Design
Memorandum
No. 13

February 1977

35

BLACK BUTTE LAKE

Stony Creek, California

MASTER PLAN

SPDCO-O (8 Mar 77) 3rd Ind
SUBJECT: Black Butte Lake, Stony Creek, California; Design Memorandum No. 13, Master Plan

DA, South Pacific Division, Corps of Engineers, 630 Sansome Street, Room 1216, San Francisco, California 94111 12 SEP 1977

TO: District Engineer, Sacramento, ATTN: SPKCO

1. District responses to comments of 1st Indorsement have been reviewed.

2. The Master Plan is approved subject to the following comments:

a. To satisfy the coordination requirements of ER 1120-2-400, it will, as a minimum, be necessary to send copies of the final plan to the NPS, BOR, and EPA. Results of this coordination will be included in a future update or supplement if appropriate.

b. Considerable reference has been made to the conceptual nature of this Master Plan. In this regard, you are reminded that Feature Design Memorandums will be required prior to Plans and Specifications, (see DAEN-CWE-M letter, dated 3 November 1976, "Development of Feature Design Memorandums for Recreation Facilities").

c. District response to Comments 5b and 5c of the 1st Indorsement note that certain details are not appropriate for a conceptual master plan. In general, it is correct that details on the type of equipment or materials to be used are not necessary in a master plan. The exception to the general rule is when the item in question may substantially affect other aspects of the master plan, including the cost estimate. Because the choice between standard and water-conserving fixtures may affect the master planning (e.g., by affecting the type or size of water system necessary, the area required for waste treatment and disposal, and the cost) the decision on this item is appropriately covered in the master plan rather than at a later stage.

d. In the case of Black Butte, in view of the fact that water conserving fixtures are incorporated in the present contract for sanitary upgrade, no change in this master plan will be required.

William E. Vandenberg

WILLIAM E. VANDENBERG
Colonel, CE
Acting Division Engineer

2 Incl
2. Comments
3. Responses
wd incl 4

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

SPKED-W

8 March 1977

SUBJECT: Black Butte Lake, Stony Creek, California; Design Memorandum No. 13, Master Plan

Division Engineer, South Pacific

1. Submitted for review and approval are ten copies of the subject master plan prepared in accordance with instructions contained in ER 1120-2-400. Your previous comments on the draft of the master plan have been incorporated.

2. The master plan has been indorsed by the District Real Estate Division pursuant to requirements of ER 405-2-835.

3. It is recommended that the master plan be approved as a guide for the preservation, development, and administration of recreation and other resources of the Black Butte Lake project.

1 Incl (10 cys)
DM No. 13 dtd Feb 77

DONALD M. O'SHEI
Colonel, CE
District Engineer

SPDCO-O (8 Mar 77) 1st Ind
SUBJECT: Black Butte Lake, Stony Creek, California; Design Memorandum No. 13, Master Plan

DA, South Pacific Division, Corps of Engineers, 630 Sansome Street, Room 1216, San Francisco, California 94111 22 June 1977

TO: District Engineer, Sacramento, ATTN: SPKCO

1. Comments on the subject master plan are attached as Inclosure 2.

2. Please submit information which is responsive to the comments and which can be incorporated into an approval statement. Submit revised pages should you determine that course of action to be more appropriate.

FOR THE DIVISION ENGINEER:

DONALD C. BAER, Chief
Construction-Operations Division

1 Incl
1. wd
Added 1 Incl
2. Comments

SOUTH PACIFIC DIVISION COMMENTS
ON
DESIGN MEMORANDUM NO. 13, MASTER PLAN
BLACK BUTTE LAKE, STONY CREEK, CALIFORNIA

1. Page 21, Paragraph 27, Application of Legislative and Administrative Requirements for Cost-Sharing, and Page 27, Paragraph 33, Recreation Site and Area Plan - Immediate Phase. New recreational facilities which would not be allowed under P.L. 89-72 are not allowable under the administrative requirements now in effect. Thus, provision of parking lots for 198 cars at Buckhorn recreation area, development of a nature trail at Lower Stony Creek recreation area, and construction of a hiking trail between the visitor center and Eagle Pass recreation area may not be carried out without cost sharing unless there is a change in or waiver of policy. The items listed above should be identified as requiring cost sharing or the reasons they are exempt from cost sharing should be specified. (ER 1120-2-404; EC 11-2-127)

2. Page 25, Chapter VI, Coordination With Other Agencies. The master plan should be coordinated with the State and areawide clearinghouses, with those agencies specified in Appendix C of ER 1120-2-400, and with any other parties likely to have particular interest in the plan of development and management of the project. (ER 1105-2-800, para. 6; ER 1105-2-811, para. 7a(4))

3. Page 27, Paragraph 32, Zoning of Project Lands and Waters, and Page 58, Paragraph 70, Management of the Forage Resource. Grazing is not an acceptable use for project lands except on an interim basis or in special circumstances. The proposed zoning to permit continued use of 3,028 acres, some 38 percent of the total fee acreage, for grazing seems particularly inappropriate in view of the recognized detriment of grazing to wildlife habitat and native vegetation regeneration. Furthermore, it suggests that large areas are surplus to project needs. The zoning of all lands should be reevaluated based upon the phasing out of grazing. If grazing is to be allowed on an interim basis or to be used as a management tool, this should be explained. (ER 1120-2-400, para. 12a)

4. Page 32, Paragraph 33f, Lower Stony Creek. What improvements will be made to adapt the existing fishing access area for use by handicapped persons should be explained. The suitability of portable restrooms for use by handicapped persons should be addressed. Permanent restrooms should be considered.

5. Page 41, Paragraph 39d, Water and Sanitation Requirements, and Page 43, Paragraph 44, Waste Collection and Treatment Systems.

a. The text should be made consistent regarding the number of campers per toilet fixture (20 or 25) since the total number of fixtures will depend on what figure is used. If a safety factor is involved, this should be stated although it would appear that a sufficient number of fixtures have been added (beyond design requirements) in order to provide reasonable walking distances and should obviate the need for a safety factor. The cost estimate should be revised if necessary.

b. Possible use of water conserving type fixtures for future restrooms should be discussed.

c. The possibility that the water system capacity requirements as well as the capacities of wastewater facilities could be reduced in size if water saving fixtures are provided should be discussed. Such water conservation provisions should be incorporated in the planning.

d. The term "central primary treatment plant" should be clarified. If this is other than a central septic tank, the system should be described and the cost estimate adjusted.

e. How boats equipped with marine sanitation devices will be accommodated or dealt with should be addressed in light of the EPA regulations (40 CFR Part 140) which prohibit discharge from boats. If boat pumpout facilities will be needed, these should be identified and costs should be estimated.

6. Page 43, Paragraph 43, Water Systems. Reference is made in the text to storage tanks for domestic, irrigation and fire fighting use. Clarification should be provided that these tanks exist and are adequate for the proposed uses or they should be added to the cost estimate.

7. Page 61, Chapter XI, Cost Estimates. The rock wall listed on page 63, if it is as it appears in photo 2 in the visitor center concept on page 47, is a decorative stone wall, mortar set. The cost should be reviewed to insure that it includes excavation, concrete footing, stone, and all labor. An estimate of $6 to $8 per square foot of wall area would be more realistic than the given estimate of $15 per ton.

SPKED-W (8 Mar 77) 2d Ind
SUBJECT: Black Butte Lake, Stony Creek, California; Design Memorandum No. 13, Master Plan

DA, Sacramento District, Corps of Engineers, 650 Capitol Mall, Sacramento, California 95814 16 August 1977

TO: Division Engineer, South Pacific, ATTN: SPDCO-O

1. Responses to comments of 1st Indorsement are provided as Inclosure 3. Numbers correspond to numbers of Inclosure 2.

2. Revised pages have been prepared and are provided as Inclosure 4 for insertion into your copies of the Master Plan.

FOR THE DISTRICT ENGINEER:

G. W. PROBASCO
Chief, Construction-Operations Division

2 Incl
Added 2 incl
3. Responses
Rev pages (10 cys)

Sacramento District Analysis and Disposition of South Pacific Division Comments Dated 22 June 1977 on Black Butte Lake Master Plan

1. It is not considered appropriate to require cost-sharing of these three recreation features for the reasons described below. Except for the trail between the visitor center and Eagle Pass, the facilities described are not new facilities. Proposed parking at Buckhorn would be upgrading the existing semi-improved parking areas and is needed to correct an operational deficiency and to prevent further degradation of the area. The nature trail is formalization of existing primitive fishermen access paths to eliminate a safety problem, reduce impact on the natural environment, and to control erosion. The hiking trail at the visitor center would be built as part of the center and would not require cost-sharing. Paragraphs 27 and 33, therefore, do not need revision.

2. Chapter VI was revised as shown on revised pages (Inclosure 4). A synopsis of the master plan was coordinated with the State Clearinghouse and no response was received. There is no areawide clearinghouse for this portion of the Sacramento Valley.

3. The master plan has been revised to indicate the interim nature of grazing on project lands (Inclosure 4). Grazing, when properly controlled, is an appropriate use of the forage resource. An annual range survey will be conducted until grazing is phased out in order to determine how many animal unit months will be permitted to graze project lands and not result in detrimental impact to wildlife habitat and native vegetation regeneration.

4. Improvements for the handicapped consist of ramps, railings, and paving to permit safe wheelchair access to the waters' edge. Portable restrooms would be adapted to handicapped use. The description provided in paragraph 33f is considered sufficient for a conceptual master plan description. The area would receive limited use spread over a considerable distance and does not warrant construction of a permanent restroom.

5. The first item below requires a revised page; the others do not.

a. This is a typographical error; the number of campers per toilet fixture should read 20. The master plan has been revised (Inclosure 4).

b. In a conceptual plan all that need be stated is that the restrooms should be flush. The actual nature of the flush facility is a design consideration to be finalized when plans and specifications are prepared.

c. In conceptual planning and cost estimating, the largest capacity is used based upon conventional flushing requirements. If, during final design, low-flow fixtures are determined practical, the capacity of the water system can be reduced while still remaining within the cost estimate appearing in the master plan.

d. Central primary treatment plant is a central septic tank.

e. There are no houseboats at this lake. Almost all trailered boats do not have self-contained toilets. There are only 20 boat mooring slips for rent at the marina. If pumpout facilities are ever needed, they will be provided by the marina operator as part of the service he provides under the terms of his contract.

6. Paragraph 43 clearly states that water storage tanks are present in existing public use areas and are adequate to supply the existing level of use. Where new or expanded water supplies are needed, the line item "Treatment plant" in the cost estimate tables includes costs for water treatment plant package unit, prefab metal building, pneumatic tank or booster pumps, and steel storage tank.

7. The decorative rock wall is 4 feet high, 12 inches wide, and 1040 feet long. Table II has been revised to read: Item, Rock wall; Quantity, 4160; Unit, SF; Unit Price $5.50; Amount $22,850. The total cost of the Observation Area is then increased from $130,000 to $150,000. Corresponding changes have also been made to Table I. (See Inclosure 4.)

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL	SUBJECT
SPKED-W	Design Memorandum No. 13, Black Butte Lake Master Plan

TO Chief, Real Estate Division FROM Chief, Engineering Div DATE 11 May 76 CMT 1
MacDonald/bm/2364

1. Transmitted is a copy of subject Design Memorandum for your review and approval.

2. Pursuant to the provisions of ER405-2-835, your concurrence of the proposed land use classification, development and management program will be an indorsement to this report.

for WEDDELL

1 Incl
as

cc: (wo Incl)
Wtr Res Plng Br
Env Plng Sec (wd)

SPKRE-A (11 May 76)

To Chief, Engineering Div From Chief, Real Estate Div Date 1 Jun 76 CMT 2
CLARK/jmr/2591

Real Estate Division concurs with the proposed land use classification, development, and management program as specified in the subject Master Plan.

WHEELER

1 Incl
nc

DESIGN MEMORANDUM NO. 13

BLACK BUTTE LAKE
STONY CREEK, CALIFORNIA

Master Plan

~~January 1977~~
FEB 19

Department of the Army
Sacramento District, Corps of Engineers
Sacramento, California

BLACK BUTTE LAKE

STONY CREEK, CALIFORNIA

MASTER PLAN

~~January 1977~~
FEB 1977

REVISIONS

Date	New Pages or Drawings

BLACK BUTTE LAKE
STONY CREEK, CALIFORNIA

DESIGN MEMORANDUMS

No.	Date	Title	Approved
VI	Apr 48	Malaria & Encephalitis Control-DPR	OCE 28Dec 48
	29 June 51	Spillway Design Flood & Maximum Wind & Wave Action	OCE 30Aug 51
1	1 May 57	Hydrology	OCE 17Oct 57
2	2 Jan 58	Real Estate	OCE 7Apr 59
3	1 Feb 58	Relocations	OCE 8Dec 58
	15 Nov 60	Supplement No. 1	OCE 25Jul 61
	10 Oct 58	Preliminary Cost Allocation	OCE 12May 59
4	1 Jan 59	Dam & Appurtenances	OCE 18Jun 59
	15 Mar 59	Supplement No. 1	OCE 18Jun 59
	6 Oct 59	Supplement No. 2	SPD 9Oct 59
5	1 May 58	Administration & Utility Bldgs	(Cancelled)
6	30 Jan 59	Preliminary Recreation and Management Plan	OCE 22Apr 59
	14 Apr 61	Supplement No. 1(Rev 9Jun61)	OCE 11Sep 61
7	Apr 59	Reservoir Regulation	OCE 25Jun 59
8	7 Aug 59	General Design	OCE 15Oct 59
	8 Mar 60	Supplement No. 1	OCE 30Mar 60
9	15 Jan 60	Reservoir Clearing	OCE 11Feb 60
10	Mar 62	Master Plan with Appendix C	OCE 21Nov 62
11	15 Nov 62	Operators Quarters and Fallout Protection	OCE 25Jan 63

DESIGN MEMORANDUM NO. 13
BLACK BUTTE LAKE
STONY CREEK, CALIFORNIA

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DESIGN MEMORANDUM NO. 13
BLACK BUTTE LAKE
STONY CREEK, CALIFORNIA

MASTER PLAN

CHAPTER I - INTRODUCTION

1. Project authorization. - The Black Butte Project on Stony Creek, California, was authorized as part of the comprehensive plan of development for the Sacramento River Basin, California, by the Flood Control Act of 1944, Public Law No. 534, 78th Congress, 2nd Session, approved 22 December 1944, to be constructed substantially in accordance with the recommendations of the Chief of Engineers contained in House Document 649, 78th Congress, 2nd Session. Improvements of the land and water areas for public purposes are authorized by Section 4 of the Flood Control Act of 1944, as amended.

2. Project purposes. - The project, comprising Black Butte Dam and Lake, was authorized for flood control and other purposes. Operation of the project affords flood protection, irrigation water supply and recreation opportunities.

3. Purpose and scope of master plan. - This master plan will be used by the Corps of Engineers to guide the administration and development of all project land and water. As public use needs change, this master plan will be updated to be consistant with these requirements. This master plan prescribes the policies, objectives, and programs for the continuation of conservation, enhancement, development, use and management of all project lands, waters and other resources. It identifies the resources of the project and describes the manner in which public use needs and other uses of the land and water resources will be met. Facility development, operation and management are described and discussed. The Master Plan supercedes the Master Plan dated March 1962.

4. Prior pertinent design memoranda. - Prior pertinent design memoranda include:

No. 6 - "Preliminary Recreation and Management Plan" appproved by OCE 22 April 1959.

No. 10 - "Master Plan" approved by OCE 21 November 1962.

Another document pertinent to this master plan is the "Environmental Assessment" dated February 1974, available in Sacramento District files.

5. Application of public laws. -

a. Public Law 78-534 Flood Control Act of 1944, as amended. - This act authorized the Corps of Engineers to construct, operate and maintain

recreation facilities at reservoir areas, and to grant leases of lands (including facilities thereon); and to construct certain public works, including Black Butte Dam.

b. Public Law 85-624, Fish and Wildlife Coordination Act, approved 12 August 1958. - This act provides for integration of fish and wildlife conservation with Federal water resource development programs.

c. Public Law 88-29, Outdoor Recreation Federal-State Programs, approved 28 May 1963. - This act promotes the coordination and development of effective programs relating to outdoor recreation.

d. Public Law 88-578, Land and Water Conservation Fund, approved 3 September 1964, and amendments. - This act establishes a program for providing urgently needed public outdoor recreation areas and facilities, and for funding such activities.

e. Public Law 89-72, Federal Water Project Recreation Act, approved 9 June 1965. - This act establishes Federal Policy for outdoor recreation planning and coordination at Federal water resource projects. Such policy requires non-Federal sharing of not less than one-half the separable costs allocated to recreation, and assumption of all operation, maintenance, and replacement costs. An amendment in 1974 provides that fish and wildlife enhancement requires non-Federal assumption of at least 25 percent of the separable cost and assumption of all operation and maintenance.

f. Public Law 89-665, National Historic Preservation Act of 1966, approved 15 October 1966. - This act establishes a program for the preservation of historic properties throughout the nation.

g. Public Law 91-190, National Environmental Policy Act of 1969, approved 1 January 1970. - This act establishes a national policy to encourage productive and enjoyable harmony between man and his environment, and directs that all Federal agencies shall consider the environmental impact of proposed Federal actions which may have an impact on man's environment.

h. Public Law 92-500, Federal Water Pollution Control Act Amendments of 1972, approved 18 October 1972, amends the Federal Water Pollution Control Act of 1961 (Public Law 87-88). This act provides for the restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters.

i. Public Law 93-291, Historical and Archeological Data Preservation Act, approved 24 May 1974, amends the Reservoir Salvage Act of 1960 (Public Law 86-523). This act provides for the preservation of historical and archeological data which might be irreparably lost or destroyed as the result of a Federal construction project or Federally licensed activity or program.

CHAPTER II - PROJECT DESCRIPTION

6. Location. - Black Butte Lake (Photo 1) is located on Stony Creek in the eastern foothills of the Coast Range, about 100 miles north of the city of Sacramento, California. The nearest population center, Orland, is located 9 miles east of the project. The northern portion of the lake, including two of the three developed recreation areas, and the observation area, lies within Tehama County; the southern portion lies in Glenn County. Primary access to the project is afforded by a good two lane, paved, county road from the city of Orland. This county road connects at this city with Interstate Highway 5, a major north-south freeway route. The location of the project is shown on plate 1.

PHOTO 1 - Black Butte dam and lake

7. Project data. -

a. Basin hydrologic and climate summary. - The Stony Creek Drainage Basin above Black Butte Dam encompasses 741 square miles. The average annual runoff (unimpeded) of the river at this point (average inflow) is 418,600 acre-feet. Prior to the construction of the dam, records indicate that frequently the flow had been 0 cubic feet per second at that location. The maximum instantaneous peak natural flow (reconstructed) was estimated to be about 60,000 second-feet on 11 December 1937. The Standard Project Flood protection provided by Black Butte Dam reduces maximum stream flow to 15,000 second-feet. Flood flows on Stony Creek are caused by heavy winter rains. They have sharp, high peaks, are usually of short duration, have comparatively small volume, and can occur in rapid succession. The runoff is not greatly affected by snowmelt. Low flows prevail in the Stony Creek basin from June through October. The basin has a temperate, semiarid climate characterized by cool, wet winters and warm, dry summers. Annual precipitation averages about 32 inches in the Stony Creek watershed. About 87 percent of the precipitation occurs during the months of November through April. The normal monthly distribution at Orland is shown in the following tabulation:

Average Monthly Precipitation at Orland (Elev. 254)*

Month	Inches	Percent of Annual	Month	Inches	Percent of Annual
Jan	3.57	19.7	Jul	0.03	0.2
Feb	3.09	17.0	Aug	0.03	0.2
Mar	2.37	13.0	Sep	0.40	2.2
Apr	1.30	7.2	Oct	1.00	5.5
May	0.71	3.9	Nov	1.95	10.7
Jun	0.34	1.9	Dec	3.36	18.5
Total				18.15	100.0

*Period of record 1882 - 1962

On the valley floor, practically all of the precipitation occurs as rain, while in the mountains it occurs as rain during the summer and rain or snow during other seasons. Winter storms usually produce rain up to the 5,000 foot elevation, and snow at the higher elevations. Temperatures in the Black Butte Lake area have ranged from a winter low of 18°F to a summer high of 120°F. The monthly distribution of mean temperatures at Orland is given in the following tabulation:

Monthly Mean Temperature - Orland (Elev. 254)*

Month	oF	oC	Month	oF	oC
Jan	45.7	7.61	Jul	82.1	27.83
Feb	49.9	9.94	Aug	79.8	26.56
Mar	54.3	12.39	Sep	73.8	23.22
Apr	60.3	15.72	Oct	64.8	18.22
May	68.0	20.00	Nov	54.3	12.39
Jun	76.1	24.50	Dec	46.8	8.22

*Period of Record 1883 - 1962

b. Lake characteristics. - Black Butte Lake, at gross pool (473.5 feet, USGS Datum), is 6.8 miles long, has a surface area of 4,560 acres, a shoreline 40 miles long, and contains 160,000 acre-feet of water. Inactive pool is at elevation 414.6 feet with a surface area of 770 acres, a length of 2.9 miles and a capacity of 10,000 acre-feet. The mean pool during the 1965 through 1975 recreation seasons (15 March through 15 August) was at elevation 453.5 feet with a surface area of 3,128 acres and a shoreline length of 23 miles. The relationship between surface area and capacity of the lake is shown on chart 1.

c. Lands. - Project lands total 8,917.5 acres of which 8,074.0 acres are held in fee, and 843.5 acres are in easements.

d. Project structures. -

Main Dam

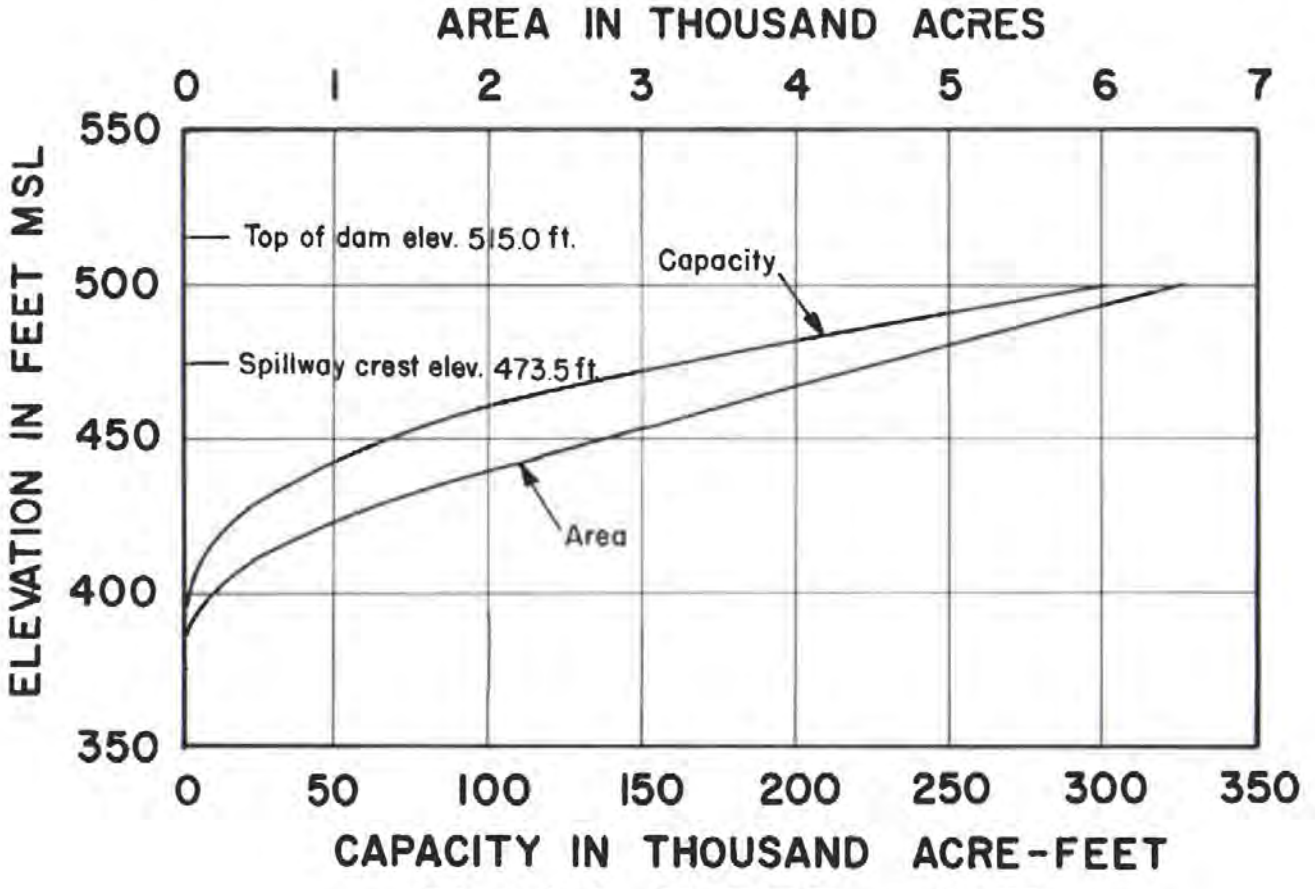
Type	Rolled earthfill
Elevation, top of dam	515.0 feet
Freeboard above spillway design flood pool	5.2 feet
Maximum height above streambed	140 feet
Length of crest	2,970 feet

