Route 37 and visitor traffic to and from the East Fork Camping and Day-Use Area.

To help alleviate overcrowding, it is recommended that (1) development of Lick Creek Beach be started as soon as practical to decentralize the visitor demand for swimming facilities at the Lake, (2) future road re-alignment alternatives be seriously considered which will separate East Fork Camp through-traffic from parking areas serving the beach, and (3) the parking at East Fork Beach be increased. It is also the recommendation of this Master Plan Update that serious consideration be given to the addition of restrooms and changing rooms at East Fork Beach as soon as funds become available.

c. Alternative Sources of Revenue. In order to meet rising operating costs, sources of additional revenues must be found to continue the existing quality of recreational services provided at East Lynn Lake. A possible alternative is raising the camping fees to levels which reflect those of state and private camping facilities within the immediate vicinity of the Project.

Another approach to providing the necessary improvements would be for the Corps of Engineers to relinquish their recreational responsibilities at East Lynn Lake to the State of West Virginia Department of Parks and Recreation. The Corps would remain sole proprietor of the Project, but the various recreational sites would be leased to the State. Under such an agreement, the State will be responsible for the administration and maintenance of the recreational areas.

9-03. Environmental Considerations.

a. Mining Operations. A continued threat to the water quality and subsequent fishing habitats at East Lynn Lake are the active mining operations which presently exist outside the Project boundaries.

Mining activity should be monitored in this area to help control any mining operations which could degrade the lake. Reports of potential or existing problems should be made to the State of West Virginia Water Control Board, Department of Health, and Department of Natural Resources, as well as the Federal Environmental Protection Agency.

b. Bank Erosion. Erosion of the shorelines of East Lynn Lake is an on-going environmental problem and needs to be continuously monitored and controlled in order to preserve both the water quality of fish habitats and the appearance and utilization of existing recreational areas. Unlike many other types of maintenance related activities at East Lynn Lake, bank erosion can only become worse and increasingly more expensive if left uncorrected.

Bank erosion stabilization areas are proposed for various areas on the East Fork. It is highly recommended that any and all bank erosion areas within the Project be given a high priority and be addressed regardless of the funding available for capital improvements.

CHAPTER 10

OPERATIONAL MANAGEMENT

CHAPTER 10

OPERATIONAL MANAGEMENT

10-01. Operational Mangement Plan

In conformance with ER 1130-2-400, the District Operations Division is currently preparing an Operational Management Plan.

This plan combines the information previously contained in the Project Resource Management, Forest Management, Fire Protection, Fish and Wildlife Management and Project Safety Plans. It will be subject to approval by the District Engineer and will appear under separate cover.

CHAPTER 11

ESTIMATED COST

CHAPTER 11

ESTIMATED COST

11-01. Summary of Estimated Cost.

The estimated total cost of construction for proposed recreational facilities in the East Lynn Lake Project is \$747,600.00 and the estimated cost for future facilities is \$262,700.00. These figures reflect the basic development costs plus the incurred expenses during the implementation and administration of the program.

11-02. Facility Cost.

All cost estimates shown in this Chapter are based on 1984 price levels. Unit prices are derived from: 1) bid tabulations supplied by the Corps of Engineers for recently completed projects, 2) Mean's 1984 Cost Estimating Catalogue, and 3) bid tabulations from recently completed public projects by Woolpert Consultants as of 1984.

11-03. Allocation of Cost.

Table 11-01 provides a summary of estimated total cost for proposed and future facility development at each recreational area in the project.

Table 11-1

EAST LYNN LAKE
SUMMARY OF ESTIMATED COSTS FOR
RECREATIONAL FACILITIES BY RECREATION AREA

Recreational Area	Proposed	Future
Dam and Tailwater Area	\$190,000.00	
Overlook and Day-Use Area	\$244,500.00	
Lick Creek Boat Launching and Picnic Area	\$ 41,400.00	\$255,600.00
Lake Side Marina	\$ 21,300.00	\$ 7,100.00
East Fork Beach	\$ 5,400.00	
East Fork Day-Use Area	\$ 26,700.00	
East Fork Camping Areas 1, 2, and 3	\$113,000.00	
East Fork Camping Areas 4, 5, and 6	\$ 92,100.00	
Laurel Creek Camping Area	\$ 13,200.00	
Total Recreational Facility Costs	\$747,600.00	\$262,700.00

INCLUDES: Approximately 25% Contingency, 10% Engineering and Design, and 10% Supervision and Administration. All cost estimates are based on August, 1984 price levels.

The costs reflect the basic development of each site plus the costs for contingencies, engineering and design, supervision, and administration fees.

Tables 11-2 through 11-10 provide detailed cost estimates for recreational facilities in each recreation area. These costs reflect the itemized calculation of proposed and future development in each recreation area.

Table 11-2

COST ESTIMATES
DAM AND TAILWATER AREA

Item	Description	Unit	Unit Price	Quantity	TOTAL COST	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
	Deciduous Trees	Each	\$ 150.00	27	\$ 4,050.00	
2.	INSTALL SIGN					
	Site Identification	Each	\$ 800.00	1	\$ 800.00	
3.	INSTALL VEHICULAR GATE					
	14' Gate	Each	\$ 1,500.00	1	\$ 1,500.00	
4.	SHORELINE FISHING IMPROVEMENTS	Lin.Ft.	3.00	350	\$ 1,050.00	
5.	PICNIC FACILITIES (includes materials and installation)					
a.	Shelters	Lump Sum	\$ 18,000.00	3	\$ 54,000.00	
b.	Picnic Tables	Each	\$ 380.00	24	\$ 9,120.00	

Table 11-2 (Continued)

COST ESTIMATES
DAM AND TAILWATER AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
c.	Grills					
	Individual	Each	\$ 170.00	8	\$ 1,360.00	
	Group Use	Each	\$ 390.00	3	\$ 1,170.00	
d.	Trash Receptacles	Each	\$ 160.00	14	\$ 2,240.00	
6.	PAVEMENT REMOVAL	Sq.Yds.	\$ 2.00	1,200	\$ 2,400.00	
7.	CONSTRUCT WALKWAY PAVEMENT (Bituminous Concrete)	Sq.Yds.	\$ 12.00	577	\$ 6,924.00	
8.	CONSTRUCT GRAVEL TRAIL (2' Wide)	Sq.Yds.	\$ 3.00	256	\$ 768.00	
9.	RELOCATE EXISTING PLAYGROUND (Includes all site preparation, new play apparatus, surface material, and edging)	Lump Sum	\$ 26,000.00	1	\$ 26,000.00	
10.	PEDESTRIAN BRIDGE (100')	Lump Sum	\$ 15,000.00	1	\$ 15,000.00	