Dikes

Number	6
Type	Rolled earthfill
Elevation (crest)	515.0 feet
Freeboard above spillway design flood pool	5.2 feet

Spillway

Type	Uncontrolled weir
Crest elevation	473.5 feet
Spillway design flood (pool elev.)	509.8 feet
Crest length	118 feet



BLACK BUTTE LAKE
AREA AND CAPACITY CURVES

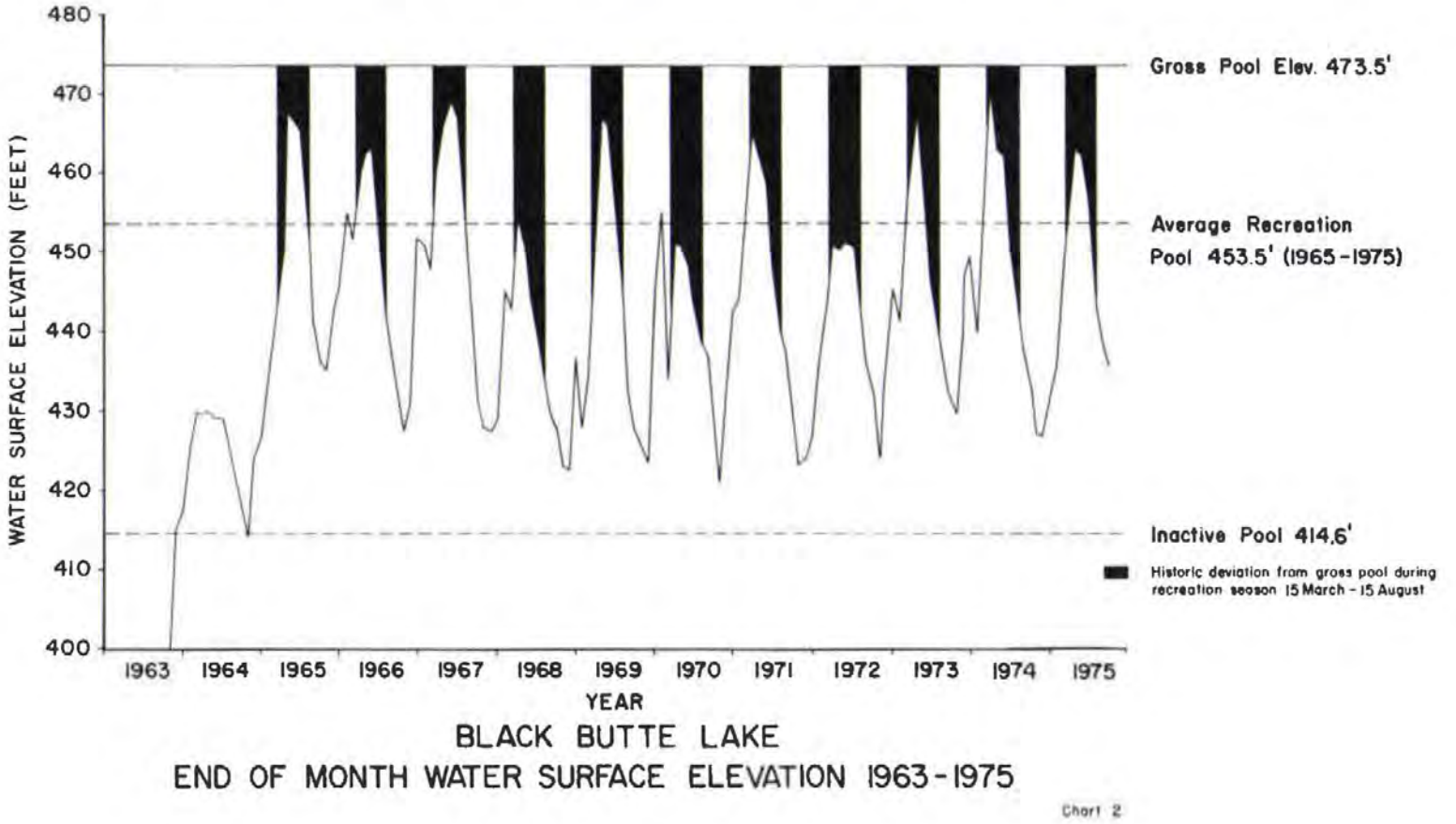
Chart 1

8. Lake operation. - Black Butte Lake is operated for flood control and irrigation purposes. Lake operation during the flood season is designed to reserve as much space for flood control as is necessary to control the lake design rainflood and, if any, forecasted snowmelt runoff. During the rain flood season (1 October to 15 March), flood protection is accomplished by reservation and use of 150,000 acre-feet of storage space to control flood flows. The flood control space in Black Butte Lake may be reduced by the amount of space, up to specified limits, known to exist in East Park and Stony Gorge Reservoirs. Stony Gorge and East Park Reservoirs were constructed by the U.S. Bureau of Reclamation (USBR) in 1928 and 1910, respectively, and partially regulate Stony Creek inflow to Black Butte Lake. The space available in these reservoirs for controlling floods is variable, since they are operated primarily for irrigation. The operation of Black Butte Lake for irrigation supply was integrated into the Central Valley Project of the U.S.B.R. on 23 October 1970. Stored water may be exchanged between East Park, Stony Gorge and Black Butte Lakes in order to maximize the conservation utilization of the stored water. In addition, conservation releases from Black Butte are coordinated with the operation requirements of the Glenn-Colusa Irrigation District. During years with low rainfall, releases for irrigation may draw the lake down to below inactive pool. Historical lake operation since impoundment is shown on chart 2. Specific lake operation information is detailed in Design Memorandum No. 7, "Reservoir Regulation Manual - Black Butte Lake."

9. Visitation. -

a. Existing. - Annual visitation records were started for Black Butte Lake in 1964 when 107,600 recreation days were recorded. Since 1964, visitation has fluctuated considerably with the highest annual visitation, 251,500 recreation days, recorded in 1975. Annual visitation from 1964 through 1975 is shown in the following tabulation:

Year	Attendance
1964	107,600
1965	155,820
1966	213,390
1967	179,740
1968	148,770
1969	136,940
1970	156,390
1971	232,300
1972	222,290
1973	170,540
1974	161,630
1975	251,500
Average (1964-1975)	178,076



BLACK BUTTE LAKE

END OF MONTH WATER SURFACE ELEVATION 1963-1975

Chart 2

Combined data from Corps of Engineers recreation use surveys conducted from 1964 through 1968 indicate the pattern of use at Black Butte Lake to be as shown in the following tabulation:

Item	Spring	Summer	Fall	Weighted Average
% of visitors on weekends	80	57	64	68
Number of persons per vehicle	3.1	3.5	2.7	3.2
% vehicles with boat trailers	11	28	6	18
% fishing	28	15	39	23
% camping on project	2	6	2	3
% picnicking	38	50	24	42
% swimming	12	51	1	30
% water skiing	10	35	3	21
% pleasure boating	4	7	3	6
% sightseeing	42	15	44	28

NOTE: Since the same individual often participates in more than one activity, the sum of the percentages exceeds 100.

Over 80 percent of annual visitation can be expected to occur during a five month recreation season (15 March - 15 August).

b. Projected. - The upper limit of recreation use which should be experienced at the project -- the "Maximum Practical Use" (MPU) -- depends upon the amount of water surface area provided by the lake and the amount of developable land within the project area. The MPU of Black Butte Lake is estimated to be 710,000 recreation days annually; however, based on population trends and anticipated participation rates, only 490,000 recreation days of use annually is expected by the year 2076. Greater detail on estimated recreation use is presented in paragraphs 26 and 38. Actual increases from present use levels depends upon population increases in the area served by the lake, upon per capita participation rates, upon the amount of future recreation developments which are made available to support this use, and other factors. Without developments such as are identified in this plan, little increase in present use levels is anticipated, or desirable.

CHAPTER III - PROJECT STATUS

10. Project development and operation chronology. - Construction of Black Butte Dam and appurtenances was initiated in June 1960. Closure of the dam was completed 15 November 1962. The overall project was completed in August 1963 except for minor additional recreation features. The Orland Buttes Campground and Eagle Pass Day Use Area, were opened to the public on 1 June 1964. The Buckhorn Recreation Area was completed in 1966. A marina concession commenced operation at the Eagle Pass Area in 1969; however, it was later moved to the Buckhorn Area. A motorcycle off-road vehicle area was formally established in 1975 adjacent to the Buckhorn Recreation Area. Some improvements were made in Fiscal Year 1976 using funds available through Title X of the Emergency Jobs and Unemployment Assistance Act of 1974, Public Law 93-567. Under this program the primitive campground at the Buckhorn Recreation Area was upgraded, picnic facilities were upgraded at Eagle Pass, visitor facilities were improved at the Observation Area and wildlife habitat improvements were made in the Squaw Point area.

11. Expenditures for public use and environmental resource development.

a. Federal government. - Capital expenditures by the Federal Government for recreation development at Black Butte Lake have totalled about $522,000. Operation and maintenance expenditures by the Federal Government for the recreation resource program at Black Butte Lake has averaged about $123,000 annually over the last five years, with $131,265 being spent in fiscal year 1975.

b. Non-Federal public. - There has been no capital expenditure by non-Federal public entities at Black Butte Lake.

c. Private recreation investment. - Capital expenditures by the marina concessionaire have totalled about $65,000.

12. Geologic. - The Stony Creek basin is underlain by a thick series of Mesozoic marine sediments overlain by Tertiary non-marine (alluvial) deposits. The marine formations, which rest unconformably on the bedrock complex are divided into three series; the Knoxville of Jurassic age and the Shasta and Chico of Cretaceous age. The Knoxville and Shasta series consist predominantly of dark gray carbonaeous shales with smaller amounts of sandstone, conglomerate and impure limestone. The lower part of the Chico series is similar to the Knoxville and Shasta but contains more sandstone. The upper Chico is composed chiefly of sandstone with numerous conglomerate beds and minor amounts of shale. The uppermost units of the foothill region, composed of Tertiary alluvial deposits, are divided into the Tehama and Red Bluff formations. The Black Butte formation, consisting of mudstone, sandstone, and poorly cemented conglomerate, occurs stratigraphically between the Chico and Tehama formations, and occurs only near the project area. The dominant feature of the project area is the basalt caps which form flat-topped buttes with near vertical edges on either side of the stream valley. There are at least two faults within the project area and two more are present about a mile upstream of the project boundary. A major fault occurs about one mile upstream from the dam at the western margin of the buttes where vertical displacement is in the order of 2,500 feet. These faults are not active and have no effect on the stability of Black Butte Dam.

13. Archeologic. - Black Butte Lake lies within the geographic territory of the Nomlaki people. This tribe is a subdivision of the Wintun group. Tribes of this group essentially occupied the entire west side of the Sacramento Valley from the Sacramento River to the crest of the Coast Range. Linguistically, the people belonged to the large language family of Penutian speakers who ethnographically occupied the interior valleys and hills of California. The Nomlaki were hunter-gatherers whose economic subsistence was based on the acorn and augmented by wild game and fish. Villages in this foothill region were placed on streambank terraces and consisted of individual houses with a rather substantial semi-subterranean structure built for the headman. An archaeological survey of the lake area was completed in 1949. Salvage operations were completed under the auspices of the National Park Service in 1961. A total of 104 archeological sites, chiefly village or habitation sites, were identified within or near the lake area. Further information may be obtained in "Salvage Archaeology in the Black Butte Reservoir Area, Glenn County, California" by Adam E. Treganza and Martin H. Hercksen available in Sacramento District files.

14. Historic. - Although the project area was undoubtedly visited during the Spanish occupation of California, little is known of early contact between the Indians and first white explorers. The early American fur trappers are assumed to have traversed the area in the 1820's; however,

their trapping was mostly along the Sacramento River or its east side tributaries. With the advance of civilization, the valley settlements became boom towns and the Indians were exploited as cheap or free labor. The west side foothills were used chiefly for grazing. No permanent settlements were established until the 1860's. During the 1860's the native Nomlaki Indians were relocated to small "rancherias" located in their historic areas. No Federal or state registered historic landmarks lie within the project area.

15. Ecologic. - A detailed "Environmental Assessment" was prepared in 1974 for Black Butte Lake and is available in Sacramento District files. A negative Finding of Fact and the Summary Environmental Assessment based upon this assessment appears in Appendix G. Situated at approximately 474 feet in elevation the lake is bordered almost exclusively by intermittent areas of grassland, chaparral and oak-woodland. Upper reaches of both arms of the lake have riparian vegetation.

The general condition of the terrestrial biological community is quite poor. Over a century of cattle and sheep grazing has reduced the quality of native grasses and stimulated native and introduced weeds. The grazing has limited the regeneration of native oaks and reduced wildlife habitat.

a. Vegetation. - There are five major vegetative cover types found in the foothill area around Black Butte Lake. They are: grassland; oak-woodland; chaparral; riparian; and agricultural. The grassland and oak-woodland are the predominant types. These vegetative cover types are characterized by such plant species as blue oak (Quercus douglasii) forming the dominant cover type, with an understory consisting of poison oak (Rhus diversiloba), wild hyacinth (Triteleia hyacinthina), burclover (Medicago hispida), filaree (Erodium sp.), lupine (Lupinus sp.) and wild oats (Avena fatua).

b. Fish and wildlife. - Prior to the construction of Black Butte Dam there was no significant year-round fishery within the project area. Although the area to be inundated was generally cleared of all trees during construction of the project, the Butte Mountain Creek arm of the lake was left uncleared for fish habitat and the area is popularly known now as "Fisherman's Cove." This area provides sufficient habitat to maintain a diverse aquatic community. Common fish species in Black Butte Lake include largemouth bass (Micropterus salmoides), smallmouth bass (M. dolomieni), striped bass (Morone saxatilis), bluegill (Lepomis macrochirus), green sunfish (L. cyanellus), red-ear sunfish (L. microlophus), black crappie (Pomoxis nigromaculatus), white crappie (P. annularis), channel catfish (Ictalurus catus) and a variety of nongame species.

Wildlife habitat around Black Butte Lake has been degraded by past grazing practices. Present Corps management of the forage resource has improved the habitat somewhat. The area surrounding the lake supports a

large population of black-tailed deer (Odocoileus hemionus columbianus). Other game species include California valley quail (Lophortyx californicus), mourning dove (Zenaidura macroura) and black-tailed jackrabbit (Lepus californicus). The lake provides resting habitat to numerous species of migratory waterfowl which seasonally traverse the Sacramento Valley. Numerous nongame mammals, birds and reptiles occupy the project area.

c. Vectors. - Anopheles freeborni, the malaria carrying mosquito, and Culex tarsalis, the encephalitis carrying mosquito are the principal vectors found at Black Butte Lake. There have been no outbreaks of these diseases in recent years and mosquito problems at Black Butte Lake are considered to be of little importance. The normal operation of the lake aids in keeping suitable mosquito habitat to a minimum.

16. Environmental and scenic quality. -

a. Scenic quality. - The visual character of Black Butte Lake is varied. The presence of the lake in an area which is hot and dry in the summer creates a striking visual scene. Changing cloud forms, reflections, and special lighting effects -- such as back lighting on ridges or afternoon setting sun on the buttes and surrounding hills -- further enhance the view. The presence of boaters and waterskiiers also contributes to the visual experience. The Butte Mountain Creek arm of the lake offers a somewhat secluded atmosphere and is suited for boat fishing. From the Buckhorn Recreation Area, short views of high relief across the lake to Black Butte and the Orland Buttes, as well as the Squaw Point area enhance the visitors' environment. The aspect and position of Eagle Pass Recreation Area provide a generally secluded visual environment. The relatively undisturbed southern slopes of Black Butte and surrounding prominences reduce the artificial distractions of the outlet tower, dam and observation area. The dam, however, has a relatively natural-appearing slope which resembles those of the neighboring buttes. The view from the Observation Area is impressive and includes the North Fork Stony Creek arm of the lake westward to the peaks of the Coast Range. The view from Orland Buttes Recreation Area provides a long, low-angle view to the north across the lake to Black Butte and the rolling shoreline of the western shore. When the lake level is low, the lakebed becomes exposed revealing large rather unsightly mud flats. The riparian vegetation colonizing the lakebed provides some visual relief.

b. Water quality. - The chemical quality of the water in Black Butte Lake is calcium-bicarbonate in character and is excellent for achieving all the beneficial uses. Dissolved oxygen is about 8.8 mg/l and changes only slightly with depth. Total dissolved solids within the lake varies from 330 mg/l at the surface to 98 mg/l at the bottom in the spring, and averages about 178 mg/l throughout the lake in the fall. Total nitrogen in the lake averages 0.32 mg/l and is only slightly higher in the spring. Phosphorus in the lake water averages about 0.07 mg/l and is highest in the spring. Water temperatures range from 38°F

(3.5°C) in the winter to 89°F (31.5°C) in the summer. Water quality deteriorates somewhat during the summer months when water inflow is low and recreation use is high.

17. Recreation. - Most recreation use of Black Butte Lake presently occurs in and originates from the developed northern and eastern shores of the lake with some use occurring at the undeveloped Burris Creek, Squaw Point, Nomlaki Coves and Grizzly Flat Recreation Areas on the western shore. A full spectrum of water-oriented and other recreation is available at Black Butte Lake which includes fishing, picnicking, camping, pleasure boating, water skiing, swimming, off-road motorcycling, hunting and sightseeing. These activities are expected to be continued and enhanced under the development plan detailed in Chapter VII. Opportunities for historic and environmental interpretation, hiking, biking and nature trails would also be provided. Recreation facilities currently available at Black Butte Lake include:

Area Facility	Camp Sites	Picnic Sites	Launch Lanes	Restroom Facilities: Flush	Vault	Portable	Parking: Car	Car-Trailer
Overlook		6		1			34 1/	
Eagle Pass		27	2		1	4	32 1/	60
Orland Buttes	31 2/	7	2		3		7	44
Burris Creek						2	30	
Buckhorn	65	4	2		1	22	15 1/	54
Lower Stony Creek						4	75	

NOTE: 1/ Additional parking available on graveled lots.
2/ Additional campsites include a ten unit group camp and 20 primitive sites.

CHAPTER V - FACTORS INFLUENCING AND CONSTRAINING RESOURCE DEVELOPMENT AND MANAGEMENT

18. General. - The development and management of resources at Black Butte Lake is primarily influenced by demography, topography, accessibility, distance from population centers, population trends, lake operation, nearby alternate recreation opportunities, funding, environmental quality, and the character of the recreation opportunities. Except for funding, these factors were considered in formulating the maximum practical use, and in developing a plan for the proper management of the project resources. In addition to the above factors, recreation development is severely constrained by the lack of non-Federal participation in cost-sharing and operation and maintenance.

19. Demography. - Most of the area surrounding Black Butte Lake is sparsely populated. The population of Glenn and Tehama Counties as of January 1975 was estimated to be 18,600 and 31,500 respectively. The three largest communities near the lake are Orland (population 3,060), Corning (population 3,780), and Willows (population 4,460). The dominant industry in the area is agriculture, principally livestock production, with a lesser amount of irrigated and dry farming. Population growth rates projected by the California Department of Finance anticipate little population expansion within the area.

20. Topography, geology and soils. - The topography and geology around Black Butte Lake are important factors in selecting areas for recreation development. Steep terrain, cliffs, and rock outcroppings occupy a large portion of the shoreline limiting development to nine specific sites. Much of the eastern shore is precipitous and unsuited for development. Lands along the shore of the upstream arms of the lake are far from water in the latter portion of the recreation season and are suited for development of facilities designed for early season use only. The northern and western shores have generally rolling terrain with gentle to moderate slopes that pose few constraints on development. Most of the soil types at Black Butte are problematic in terms of their sewage treatment capacity due to lack of depth and impermeability which does not allow for efficient leaching action and results in high runoff of waste water. This necessitates construction of evaporative oxidation ponds for sewage disposal rather than utilizing leach fields.

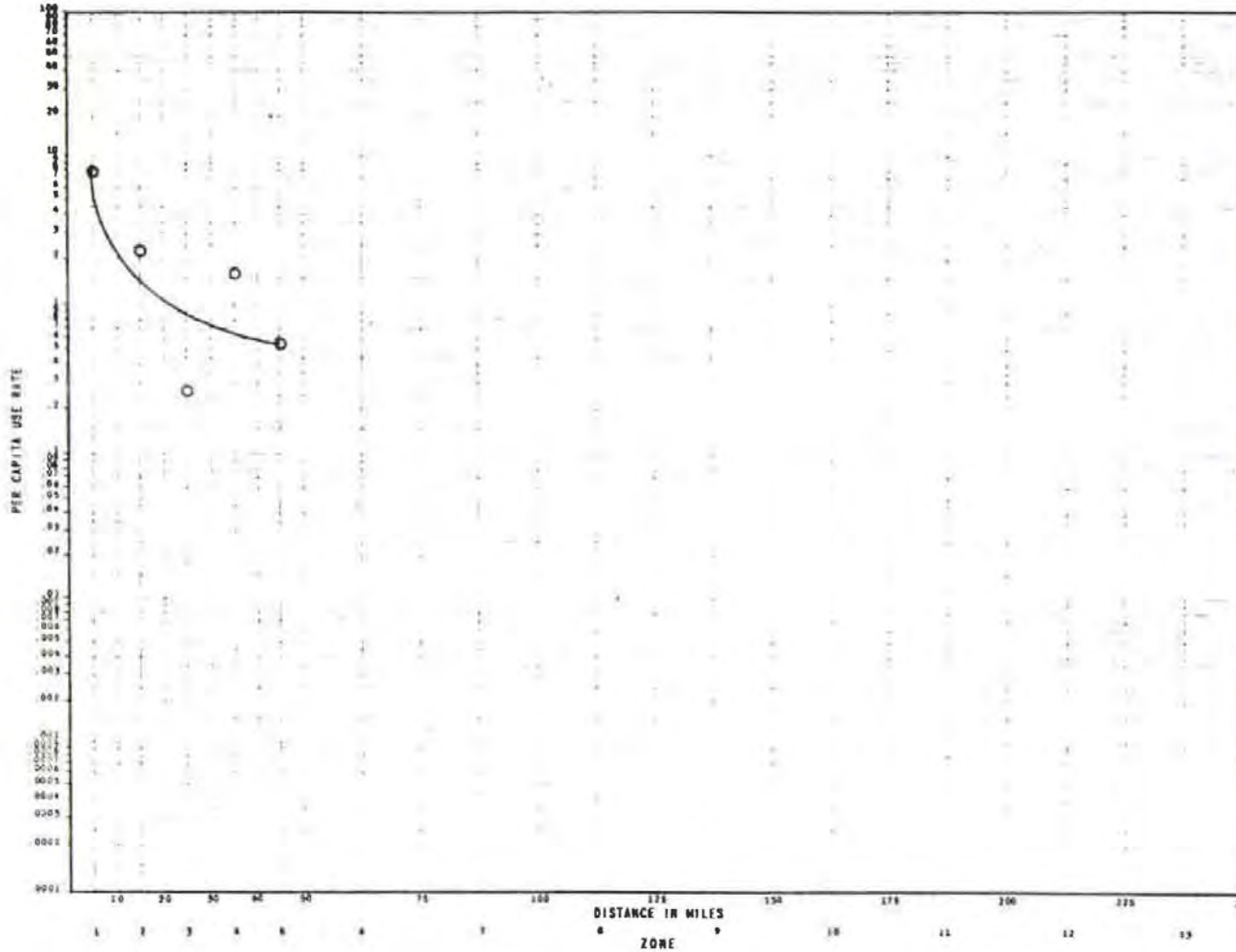
21. Accessibility. - Access from major population centers to the general area of the lake is good as shown on plate 1. Interstate 5, a major north-south freeway, joins the metropolitan centers of the Sacramento and the San Francisco Bay areas with the city of Orland. Access to Buckhorn, Burris Creek, Eagle Pass, and Orland Buttes Recreation Areas and the Observation Area is good, provided by paved county roads from Orland. Improved access to Squaw Point, Nomlaki Coves and Grizzly Flat Recreation Areas is detailed in this master plan. Currently, access to Grizzly Flat is by paved county road from the

Orland Buttes Recreation Area to the Stony Creek Bridge, where the road becomes gravel surfaced. Access to Nomlaki Coves and Squaw Point is by improved, gravel surfaced road to Nomlaki Coves, and unimproved dirt (firebreak) road through the Squaw Point area to the Burris Creek Recreation Area which connects with an existing paved county road. The Squaw Point area is currently closed to public vehicular access. Until the roads are improved into the Squaw Point area, recreation development is constrained.