Table 11-2 (Continued)

COST ESTIMATES
DAM AND TAILWATER AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
					\$ 126,800.00	
	SUB TOTAL					
	Contingency				\$ 31,200.00	
	Engineering and Design				\$ 16,000.00	
	Supervision and Administration				\$ 16,000.00	
	TOTAL				\$ 190,000.00	

Table 11-3

COST ESTIMATES
OVERLOOK AND DAY USE AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
a.	Coniferous Trees	Each	\$ 125.00	42	\$ 5,250.00	
b.	Deciduous Trees	Each	\$ 150.00	224	\$ 33,600.00	
2.	ROADWAY IMPROVEMENTS					
a.	Upgrading and Extension of Gravel Road (18' x 470')	Sq.Yds.	\$ 5.00	940	\$ 4,700.00	
b.	Construct Vehicular Turnaround (Bituminous Concrete)	Sq.Yds.	\$ 14.00	279	\$ 3,906.00	
3.	PARKING IMPROVEMENTS					
a.	Construct Lot (Bituminous Concrete)	Sq.Yds.	\$ 14.00	156	\$ 2,184.00	
b.	Precast Concrete Parking Blocks	Each	\$ 35.00	7	\$ 245.00	
c.	Pavement Striping	Lin.Ft.	\$ 0.40	160	\$ 64.00	

Table 11-3 (Continued)

COST ESTIMATES
OVERLOOK AND DAY USE AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
4.	WALKWAY IMPROVEMENTS					
a.	Paved walkway	Sq.Yds.	\$ 12.00	1,620	\$ 19,440.00	
b.	Staired access walkway to waterfront (120 Lin. Ft.)	Lump Sum	\$ 6,000.00	1	\$ 6,000.00	
5.	CONSTRUCT HANDICAPPED ACCESSIBLE OVERLOOK	Lump Sum	\$ 15,000.00	1	\$ 15,000.00	
6.	UPGRADE EXISTING OVERLOOK	Lump Sum	\$ 7,500.00	1	\$ 7,500.00	
7.	SELECTIVE VEGETATIVE CLEARING	Acres	\$ 4,000.00	1	\$ 4,000.00	
8.	INSTALL VEHICULAR GATES					
a.	28' Wide	Each	\$ 2,500.00	2	\$ 5,000.00	
b.	14' Wide	Each	\$ 1,500.00	1	\$ 1,500.00	

Table 11-3 (Continued)

COST ESTIMATES
OVERLOOK AND DAY USE AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
SUB TOTAL					\$ 162,969.00	
Contingency					\$ 40,731.00	
Engineering and Design					\$ 20,400.00	
Supervision and Administration					\$ 20,400.00	
TOTAL					\$ 244,500.00	

Table 11-3 (Continued)

COST ESTIMATES
OVERLOOK AND DAY USE AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
9.	CONSTRUCT NEW SIGN					
	Class III	Each	\$ 1,500.00	1	\$ 1,500.00	
10.	SLOPE EROSION CONTROL AREA (Plant Material and R.R. Tie Retaining Walls)	Lump Sum	\$ 3,000.00	1	\$ 3,000.00	
11.	PICNIC FACILITIES (includes materials and installation shelters)					
a.	Picnic Shelters	Each	\$ 18,000.00	2	\$ 36,000.00	
b.	Picnic Tables	Each	\$ 380.00	28	\$ 10,640.00	
c.	Grills					
	Individual	Each	\$ 170.00	10	\$ 1,700.00	
	Group Use	Each	\$ 390.00	2	\$ 780.00	
d.	Trash Receptacles	Each	\$ 160.00	6	\$ 960.00	

Table 11-4

COST ESTIMATES
LICK CREEK BOAT LAUNCHING AND PICNIC AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation-deciduous trees)	Each	\$ 150.00	50		\$ 7,500.00
2.	ROADWAY IMPROVEMENTS					
	Upgrade Gravel Road	Sq. Yds.	\$ 5.00	3,250	\$ 16,250.00	
3.	ASPHALT PAVEMENT REMOVAL (6 parking spaces)	Sq. Yds.	\$ 2.00	250		\$ 500.00
4.	PARKING LOT IMPROVEMENTS					
a.	Construct Lot (Bituminous Concrete) (43 spaces)	Sq. Yds.	\$ 14.00	2,000		\$ 28,000.00
b.	Precast Concrete Parking Blocks	Each	\$ 35.00	43		\$ 1,505.00
c.	Pavement Striping	Lin. Ft.	\$ 0.40	860		\$ 344.00
d.	Construct Traffic Islands	Lump Sum	\$ 6,400.00	1		\$ 6,400.00
5.	GRAVEL LOT IMPROVEMENTS					
a.	Construct Gravel Lot	Sq. Yds.	\$ 5.00	555	\$ 2,775.00	
b.	Precast Concrete Parking Blocks	Each	\$ 35.00	8	\$ 280.00	

Table 11-4 (Continued)

COST ESTIMATES
LICK CREEK BOAT LAUNCHING AND PICNIC AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
6.	INSTALL SIGN					
	Site Identification	Each	\$ 800.00	1	\$ 800.00	
7.	INSTALL VEHICULAR GATES					
	22' Wide	Each	\$ 2,000.00	2	\$ 4,000.00	
8.	CONSTRUCT WALKWAY (Bituminous Concrete)	Sq.Yds.	\$ 12.00	67		\$ 804.00
9.	LOCATE PORTABLE RESTROOMS (As Required by Demand)	Each	\$ 3,000.00	2		\$ 6,000.00
10.	PEDESTRIAN BRIDGE	Lump Sum	\$ 5,000.00	1		\$ 5,000.00
11.	CONSTRUCT BEACH					
a.	Buoys (Swimming Limit)	Each	\$ 200.00	6		\$ 1,200.00
	Buoys (Warning)	Each	\$ 200.00	3		\$ 600.00
b.	Seeding	Sq.Yds.	\$ 0.40	4,500		\$ 1,800.00
c.	Sand	Cu.Yds.	\$ 20.00	2,500		\$ 50,000.00

Table 11-4 (Continued)

COST ESTIMATES
LICK CREEK BOAT LAUNCHING AND PICNIC AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
12.	CONSTRUCT PEDESTRIAN UNDERPASS					
a.	Concrete Pipe	Lin.Ft.	\$ 200.00	160		\$ 32,000.00
b.	Installation of Pipe	Lin.Ft.	\$ 170.00	160		\$ 27,200.00
c.	Roadway Reconstruction	Sq.Yds.	\$ 14.00	111		\$ 1,554.00
13.	SHORELINE FISHING IMPROVEMENTS	Lin.Ft.	\$ 3.00	1,160	\$ 3,480.00	
SUB TOTAL					\$ 27,585.00	\$170,407.00
Contingency					\$ 6,915.00	\$ 42,593.00
Engineering and Design					\$ 3,450.00	\$ 21,300.00
Supervision and Administration					\$ 3,450.00	\$ 21,300.00
TOTAL					\$ 41,400.00	\$255,600.00