22. Area of influence. - Chart 3 indicates the per capita use rates for 1966-1969 for Black Butte Lake. These use rates indicate that the primary recreation market area is within the 1-hour travel zone (50 miles) of the lake which includes the counties of Tehama, Glenn, and Butte. The 1970 population of this zone was 149,007. The State of California Department of Finance Series D-100 projections (birthrate = 2.5, net in-migration = 100,000) projects a 1980 population of 183,000 and a 1990 population of 217,500 for this zone.

23. Related recreation areas. - Within 50 road miles of Black Butte Lake are three other lakes and one waterway offering a full spectrum of water-oriented recreation. East Park and Stony Gorge Reservoirs have limited camping, swimming, boating and fishing facilities. Lake Pillsbury, located in Mendocino National Forest, provides limited boating, fishing, camping and swimming, but is situated on the west slope of the Coast Range and does not compete with Black Butte for recreation use. Lake Oroville is located just outside the 50-road mile zone from Black Butte but likewise does not noticably compete with Black Butte for recreation use. The Sacramento River offers a somewhat different kind of water oriented recreation experience with boating, swimming and fishing the main pursuits. Another nearby recreation area is the Mendocino National Forest. All of these available recreation areas complement the variety of choices available to residents and visitors in the Black Butte Lake area. Black Butte Lake has and will continue to contribute greatly towards the satisfaction of the region's recreation demands.

24. Lake plan of operation. - Operation of the lake for flood control and irrigation is discussed in paragraph 8. During the recreation season the highest pool level possible consistent with irrigation demands is maintained to enhance recreation opportunities. Chart 4 compares average pool elevation (1965 through 1975) with percent of yearly attendance (1970 through 1975). By August in an average water year, water surface elevation is near 440 feet. As the lake level drops below this elevation, the boat launching facilities at the Orland Buttes Recreation Area are unusable, extensive mud flats are exposed in the upper arms of the lake and most developable land is some distance from the water. This limits the areas in which year around recreation facilities may be developed to Buckhorn, Eagle Pass and Squaw Point recreation areas. The summer drawdown is a definite constraint to be considered in any new recreation area development.



PLAN FORMULATION STUDIES - RECREATION

ESTIMATING INITIAL PROJECT RECREATION USE

PER CAPITA USE RATES 1966 – 1969

DISTRICT: SACRAMENTO

PROJECT: BLACK BUTTE

LEGEND

O SURVEY ESTIMATE

—— REGRESSION ESTIMATE

REGRESSION EQUATION:

$Y = \text{Exp}(-1.850206 + 8.623624\ X^{-0.5})$

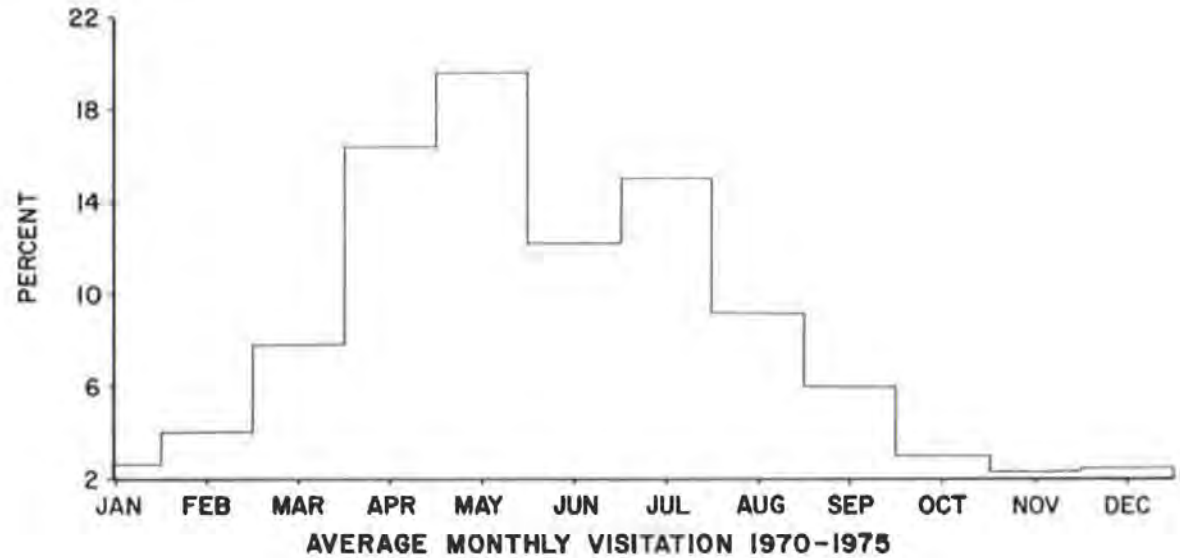
$R^2 = .95$

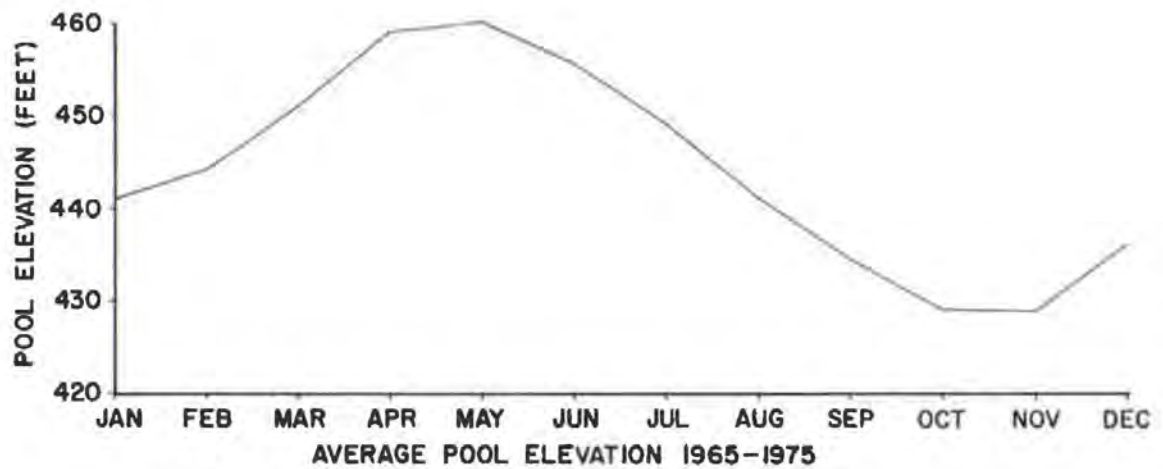
ZONE	PER CAPITA 1/ USE RATE	ZONAL 2/ POPULATION
1	7.4165	5,790
2	1.4570	9,150
3	.8821	38,130
4	.6753	16,690
5	.5685	19,170
6		
7		
8		
9		
10		
11		
12		
13		

1/ REGRESSION ESTIMATE

2/ ESTIMATED 1965 POPULATION

Chart 3





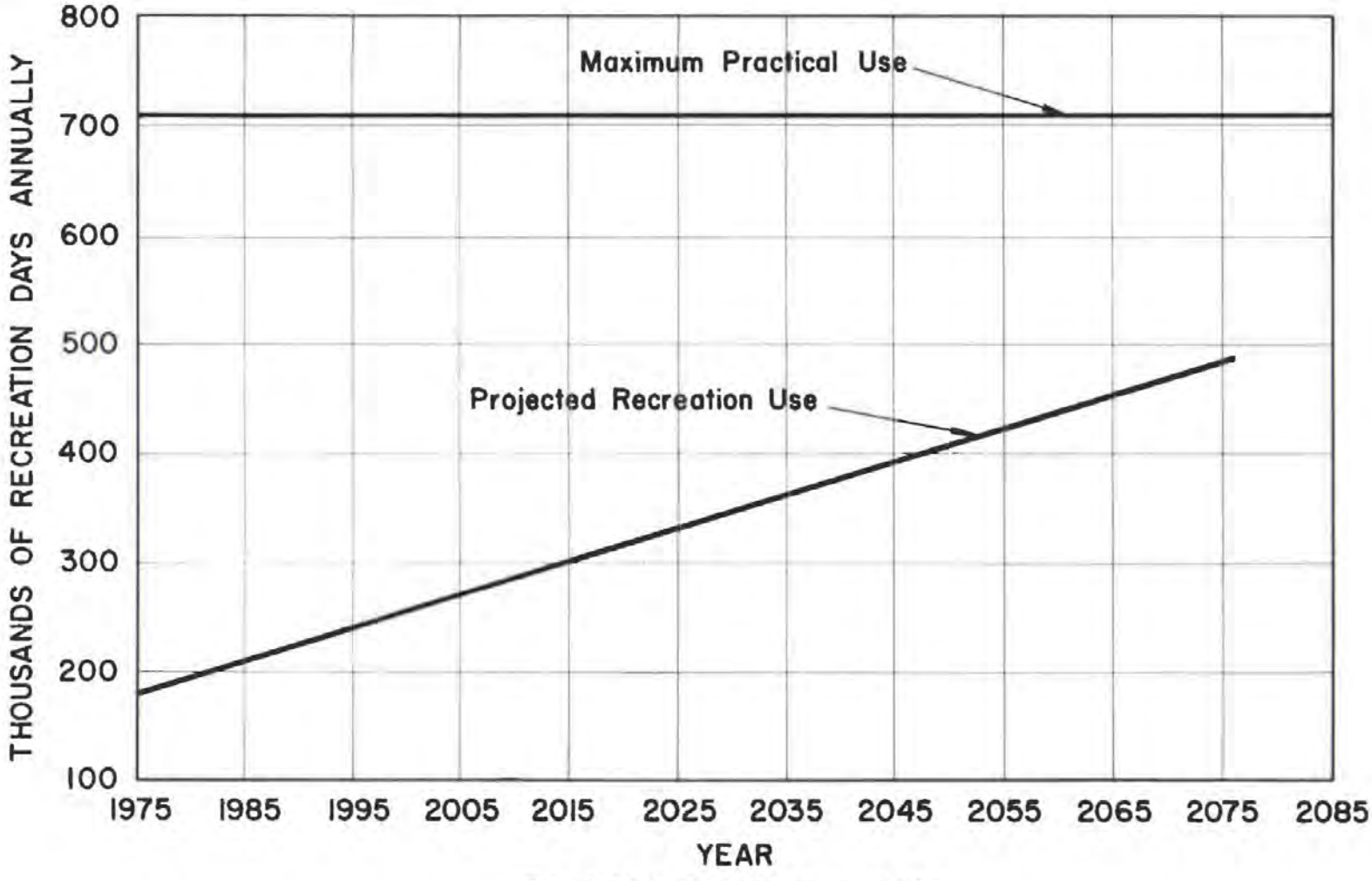
BLACK BUTTE LAKE

Chart 4

25. Water quality. - As discussed in paragraph 16, the water quality of Black Butte Lake is good; however, a high suspended solid concentration and turbid condition exists in the lake throughout the year. This high suspended solid load makes the waters somewhat undesirable for water-contact recreation use. During the summer months the lake becomes isothermal which makes it suitable for a warm water fishery but precludes a cold water fishery. Nutrient content of the lake, especially phosphorus, is occasionally high which could allow for algal blooms if nitrogen or light penetration in the lake were not limiting. Currently, organic load in lake inflows is low, indicating no serious sanitary problems upstream. Provision of adequate sanitary disposal facilities as proposed in this master plan will assist in avoiding potential degradation of water quality as well as satisfying the water quality objectives of the California State Water Resources Control Board identified in their study conducted pursuant to Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500).

26. Anticipated attendance. - Anticipated attendance at Black Butte Lake was projected using per capita attendance rates developed for each county within the market area based upon survey data collected at the lake during 1966-1969 (see chart 3). Estimates of county populations were obtained from population projections, series D-100, dated June 1974, of the California State Department of Finance. Annual attendance was estimated by multiplying the projected population of each county by the appropriate per capita use rate, and summing the products for all of the counties. The anticipated visitation curve, through 2076, appears in chart 5. The maximum practical use for Black Butte Lake is 710,000 and is discussed in paragraph 38. Since the ultimate anticipated annual use (2076) of 490,000 recreation days is well below the maximum practical use, the 490,000 recreation days figure was used for planning purposes in determining the level of ultimate facility development. The participation rates by activity as shown in paragraph 9 are expected to remain relatively the same. The ultimate anticipated annual use of 490,000 recreation days is predicated on static per capita use rates. If, in fact, per capita use rates increase, then the anticipated annual use would also increase and annual visitation could approach the true MPU of 710,000.

27. Application of legislative and administrative requirements for cost-sharing. - Federal policy for provision of funds to construct new recreation facilities at completed projects including Black Butte Lake, requires participation by a non-Federal entity. The non-Federal entity must provide at least one-half of the first cost allocated to recreation development and assume responsibility for operation and maintenance of the new recreation facilities. This policy is based on the Federal Water Project Recreation Act, Public Law 89-72. Tehama and Glenn Counties have consistently declined to participate in cost-sharing with the Corps in recreation development at Black Butte Lake. This lack of cost-sharing limits recreation improvements to renovation, repair,



BLACK BUTTE LAKE
PROJECTED RECREATION USE

Chart 5

modification, and upgrading of existing facilities to acceptable standards. This improvement would be carried out by the Corps of Engineers with funds made availabe for this purpose. Other sources of funding are possible, such as funding from the California Department of Navigation and Ocean Development for boating improvements, which has occurred at other Corps lakes in California, and programs of other kinds such as Title X of the Emergency Jobs and Unemployment Assistance Act of 1974, which was utilized during fiscal year 1976 to upgrade existing facilities and for lake cleanup at Black Butte Lake.

28. Environmental and ecological features. - An environmental assessment for Black Butte Lake was prepared in 1974. For a summary see appendix G. It concluded that additional development of recreation resources, as planned, would result in disturbance and removal of some native vegetation, especially in the Squaw Point Area, and could cause stressing and eventual death of some oak trees within the recreation areas due to soil compaction. At this time there is virtually no regeneration of the oak-woodland vegetative type as noted in paragraph 66. Following approval of this master plan, and prior to a budget request for construction of major facilities, the environmental assessment will be reevaluated for possible environmental impacts which might occur from approved changes in operation and management or from significant additional recreation development.

CHAPTER VI - COORDINATION WITH OTHER AGENCIES

29. General. - Several agencies were contacted as described below for assistance in preparing the master plan. A synopsis of the master plan was coordinated with the State Clearinghouse and no response was received; there is no areawide clearinghouse for this portion of the Sacramento Valley.

30. Federal agencies. - Coordination with the U.S. Fish and Wildlife Service has resulted in the planning aid letter which is included in this master plan as appendix H.

31. State and local agencies. - Coordination with the California Department of Fish and Game has resulted in the development of the Fish and Wildlife Management Plan (appendix D). Contact is also maintained with the California Department of Forestry; the Joint Fire Protection Plan prepared by the Corps and the Department of Forestry is part of appendix C. The Glenn and Tehama County Planning Departments were contacted with regard to their perception of recreation needs at Black Butte Lake and the recreation developments detailed in this master plan. An indication of their intent in sharing in recreation development costs was requested; however, the counties while recognizing the need for additional public recreation facilities, are unable to provide funds for cost-sharing and operation and maintenance under current economic conditions.

32. Zoning of project lands and waters. - Of the 8,917.5 acres of land which have been acquired for Black Butte Lake, 843.5 acres are held in easements and are not specifically available for public use. Additionally, 485 acres in the vicinity of the dam and the dikes, are zoned against public entry for safety reasons. All of the remaining land currently owned in fee title is available for public use. The Butte Mountain Creek (Fisherman's Cove) arm of the lake, Eagle Pass Cove, and areas comprising an arc of 200 feet from the boat launching ramps and the swimming beaches are zoned for restricted boating speeds (5 mph maximum). Project land uses (plate 2) are allocated according to ER 1120-2-400, into the following categories: Project operations; Operations: recreation-intensive use; Operations: recreation-low-density use; and Operations: wildlife management. The category Operations: natural area was considered but not used because lands which potentially could have been included in this category have been allocated to other categories. The categories Operations: reserve forest land and Operations: intensive forest management were not used because of the absence of commercial timber species. No lands were acquired specifically for recreation and fish and wildlife purposes.

33. Recreation site and area plan - Immediate Phase. - The Immediate Phase describes recreation facility needs now and over the next several years. For planning purposes this is taken to be a 5-year period. After this time, the master plan, at the direction of the Division Engineer, will be reevaluated and updated according to criteria established by ER 1120-2-400.

Facilities that can be constructed without obtaining local cost-sharing (limited to renovation, repair, upgrading and modification of existing facilities) will be developed as funds become available. This funding may be by appropriations of Code 710 funds for upgrading sanitary facilities or by operation and maintenance funds. The following subparagraphs detail the Immediate Phase facilities. Those facilities requiring local cost-sharing and operation and maintenance are specifically identified.

a. Observation area. - (Photo 2) The partially completed rock wall, surrounding the picnic area, will be extended around the area, replacing the existing chain link fence. The existing restroom will be removed and the circulation road re-aligned. A visitor center/overlook facility would be constructed. The visitor center would include integral flush restroom facilities to replace those in the existing restroom. The area would receive extensive landscaping treatment to help soften the treeless environmental conditions and improve the aesthetics of the area. The area would accommodate a design day load of 200 persons. See plate 3.

b. Eagle Pass - (Photos 3 and 4) The existing vault type restroom would be replaced with a 4-fixture flush restroom and an evaporative

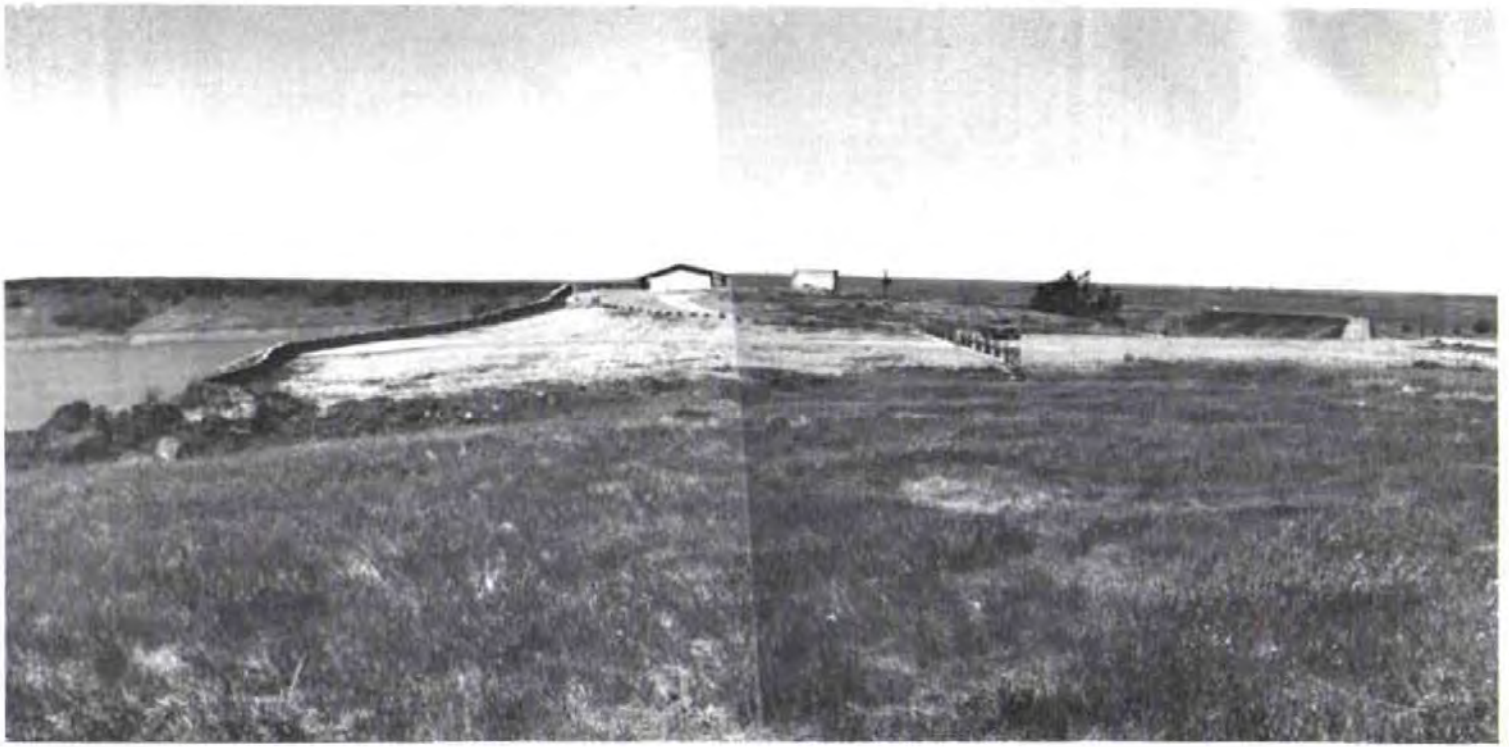


PHOTO 2 - Black Butte Lake Observation Area

oxidation pond would be constructed. A 4-fixture flush restroom would be placed in the westernmost picnic area, replacing the two existing portable restrooms. The uppermost picnic sites on the hill will be moved to more useable locations. The existing picnic shelters would be replaced by more aesthetically pleasing and functional shelters. Landscaping would be provided utilizing species listed in paragraph 57. The area would accommodate a design day load of 325 persons. See plate 4.

PHOTO 3 - Eagle Pass Recreation Area

PHOTO 4 - Eagle Pass picnic shelter

c. Orland Buttes. - (Photos 5 and 6) Each of the three existing vault restrooms will be replaced with 4-fixture flush facilities, and an evaporative oxidation pond would be constructed. The campground would be redesigned to provide for a maximum of 20 campsites (plus the 10 unit group camp). If cost-sharing is obtained, fifteen campsites would be constructed just south of the old county road and two 4-fixture flush restrooms would be included and connected to the main Orland Buttes

PHOTO 5 - Orland Buttes Recreation Area

PHOTO 6 - Orland Buttes Fish Cleaning Station

sewerage system; parking for 20 cars would be provided at the trailhead to the existing primitive camp; a tot lot would be constructed and landscaping would be provided as necessary. When all Immediate Phase facilities are completed, the area would accomodate a design day load of 400 persons.

d. Grizzly Flat. - If cost-sharing is obtained an area would be cleared and graded and marked to be utilized as an informal archery target range. Parking for 20 cars would be provided. The area would accommodate a design day load of 50 persons. See plate 6.

e. Buckhorn. - (Photo 7) The major alterations within this area include replacing the existing vault restroom with a 4-fixture flush restroom, the replacement of portable restrooms with two 4-fixture flush restrooms and a 6-fixture flush restroom/change shelter, and construction of an evaporative oxidation pond. Within the day-use areas, random

PHOTO 7 - Buckhorn Recreation Area

parking will be eliminated by formalizing a total of 123 car parking spaces above gross pool, and 75 car parking spaces below gross pool. All vehicular traffic will be confined to paved roads. Landscaping will

be provided as needed. With cost-sharing, a youth-group camp would be provided with facilities including: group kitchen and eating facility, access road, a 20-car parking lot and two portable restrooms. The area would accommodate a design day load of 1000 persons. See plates 10 and 11.

f. Lower Stony Creek. - Immediate phase development of this area would include improvement of the existing informal fishing access area, to particularly adapt it for use by handicapped persons, two 20-car parking lots and eight portable restrooms. A nature trail would be constructed and landscaping would be provided for aesthetics as well as for wildlife habitat improvement. All of this development, except the nature trail, would require local cost-sharing. The area would accommodate a design day load of 400 persons (510 persons ultimately). See plate 3.

g. Trails. - A hiking trail would be constructed from Eagle Pass to the top of the Butte immediately west of the picnic area. Another hiking trail would connect the Visitor Center/Observation area with Eagle Pass. A nature trail would be constructed in the Lower Stony Creek area (see plate 3).