Table 11-5

COST ESTIMATES
LAKE SIDE MARINA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
a.	Coniferous Trees	Each	\$ 125.00	13	\$ 1,625.00	
b.	Deciduous Trees	Each	\$ 150.00	70	\$ 10,500.00	
2.	INSTALL SIGN					
	Site Entry	Each	\$ 2,000.00	1	\$ 2,000.00	
3.	SHORELINE FISHING IMPROVEMENTS	Lin.Ft.	\$ 3.00	750		\$ 2,250.00
4.	INSTALL BOAT SLIPS	Each	\$ 2,000.00	32		\$ 64,000.00*
5.	CONSTRUCT HIKING TRAIL	Lin.Ft.	\$ 3.00	817		\$ 2,451.00
SUB TOTAL					\$ 14,125.00	\$ 4,701.00
Contingency					\$ 3,575.00	\$ 1,175.00
Engineering and Design					\$ 1,800.00	\$ 600.00
Supervision and Administration					\$ 1,800.00	\$ 600.00
TOTAL					\$ 21,300.00	\$ 7,100.00

* Cost to be incurred by concessionaire

Table 11-6

COST ESTIMATES
EAST FORK BEACH

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	INSTALL SIGNS					
a.	Site Entry	Each	\$ 2,000.00	1	\$ 2,000.00	
b.	Site Identification	Each	\$ 800.00	2	\$ 1,600.00	
SUB TOTAL					\$ 3,600.00	
Contingency					\$ 900.00	
Engineering and Design					\$ 450.00	
Supervision and Administration					\$ 450.00	
TOTAL					\$ 5,400.00	

Table 11-7

COST ESTIMATES
EAST FORK DAY-USE AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
a.	Coniferous Trees	Each	\$ 125.00	6	\$ 750.00	
b.	Deciduous Trees	Each	\$ 150.00	57	\$ 8,550.00	
2.	SHORELINE STABILIZATION (Stone Rip Rap)	Cu.Yds.	\$ 28.00	307	\$ 8,596.00	
SUB TOTAL					\$ 17,896.00	
Contingency					\$ 4,404.00	
Engineering and Design					\$ 2,200.00	
Supervision and Administration					\$ 2,200.00	
TOTAL					\$ 26,700.00	

Table 11-8

COST ESTIMATES
EAST FORK CAMPING AREAS 1, 2, AND 3

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
a.	Coniferous Trees	Each	\$ 125.00	57	\$ 7,125.00	
b.	Deciduous Trees	Each	\$ 150.00	392	\$ 58,800.00	
2.	INSTALL VEHICULAR GATE					
	14' Wide	Each	\$ 1,500.00	1	\$ 1,500.00	
3.	INSTALL SIGNS					
	Site Identification	Each	\$ 800.00	2	\$ 1,600.00	
4.	SHORELINE FISHING IMPROVEMENTS	Lin.Ft.	\$ 3.00	460	\$ 1,380.00	
5.	SHORELINE STABILIZATION (Stone Rip Rap)	Cu.Yds.	\$ 28.00	171	\$ 4,788.00	

Table 11-8 (Continued)

COST ESTIMATES
EAST FORK CAMPING AREAS 1, 2, AND 3

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
SUB TOTAL					\$ 75,193.00	
Contingency					\$ 18,807.00	
Engineering and Design					\$ 9,500.00	
Supervision and Administration					\$ 9,500.00	
TOTAL					\$113,000.00	

Table 11-9

COST ESTIMATES
EAST FORK CAMPING AREAS 4, 5, AND 6

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (includes materials and installation)					
a.	Coniferous Trees	Each	\$ 125.00	15	\$ 1,875.00	
b.	Deciduous Trees	Each	\$ 150.00	209	\$ 31,350.00	
2.	INSTALL VEHICULAR GATE					
	22' Wide	Each	\$ 2,000.00	1	\$ 2,000.00	
3.	INSTALL SIGN					
	Site Identification	Each	\$ 800.00	1	\$ 800.00	
4.	PARKING IMPROVEMENTS					
a.	Construct Gravel Parking Lot (3 Spaces)	Sq.Yds.	\$ 5.00	67	\$ 335.00	
b.	Precast Concrete Parking Blocks	Each	\$ 35.00	3	\$ 105.00	

Table 11-9 (Continued)

COST ESTIMATES
EAST FORK CAMPING AREAS 4, 5, AND 6

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
5.	SHORELINE FISHING IMPROVEMENTS	Lin.Ft.	\$ 3.00	310	\$ 930.00	
6.	CONSTRUCT NEW PLAYGROUND (Includes all site preparation and new creative play apparatus)	Lump Sum	\$ 24,000.00	1	\$ 24,000.00	
SUB TOTAL					\$ 61,395.00	
Contingency					\$ 15,305.00	
Engineering and Design					\$ 7,700.00	
Supervision and Administration					\$ 7,700.00	
TOTAL					\$ 92,100.00	

Table 11-10

COST ESTIMATES
LAUREL CREEK CAMPING AREA

Item	Description	Unit	Unit Price	Quantity	Total Cost	
					Proposed	Future
1.	LANDSCAPE PLANTING (including materials and installation)					
	Deciduous Trees	Each	\$ 150.00	40	\$ 6,000.00	
2.	INSTALL SIGN					
	Site Identification	Each	\$ 800.00	1	\$ 800.00	
3.	INSTALL VEHICULAR GATE					
	22' Wide	Each	\$ 2,000.00	1	\$ 2,000.00	
SUB TOTAL					\$ 8,800.00	
Contingency					\$ 2,200.00	
Engineering and Design					\$ 1,100.00	
Supervision					\$ 1,100.00	
TOTAL					\$ 13,200.00	

CHAPTER 12

CONCLUSIONS

CHAPTER 12

CONCLUSIONS

12-01. Master Plan Update Conclusions.

This Master Plan Update establishes a set of guidelines to be followed in the further development and management of East Lynn Lake. It should be emphasized that this is not a rigid plan for action, but rather a set of performance standards which should set the tone for future planning and development efforts.

Due to fiscal reductions and the present economic climate, many of the capital expenditures necessary for both existing and proposed recreational facilities at East Lynn Lake have had to be tabled. When the economy improves, or alternative sources of revenue can be found, it will be necessary to reevaluate the development strategies in order to provide a more comprehensive development plan. Recommendations for future recreational facilities and capital improvements required at existing facilities will need to be addressed at this time.

CHAPTER 13

RECOMMENDATIONS

CHAPTER 13

RECOMMENDATIONS

13-01. Master Plan Update Recommendations.

It is recommended that:

- a. This Master Plan Update be accepted and used to guide the present and future development, use, and management of East Lynn Lake; and
- b. Further detailed plans be prepared to insure continuity of design between proposed and existing recreational facilities; and
- c. Upon the availability of additional revenues, further planning and development studies be conducted in order to provide necessary capital improvements of existing and proposed recreational areas as outlined in this report.

APPENDIX I

COMMENTS FROM OTHER AGENCIES



United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825B VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401
April 25, 1984

Mr. Donald W. Herndon, Chief
Environmental Planning Branch,
Planning Division
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701

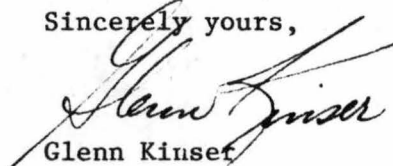
Dear Mr. Herndon:

The U.S. Fish and Wildlife Service has reviewed the Final Draft Master Plan Update for East Lynn Lake, Wayne County, West Virginia, as per your request of March 1, 1984. This constitutes the report of the Fish and Wildlife Service on the document and is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

For the most part the Fish and Wildlife Service has no objection to the plan. We do have concerns with the proposed swimming beach and parking area along Lick Creek. According to Photo Map, Exhibit No. 9 and page 135 of your report, this activity would involve relocation of a small stream. This Service discourages stream channelization and often opposes such projects unless extenuating circumstances exists. Alternatives to re-locating this stream should be carefully analyzed prior to finalizing project plans. Alternatives and project plans should be coordinated with this Service and mitigative measures utilized, if necessary.

Thank you for the opportunity to comment at this stage of the planning process. We look forward to receiving the final plans, as they become available.

Sincerely yours,


Glenn Kinsey
Supervisor
Annapolis Field Office



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

MAR 30 1984

Donald W. Herndon
Chief, Planning Division
Department of the Army
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701

Re: COMMENTS - East Lynn Lake, Twelvepole Creek, Wayne County,
West Virginia (A. COE. D34013 WV);
Final Draft Master Plan Update

Dear Mr. Herndon:

Pursuant to authority granted to the USEPA under Section 309 of the Clean Air Act (P.L. 91-604), we have reviewed the Corps of Engineers Master Plan update for the East Lynn Lake. Our primary objectives were to evaluate the implementation of the Corps' policy in management of the facility's resources, and, to assess the impacts of this plan on the Twelvepole Creek and adjacent land areas. Our comments are presented for your consideration.

Our general conclusions were that the plan adequately identified the needs of the East Lynn Lake area; addressed the central issues in managing and in further developing the recreational resources of the East Lynn Lake; and, provided a series of procedures to maintain those resources for the current, and future, enhancement of the fish and wildlife of this area. Consequently, this project is rated LO-1 in the USEPA reference category.

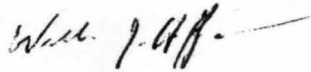
There are two additional areas which should receive further analysis by the Corps of Engineers:

- (a) We acknowledge that the preponderance of the proposed activities are the rehabilitation of, or addition to, existing recreational and public-use areas. However, it is essential that all wetlands and exceptional wildlife habitat areas in reasonable proximity to the recreational areas are identified and that appropriate procedures will be developed to avoid, or, substantially mitigate, any adverse impacts to these areas.
- (b) The East Lynn Project was defined as primarily consisting of operations... "for flood control, recreation, and fish and wildlife conservation." (p. iv; Design Memorandum No. 4c). If a hydroelectric generating unit(s) is proposed for the basin at the East Lynn Dam, we would expect your detailed analysis of that proposal with a

discussion of the anticipated environmental impacts, primarily those impacting the aquatic biota/habitat and water quality.

Thank you for the opportunity to review and comment upon this document. If there are any questions or comments, contact Mr. Robert C. Runowski (215-597-6289).

Sincerely,



John R. Pomponio, Chief
Environmental Impact and
Marine Policy Branch



STATE OF WEST VIRGINIA
DEPARTMENT OF NATURAL RESOURCES
CHARLESTON 25305

JOHN D. ROCKEFELLER IV
Governor

May 17, 1984

WILLIS H. HERTIG, JR.
Director

RONALD R. POTESTA
Deputy Director

Mr. Donald W. Herndon
Chief, Planning Division
Environmental Planning Branch
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701

RE: East Lynn Lake Final Draft
Master Plan Update

Dear Mr. Herndon:

The West Virginia Department of Natural Resources (WVDNR) has reviewed the subject document and offers the following comments.

General

1. The Master Plan does not include the new lease agreement between the Wildlife Resources Division (WRD) of this department and the U. S. Army Corps of Engineers (COE). This recently signed document will significantly alter certain maps and text sections. The WRD's Wildlife Management Plan for the affected lands will soon be available for COE review.

2. The discussions of the water quality and fishery resources are misleading. The former hinders the fishery potential of the lake and should be stated in order to justify measures that may alleviate such problems (e.g., lake fertilization, aeration).

3. The WVDNR wishes to review the fire protection plan that is cited in Chapter 12.

Specific

Exhibit 1 - This map should be revised as I-64 is complete to Charleston.

Page 41, Section b -- Contrary to the statements in this section, recreational fishing probably occurs year round (especially from February to December).

Mr. Donald W. Herndon

Page Two

May 17, 1984

Page 47, Sect. 5-09 and Page 63, Par. 5 -- Relatively high iron levels coupled with low productivity support poor to fair water quality conditions rather than "good." If the state-of-the-art technology to alleviate such problems in large impoundments exist, it would behoove the COE to formulate plans to enhance water quality.

Page 63, Par. 4, Sent. 1 -- This sentence is misleading as it implies the fishery is exceptional. The fishery resource potential is hindered due to the water quality limitations stated in the previous comment.

Page 77, Par. 1 -- The WVDNR recommends that handicapped citizen features be included in the footbridge design if possible.