34. Recreation site and area plans - Future Phase. - The Future Phase describes recreation facility needs beyond the Immediate Phase planning period. This planning encompasses needs over the project life and is subject to revision to meet changing public needs and demands. All of the development described in this paragraph requires local cost-sharing agreements.

a. Observation area. - Future plans call for the addition of four picnic sites. The area would then accommodate a maximum design day load of 280 persons. See plate 3.

b. Eagle Pass - At the Eagle Pass area, the existing high stage boat launching ramp would be expanded by adding one lane and an additional boarding float. The area below the dike would be filled in, and 10 picnic sites, parking for 50 cars and 15 car-trailers would be constructed on the fill, and the area landscaped. A swimming beach would be constructed so as to provide a suitable beach at all lake levels (see paragraph 51). A 6-fixture flush restroom/change shelter would be provided. A 4-fixture flush restroom would replace the portable restrooms near the boat launching ramp. Six new picnic units would be constructed near the old marina site, 2 picnic units would be relocated from the existing picnic area, and an access road and parking for 10 cars provided. The area would accommodate a maximum design day load of 910 persons. See plate 4.

c. Orland Buttes. - Future development within the Orland Buttes recreation area includes 102 campsites, eight 4-fixture flush restrooms along with appropriate sewage treatment facilities, a water supply and distribution system and an entrance station. Additional sanitary facilities include six portable restrooms and a trailer dump station. The existing boat launching ramp would be upgraded by adding one lane and an additional boarding float. In addition, parking for an additional 31 car-trailers would be provided. The area would accommodate a maximum design day load of 1,010 persons. See plate 5.

d. Grizzly Flat. - Future development of the Grizzly Flat area would consist of a 31-unit no charge campground, 17 picnic sites and 12 portable restrooms. An athletic field would be provided within the picnic area. Parking for 35 cars would be provided. The archery range would be upgraded to conform to National Field Archery Association design standards. A water supply and distribution system would be installed. The area would accommodate a maximum design day load of 450 persons. See plate 6.

e. Nomlaki Coves. - Future development of the Nomlaki Coves area would consist of a 70-unit campground, an entrance station, two picnic sites, five 4-fixture flush restrooms, with sewage treatment facilities, a children's play area (tot lot), a car-top boat launching area, horseshoe pitching pits, trailer dump station, and 35 car parking spaces. A water supply and distribution system would be constructed. The area would accommodate a maximum design day load of 370 persons. See plate 7.

f. Squaw Point - (Photos 8, 9 and 10) Future development within the Squaw Point area would include a 102-unit campground, nine 4-fixture

PHOTO 8 - Squaw Point Future Campground

and one 6-fixture (with change shelter) flush restrooms, and sewage treatment facilities. Additional developments include a two stage boat

PHOTO 9 - Squaw Point Future Campground

PHOTO 10 - Squaw Point Future Campground

launching ramp, with four lanes for high lake levels and two lanes for low lake levels, and two boarding floats. A water supply and distribution system would be constructed. Parking would be provided for 100

car-trailers above gross pool and a stabilized aggregate parking area for 20 car-trailers below gross pool, as well as 10 cars above gross pool. Other facilities would include a children's play area (tot lot), swimming beach, horseshoe pitching pits, trailer dump station, fish cleaning station, and four portable restrooms. The area would accommodate a maximum design day load of 900 persons. See plate 8.

g. Burris Creek - The Burris Creek area would be developed as a day-use area with 12 family picnic sites and four 2-table group sites located within the area. The existing dirt road would be improved and paved parking for 30 cars would be provided. Sanitary facilities would include an additional two portable chemical toilets. The area would accommodate a maximum design day load of 190 persons. See plate 9.

h. Buckhorn - At the Buckhorn area, the existing boat launching ramp would be enlarged by adding one lane for high lake stages and one lane for low lake stages. An additional boarding float would be provided. Parking for an additional 21 car-trailers would be provided. Three picnic sites would be constructed at the Fisherman's Cove area. The area would accommodate a maximum design day load of 1,180 persons. See plates 10 and 11.

i. Trails. - A hiking and bicycling trail would be constructed between the Orland Buttes and Eagle Pass recreation areas.

35. Fish and wildlife plan of development. -

a. Existing. - Ongoing fish and wildlife management programs are accomplished with the advice of the Fish and Wildlife Service in cooperation with the California Department of Fish and Game. The Corps operates and maintains the project lands shown on plate 2 consistent with the overall conservation and management program of the Department of Fish and Game and with the annual hunting and fishing rules and regulations specified by the California Fish and Game Commission. With the cooperation of the U. S. Bureau of Reclamation (in distributing Stony Creek water among Black Butte, Stony Gorge and East Park Lakes) the lake water level is regulated during the spawning season to provide optimum spawning conditions for selected game fish. Creel censuses are undertaken at irregular intervals to provide information on the effectiveness of the fishery management program. The Squaw Point Wildlife Area is presently being managed for deer habitat improvement. This program includes a discing and broadcast-seeding process utilizing lana vetch (Vicia dasycarpa) as a forage plant. The vetch is also expected to improve cover for upland game birds such as quail, dove, pheasant, wild turkey and others. To further encourage game birds, two "quail cribs" (Photo 11) have been constructed to improve nesting habitat. Hunting, in season, is permitted on the project (including the wildlife area), but only away from developed recreation areas and only with shotguns or archery equipment.

PHOTO 11 - Squaw Point "Quail Crib"
(prior to covering with brush)

b. Immediate phase. - The existing fish and wildlife management programs will be continued. Additionally a habitat improvement program, principally for waterfowl, will be undertaken in the Lower Stony Creek Area and would include planting wildlife food and cover vegetation.

c. Future phase. - As the Squaw Point area is developed for recreation, lands devoted to wildlife management would be reduced to that area west of the Squaw Point access road and to the northernmost finger of Squaw Point. Hunting would be limited to those undeveloped areas of the project, and may eventually be eliminated as the project achieves total development.

36. Funding for easement acquisition. - An access easement, for the Squaw Point access road, would be required. This easement would be across land that is already held by the Corps of Engineers in flowage easement. About 14.2 acres would be required. Authority for acquisition of this access easement will be requested when assurances for cost-sharing have been received from non-Federal interests to provide at least 50 percent of the development costs and all operation and maintenance costs of the Squaw Point area.

37. Cost estimates. -

a. Immediate Phase - without cost-sharing. - The cost estimate (1 October 1976) of the development needed immediately but which can be accomplished without local cost-sharing requirements is $2,150,000. The cost excluding engineering and design and supervision and administration is distributed in the following manner:

Observation Area	$130,000
Eagle Pass	255,000
Orland Buttes	530,000
Buckhorn	858,000
Trails	17,000

b. Immediate Phase - with cost-sharing. - The cost estimate (1 October 1976) of the development needed immediately but which will require local cost-sharing and operation and maintenance to accomplish is $820,000. The cost excluding engineering and design and supervision and administration is distributed in the following manner:

Orland Buttes	$325,000
Grizzly Flat	205,000
Buckhorn	110,000
Lower Stony Creek	45,000

c. Future Phase - with cost-sharing. - The cost estimate (1 October 1976) of the developments proposed in the Future Phase (Paragraph 34) is $8,230,000. The cost excluding engineering and design and supervision and administration is distributed in the following manner:

Observation Area	$ 2,000
Eagle Pass	355,000
Orland Buttes	1,350,000
Grizzly Flat	455,000
Nomlaki Coves	1,580,000
Squaw Point	2,840,000
Burris Creek	95,000
Buckhorn	56,000
Trails	131,000

38. Maximum practical use. - Maximum practical use (MPU) is an estimate of the capacity of land and water to accommodate anticipated visitation while considering crowding and expected use patterns. The amount of available water surface during the recreation season is the major constraint in estimating MPU. MPU is regarded as the amount of use which can exist without detriment to the environmental resources or to the quality of the recreation experience. The annual MPU for Black Butte Lake and surrounding project lands is 710,000. The method for deriving this figure follows.

a. Design load. - The amount of lake surface expected to be available and usable for recreation during the recreation season, 15 March through 15 August, (paragraph 7) is 3,128 acres. Because a large proportion of the expected visitors are expected to be engaged in waterskiing (20 percent), which requires a rather large area per boat, a planning guideline of six acres of water surface per boat was used to determine the number of boats which could be accommodated on the lake surface. At 6 acres per boat, about 521 boats can be accommodated (3,128 ÷ 6 = 521). Utilizing a turnover rate of 2 to account for the use of the lake by successive boating groups in one day, the total number accommodated would be about 1,042 boats per day (521 x 2 = 1,042). The average number of persons expected for boating groups is 3.2; thus, 1,042 boats would result in 3,334 people per day (1,042 x 3.2 = 3,334). The next step in developing the design load for the lake involves determination of the importance of boating as compared to total recreation use. A number of factors were recognized in making this determination: The influence of future proposed developments; suitability of the surrounding terrain; extent and adequacy of highway routes available; continuing increases anticipated in amounts of leisure time, income and mobility of the public expected to visit Black Butte Lake; activity participation levels previously experienced at Black Butte and at other lakes; and others. In view of these considerations, boating activities are expected to be 40 percent of all use. Thus, with 3,334 boaters, the total design day recreation use which would be anticipated at the lake is 8,335 recreation days (3,334 ÷ .40 = 8,335). This figure is termed the design load and is the maximum number of persons for which development should be planned.

b. Design day. - The design day for planning recreation development occurs on an average weekend day during the peak month of recreation use. On peak days, particularly holidays, the design day would probably be exceeded. Facilities to accommodate peak-day use would often be unused if the design day were based upon peak-day, thus, the average weekend day during the peak month was selected. Surveys of recreation use at Black Butte provides considerable data which was used to estimate that peak month use would be 19.7 percent (rounded to 20 percent) of the total annual use and that 53 percent of the peak month's use would occur on weekends.

c. Annual visitation. - The maximum annual use that could be satisfied at Black Butte, considering design load and design day, may be determined by the following formula:

$$A = \frac{L \times D}{P \times E}$$

where: A = annual recreation days
L = design load
D = number of weekend days per month
P = percentage of peak month use
E = percentage of weekend use

Maximum practical use was thus determined to be 707,689 (710,000 rounded) recreation days.

$$\frac{8{,}335 \times 9}{.20 \times .53} = 707{,}689 = 710{,}000 \text{ (rounded)}$$

As noted in paragraph 9b., recreation use at Black Butte Lake is not expected to reach MPU during the next 100 years. The maximum predicted use within 100 years, based upon population projections and per capita use rates, is 490,000 recreation days. Since the anticipated use will not reach the maximum practical use during the next century, facility load and design criteria proposed in this master plan are based on a maximum anticipated annual use of 490,000 recreation days. Consequently, the design load anticipated for Black Butte Lake, utilizing the maximum anticipated annual use is reduced from the design day load of 8,335 to 5,800 recreation days as follows:

$$L = \frac{(A \times P \times E)}{D}$$

where: L = design load
A = annual recreation days
P = percentage of peak month use
E = percentage of weekend use
D = number of weekend days per month

The design load was determined to be 5,771 (5,800 rounded) recreation days:

$$\frac{(490{,}000 \times .20 \times .53)}{9} = 5{,}771 = 5{,}800 \text{ (rounded)}$$

39. Design day facility requirements. - Based on estimates of design load users expected to participate in boating, camping, and picnicking, estimates of facilities that need to be developed to support these activities may be prepared. Facilities detailed in this chapter are those required to satisfy the design load anticipated (paragraph 38c.)

at Black Butte Lake. The facilities required to serve anticipated users are estimated by employing such factors as number of persons per party, turnover rates in the use of facility units, and the desire of participants to use facilities. The number of parking spaces, toilets and the size of accompanying sewerage systems may then be estimated. Other facilities, such as roads for access or circulation, and trails, have been estimated by on-site inspection. Selection of appropriate sites and routes in relation to the lake and its adjacent lands were made in accordance with Corps of Engineers general guidelines (Engineer Manual 1110-2-400, Appendix A) as described in paragraphs 43 through 60. Factors and computations used in estimating the more prominent facilities are discussed as follows.

a. Boating. - Utilizing a design load of 5,800, and assuming that boating activities are expected to be 40 percent of all use, the number of people boating on the design day would be expected to be 2,320 (5,800 x .40 = 2,320). The average number of persons expected for boating groups is 3.2; thus the total number of boats on the lake in one day would be 725 (2,320 ÷ 3.2 = 725). An acceptable use factor or turnover factor for use of a launching lane is 40 boats per day. Considering the mooring space at the marina and the number of car-top type of boats used, boat-launching facilities should be provided for about 500 boats. At a launching capacity of 40 boats per lane, a total of 13 lanes would be needed.

b. Camping. - About 24 percent of the anticipated design day users would be campers resulting in 1,392 campers (5,800 x .24 = 1,392). Using an average of 3.2 persons per camping party, a need for a total of 435 (1,392 ÷ 3.2 = 435) campsites is indicated for ultimate development. A total of 435 campsites are proposed for ultimate development.

c. Picnicking. - About 30 percent of the anticipated design day users are expected to be picnickers resulting in 1,740 picnickers (5,800 x .30 = 1,740). Recreation use survey information indicates that about 40 percent of the picnickers would desire to use developed picnic sites (table, barbecue grill, water supply, nearby restroom facilities, etc.) if available. Information obtained in the use surveys indicates that the remaining picnickers prefer to conduct their activities at undeveloped and possibly more remote locations in a more informal atmosphere. Using an average of 3.2 persons per picnicking party, and applying the 40 percent use factor as well as a turnover rate of 2, the indicated number of picnic sites needed is 110 (1,740 x .40 ÷ 3.2 ÷ 2 = 109 or 110 rounded). A total of 110 picnic sites are proposed for ultimate development.

d. Water and sanitation requirements. - A supply of drinking water would be provided at each developed public use area. Recreationists utilizing primitive camping areas would have minimal water facilities (e.g., hand pump, etc.). Sanitation facilities would be provided generally at a rate of one toilet fixture per 20 campers, or one per 75

picnickers at established day use areas or one per 170 other persons engaged in day use activities. In some cases, additional toilet fixtures, than would normally be installed based on use, are included where restroom plans call for either two, four or six fixtures. The distance from picnic or camp site to restroom buildings was also considered and may have resulted in additional facilities. Flush facilities would be provided at the Buckhorn, Eagle Pass, Orland Buttes, Nomlaki Coves, and Squaw Point Recreation Areas together with the necessary sewage disposal facilities. Pump-out vault restrooms and/or portable chemical toilets would be placed in other areas where use patterns indicate there is a need. Details of the number of fixtures proposed are contained in the development chapter of this master plan (paragraphs 33 and 34).

40. Project theme. - "Black Butte Basalt" is the project design theme for Black Butte Lake. It is intended that this design theme be reflected as appropriate in all recreation developments to achieve aesthetic treatment. The dominant topographic features at the project are the basalt caps which form near vertical scarps on either side of the dam and the flat-topped buttes which are conspicuous in the surrounding topography of gradual slopes and rounded hill tops. The prominence of the dam has been softened by use of basalt as random rock for slope protection. The visual perception of the dam is one of continuity with the abutments. Large rocks, quarried near the left abutment of the dam, are used and will continue to be used for stone walls, vehicle barriers and other features within all recreation areas. Interpretive displays pointing out the various geologic formations and relating how the basalt was intruded and weathered would be included in the visitor-interpretive center.

41. Siting . - This Master Plan presents a conceptual plan for specific proposed facilities at individual recreation areas. And although the functional location for facilities has been indicated generally, on the drawings, specific locations of structures, roads and other facilities will be determined at the time of design to insure compatibility with the surroundings and overall development purposes. Although picnic and camp sites have been site located in the field for planning purposes, they may be modified to blend with the natural terrain and vegetation to reduce the need for excavation and vegetation removal. Normally, day and overnight use areas are separated to maintain maximum recreation enjoyment and to facilitate management. Compatible activities such as picnicking and swimming and picnicking and game areas should be grouped together while noncompatible activities such as picnicking and off-road vehicle areas should be separated. All permanent facilities are located above gross pool elevation of 473.5 feet.

42. General design criteria. - The facilities described in Chapter VII - "Physical Plan of Development" are in accordance with criteria contained in Engineering Manual 1110-2-400 and Engineering Regulation

1110-2-400. State and local public health requirements would be adhered to in the design and construction of water supply and sewerage facilities. Cost estimates for the proposed facilities including access road easement acquisition are contained in Chapter XI.

43. Water systems. - The water systems would be designed in accordance with Technical Manuals 5-813-1, 5-813-4 and 5-813-5. Water distribution systems presently exist at all four developed areas available for public use: Buckhorn, Orland Buttes, Eagle Pass, and the Observation Area. New water supply and distribution systems would be developed at Grizzly Flat, Nomlaki Coves, and Squaw Point Recreation Areas, as well as for the future campground expansion at Orland Buttes. All water systems would include a well (or other water source), and storage tanks sized to supply sufficient water for design day load users over a 24-hour period as well as an adequate reserve to provide for landscape irrigation and fire-fighting. All water systems would be designed to provide for minimum static pressure of 40 p.s.i. Water system capacities would be based on allowances of 30 gallons per camper per day, 10 gallons per picnicker and swimmer per day, and 5 gallons per person per day for all other activities. Hose bibbs would be provided on the basis of one for every 400 feet maximum in the picnic and day use areas and one for every 8 camping sites within camping areas. Field hydrants would be provided at convenient locations to serve as fill points for fire trucks.

44. Waste collection and treatment systems. - The design for sewerage facilities would be in accordance with Engineer Manual 1110-345-241 and Technical Manual 5-814-3. Flush type restrooms would be provided in the Eagle Pass, Orland Buttes, Nomlaki Coves, Squaw Point and Buckhorn areas. Disposal in each area will be by a central primary treatment plant and an evaporative oxidation pond. The evaporative oxidation pond would be used in conjunction with low flow sanitation facilities, and would attain a balance between inflow and evaporation. The design of the ponds would incorporate features such as compartments, extra storage, etc., which would preclude the need for liquid disposal other than by evaporation; however, the solids would need to be occasionally pumped from the septic tanks. Each plant design would be based on 5 gallons per capita per day per fixture in day use areas (assuming 75 people per fixture per day); and 15 gallons per capita per fixture per day in camping areas (assuming 20 people per fixture per day). On this basis nearly 6,000 gallons of outflow can be expected to be generated at the Eagle Pass area, 7,500 gallons initially (19,500 gallons when all future development is completed) at the Orland Buttes area and nearly 12,000 gallons each at the Squaw Point and Buckhorn areas. Vault pump- out type restrooms presently exist at the Eagle Pass, Orland Buttes and Buckhorn areas; however they would be replaced by flush facilities. Portable chemical restrooms would be placed at the smaller recreation sites and at locations in the larger sites more than 300 feet from other restroom facilities. These facilities would be periodically pumped out and the material deposited at a regional sanitary treatment facility. Restrooms with water-borne sewage should be sited at least 100 feet from the nearest camp or picnic site and located

the nearest camp or picnic site and located above gross pool elevation. Vault or chemical restrooms would be sited at least 150 feet from the nearest camp or picnic site. Restrooms should be within 300 feet of camp or picnic sites wherever feasible. Solid wastes are collected as needed by project operations personnel. The wastes are deposited in a holding area and collected weekly from the holding area by a commercial garbage collection company.

45. Roads. - Access roads, where required, would be 20 feet in width with minimum 4 foot shoulders and 10 percent maximum grade. Circulation roads would be 18 feet wide with 3 foot shoulders for two-way traffic and 12 feet wide with 2 foot shoulders for one-way traffic. All roads above gross pool would be surfaced with 1½ inches of bituminous surfacing over a 6 inch stabilized aggregate base course. Road shoulders would be constructed of stabilized aggregate 6 inches thick and oiled to reduce erosion. All roads below gross pool would be constructed of stabilized aggregate, 6 inches thick. Design speed for circulation roads would be 5 mph. Minimal cut and fill and vegetation removal would be incorporated into road alignment and design. All roads would have erosion control measures on cuts and fills. Culverts would be located as required. Road design includes signs sited and designed to blend with the environment, and striping on all bituminous-surfaced roads for traffic control and safety purposes. Rock barriers would be provided to restrict vehicular traffic to project roads and designated parking areas. These rock barriers would be placed in such a manner as to be effective while blending into the natural environment.

46. Parking areas. - Parking will be provided within all vehicular access recreation areas. Parking in the day-use areas would be sufficient to accommodate use of all facilities. Each campsite would have a parking spur or turnout sized to accommodate a car and camping trailer (10 by 40 feet or 20 by 20 feet). Parking spaces in day-use areas are sized (10 by 20 feet) to accommodate design day loads. All parking facilities would have a 1½ inch bituminous surface on 6 inches of stabilized aggregate except for parking facilities located below gross pool which would consist of 6 inches of stabilized aggregate. Minimal cut and fill and vegetation removal would be incorporated into parking area design. Concrete wheel stops and striping would be used for safety and traffic control. Curbs and gutters would be used in the parking lots to control surface runoff. Parking facilities located above gross pool would be provided with planter islands and other environmental treatments, wherever practicable. A limited number of parking spaces in each parking lot should be marked as reserved for the handicapped.

47. Launching ramps. - Six launching lanes presently exist for high lake levels and four launching lanes for medium and low lake levels at Black Butte Lake. However, additional lanes will be needed in the future as identified in paragraph 34. The new launching lanes would be constructed of 6 inch concrete pavement reinforced with wire fabric and would have doweled construction joints. The surface of the concrete

pavement would be scored transversely to afford maximum vehicular traction. A concrete curb would be provided on the shoulder where the ramp is on a fill over four feet high. Riprap would be placed to protect against wave action.

48. Docks and mooring facilities. - An additional courtesy boarding dock would be provided at the Eagle Pass, Orland Buttes and Buckhorn launching ramps and two courtesy boarding docks would be provided at the proposed Squaw Point ramp. Moorage, docking (20 slips) and refueling facilities are currently provided by a concessionaire at the Buckhorn Recreation Area. The concession operator is subject to provisions of his contract with the Corps of Engineers (Lease No. DACW05-1-68-48) and provisions of the Engineer Manual 1110-2-400, Appendix A. No major improvement of the concession facility is anticipated during the Immediate Phase.

49. Picnic units. - Each picnic area would be provided with a wooden table and bench combination (with concrete and/or natural rock supports) consistent with the project theme. Concrete wearing pads would be placed under each table where needed. Charcoal grills would be provided at a ratio of one for every two picnic tables. One 30-gallon metal trash can would be provided at a ratio of one for every four tables and would be anchored. An appropriate number of sites would be designed to accommodate the handicapped.

50. Camping units - Each vehicular access campsite would be provided with a wooden table and bench combination (with concrete and/or natural rock supports) consistent with the project theme, a charcoal grill and a cleared and graded area (15 by 15 feet) for a tent. Concrete fire rings would be placed as needed. Concrete wearing pads would be placed under each table where needed. Primitive campsites would be provided with a cleared and graded area (15 by 15 feet) for a tent and a concrete fire ring. One 30-gallon metal trash can would be provided on a ratio of one to every two vehicular access camping sites, and a ratio of one to every four primitive camping sites. All trash cans would be anchored. A wastewater drain, not connected to the sewerage system would be provided for each campsite (vehicular access and primitive). Sanitary waste dumping stations for recreation vehicles and boats would be located in the Orland Buttes, Nomlaki Coves, Squaw Point and Buckhorn Recreation areas. An appropriate number of sites would be designed to accommodate the handicapped.

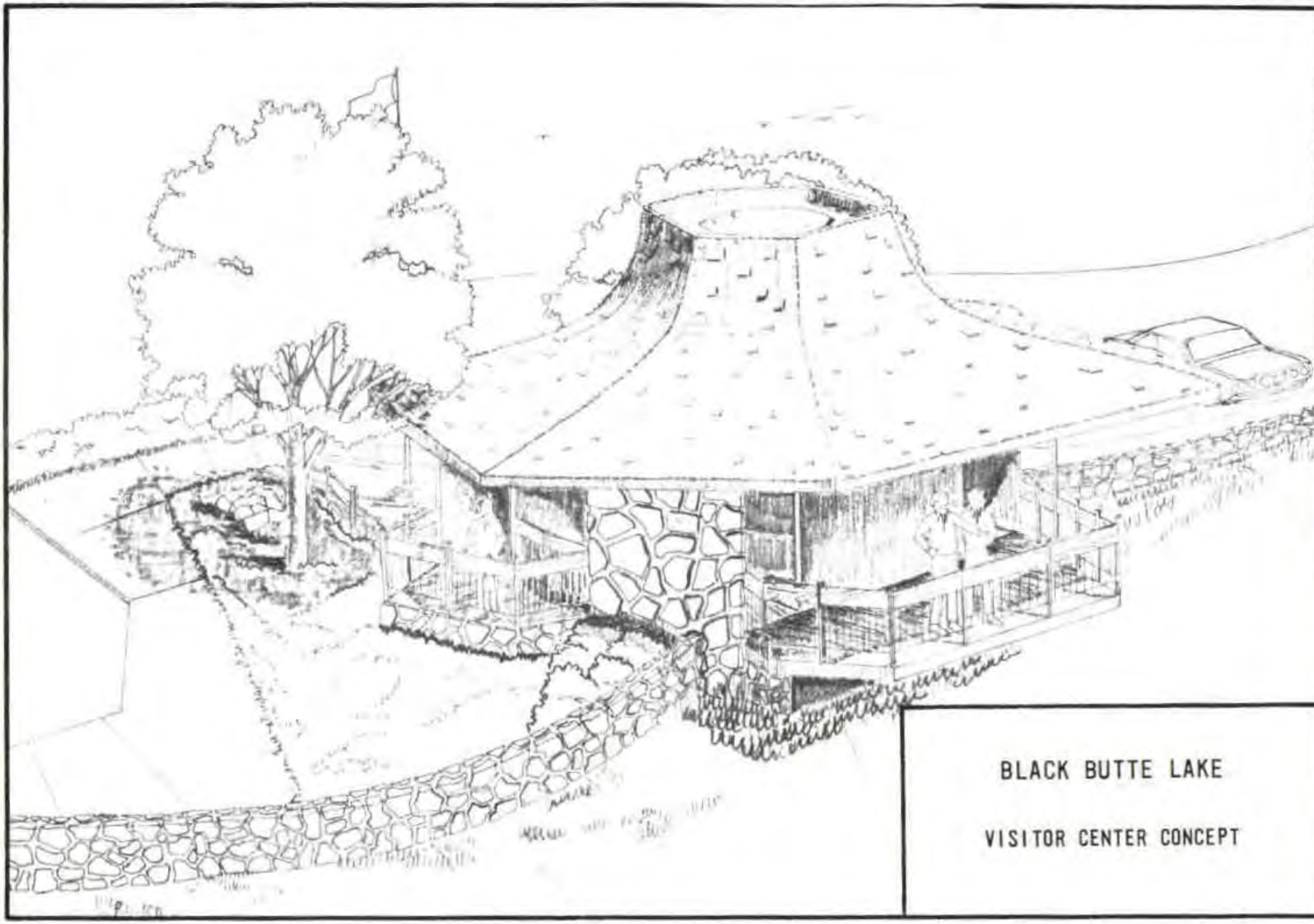
51. Swimming beaches. - Additional swimming beaches would be laid out in accordance with Engineer Manual 1110-2-400 at the Eagle Pass and Squaw Point Recreation Areas. The existing soil at the Eagle Pass beach area is high in clay content and therefore may prove unsuited for a beach unless a soil stabilization and beach construction program is initiated. Such a program would utilize a layer of fine sand on the existing soil, then a layer of coarse pea gravel topped with a layer of coarse sand for the beach surface. Thickness of these layers would be

determined by the results of a soil analysis at the beach site. Each of the beaches would be provided with a buoy line 200 feet from the shore or at the 10 foot depth whichever occurs first and would be moved as pool levels change. Sanitary facilities would include a 6 fixture restroom/change shelter in the Squaw Point, Buckhorn, and Eagle Pass areas. Portable restrooms and change shelters would be utilized whenever the distance from the beach to established restrooms, caused by pool fluctuation, exceeds 300 feet. Metal trash cans would be placed along the beaches wherever the amount of use indicates a need.