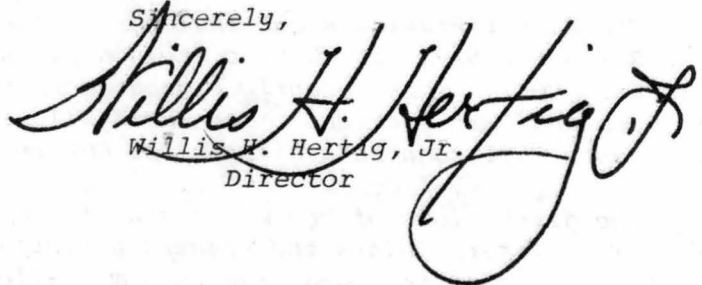
Page 80, Par. 3 -- If handicapped citizen use is intended for these trails, a macadam surface would be more appropriate.

Page 152, Par. 2 -- Contrary to statements here, stockings are not made to maintain a constant trout population. The tailwater trout stockings occur in February, March, April and May to maintain a "put and take" fishery only.

Page 152, Par. 1, Sent. 1 -- The first sentence should be altered to read, "The ¹⁵³primary wildlife species to be managed on the project include deer, grouse, squirrel, rabbit, fox, turkey and raccoon." Quail management in this area is impractical and should be deleted.

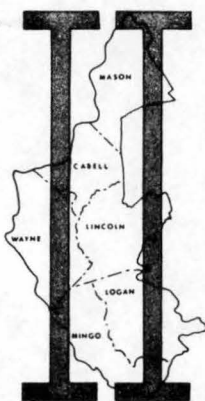
Thank you for the opportunity to review this document. Should you have any questions regardingg our comments, please contact H. G. Woodrum, Environmental Analysis Section, at 348-2761.

Sincerely,


Willis W. Hertig, Jr.
Director

WHH/hws

cc: U. S. Fish and Wildlife Service
Division of Wildlife Resources



REGION II PLANNING AND DEVELOPMENT COUNCIL

P.O. BOX 939 • 1221 SIXTH AVENUE
HUNTINGTON, WEST VIRGINIA 25712

SAM KAPOURALES, CHAIRMAN
RAY CRABTREE, EXECUTIVE DIRECTOR
PHONE (304) 529-3357

March 7, 1984

Department of the Army
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, WV 25701

ATTENTION: Mr. Donald W. Herndon, Chief Planning Division

re: Master Plan Update - East Lynn Lake

Dear Mr. Herndon:

The project referenced above meets the requirements of the Intergovernmental Review Process and the Regional Development goals. This agency hereby concurs with this project proposal with the following exceptions:

1. Planned day use areas do not include tennis courts;
2. Trail roads to include bicycling.

This letter will certify that the review requirements of the areawide clearinghouse have been fulfilled.

If this agency can be of further assistance, please advise.

Sincerely,

Ray Crabtree
Executive Director

RC/JS/b

DEPARTMENT OF CULTURE AND HISTORY



STATE OF WEST VIRGINIA
JOHN D. ROCKEFELLER IV, GOVERNOR

NORMAN L. FAGAN, COMMISSIONER

March 6, 1984

Donald W. Herndon
Chief, Planning Division
U.S. Army Corps of Engineers
Huntington District
502 Eighth Street
Huntington, West Virginia 25701

Dear Mr. Herndon:

RE: Final Draft Master Plan Update
East Lynn Lake, Wayne County, WV

We have reviewed your Final Draft Master Plan Update of March 1, 1984, in which you bring to our attention the proposed development plans for East Lynn Lake, Twelvepole Creek, Wayne County, West Virginia.

The information we currently possess in our inventory indicates that the project should not affect any historic or archaeological properties now known to us. This reflects an in-office review and not a systematic field survey and evaluation of the subject area.

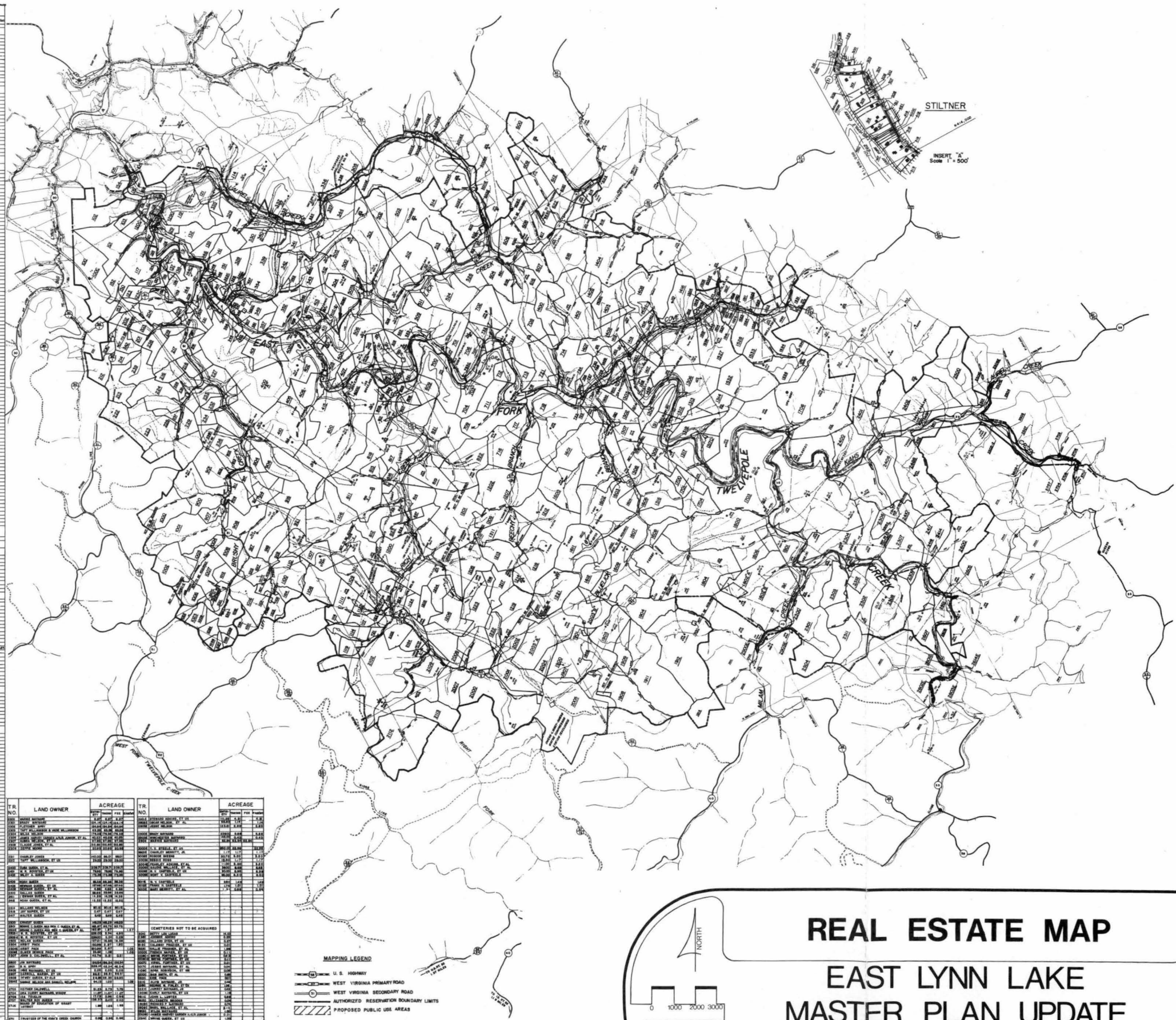
Thank you for the opportunity to respond on this matter. If we may be of further assistance, please contact our office.