52. Shelters and structures. - Because Black Butte Lake experiences hot, dry summers and because there are few shade trees or other vegetative cover in areas otherwise suited for recreation use, shelters are proposed for many of the picnic sites. There would also be a shelter over the cooking and eating area of the youth camp at Buckhorn. These shelters would be constructed of wood and be designed to harmonize with the surrounding environment. All structures placed in the recreation areas would be constructed of native rock and/or stained wood to harmonize with the natural environment and be consistent with the project theme.

53. Visitor center-overlook. - The present observation area consists of a 34-car parking area, a 4-fixture flush restroom, and six picnic sites. Pursuant to guidance provided by ER 1130-2-401, a visitor-interpretive center (see concept sketch) is proposed for placement on the site occupied by the existing restroom. Historic, geologic, archeologic, ecologic and project information would be displayed at the center. A supplement to this master plan for the center will be prepared at an appropriate time following approval of this Master Plan.

54. Playground facilities. - Playground facilities currently exist at the Buckhorn Recreation Area. Additional tot lots are proposed for the Orland Buttes, Nomlaki Coves and Squaw Point areas. Freeform timbers and logs to harmonize with the natural setting, would be utilized in the construction of swings, slides and climbers. All of these facilities would be located on a sand base enclosed by a timber retaining curb (see photo 12). Horseshoe pitching courts are currently available at the Eagle Pass and Orland Buttes Recreation Areas. Additional courts would be provided at Nomlaki Coves and Squaw Point. A play field in Grizzly


BLACK BUTTE LAKE
VISITOR CENTER CONCEPT

Flat would be included in the future phase development. The field would be contoured and planted with perennial grasses. Areas suitable for

PHOTO 12 - Buckhorn "Tot Lot"

volleyball courts will be located at Buckhorn, Eagle Pass, Orland Buttes, Nomlaki Coves and Squaw Point.

55. Electrical distribution. - Electrical service, provided by Pacific Gas and Electric Company, is available in all existing recreation areas. New service would be provided to Grizzly Flat, Nomlaki Coves and Squaw Point. Underground distribution lines would provide electrical service to restrooms, waste treatment plants and pumping stations. A public telephone is currently installed in the Buckhorn Campground. Additional public telephones would be installed at Eagle Pass, Orland Buttes, Grizzly Flat and Squaw Point.

56. Trails. - A hiking trail would be constructed between the Observation Area and Eagle Pass. At the Eagle Pass area, a trail would be constructed around the base of the butte west of the picnic area. A hiking and bicycling trail would be constructed between Eagle Pass and Orland Buttes. A trail would be constructed to service the Orland Buttes Primitive camp. A nature trail loop would be constructed at the

Lower Stony Creek Area. Hiking trails would be three feet wide and would be cleared of rocks, brush or other obstructions, graded and surfaced to facilitate ease of travel. The bicycle trail would be 6 feet wide and be constructed of 1.5 inches of asphaltic concrete with a 6 inch gravel subbase. Construction of the nature trail would involve minimal grading and vegetation disturbance and would be sited to provide the maximum opportunity for observation of a wide variety of species of plants and animals. Interpretive and informative signs would identify and describe the various plants, animals, geology and other items likely to be encountered along the trail. Where possible the trails would be incorporated into project firebreaks to minimize vegetation removal.

57. Site improvement. - Beautification measures would be provided in accordance with provisions contained in Engineering Manual 1110-2-38 to complement the natural scenic beauty of the recreation areas. Functional plantings of trees, large shrubs and ground cover would be provided for shade, screening and site enhancement. A tree planting program is proposed for the Observation and Eagle Pass Areas to provide shade and aesthetic treatment. Plantings would be made at other sites as necessary for shade and screening of adjacent units and for aesthetic improvement of structures. Species would be selected to harmonize with nearby native vegetation and to provide reasonably rapid growth, canopy of shade, drought tolerance, pest resistance, and adaptability to local soil and temperature conditions. Deciduous shade trees will be used in all activity areas. Evergreen trees will be used for visual screening of water tanks, utility buildings and other "obtrusive" features. Evergreen border shrubs will be used in parking areas, as accent plants in groupings or to provide a vegetative barrier. Deciduous screen shrubs will be used primarily around oxidation ponds and other locations where deciduous shrubs would blend well with existing deciduous natives. Evergreen climbing vines could be used on restrooms and other user oriented structures. Evergreen ground covers will be used in planting strips and around structures. Turf areas will be located within developed picnic areas and adjacent to swimming beaches. A partial list of trees, shrubs, and ground cover considered suitable for planting follows.

Deciduous Shade Trees

Valley Oak
California buckeye
White alder
California Sycamore
Black locust
Sawleaf zelkova

Evergreen Shade Trees

Digger pine
California laurel
Glossy privet

Evergreen Border Shrubs

Howard McMinn Manzanita
Bearberry (Kinnikinnick)
Oregon grape
Sugar bush
California holly (Toyon)
Wild lilac (Ceanothus)

Evergreen Climbing Vines

Creeping fig
Boston ivy
Star jasmine
Primrose jasmine

Evergreen Ground Covers

Ivy (Hedera sp.)
Rosemary ("Lockwood de Forest")
Dwarf periwinkle
Creeping St. Johnswort
Dwarf coyote brush
Cotoneaster

Turf Areas

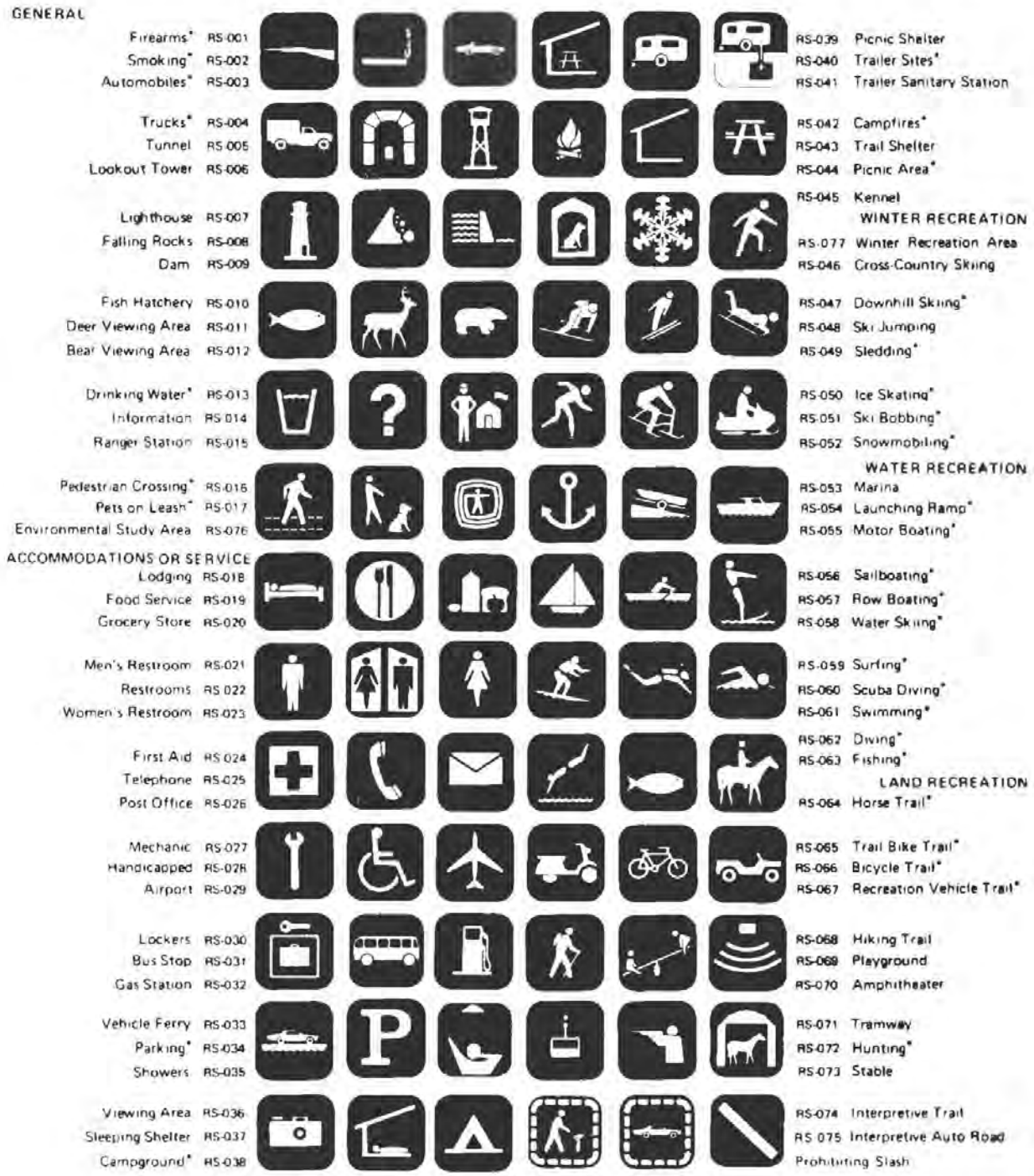
Blue fescue
Kentucky blue grass

Landscape planting procedures will include preparation of planting pits, installation of irrigation systems, addition of fertilizers and mulch and placement of topsoil, as necessary, and staking to promote establishment and growth of the plants. Subsequent maintenance would include adequate watering, pruning, and replacement as required. Areas disturbed during construction would be graded and seeded to reduce erosion and to hasten site recovery.

58. Signs. - Signs would be both pictorial and lettered wherever appropriate, utilizing the standard representations prescribed by the National Park Service (Chart 6). These signs would be standard white on grey-blue or brown background. Larger informational signs, particularly those at recreation area entrances, would be of wood with routed lettering. The wooden signs would be stained brown with yellow lettering. Sign posts and/or braces, when possible, would be of rock, in conformance with the project theme. Traffic control signs are discussed in paragraph 60.

59. Navigation aids. - Floating buoys, painted and signed in accordance with the California Boating Law, would be placed around the marina and

INTERNATIONAL PARK AND RECREATION SYMBOLS



*Symbol available with red slash mark to indicate activity is prohibited

Obtained from "The Park Practice Program" publication dated July 1973, contributed by National Park Service, U.S. Department of the Interior.

Chart 6

swimming areas to delineate restricted speed zones. A floating buoy line and markers have been provided to identify the restricted waters upstream from the dam. The uncleared Butte Mountain Creek arm of the lake (Fishermans Cove) and the entrance to Eagle Pass cove are marked and buoyed. Hazards to navigation such as snags, rocks and shallow water areas would also be appropriately buoyed.

60. Visitor safety. - Signs and markers on roads within project boundaries would conform with American National Standards Institute Standard D6.1, Manual on Uniform Traffic Control Devices for Streets and Highways. Maximum use would be made of traffic control signs to adequately inform the public of maximum safe speed and road conditions and characteristics. Signs indicating hazards or obstacles would be reflectorized. Service roads, not designed for public access would be closed by barricades and appropriate warning signs. Ramps would be constructed in lieu of steps to and within all buildings whenever possible. Caution signs (reflectorized type on yellow background with black letters and numerals) will be installed from 300 to 500 feet from all launching sites. Standard boat launching ramp signs (with arrow) shall be installed from 50 to 125 feet on the ramp side of the caution sign. Distance to ramp shall be shown in the second line of this sign as "__ Feet". Safety and public health measures would conform to Paragraph 13 of Engineer Manual 1110-2-400, Appendix A. New restrooms would be provided with special stalls and facilities for the handicapped. Architectural barriers to the handicapped such as curbs and steps would be avoided.

61. Natural resource preservation. - The natural resources of the Black Butte Lake area within the boundary of the lands under the control of the Department of the Army will be managed to allow biological productivity within the natural biological cycle consistent with the need to accommodate public use. The impact of people recreating on and around the lake will be minimized by concentrating the recreation developments in areas where the people may best be accommodated with the least detriment to the natural environment. Through the park ranger program and close cooperation with local law enforcement agencies, vandalism and destruction of project resources will be minimized. Measures will be taken to assure confinement of vehicular traffic to roads and designated areas to prevent indiscriminate damage to the scenic and natural resources. Below gross pool use will be limited to day use activities. Below gross pool camping and camping outside of designated campgrounds will be prohibited.

62. Fish and wildlife resources. - Development of the recreation resource of Black Butte Lake and surrounding project lands would reduce the quantity and quality of available wildlife habitat. Proposed developments, particularly at the Squaw Point area, would reduce the available habitat for deer and upland game birds. Particular care would be taken in the location of facilities to reduce the impact on wildlife. With planned development and managed use, the impact is expected to be controlled to a level acceptable for the public use benefits to be gained.

63. Sewage treatment and disposal. - Vault-type restrooms that require frequent pumping are currently utilized at all developed areas except at the Overlook where flush facilities exist. Vault-type restrooms have been a source of odor problems and visitor complaints as well as a potential source for lake pollution. The odor problems are most apparent during the recreation season when it is often hot and windless. The vault restrooms require frequent pumping out and the raw sewage must be transported to disposal facilities. In recent years, the State of California, Department of Health has strongly discouraged the use of vault-type restrooms for public health reasons. The public generally have expressed their desire for high quality restroom facilities. Flush-type facilities, which are more economical to operate than facilities that have to be pumped out regularly, require some means for the disposal of effluent. Normally this is accomplished by either the utilization of leaching fields or evaporation ponds. At Black Butte, soil horizons are either shallow or absent entirely and the underlying rock is relatively impermeable. These factors preclude the use of a leaching field effluent disposal system. The sewage treatment systems proposed for the Eagle Pass, Orland Buttes and Buckhorn areas in the Immediate Phase and for the Nomlaki Coves and Squaw Point Recreation Areas in the Future Phase consist of a primary treatment facility (septic tank) and a secondary treatment facility (evaporative oxidation pond). The evaporative oxidation pond would be lined to safeguard against effluent entering the lake.

64. Uncontrolled vehicular access. - Due to the shortage of developed campsites, campers have been allowed in the past to utilize the lakeshore below gross pool in a random manner within specified limits as an overflow camping area, especially during periods of heavy use (e.g., holidays). This heavy use of the exposed lakeshore has contributed to soil erosion and presents a potential for contamination of the lake. This practice of random camping along the lakeshore has been eliminated and random vehicular access within areas above gross pool has been controlled through placement of barriers and development of parking areas.

An area has been established for off-road motorcycle use, in accordance with guidelines set forth in ER 1130-2-405. All project lands and waters are closed to off-road vehicle use except for the designated off-road motorcycle area. A monitoring program as outlined in ER 1130-2-405, Appendix D, has been established which provides for continuous monitoring of the effects of off-road motorcycle use on the environment. The off-road motorcycle area is closed for three months during the spring to allow for site regeneration.

65. Wave wash erosion. - Wave wash erosion has proved to be a problem at the Orland Buttes Recreation Area. During the spring, when water levels are high, strong northerly winds create waves that have been continuously eroding the cliffs of this southern shore area. The Corps has had limited success in protecting the cliffs in small areas near the boat launching ramp by the use of gunnite; however, this is a temporary measure protecting small areas and the erosion will continue unless some means is found to stabilize the cliffs from this wave erosion.

66. Native oak regeneration. - The dominant ecotype in the project area is oak-woodland. The tree age structure of the stands of blue oak is significantly biased towards older trees (greater than 3-6 inches in chest-high diameter). Intensive grazing pressure for well over 100 years has caused considerable cropping or elimination of shrubs and oak seedlings. This intensive grazing was eliminated with purchase of the land by the Corps of Engineers. Corps grazing leases are limited to those areas, remote from recreation facilities, that can best accommodate this use. Almost 15 years of sound range management practices has increased the quality of the forage; however, there is a noticeable lack of young and medium age oak trees. The existing trees, although most of them are quite old, add to the aesthetic environment, provide shade and separation within recreation areas. The combined effects of soil compaction, watering of adjacent turf and landscaped areas, and alteration of the micro-climate has weakened these old trees. A landscaping program utilizing native species, proposed in this master plan (paragraph 57), would be instituted as soon as funds are available so that new plants can mature and be available for shade, cover and screening, as the older oaks die out.

67. New facility cost-sharing. - Tehama and Glenn Counties have consistently declined to cost-share with the Corps in the recreation

development of Black Butte Lake. As discussed in paragraph 27, this constrains expansion of recreation facilities. Authority does not exist for the Corps to do other than renovate, repair, upgrade and modify existing recreation facilities. Consequently little or no increase in recreation facilities may be provided with Corps funds.

CHAPTER X - PROJECT RESOURCE MANAGEMENT

68. Operational concepts and policies. - The objective of resource management activity at Black Butte Lake is to assure continued public enjoyment and maximum sustained use of the lands, waters, forests and recreation resources consistent with their carrying capacity and their aesthetic and biological values. Major operational policies include: safety and protection of visitors and employees; protection of project resources; prevention of visual and physical encroachments; preservation and enhancement of aesthetic integrity; prevention or elimination of unauthorized structures and habitation; assurances of compatibility between uses; improvement of the environment by landscape treatment; assurance that management practices and recreation development are consistent with public demand; and control of adjacent private developments which may have detrimental effects upon project lands and waters through encouragement of local zoning. All resources will be considered in management decisions so that optimum public benefits may be obtained. Specific operational concepts and policies are detailed in Appendixes A through E. These appendixes are part of this master plan but are bound separately. Appendix A, "Project Resource Management Plan" was prepared in August 1972, and approved by the Division Engineer. This appendix details public use facilities, staffing, operation and maintenance procedures and law enforcement. Appendix B, "Forest Management Plan" was prepared in November 1975, and approved by the Division Engineer. Because of the absence of significant forest resources at Black Butte Lake, no active or specific forest management program is proposed. Appendix C, "Fire Protection Plan" was prepared in November 1973, and approved by the Division Engineer. This appendix details fire suppression training procedures, location and availability of tools and equipment, and fire prevention activities. Appendix D, "Fish and Wildlife Management Plan" was prepared in November 1975, and approved by the Division Engineer. This appendix details policies and specific long and short range management programs for fish and wildlife. Appendix E, "Project Safety Plan" was prepared in April 1975, and is approved by the Division Engineer. This appendix sets forth policy, assigns responsibilities, and prescribes administrative procedures for an accident prevention program for the public and for project personnel.

69. Management of land use zones. - Paragraph 32 and plate 2 delineate land use zones for Black Butte Lake. Specific management objectives for these zones are as follows:

a. Project operations. - These lands are occupied by and are immediately adjacent to the dam or the project office and maintenance yard. These lands are restricted from public use to insure safe and efficient operation of the project.

b. Operations: Recreation - Intensive Use. - These lands were acquired for project operation purposes and are allocated for use as developed public areas for intensive recreation activities. Fences are

to be constructed around these areas to exclude livestock. A firebreak at least 10-feet wide will be cleared around each recreation area. All grass, weeds and brush will be removed from the firebreak, all trees pruned of dead branches to a height of 10 feet, all forest litter and duff will be removed and mineral soil exposed. This system of firebreaks serves as a prevention measure by separating fire sources from fuels and must be maintained annually, preferably in late spring, to retain its effectiveness. Roads and trails may be incorporated into this fuel break to minimize the total land area disturbed.

c. Operations: Recreation - Low Density Use. - These lands were acquired for project operations purposes and are allocated for low density recreation activities. These lands are utilize' for extensive recreation uses (as opposed to intensive recreation uses at the developed sites), for maintenance of resources associated with the lake margin needed for public enjoyment of the lake area, and as open space between intensive recreation developments or between the lake area and adjacent private land to safeguard against incompatible uses which would detract from the quality of the public's recreation enjoyment. Interim grazing is permitted.

d. Operations: Wildlife management. - These lands were acquired for project operations purposes and are allocated as habitat for wildlife. The lands will be continuously available for low density recreation activities, including hunting. Grazing will be precluded.

70. Management of the forage resource. - A substantial portion of project lands are utilized for interim grazing. The Corps administers four grazing leases of 365, 145, 596 and 1932 acres. Interim grazing of the forage resource will be permitted on all project land shown on plate 2 except the intensive use recreation areas and the Lower Stony Creek wildlife management area. Grazing is also excluded from those lands zoned for Project Operation on plate 2. The grazing regulations included in the most recent grazing lease (1 November 1975) are attached as Appendix F. Annual range surveys will be conducted until grazing is eventually phased out. These surveys will provide the basis for determining the numbers of animal unit months that will be permitted to graze project lands and not result in deterimental impact to wildlife habitat and native vegetation regeneration.

71. Management of the recreation resource. - The responsibility for managing the recreation resource on lands within the project boundary shown on plate 2 will continue to rest with the Corps of Engineers. A user fee program may be established and would be managed in accordance with applicable instructions such as ER 1130-2-404. All recreation areas are designed with a minimal number of access points to facilitate the fee collection effort. Implementation of the fee program is partially dependent upon the construction of upgraded facilities (including showers) proposed in this master plan. At such time as a non-Federal public entity participates with the Corps in the development of future recreation facilities, the non-Federal public entity would assume all operation, maintenance and replacement responsibilities for the newly developed areas. Non-Federal interests would be able to assess entrance and user fees on a schedule approved by the District Engineer to offset capital investment and/or operation and maintenance costs.

72. Management of the cultural resource. - Prior to construction of Black Butte Dam, an extensive archeological survey was conducted of the project area. Field surveys located over 100 sites; both above and below gross pool; however, only six were excavated. Although the sites excavated were villages of more or less permanent habitation, their associated cemeteries were not discovered. The sites excavated yielded valuable information about the day-to-day lives and existence of the Indians; however, since the villages' burial grounds were not found, few artifacts or possessions were uncovered, because the material culture of the prehistoric Indians was generally so personal that most possessions were buried with the body. In spite of the apparent richness of sites in the project area, no further excavations were recommended at that time. Pursuant to Executive Order 11593 an intensive cultural resources survey will be made of the project area shown on plate 1, especially that area between gross pool and the project boundary, to inventory any historic and archeologic resources. A program of preservation, restoration and maintenance would be coordinated with the Advisory Council on Historic Preservation, the State Historic Preservation Officer, and the National Park Service according to 36 CFR 800 procedures for any cultural resources identified.

73. Recreation developments. - Cost estimates for facilities described in Chapter VII - Physical Plan of Development, are appended to this master plan. Table I consists of a summary of the three development phases. Table II presents the detailed cost-estimate for facilities needed for the Immediate Phase and not requiring local cost-sharing for implementation. Table III presents the detailed cost estimate for facilities needed for the Immediate Phase but which will require local cost-sharing to implement. Table IV consists of detailed cost estimates for facilities needed to satisfy future phase recreation demand.

74. Basis of cost estimate. - The cost estimate is based on 1 October 1976 price levels. Unit prices used for water supply systems, sewage facilities, boat launching ramps, and parking facilities were derived by applying current unit prices to a quantity breakdown. Unit prices for other items were determined by the adjustment of average bid prices received for similar work at nearby areas or a plant, labor and material breakdown. Due to a lack of detailed studies and limited field surveys and investigations, a contingency allowance of 25 percent was included in the estimate. The possibility of encountering more rock excavation than currently assumed could increase costs materially. Suitable allowances are included for engineering and design, and supervision and administration based on costs experienced on similar work in the Sacramento District.

75. Annual operation, maintenance and replacement costs. - Operation and maintenance of existing recreation facilities and those installed under the Immediate Phase plan will be the responsibility of project personnel. Costs for equipment, personnel, maintenance and repairs for FY 1977 are estimated to be about $175,000. Annual costs during the interim period are anticipated to be similar to the FY 1977 estimate.

BLACK BUTTE LAKE MASTER PLAN

TABLE I

COST ESTIMATE - SUMMARY
(1 October 1976)

Cost Account No.	Item	Immediate Phase Without Cost-Sharing	Immediate Phase With Cost-Sharing	Future Phase
01	LAND AND DAMAGES			
	Access easement			$ 6,000
14	RECREATION FACILITIES			
	Observation Area	$ 150,000		2,000
	Eagle Pass	255,000		355,000
	Orland Buttes	530,000	325,000	1,350,000
	Grizzly Flat		205,000	455,000
	Nomlaki Coves			1,580,000
	Squaw Point			2,840,000
	Burris Creek			95,000
	Buckhorn	858,000	110,000	56,000
	Lower Stony Creek		45,000	
	Trails	17,000		131,000
	Subtotal	$1,810,000	$685,000	$6,864,000
30	ENGINEERING AND DESIGN	$ 215,000	$ 80,000	$ 835,000
31	SUPERVISION AND ADMINISTRATION	$ 145,000	$ 55,000	$ 525,000
	TOTAL COST RECREATION DEVELOPMENT	$2,170,000	$820,000	$8,230,000
	TOTAL ALL PHASES			$11,220,000

BLACK BUTTE LAKE MASTER PLAN

TABLE II

DETAILED COST ESTIMATE - Immediate Phase
Without Cost-Sharing
(1 October 1976)

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
14	RECREATION FACILITIES				
	Observation Area				
	Roads & Parking				
	Parking, Paved	3,164	SF	$ 1.00	$ 3,164
	Circulation road re-align (4,300 ex/m.)	.05	Mi	82,000	4,100
	Water facilities				
	Distribution System	1	Job	LS	1,575
	Sanitary Facilities				
	Gravity Sewer Line 6"	200	LF	12	2,400
	Manhole	1	Ea	750	750
	Cleanout	1	Ea	150	150
	Electrical	1	Job	LS	7,000
	Rock wall	4,160	SF	5.50	22,880
	Remove existing improvements	1	Job	LS	2,300
	Visitor Center/Overlook with 4-fixture flush restroom	1,200	SF	62.50	75,000
	Landscaping	1	Job	LS	2,600
	Subtotal				$121,919
	Contingencies 25%+				28,081
	Total Observation Area				$150,000
	Eagle Pass				
	Water facilities				
	Distributions system (1960'-3/4" to 2")	1	Job	LS	$12,500
	Sanitary Facilities				
	Restroom - Convert Vault to 4 fixture flush (355 SF)	1	ea	$32,000	32,000
	Restroom - Replace portables with 4-fixture flush (355 SF)	1	ea	31,000	31,000
	Gravity Sewer line - 6"	700	LF	12	8,400
	Sewer Force Main - 4"	1,000	LF	9	9,000

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Eagle Pass (Cont'd)				
	Holding tank with pump	1	ea	4,000	4,000
	Septic tank (9000G)	1	ea	18,000	18,000
	Oxidation pond (210' x 100')	1	Job	LS	64,000
	Manhole	1	ea	750	1,500
	Electrical	1	Job	LS	11,000
	Relocate picnic unit (2)	1	Job	2,000	2,000
	Picnic Shelter	2	ea	4,000	8,000
	Landscaping	1	Job	LS	2,200
	Subtotal				$203,600
	Contingencies 25%+				51,400
	Total Eagle Pass				$255,000
	Orland Buttes				
	Sanitary Facilities				
	Restroom - Convert vault to 4-fixture flush	3	ea	$32,000	$96,000
	Oxidation pond (300' x 228')	1	ea	LS	196,000
	Holding tank w/ grinder pump	1	ea	7,600	7,600
	Septic tank (30,000G)	1	ea	58,500	58,500
	Gravity sewer line 6"	1,800	LF	12	21,600
	Manhole	2	ea	750	1,500
	Electrical	1	Job	LS	20,200
	Campground renovation	1	Job	LS	9,560
	Group camp renovation	1	Job	LS	5,150
	Landscaping	1	Job	LS	8,000
	Subtotal				$424,110
	Contingencies 25%+				105,890
	Total Orland Buttes				$530,000
	Buckhorn				
	Roads & Parking				
	Road - 2 lane paved access (5300 Ex/Mi)	1.17	Mi	$100,000	$117,000
	Parking - paved	38,800	SF	0.85	32,98
	Parking - gravel	23,500	SF	0.45	10,575
	Water Facilities				
	Well and pump	1	ea	11,500	11,500

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Buckhorn (Cont'd)				
	Treatment plant	1	ea	30,000	30,000
	Water line 4"	900	LF	7.50	6,750
	Water line 3"	1,560	LF	7	10,920
	Water line 1" to 2"	2,520	LF	6	15,120
	Water line 3/4"	600	LF	5	3,000
	Misc. Water Items	1	Job	LS	6,225
	Sanitary Facilities				
	Restroom - Convert vault to 4-fixture flush	1	ea	32,000	32,000
	Restroom - 4-fixture flush (355 SF)	2	ea	31,000	62,000
	Restroom - 6-fixture flush with change shelter (560 SF)	1	ea	45,000	45,000
	Oxidation pond (280' x 150')	1	ea	LS	123,250
	Holding tank with grinder pump	1	ea	3,800	3,800
	Septic tank (18,000 G)	1	ea	36,000	36,000
	Sewer Force main 4"	600	LF	9	5,400
	Gravity sewer line 6"	3,700	LF	12	44,400
	Manhole	8	ea	750	6,000
	Electrical	1	Job	LS	74,070
	Landscaping	1	Job	LS	11,000
	Subtotal				$686,990
	Contingencies 25%+				171,010
	Total Buckhorn				$858,000
	Trails				
	Trail - hiking	7,144	LF	$1.25	$ 8,930
	Trail - nature	1.3	Mi	3500	4,550
	Subtotal				$ 13,480
	Contingencies 25%+				3,520
	Total Trails				$ 17,000
	TOTAL RECREATION FACILITIES				$1,790,000
30	ENGINEERING AND DESIGN				$ 215,000
31	SUPERVISION AND ADMINISTRATION				$ 145,000
	TOTAL COST IMMEDIATE PHASE WITHOUT COST-SHARING				$2,150,000

BLACK BUTTE LAKE MASTER PLAN

TABLE III

DETAILED COST ESTIMATE - Immediate Phase with Cost-Sharing
(1 October 1976)

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
14	RECREATION FACILITIES				
	Orland Buttes				
	Roads & Parking				
	Road - 2 lane paved circulation	0.62	Mi	$120,000	$74,400
	Parking - paved	6,300	SF	0.85	5,355
	Water Facilities				
	Distribution system (3000'- 3/4" to 2")	1	Job	LS	32,200
	Sanitary Facilities				
	Restroom - 4-fixture flush (485 SF)	2	ea	31,000	62,000
	Sewer Force Main 4"	2,900	LF	9	26,100
	Manhole	5	ea	750	3,750
	Camp unit	15	ea	1,250	18,750
	Tot Lot	1	ea	2,000	20,000
	Trail - hiking	1	Mi	5,850	5,850
	Landscaping	1	Job	LS	4,700
	Subtotal				$253,105
	Contingencies 25%±				71,895
	Total Orland Buttes				$325,000
	Grizzly Flat				
	Roads & parking				
	Road - 2 lane paved access (5,280 Ex/Mi)	1.36	Mi	$113,000	$153,680
	Parking paved (240 cy/ex)	6,300	SF	0.85	5,355
	Archery range	1	Job	LS	3,325
	Subtotal				$162,360
	Contingencies 25%±				42,640
	Total Grizzly Flat				205,000

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Buckhorn				
	Roads and parking				
	2-lane paved access (5300 ex/mi)	0.6	Mi	$100,000	$ 60,000
	Parking Paved	6,300	SF	0.85	5,355
	Group Camp	1	Job	LS	21,000
	Sanitary facilities				
	Restroom - portable	2	ea	500	1,000
	Subtotal				$ 87,355
	Contingencies 25%+				22,645
	Total Buckhorn				$110,000
	Lower Stony Creek				
	Roads & Parking				
	Parking - paved	13,520	SF	$1.20	$16,224
	Sanitary Facilities				
	Restroom - portable	8	ea	500	4,000
	Handicapped use area	1	Job	LS	13,700
	Landscaping	1	Job	LS	1,200
	Subtotal				$35,124
	Contingencies 25%+				9,876
	Total Lower Stony Creek				$45,000
	TOTAL RECREATION FACILITIES				$685,000
30	ENGINEERING AND DESIGN				80,000
31	SUPERVISION AND ADMINISTRATION				55,000
	TOTAL COST IMMEDIATE PHASE WITH COST-SHARING				$820,000

BLACK BUTTE LAKE MASTER PLAN

TABLE IV

DETAILED COST ESTIMATE - Future Phase
(1 October 1976)

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
01	LANDS AND DAMAGES				
	Access easement (June 1976)	14.2	A	varies	$ 6,000
14	RECREATION FACILITIES				
	Observation area				
	Picnic unit	4	ea	$ 390	$1,560
	Subtotal			$1,560	
	Contingencies 25%+				440
	Total Observation Area				$ 2,000
	Eagle Pass				
	Roads & parking				
	Road - 2 lane paved	0.32	Mi	$100,000	$32,000
	Parking - paved	25,650	SF	1.20	30,780
	Water Facilities				
	Well and pump	1	ea	11,500	11,500
	Treatment plant	1	ea	LS	24,900
	Waterline 1" to 2"	2,935	LF	6	17,610
	Waterline 3/4"	200	LF	5	1,000
	Misc Items	1	Job	LS	1,550
	Sanitary Facilities				
	Restroom - 4-fixture flush (485 SF)	1	ea	31,000	31,000
	Restroom - 6-fixture flush with change shelter (415 SF)	1	ea	45,000	45,000
	Gravity sewer line 6"	1,350	LF	12	16,200
	Manhole	3	ea	750	2,250
	Electrical	1	Job	LS	18,700
	Boat ramp widening	1	Job	LS	13,100
	Boarding Float	1	ea	7,000	7,000

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Eagle Pass (Cont'd)				
	Picnic Unit	16	ea	640	10,240
	Relocate picnic unit (2)	1	Job	2,000	2,000
	Site preparation	1	Job	LS	10,000
	Swimming area	1	Job	LS	4,900
	Landscaping	1	Job	LS	5,000
	Subtotal				284,730
	Contingencies 25%+				70,270
	Total Eagle Pass				$355,000
	Orland Buttes				
	Roads & parking				
	Road - 2 lane paved circulation (incl 36 pull thru and 50 pkg stubs)	2.18	Mi	168,000	366,240
	Parking - paved	13,900	SF	0.85	11,815
	Water Facilities				
	Well and pump	1	ea	21,700	21,700
	Treatment plant	1	ea	33,000	33,000
	Water line 3"	2,600	LF	7	18,200
	Water line 1-1/2" to 2"	3,350	LF	6	20,100
	Water line 3/4"	2,600	LF	5	13,000
	Misc items	1	Job	LS	7,400
	Sanitary facilities				
	Restroom - 4-fixture flush (485 SF)	8	ea	31,000	248,000
	Restroom - portable	6	ea	500	3,000
	Sewer Force Main 4"	3,000	LF	9	27,000
	Gravity sewer line 6"	5,900	LF	12	70,800
	Holding tank w/ grinder pump	1	ea	3,800	3,800
	Manhole	17	ea	750	12,750
	Electrical	1	Job	LS	51,800
	Entrance Station	1	ea	LS	3,000
	Boat ramp widening	1	Job	LS	13,095
	Boarding float	1	ea	7,000	7,000
	Camp unit	102	ea	445	45,390
	Site preparation	1	Job	LS	500
	Rock barrier	9,600	LF	7	67,200
	Trailer dump station	1	ea	10,000	10,000
	Landscaping	1	Job	LS	26,000
	Subtotal				$1,079,990
	Contingencies 25%+				270,010
	Total Orland Buttes				$1,350,000

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Grizzly Flat				
	Roads & parking				
	Road - 2 lane paved access	0.24	Mi	$113,000	$ 27,120
	Road - 2 lane paved circulation	0.66	Mi	143,000	94,380
	Parking - paved	11,000	SF	0.85	9,350
	Water Facilities				
	Pump system	1	ea	21,700	21,700
	Treatment plant	1	ea	25,000	25,000
	Water line 3"	1,680	LF	7	11,760
	Water line 1"-2"	2,080	LF	6	12,480
	Water line 3/4"	2,420	LF	5	12,100
	Misc items	1	Job	LS	3,000
	Sanitary Facilities				
	Restroom - portable	12	ea	500	6,000
	Electrical	1	Job	LS	71,000
	Camp unit	31	ea	450	13,950
	Picnic unit	17	ea	370	6,290
	Site preparation	1	Job	LS	1,000
	Rock barrier	4,320	LF	7	30,240
	Play field	1	ea	6,630	6,630
	Archery range (upgrade)	1	Job	LS	2,000
	Landscaping	1	Job	LS	8,000
	Subtotal				$362,000
	Contingencies 25%+				93,000
	Total Grizzly Flat				$455,000
	Nomlaki Coves				
	Roads & parking				
	Road - 2 lane paved access	2.36	Mi	$113,000	$266,680
	Road - 2 lane paved circulation	2.30	Mi	123,000	282,900
	Road - 1 lane service	0.16	Mi	54,600	8,736
	Parking - paved	11,080	SF	0.85	9,418
	Water Facilities				
	Pump system	1	ea	23,500	23,500
	Treatment plant	1	ea	28,000	28,000
	Water line 3"	3,120	LF	7	21,840
	Water line 1" to 2"	3,220	LF	6	19,320
	Water line 3/4"	4,080	LF	5	20,400

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Nomlaki Coves (Cont'd)				
	Misc. items	1	Job	LS	5,900
	Sanitary Facilities				
	Restroom - 4-fixture flush (485 SF)	5	ea	31,000	155,000
	Oxidation pond (250' x 105')	1	ea	LS	79,090
	Holding tank w/ grinder pump	1	ea	3,800	3,800
	Septic tank (11,250 G)	1	ea	22,500	22,500
	Sewer Force main 4"	2,300	LF	9	20,700
	Gravity sewer line 6"	3,500	LF	12	42,000
	Manhole	11	ea	750	8,250
	Electrical	1	Job	LS	93,200
	Boat launching - car top	1	ea	6,600	6,600
	Camp unit	70	ea	450	31,500
	Picnic unit	2	ea	400	800
	Site preparation	1	Job	LS	500
	Rock Barrier	7,560	LF	7	52,920
	Horseshoe court	2	ea	1,500	3,000
	Tot Lot	1	ea	20,000	20,000
	Trailer dump station	1	ea	10,000	10,000
	Entrance station	1	ea	3,000	3,000
	Landscaping	1	Job	LS	24,000
	Subtotal				$1,263,554
	Contingencies 25%±				316,446
	Total Nomlaki Coves				$1,580,000
	Squaw Point				
	Roads & parking				
	Road - 2 lane paved access	3.54	Mi	$113,000	$ 400,020
	Road - 2 lane paved circulation	5.70	Mi	100,000	570,000
	Road - 1 lane service	0.10	Mi	61,000	6,100
	Parking - paved	53,000	SF	0.85	45,050
	Parking - gravel	9,100	SF	0.45	4,095
	Water Facilities				
	Pump system	1	ea	24,400	24,400
	Treatment plant	1	ea	30,000	30,000
	Water line 4"	5,000	LF	7.50	37,500

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Squaw Point (Cont'd)				
	Water line 3"	2,500	LF	7	17,500
	Water line 1-1/2" to 2"	3,540	LF	6	21,240
	Water line 3/4"	3,400	LF	5	17,000
	Misc. items	1	Job	LS	7,600
	Sanitary Facilities				
	Restroom - 4-fixture flush (485 SF)	9	ea	31,000	279,000
	Restroom - 6-fixture flush with change shelter (560 SF)	1	ea	45,000	45,000
	Restroom - portable	4	ea	500	2,000
	Oxidation pond (280' x 150')	1	ea	LS	123,250
	Holding tank w/ grinder pump	2	ea	3,800	7,600
	Septic tank (18,000 G)	1	ea	36,000	36,000
	Sewer Force main 4"	6,600	LF	9	59,400
	Gravity sewer line 6"	2,250	LF	12	27,000
	Manhole	21	ea	750	15,750
	Electrical	1	Job	LS	145,650
	Boat ramp (4 lane)	1	Job	LS	116,500
	Boarding float	2	ea	7,000	14,000
	Camp unit	102	ea	450	45,900
	Site preparation	1	Job	500	500
	Rock barrier	10,720	LF	7	75,040
	Horseshoe Court	2	ea	1,500	3,000
	Totlot	1	ea	20,000	20,000
	Fish Cleaning station	1	ea	3,000	3,000
	Trailer dump station	1	ea	10,000	10,000
	Swim area - excavation	3,700	CY	3.50	12,950
	Swim area - sand	920	T	4	3,680
	Landscaping	1	Job	LS	46,000
	Subtotal				$2,271,725
	Contingencies 25%±				568,275
	Total Squaw Point				$2,840,000
	Burris Creek				
	Roads & parking				
	Road - 2 lane paved circulation	0.60	Mi	$96,500	$57,900
	Parking - paved	9,520	SF	0.85	8,092
	Sanitary Facilities				
	Restroom - portable	2	ea	500	1,000
	Picnic unit	12	ea	370	4,440

Cost Account No.	Item	Quantity	Unit	Unit Price	Amount
	Burris Creek (Cont'd)				
	Group picnic unit	4	ea	600	2,400
	Site preparation	1	Job	LS	200
	Landscaping	1	Job	LS	2,000
	Subtotal				$76,032
	Contingencies 25%+				18,968
	Total Burris Creek				$95,000
	Buckhorn				
	Roads & parking				
	Parking - paved	10,370	SF	$0.85	$8,815
	Boat ramp widening	1	Job	LS	24,500
	Boarding Float	1	ea	7,000	7,000
	Picnic unit	3	ea	375	1,125
	Site preparation	1	Job	LS	250
	Rock barrier	50	LF	7	350
	Landscaping	1	Job	LS	2,000
	Subtotal				44,070
	Contingencies 25%+				11,930
	Total Buckhorn				56,000
	Trails				
	Trail - Hiking and biking (Paved 8' wide)	2.76	Mi	$38,000	$104,880
	Contingencies 25%+				26,120
	Total Trails				$131,000
	TOTAL RECREATION FACILITIES				$6,864,000
30	ENGINEERING AND DESIGN				835,000
31	SUPERVISION AND ADMINISTRATION				525,000
	TOTAL COST FUTURE PHASE RECREATION DEVELOPMENT				$8,230,000

CHAPTER XII - CONCLUSIONS AND RECOMMENDATIONS

76. Conclusions. - Water oriented outdoor activities constitute a major use of Black Butte Lake's water and land areas. Recreation use in excess of 170,000 recreation days annually is sustained at the lake, with the trend toward increasing recreation use in the future. Improved recreation facilities are needed in some of the more heavily used areas to alleviate public health and safety problems. Additional recreation facilities will be needed in the future to provide for the anticipated annual use of 490,000 recreation days by the year 2076. The developments proposed in this master plan would provide quality recreation opportunities at the maximum practical utilization level, and at the same time safeguard the environmental quality of project lands and waters. Acquisition of additional lands is needed for the identified program of recreation development. At the appropriate time following approval of this Master Plan, and following receipt of a letter from a non-Federal governmental entity expressing intent to pay at least 50 percent of the capital cost of recreation development and operate and maintain the new facilities, a feasibility report will be processed to obtain authorization for the land acquisition. Prior to acquisition of lands, a Real Estate Design memorandum would be prepared and a cost-sharing contract executed. At the appropriate time following approval of this master plan a supplement will be prepared for the visitor center.

77. Recommendation. - It is recommended that this master plan be approved as the basis for immediate and future development and administration of project lands and waters and related resources.

BUCKHORN RECREATION AREA

BLACK BUTTE DAM

LOWER STONY CREEK RECREATION AREA

OBSERVATION AREA

EAGLE PASS RECREATION AREA

BURRIS CREEK RECREATION AREA

SQUAW POINT RECREATION AREA

NOMLAKI COVES RECREATION AREA

ORLAND BUTTES RECREATION AREA

GRIZZLY FLAT RECREATION AREA

TEHAMA CO.

GLENN CO.

T. 23 N.

T. 22 N.

TO CORNING

TO NEWVILLE

TO ORLAND

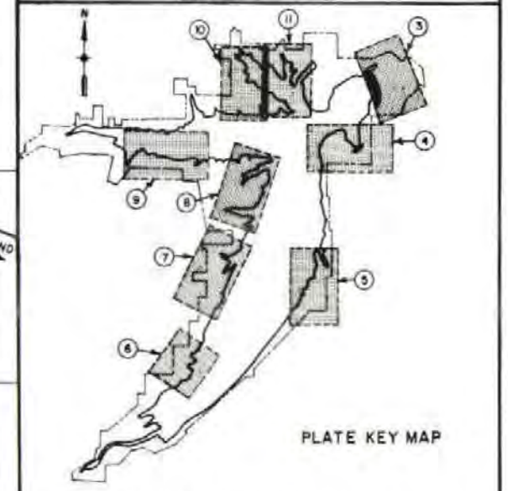
Stony Creek

Burris Creek

N

LEGEND

- Project Boundary
- Gross Pool Elev. 473.5 feet
- Normal Recreation Pool Elev. 453.5 feet
- Inactive Pool Elev. 414.6 feet
- Existing County Road and Access Road
- Proposed Road
- Proposed Trail
- Recreation Development Area
- BUCKHORN — Area Development Label
- EXISTING
- IMMEDIATE
- FUTURE



0 1000 2000 4000 6000 8000 12000
SCALE IN FEET

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN

GENERAL RECREATION PLAN

APPROVED: FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO SC-1-20-226
SHEETS SHEET NO
226/1 TO 226/14 226/1

PLATE 1

BUCKHORN RECREATION AREA

BLACK BUTTE DAM

LOWER STONY CREEK RECREATION AREA

OBSERVATION AREA

EAGLE PASS RECREATION AREA

BURRIS CREEK RECREATION AREA

SQUAW POINT RECREATION AREA

NOMLAKI COVES RECREATION AREA

ORLAND BUTTES RECREATION AREA

GRIZZLY FLAT RECREATION AREA

MARINA CORRIDOR

LAUNCHING CORRIDOR

SWIMMING CORRIDOR

TEHAMA CO
GLENN CO

TO NEWVILLE

TO ORLAND

LEGEND

- Project Boundary
- Gross Pool Elev. 473.5 feet
- Normal Recreation Pool Elev. 453.5 feet
- Inactive Pool Elev. 414.6 feet
- Existing County Roads and Access Roads
- Boundary of Lands Identified for Access Easement
- Boundary for Low Speed Boating Zone and Restricted Area Near Dam

LAND ZONING

- Project Operations
- Operations: Recreation - Intensive Use
- Operations: Recreation - Low Density Use
- Operations: Wildlife management
- Operations: Recreation - Intensive Use, Interim Use, Wildlife Management
- Flowage Easement