Sincerely,

Rodney S. Collins
Director
Historic Preservation Unit

RSC:kfs;apw

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REAL ESTATE MAP

EAST LYNN LAKE

MASTER PLAN UPDATE

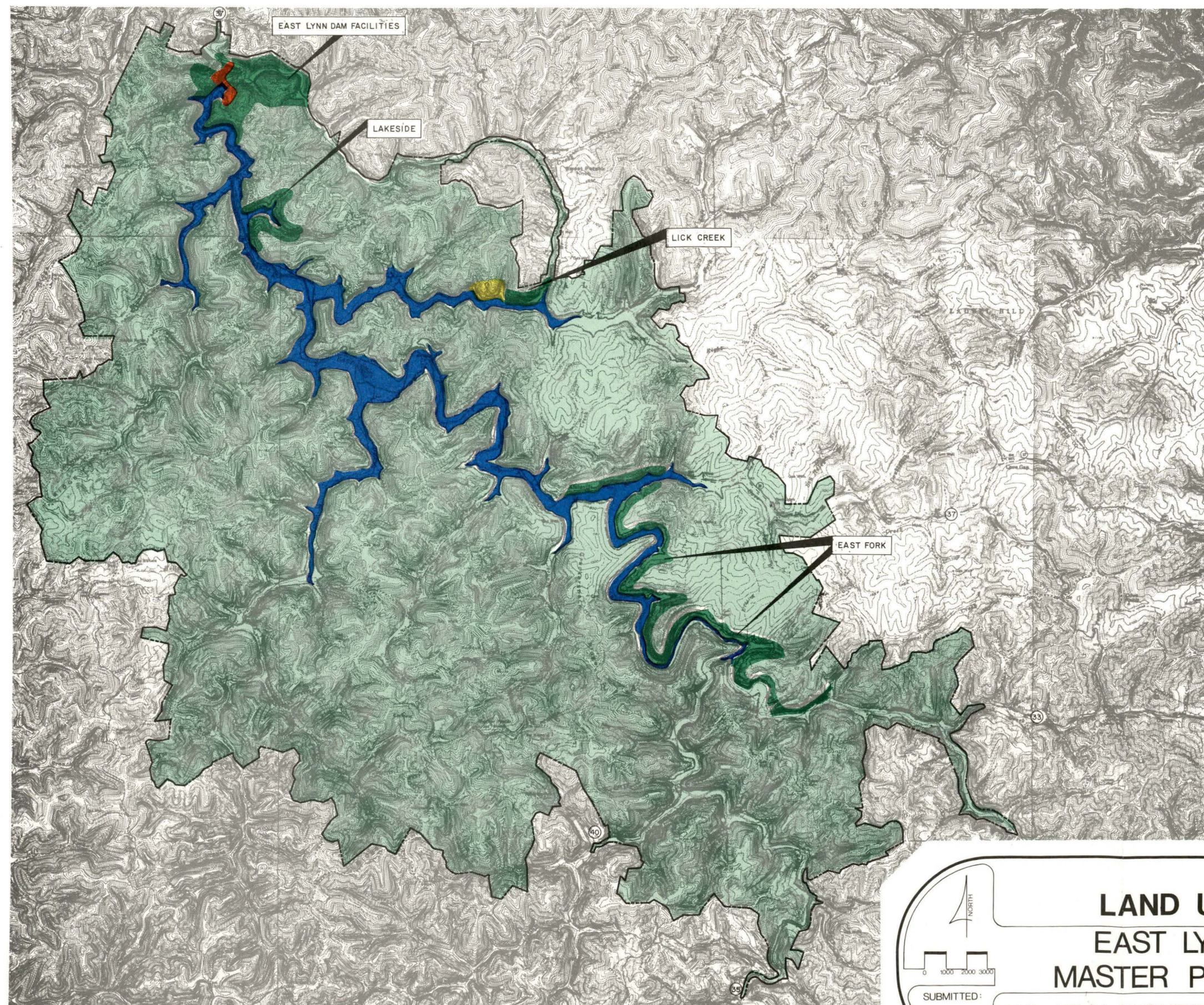
SUBMITTED:

U.S. ARMY ENGINEER DISTRICT, HUNTINGTON

CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA

Prepared by:
WOOLPERT
CONSULTANTS

EXHIBIT NO.
3

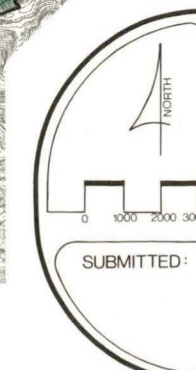


LEGEND

- PROJECT OPERATIONS
- OPERATIONS - RECREATION INTENSIVE
- GROUP-USE AREA
- OPERATIONS - WILDLIFE MANAGEMENT

- NOT SHOWN WINTER POOL, EL. 656 M.S.L.
- SEASONAL POOL, EL. 662 M.S.L.
- 701--- MAXIMUM FLOOD CONTROL POOL, EL. 701 M.S.L.
- RECREATION AREA - EXISTING
- RECREATION AREA - PROPOSED
- WEST VIRGINIA SECONDARY ROUTE
- U.S. GOVERNMENT PROPERTY LINE (FOR PROJECT)

SOURCE OF TOPOGRAPHY: UNITED STATES GEOLOGICAL SURVEY
7.5 MINUTE QUADRANGLE MAPS.