SCALE IN FEET

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN

LAND USE AND WATER ZONING

DONALD M. O'SHEI

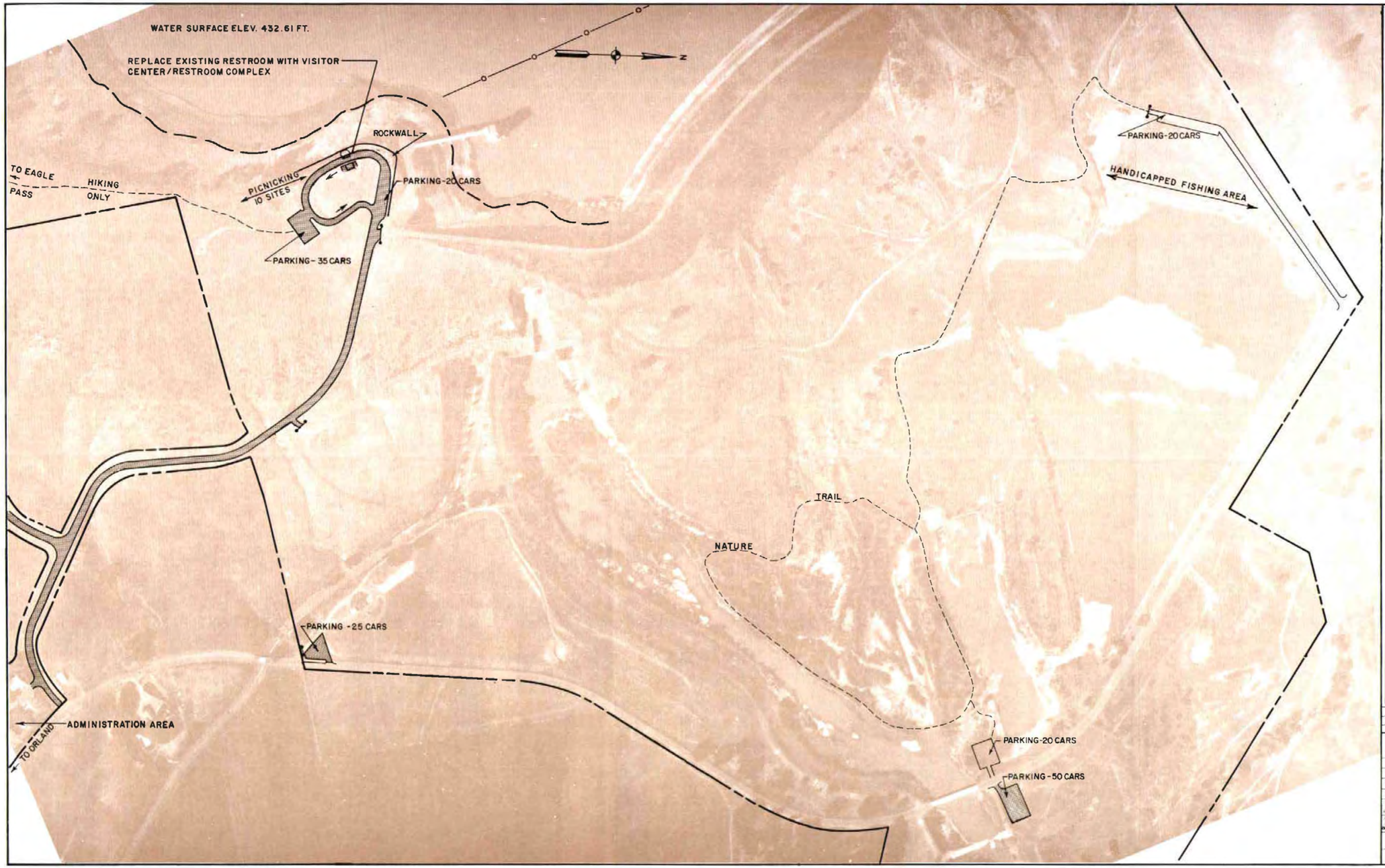
FILE NO. SC-1-20-226

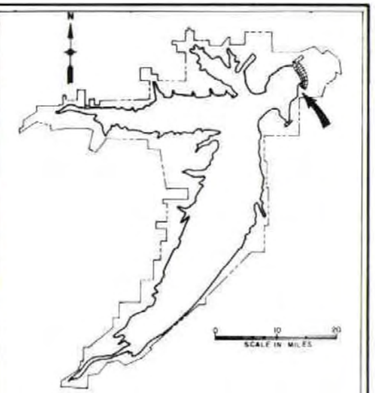
SHEETS 226/1 TO 226/1R

SHEET NO. 226/2

FEB 1977

PLATE 2





AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

NUMBER	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY DWA-BHM
CHECKED BY J.J.M.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE

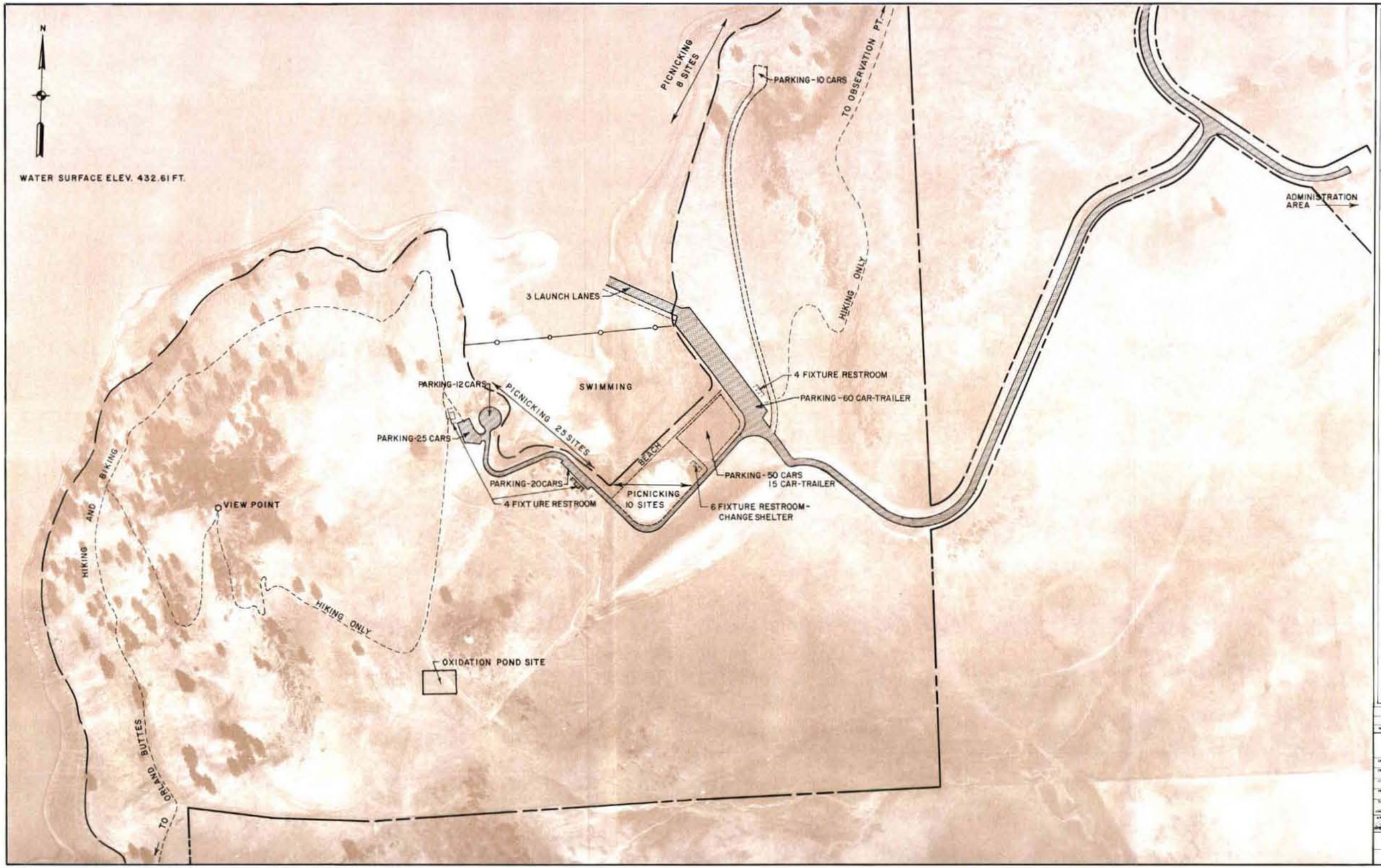
MASTER PLAN
OBSERVATION AREA
AND LOWER STONY CREEK
RECREATION AREA

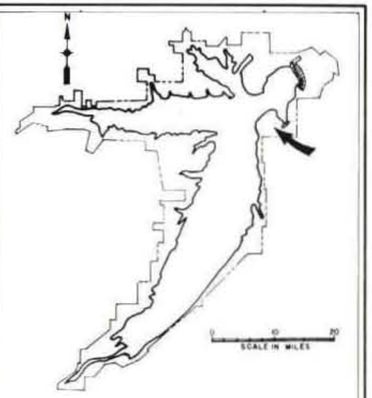
APPROVED DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO. SC-1-20-226
SHEETS SHEET NO.
226/1 TO 226/4 226/3

PLATE 3





AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

NO.	DATE	DESCRIPTION	BY	APP'D

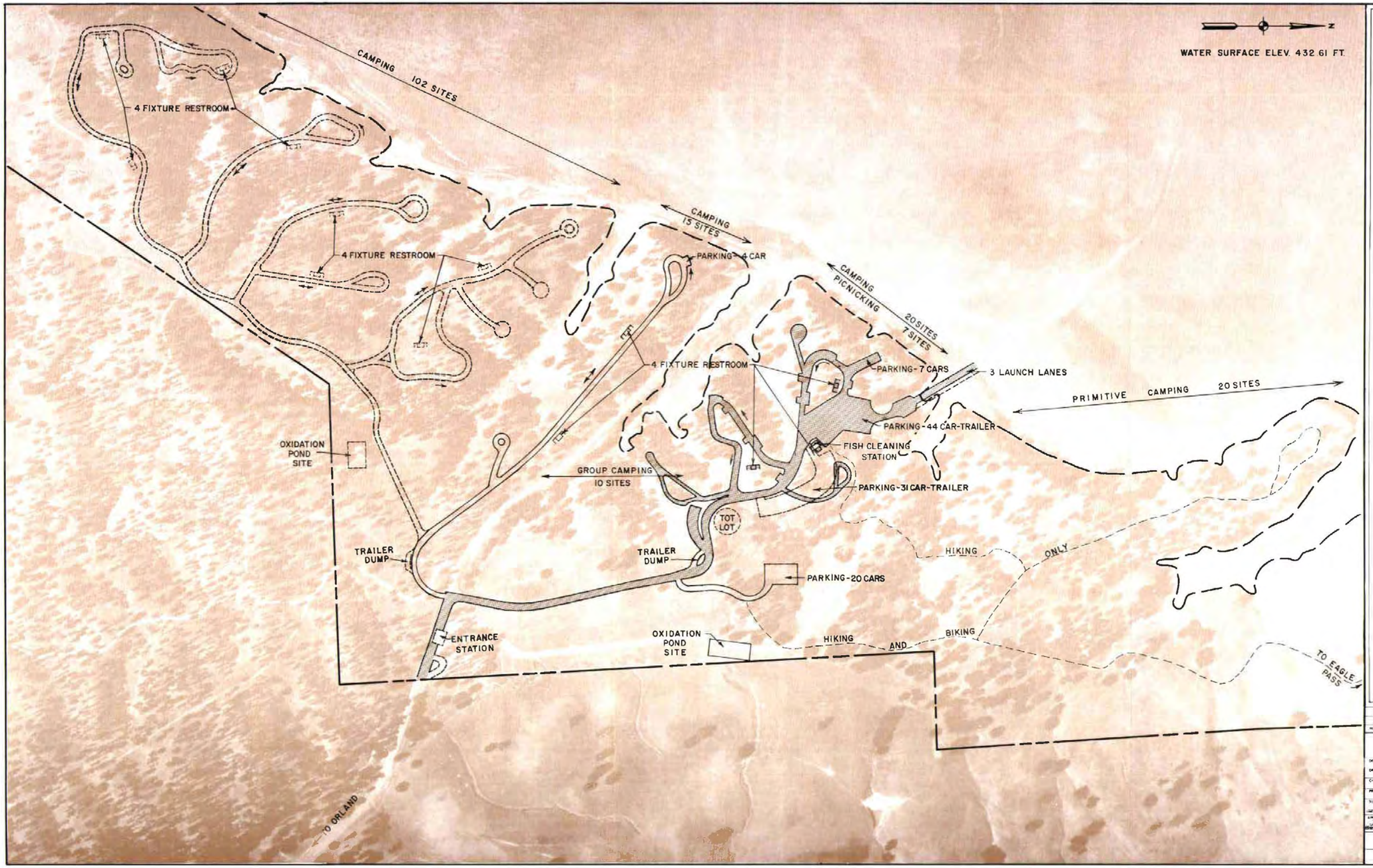
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A. B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
EAGLE PASS
RECREATION AREA

APPROVED FOR THE DISTRICT ENGINEER
DATE FEB 1977
PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI
DISTRICT ENGINEER
SCALE
FILE NO. SC-1-20-226
SHEETS
SHEET NO.

PLATE 4



AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A.-B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
ORLAND-BUTTES
RECREATION AREA

APPROVED
DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI
DISTRICT ENGINEER

SCALE
FILE NO SC-I-20-226
SHEETS 226/1 TO 226/14
SHEET NO 226/5

PLATE 5

ARCHERY RANGE

PARKING - 20 CARS

TO NOMLAKI COVES

TO ORLAND

FREE CAMPING - 31 SITES

PARKING - 15 CARS

PARKING - 20 CARS

PLAY FIELD

PICNICKING - 17 SITES

AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

NO.	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.G.M.
DRAWN BY D.W.A - B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

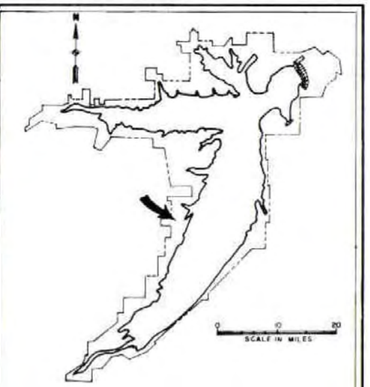
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
GRIZZLY FLAT
RECREATION AREA

APPROVED
DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
SPEC NO
FILE NO SC-I-20-226
SHEETS 226/1 TO 226/14
SHEET NO 226/6

PLATE 6



AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Fence
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.D.M.
DRAWN BY DWA-BHM
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

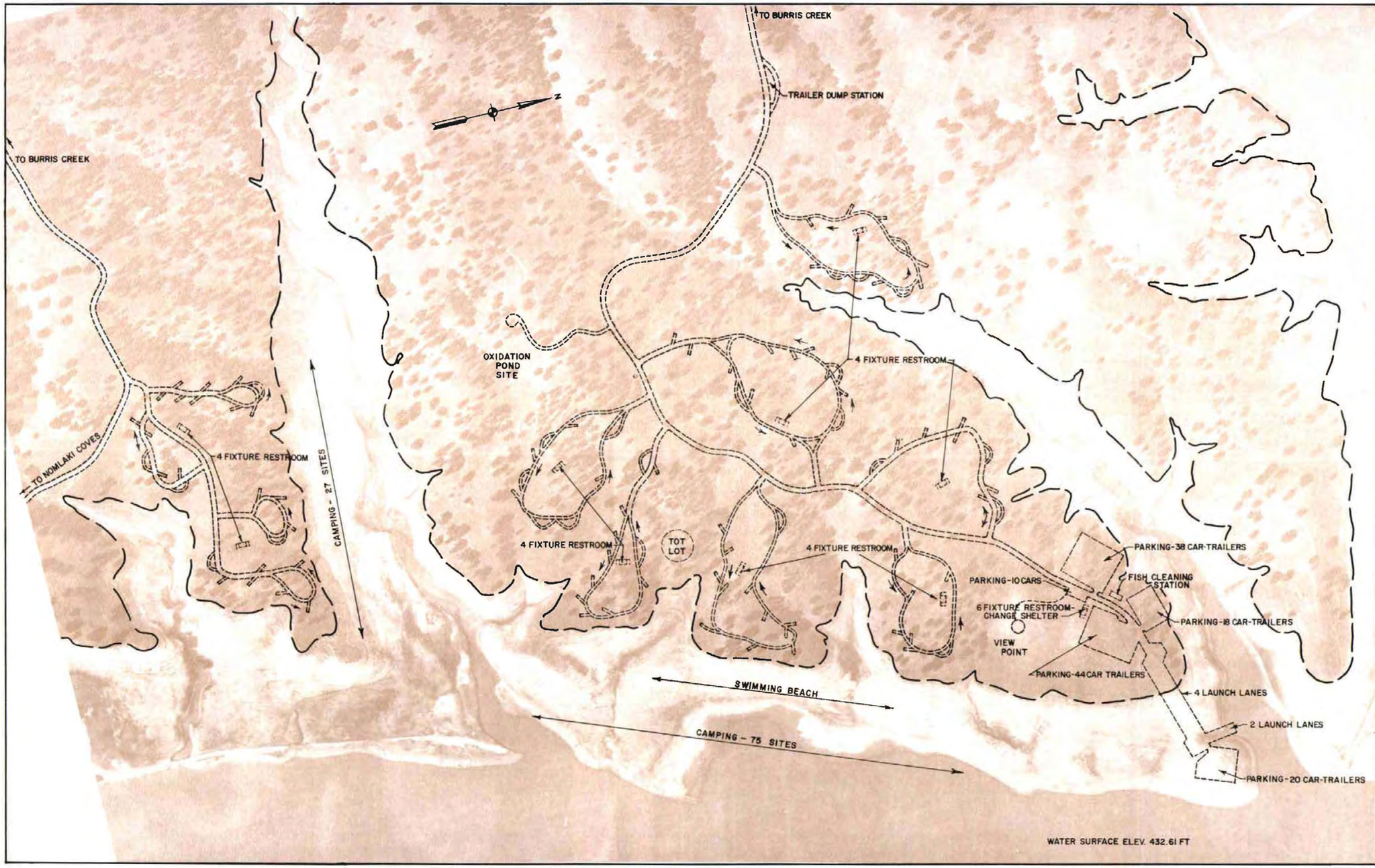
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
NOMLAKI COVES
RECREATION AREA

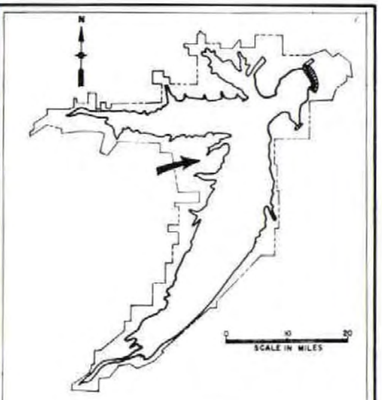
APPROVED DATE FEB 1977

RECOMMENDED UNDER THE DIRECTION OF
DONALD M OSHEI

SCALE SPEC NO
FILE NO SC-I-20-226
SHEETS 226/1 TO 226/14
SHEET NO 226/7

PLATE 7





AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES :

1. Aerial photography 20 October 1975 (Pool Elev. 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A-R.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED BY
APPROVAL RECOMMENDED
APPROVED

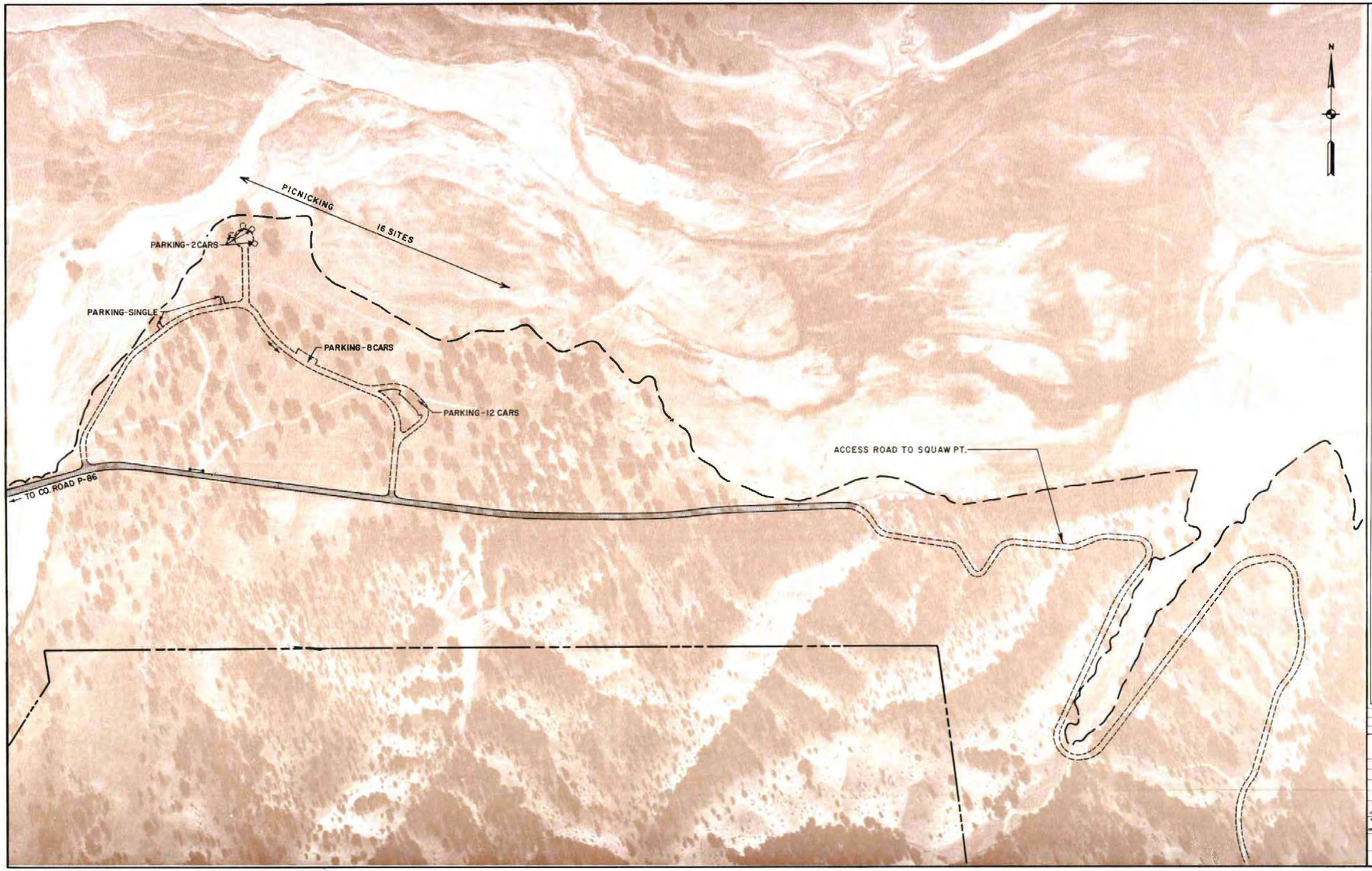
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
SQUAW POINT
RECREATION AREA

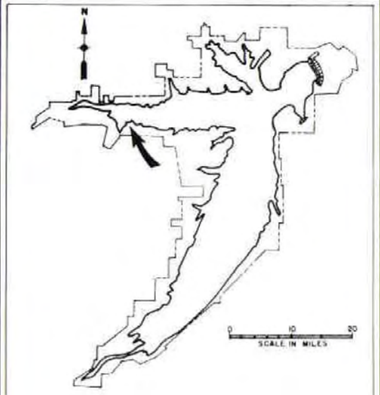
DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO. SC-1-20-226
SHEETS 226/1 TO 226/14
SHEET NO. 226/8

PLATE 8





AREA LOCATION MAP

LEGEND

- Gross Pool Elev 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A-B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

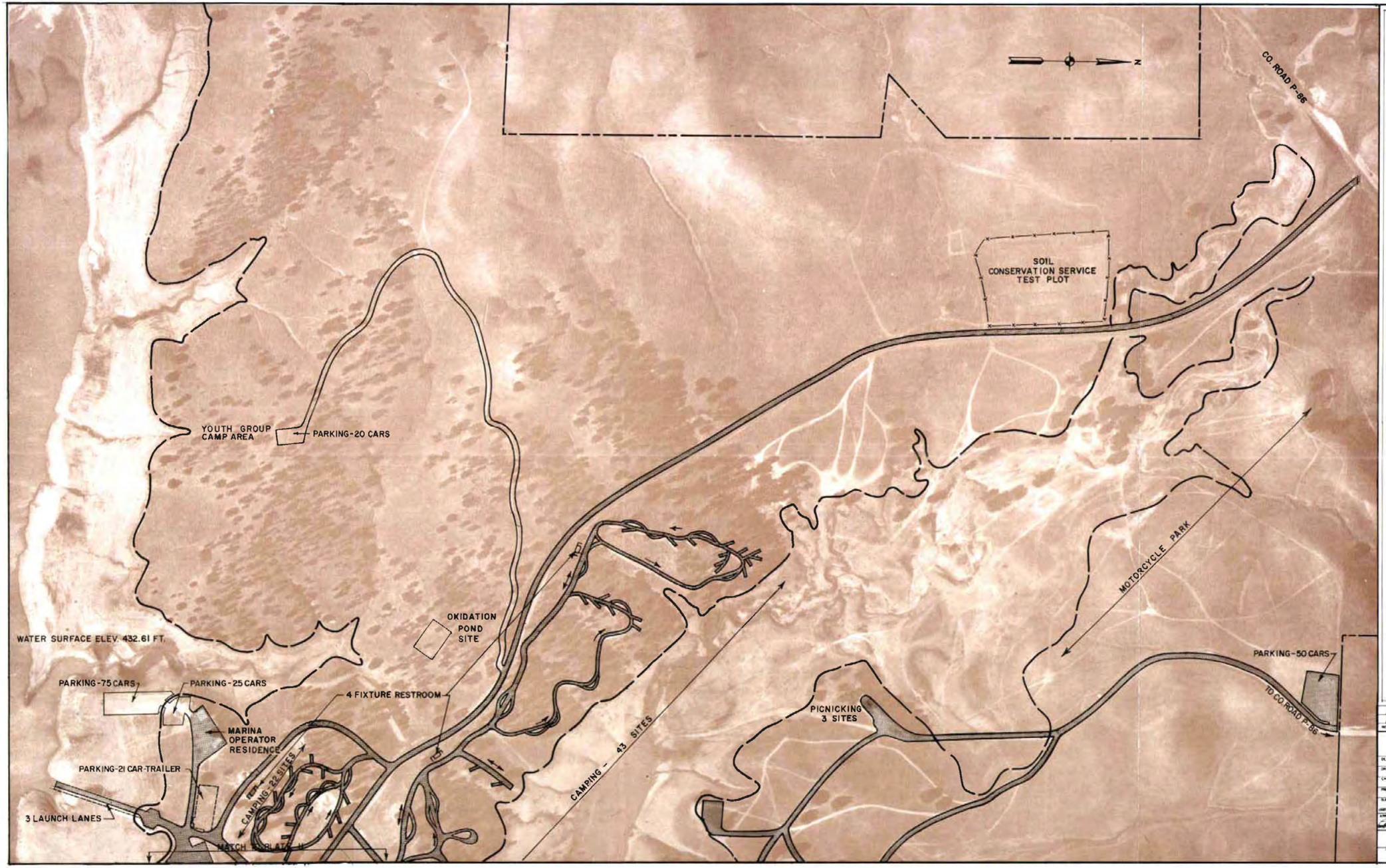
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
BURRIS CREEK
RECREATION AREA

APPROVED DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE SPEC NO
FILE NO SC-1-20-226
SHEETS 226/1 TO 226/14 SHEET NO 226/9

PLATE 9



AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY D.W.A-B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
BUCKHORN
RECREATION AREA

APPROVED DATE FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI
DEPUTY DIVISION

SCALE
FILE NO. SC-1-20-226
SHEETS 226/1 TO 226/14
SHEET NO. 226/10

PLATE 10

AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Restroom

NOTES:

1. Aerial photography 20 October 1975 (Pool Elev 432.61 feet)
2. All elevations refer to sea level datum of 1927

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	APP'D

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY DWA-B.H.M.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED
APPROVAL RECOMMENDED
APPROVED
DATE FEB 1977

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE

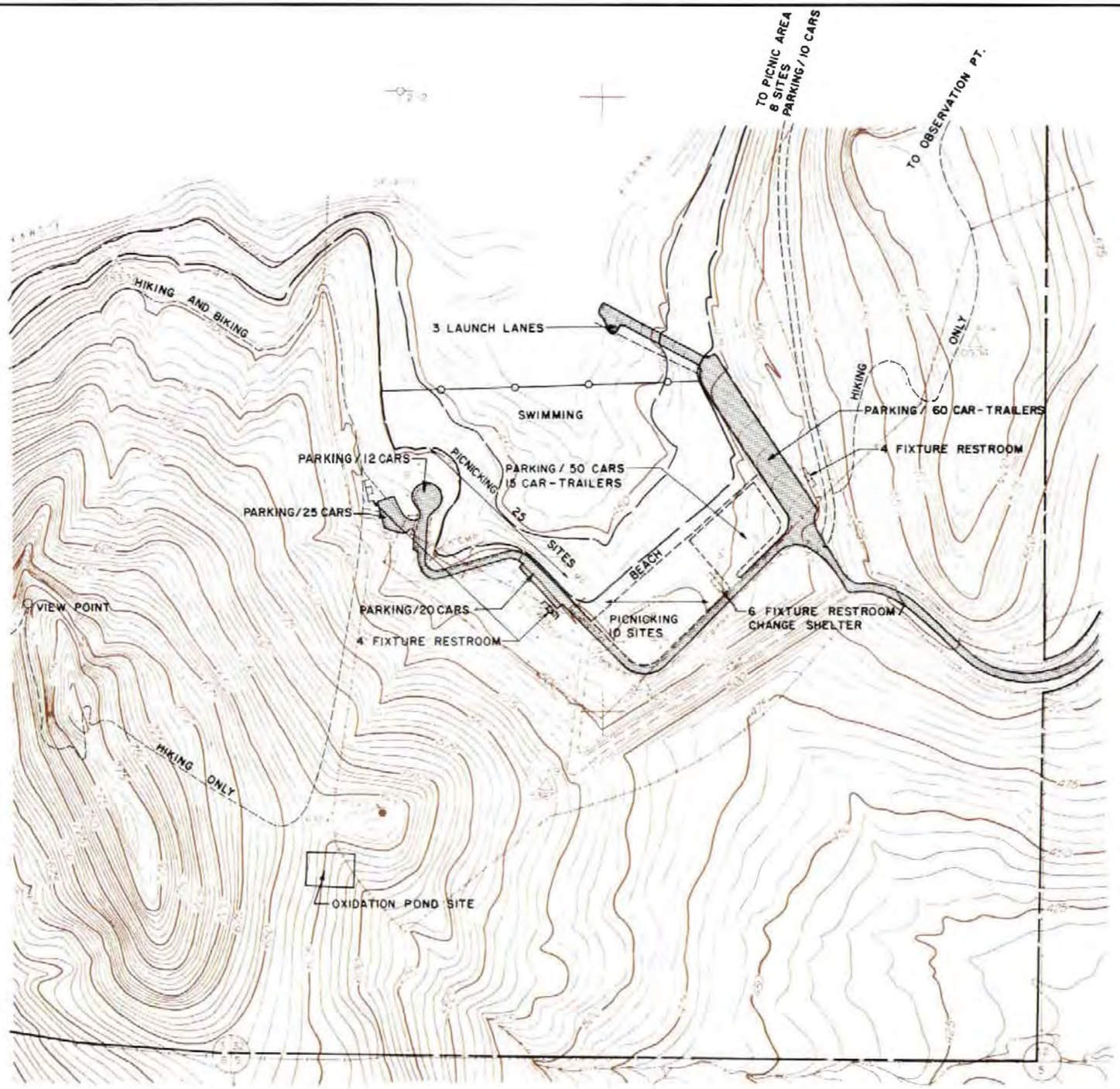
MASTER PLAN

BUCKHORN
RECREATION AREA

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI
SURVEY ENGINEER

SCALE
SPEC NO
FILE NO SC-1-20-226
SHEETS 226/1 TO 226/14
SHEET NO 226/11

PLATE 11



AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Average Recreation Pool Elev. 453.5 feet
- Water Edge Elev. 428.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Fence
- Power Line
- Restroom

NOTES:

1. *Horizontal Control referred to U.S.C.E. System for Black Butte Dam*
2. *Elevations are referred to Sea Level Datum of 1927*
3. *Aerial Photography 26 December 1967*
4. *Topography by Kelsh Stereo-Plotter December 1967*
5. *See Plate 4 for photograph of area*

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY C.I.W
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

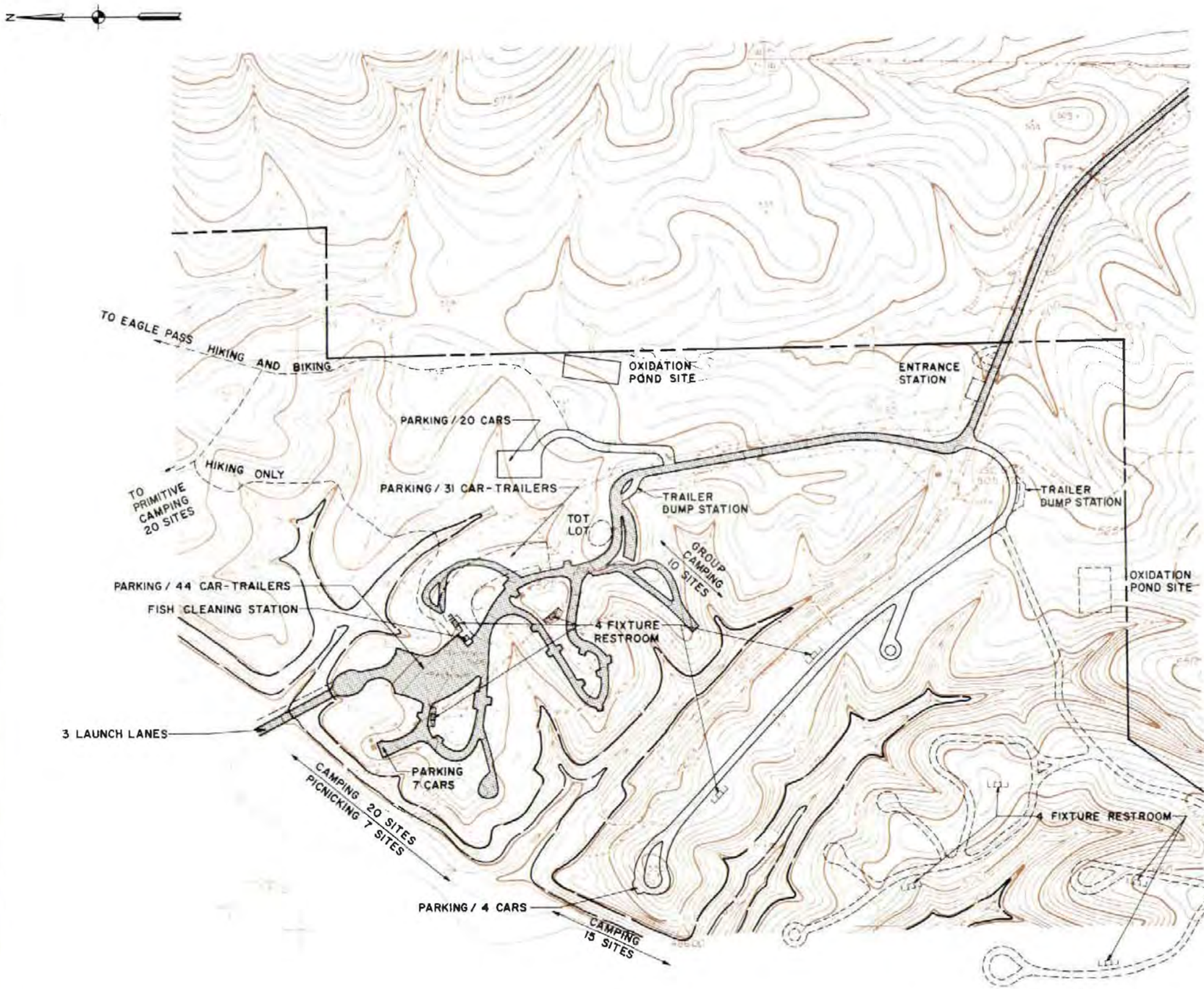
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
EAGLE PASS RECREATION AREA
TOPOGRAPHY

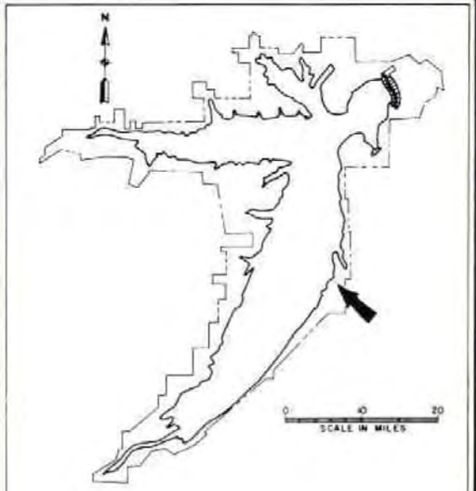
APPROVED: George B. Woodell DATE: FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO SC-1-20-226
SHEETS 226/1 TO 226/14
SHEET NO 226/12

PLATE 12





AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Average Recreation Pool Elev. 453.5 feet
- Water Edge Elev. 428.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Fence
- Power Line
- Restroom

NOTES:

1. *Horizontal Control referred to U.S.C.E. System for Black Butte Dam*
2. *Elevations are referred to Sea Level Datum of 1927*
3. *Aerial Photography 26 December 1967*
4. *Topography by Kelsh Stereo-Plotter December 1967*
5. *See Plate 5 for photograph of area*
6. *Topography not available for southern portion of future campground*

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	BY

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY C.I.W.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

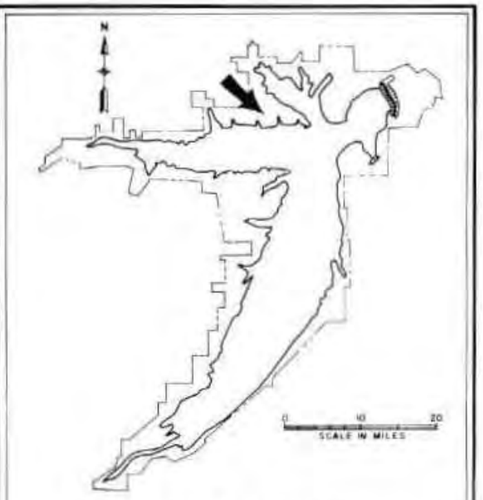
STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
ORLAND BUTTES RECREATION AREA
TOPOGRAPHY

APPROVAL RECOMMENDED
APPROVED: DATE: FEB 1971

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO SC-1-20-226
SPEC NO.
SHEETS 226/1 TO 226/14
SHEET NO 226/13

PLATE 13



AREA LOCATION MAP

LEGEND

- Gross Pool Elev. 473.5 feet
- Average Recreation Pool Elev. 453.5 feet
- Water Edge Elev. 428.5 feet
- Project Boundary
- Developed Facilities
- Immediate Phase Facilities
- Future Phase Facilities
- Trail
- Fence
- Power Line
- Restroom

NOTES:

1. *Horizontal Control referred to U.S.C.E. System for Black Butte Dam*
2. *Elevations are referred to Sea Level Datum of 1927*
3. *Aerial Photography 26 December 1967*
4. *Topography by Kelsh Stereo-Plotter December 1967*
5. *See Plates 10 and 11 for photographs of the area*

200 0 200 400 600 800
SCALE IN FEET

REVISION	DATE	DESCRIPTION	BY	AP

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DESIGNED BY R.C.M.
DRAWN BY C.I.W.
CHECKED BY J.J.H.
PREPARED BY
SUBMITTED

STONY CREEK, CALIFORNIA
BLACK BUTTE LAKE
MASTER PLAN
BUCKHORN RECREATION AREA
TOPOGRAPHY

APPROVED FEB 1977

PREPARED UNDER THE DIRECTION OF
DONALD M. O'SHEI

SCALE
FILE NO SC-1-20-226
SHEETS SHEET NO
226/1 TO 226/14 226/14

PLATE 14

APPENDIX E

Land Use Regulations-Grazing

Appendix F
LAND USE REGULATIONS
GRAZING
BLACK BUTTE LAKE, CALIFORNIA
AREA "D" *

1. These land use regulations are intended to provide for multiple purpose use of these lands for water resource management, grazing by domestic livestock, wildlife habitat, and the protection of the ecological balance to assure continued productivity while permitting economic returns to the lessee.

2. The current primary uses of Black Butte Lake are flood control, irrigation, and recreation. The lessee is expected to conduct his grazing activities in a manner which will not interfere with these activities at any time.

3. The lessee or his representative, hereinafter referred to as "lessee" shall closely coordinate the grazing operations with the Park Manager, Black Butte Lake, or his authorized representative hereinafter referred to as "Park Manager." In addition, said lessee shall be available to correct emergency situations with regard to the lease. Accordingly, the lessee shall provide the Park Manager with current emergency telephone numbers where the lessee may be contacted during working and non-working hours. When livestock are grazing on the premises, the lessee, or his representative, shall contact the Park Manager's Office, at least once each month in order to maintain adequate coordination between park activities and the lessee's operation. Only the lessee or people in his employ are authorized access to the leased area by this agreement. The lessee shall furnish the Park Manager the names of all the lessee's employees who will be working on the leased area prior to their arrival.

4. It is the expressed intent of the government that the premises be utilized in accordance with sound range management practices consistent with concurrent project use. The protection of the soil and its vegetative cover from deterioration by erosion, overgrazing, wildfire, noxious weed infestations, or other causes is considered part of sound range management. Accordingly, the lessee shall comply with the following management practices:

a. Use of the leased premises by the lessee shall be limited to cattle grazing only.

b. The availability of adequate forage and the general condition of the range shall govern the intensity of grazing by domestic livestock. All grazing shall cease on any portion of or the entire leased property when, in the opinion of the District Engineer, or his authorized representative, the accessible range forage has been utilized to a point where further grazing is not in the best interest of the government.

c. Grazing during the period 15 May to 31 October will only be permitted at the discretion of the Park Manager. This is to insure minimum conflict between grazing and recreational uses and to prevent overgrazing. In addition, the Park Manager will control seasonal use of the proposed Deer Habitat Improvement Area within Area "D". A separate annual grazing schedule, September through January, will be established for the 1,035-acre Deer Habitat Improvement Area. Livestock will not be allowed in this area after January.

d. Salt and supplements for livestock shall <u>not</u> be located adjacent to water and shall be moved to other locations as required to prevent serious trampling damage to the range.

*Attached and made part of grazing lease for Area "D" which began 1 November 1975 and ends 31 October 1980.

e. The lessee shall comply with all Federal, State, and local animal health laws and regulations with respect to livestock grazing on the leased area, and upon request he shall furnish written evidence to that effect to the District Engineer.

f. The lessee shall dispose of any dead animals by removing them from the area immediately to the satisfaction of the Park Manager.

5. The lessee shall submit a certificate that lists the number of Animal Unit Months (AUM's) grazed by the tenth day of each month. The certificate, to be provided by the District Engineer, specifies the method for computing the average AUM. The form shall be made out in duplicate and sent to the following:

District Engineer	Project Manager
ATTN: SPKRE-M	Black Butte Lake
650 Capitol Mall	Star Route #30
Sacramento, CA 95814	Orland, CA 95963

The following definitions shall apply for the purpose of this report, notwithstanding any other commonly known definitions:

Animal Unit (AU) - One (1) cow, heifer, steer or bull 6 months of age or older or one (1) horse.

Animal Unit Month (AUM) - One (1) Animal Unit grazing for an entire month.

6. The lessee, at his own expense, shall participate in a noxious weed control program which shall be in accordanee with the standards set by the local county agricultural commissioner. The lessee shall obtain the written approval of the District Engineer prior to using any pesticide on the leased premises and under no circumstances shall the lessee use DDT, 2, 4, 5T or Amitrol T. As use herein, the term "pesticide" includes herbicides, insecticides, fungicides, and rodenticides, but does not include products commonly known as medicines.

7. The lessee at his own expense shall construct temporary fences, cattleguards, and other controls as necessary to control livestock on the leased areas at the direction of the Park Manager. All fences and cattleguards, so installed, shall remain the property of the lessee (unless as otherwise specified) and upon request of the Park Manager shall be removed immediately or withdrawn to a position that will not interfere with project operations. Failure to comply with the installation or removal of such fences shall constitute cause for revocation of the lease. Temporary fencing shall be constructed of not less than four strands of 2-point 12½ gauge barbed wire hung on wood or steel posts. The overall quality of fence construction will be at the direction of the lessee but it must be adequate to control livestock being grazed. Stretch posts and corner posts shall be of the size and number to maintain wire tension. Electric fences will not be permitted. Fences shall not be allowed to become inundated, unless permitted by the Park Manager and marked as he may direct. The lessee shall supply his own locks and shall furnish the Park Manager with keys to all locked gates on the leased premises.

8. The lessee shall, at his own cost and expense, repair and maintain in a livestock-tight condition all fencing separating the leased premises from adjoining government or non-government property. All materials used in maintaining government-owned fences shall become the property of the government and shall not be removed by the lessee.

9. The lessee agrees that he will not accept any Federal cost sharing payments for soil conservation practices required by the lease that will result in duplicate payment for such practices.

10. Lessee shall insure proper cleanup of areas used by his personnel, i.e., disposal of all types of refuse and debris generated at temporary work sites.

11. The entire leased area is subject to hunting (during regular seasons), fishing and other recreational uses by persons authorized by the Park Manager.

12. The lessee and all people in his employ shall adhere to park regulations regarding vehicle travel, security, safety, hunting, fishing and woodcutting.

13. Work items to be performed by the lessee for which a credit or refund will be allowed by the government is shown on the attached Work Schedule (WS). The amount of credit or refund to be allowed by the government shall be negotiated prior to beginning each project. Appropriate Technical Specifications, locations, schedules and the negotiated credit amounts will be made a part of this lease by Supplemental Agreement. The term "work" implies all labor, equipment and material The District Engineer reserves the right to modify, add, or delete items of work on the WS as may be in the best interest of the government. The District Engineer will negotiate with the lessee for the accomplishment of additional work or modification of scheduled work. The lessee shall notify and coordinate with the Park Manager prior to beginning work projects. Lessee will not be able to utilize approximately 1,035 acres of Deer Habitat Improvement Area for first year of lease due to seed cultivation project.

APPENDIX G

Finding of fact and summary environmental assessment.

FINDING OF FACT

SUBJECT: Environmental Impact Statement Not Required - Black Butte Lake, California (Operation, Management, and Development of Project Lands for Recreation)

1. Reference Paragraph 4b(2) ER 1105-2-507, Preparation and Coordination of Environmental Statements.

2. The procedures for operation and management of Black Butte Lake, and future development of project lands for recreation have been examined for possible environmental impacts. This examination included review of current operation and management procedures, review of AE prepared Environmental Assessment, and coordination with appropriate regulatory agencies. A summary of the results of this examination is contained in the attached Summary Environmental Assessment. This examination found that the proposed minor actions should not cause any significant environmental impacts. Based on the lack of any significant impact on the environment, an Environmental Impact Statement is not required for the operation and management of Black Butte and proposed development of project lands for recreation. This determination will be reevaluated periodically and prior to any change in operation, management, or significant additional recreation development at the project.

1 Incl
as

F. C. ROCKWELL, JR.
Colonel, CE
District Engineer

BLACK BUTTE LAKE, CALIFORNIA
(Operation and Management)
Summary Environmental Assessment

Responsible Office: U.S. Army Engineer District, Sacramento, California

1. Name of Action: Administrative

2. Description of Action: Continued operation and management of the existing dam, lake, and project lands for flood control, water conservation storage, recreation, and other uses. Additional development of recreation areas.

3. a. Environmental Impact: Continuation of operation for flood control and water conservation storage will maintain the existing environmental conditions at the project, provide an average of 56,800 acre-feet of new water annually for irrigation, and provide flood protection to downstream areas. Additional recreation development will enhance recreation, but may cause some loss of Indian artifacts. Two archeological surveys were conducted prior to construction of Black Butte Dam and all sites considered to be of significance have been excavated and the artifacts from these sites have been removed. Development of additional recreation facilities will reduce conflicts between various recreation uses and reduce the possibility of water quality degradation.

b. Adverse Environmental Effects: Some interference with wildlife and loss of Indian artifacts from recreation facilities development and anticipated increased recreation use. A minor temporary increase in noise and dust will occur during construction of additional recreation facilities.

4. Alternatives: Do nothing; restrict attendance; alternative recreation development plans.

5. Coordination: Informal comments were obtained from the Environmental Protection Agency, California Water Quality Control Board, U.S. Fish and Wildlife Service and the California Department of Fish and Game. None of the comments obtained indicated the need for the preparation of a formal Environmental Impact Statement.

APPENDIX H

Reports of Other Agencies

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Division of Ecological Services
2800 Cottage Way, Room E-2727
Sacramento, California 95825

November 30, 1976

Colonel Donald M. O'Shei
District Engineer
Sacramento District, Corps of Engineers
650 Capitol Mall
Sacramento, California 95814

Your Reference:
SPKED-W

Dear Colonel O'Shei:

This is in response to Mr. George Weddell's request for information on updating the Master Plan for Black Butte Reservoir, Tehama and Glenn Counties, California. Black Butte Reservoir is operated for flood control, irrigation, and recreation. Two other reservoirs are located upstream from Black Butte Reservoir: Stony Gorge Reservoir on Stony Creek and East Park Reservoir on Little Stony Creek. These two reservoirs are part of the Orland Project of the Bureau of Reclamation.

The three reservoirs are operated conjunctively and, within limits, water storage capacity is interchanged. This operational flexibility has benefited the reservoir fisheries by permitting water levels to ordinarily be stabilized in Black Butte in the spring to enhance crappie spawning and by facilitating maintenance of minimum pools in East Park and Stony Gorge through use of Black Butte storage to meet Orland Project requirements.

Your plans for Black Butte Reservoir involve the enlargement of existing recreational facilities and the development of additional recreational facilities. A wildlife area is proposed on project lands downstream from the dam. The earliest developments would be the enlargement of the existing recreational areas and establishment of the wildlife area. We approve of the general plans for Black Butte Reservoir, especially those for the wildlife area. We assume that operation of all three reservoirs will continue to be coordinated to maximize beneficial use of the area's resources.

Sincerely,

for Felix E. Smith
Field Supervisor

cc: ARD-Env. (ES), USFWS,
Portland, OR