SUBMITTED:

LAND USE MAP EAST LYNN LAKE MASTER PLAN UPDATE

U.S. ARMY ENGINEER DISTRICT, HUNTINGTON
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Prepared by:
WOOLPERT
CONSULTANTS

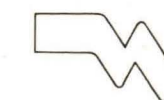
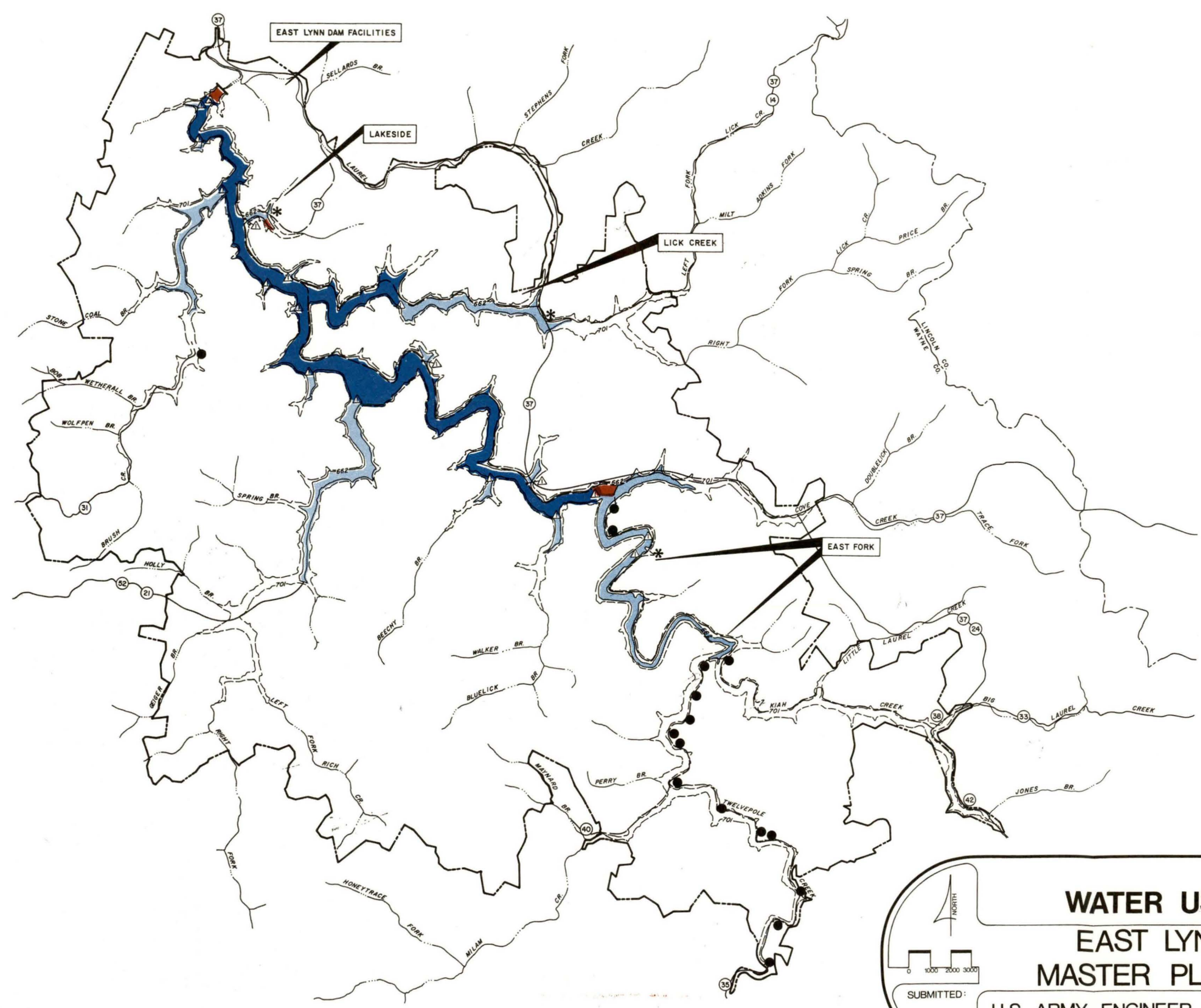


EXHIBIT NO.
5



LEGEND

- UNRESTRICTED
- BOAT EXCLUSION AREAS
- CONTROLLED AREAS
- * CREEL CENSUS STATION
- SMALL CRAFT ACCESS

BUOYS AND MARKERS

- CONTROLLED AREA
- DANGER
- BOATS KEEP OUT
- INFORMATION
- DIVER BELOW

NOT SHOWN WINTER POOL, EL. 656 M.S.L.

— 662 — SEASONAL POOL, EL. 662 M.S.L.

— 701 — MAXIMUM FLOOD CONTROL POOL, EL. 701 M.S.L.

RECREATION AREA - EXISTING

RECREATION AREA - PROPOSED

○ WEST VIRGINIA SECONDARY ROUTE

--- U.S. GOVERNMENT PROPERTY LINE (FOR PROJECT)

SOURCE OF TOPOGRAPHY: UNITED STATES GEOLOGICAL SURVEY
7.5 MINUTE QUADRANGLE MAPS.

WATER USE PLAN

EAST LYNN LAKE

MASTER PLAN UPDATE

SUBMITTED:

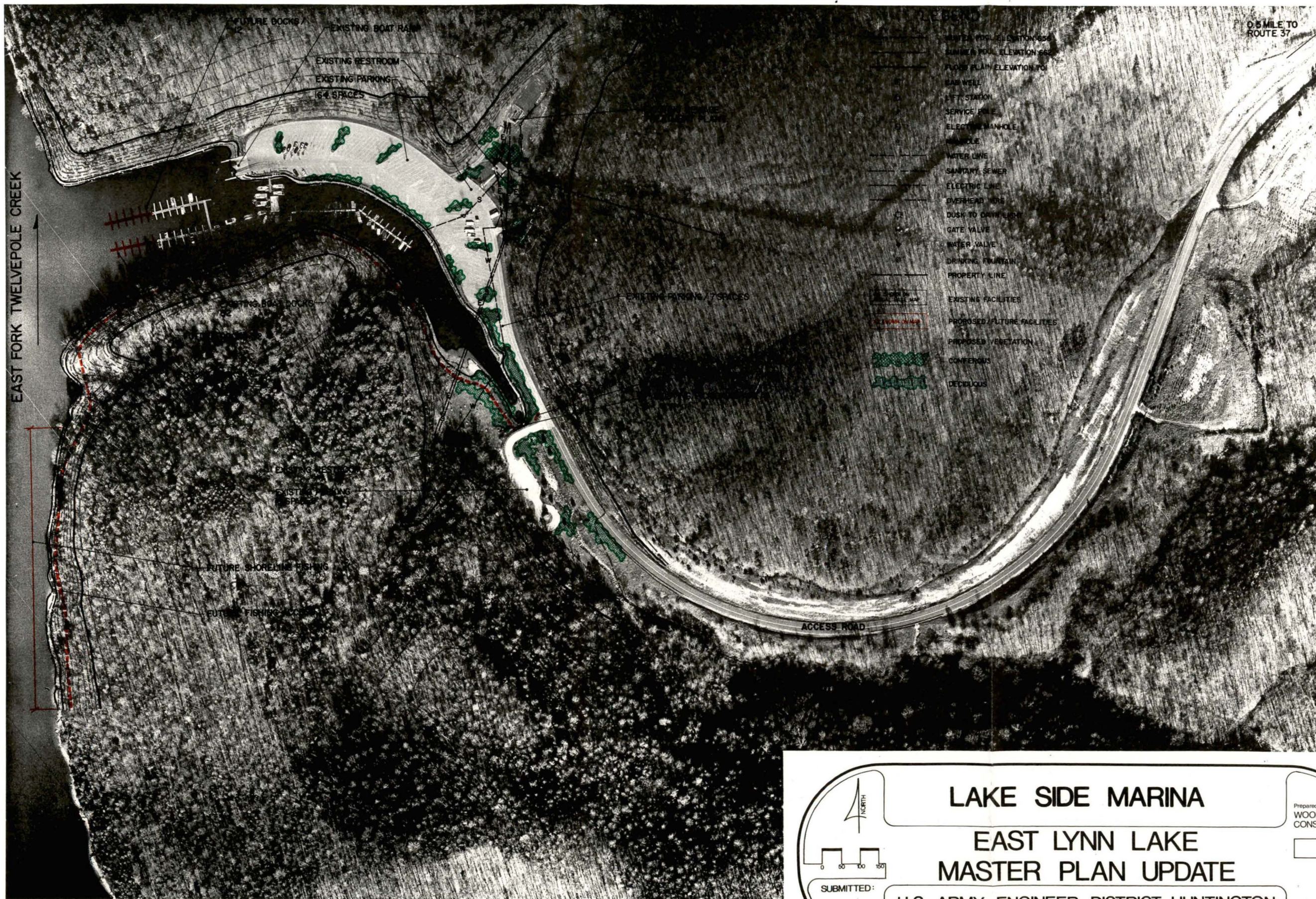
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CORPS OF ENGINEERS

HUNTINGTON, WEST VIRGINIA

Prepared by:
WOOLPERT
CONSULTANTS

EXHIBIT NO.
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NORTH



0 50 100 150

LAKE SIDE MARINA

EAST LYNN LAKE

MASTER PLAN UPDATE

U.S. ARMY ENGINEER DISTRICT, HUNTINGTON

CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA

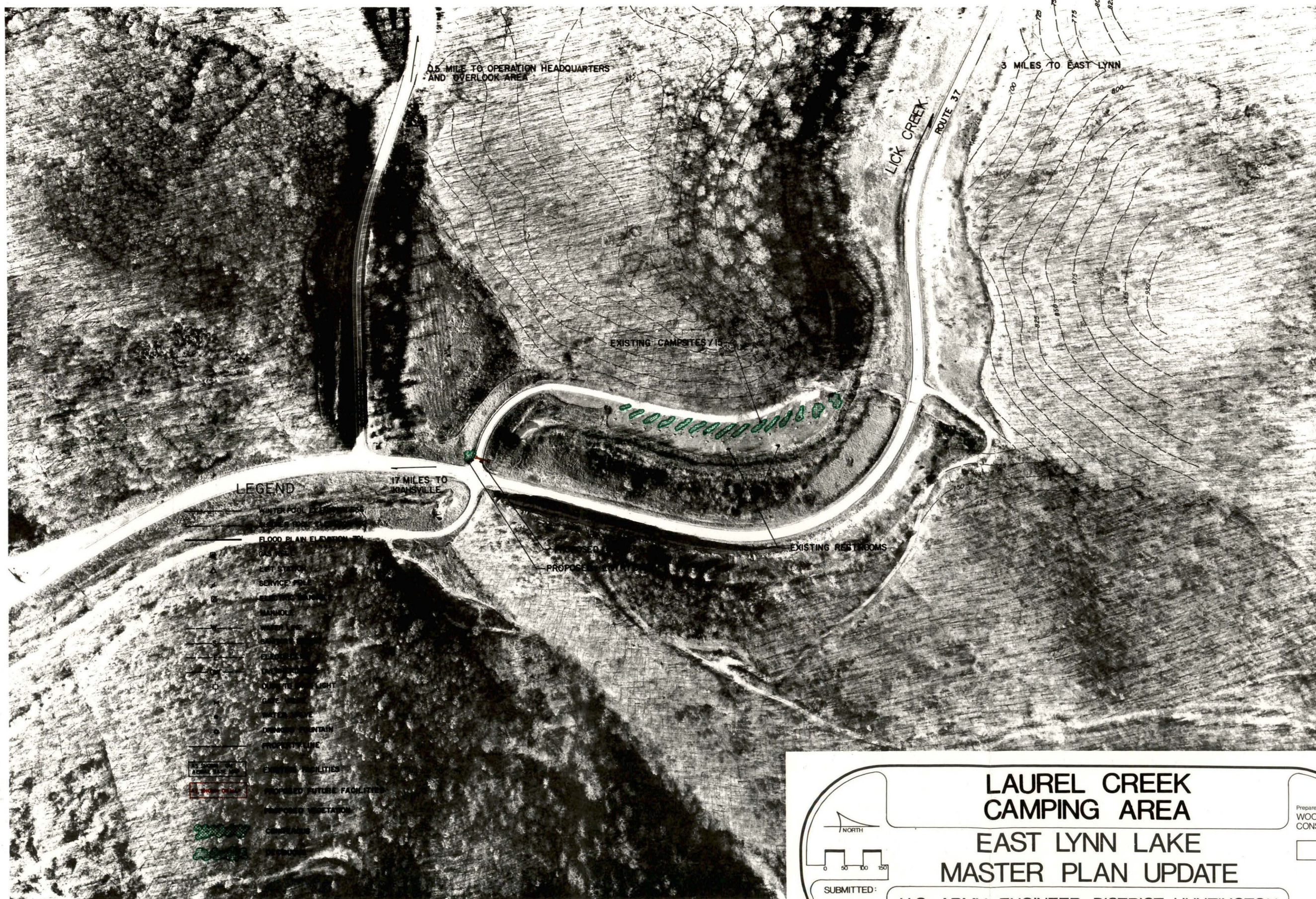
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CONSULTANTS



EXHIBIT NO.
10

SUBMITTED:

U.S. ARMY ENGINEER DISTRICT, HUNTINGTON



NORTH

0 50 100 150

SUBMITTED:

LAUREL CREEK CAMPING AREA

EAST LYNN LAKE MASTER PLAN UPDATE

U.S. ARMY ENGINEER DISTRICT, HUNTINGTON
CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA

Prepared by:
WOOLPERT
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EXHIBIT NO.
15