

**Resource Management Plan
for the
Cutler Hydroelectric Project
FERC No. 2420**

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PacifiCorp

Assisted by:
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Cutler Reservoir Resource Management Plan

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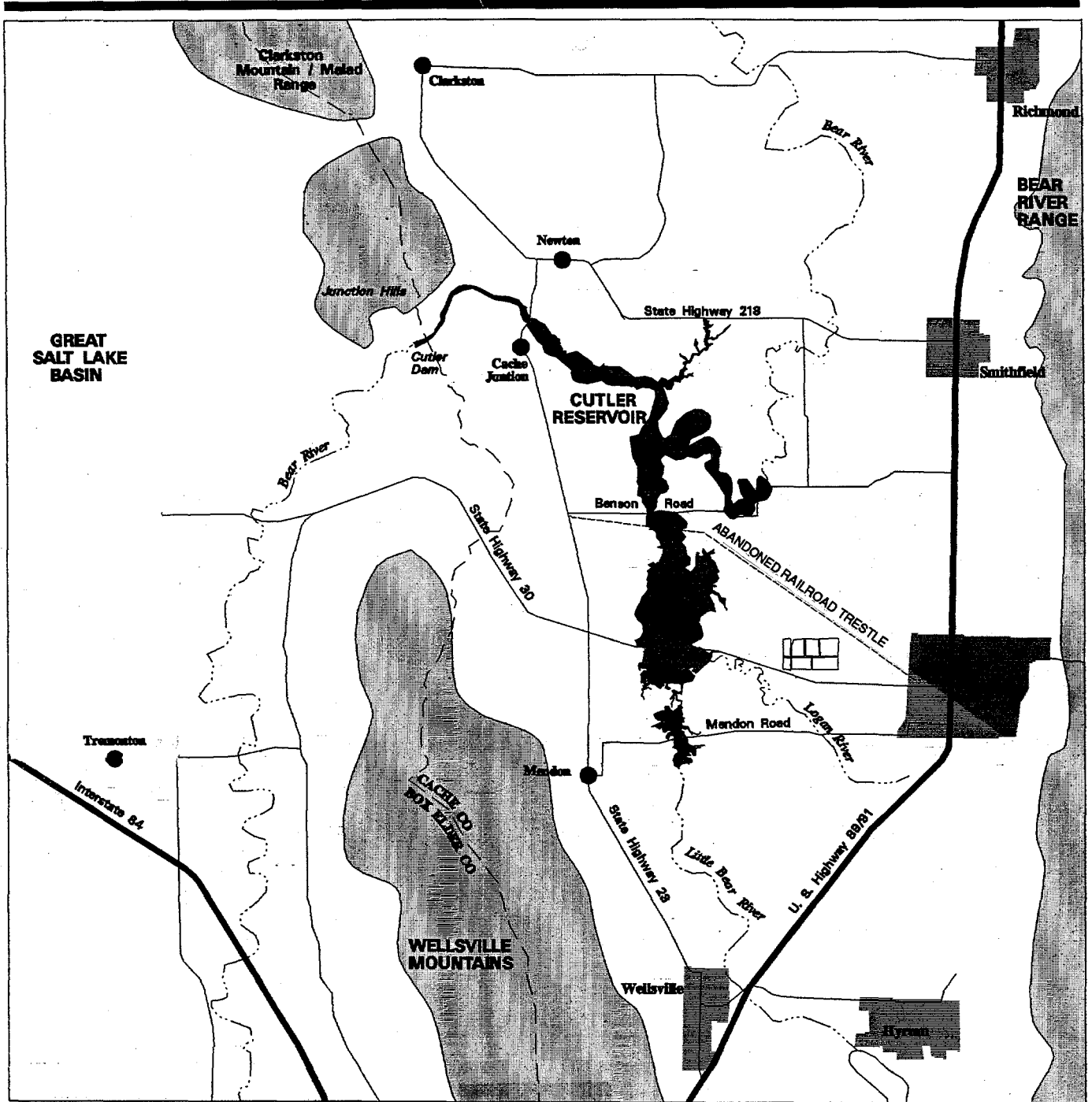
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1.0 INTRODUCTION

PacifiCorp's Resource Management Plan (RMP) is specifically designed to implement the recommendations contained in the Federal Energy Regulatory Commission (FERC) application for the Cutler Hydroelectric Project (FERC No. 2420) and the FERC license order issued April 29, 1994. The RMP document contains information on the natural resources and recommendations on land use practices to protect and enhance these resources. Chapters 1-3 provide background information and a historical overview contained in the license application. **Chapters 1-3 are intended to provide the reader an overview of the issues identified, studies performed and enhancement recommendations made by PacifiCorp during the relicense period. Chapters 4-6 provide the specific components of the RMP which includes goals, actions, schedule and monitoring activities required in the FERC order.** A reader unfamiliar with the Cutler Project relicensing process and applicants recommendations should review chapters 1-3 to understand the RMP goals and actions contained in chapters 4-6.

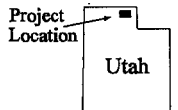
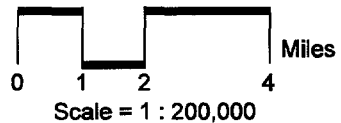
1.1 Location and Setting

Cutler Reservoir is located on the Bear River near the confluence of the Little Bear and Logan Rivers in northern Utah (Figure 1-1). Cutler Dam is in Box Elder County, Utah, and the reservoir spreads out from the narrow canyon to the southeast into the flat expanse of Cache Valley in Cache County. The valley is bordered by the Bear River Range to the east, the Junction Hills of the Malad Range to the northwest, and the Wellsville Mountains to the southwest, which separate Cache Valley from the Great Salt Lake Basin. The reservoir is located in Cache Valley at an elevation of 4,407.5 feet above mean sea level (at full pool as measured at the dam). It is accessible from State Highway 30 between Logan and Tremonton and State Highway 23 between Newton and Mendon via US Highway 89-91. Other major access roads include the Benson and Mendon Roads.



Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.

Cutler Reservoir Resource Management Plan



General Location

Figure 1-1



North

PacifiCorp, 1995

Cache Valley is rural in character, with farming and grazing being the principal land uses. Manufacturing provides the greatest number of jobs in the county, followed by agriculture and government service, respectively. The single largest employer in the county is Utah State University. The total population of Cache County is 70,183 persons (1990 census) with the majority of the population residing in Logan, the county seat, located approximately 6 miles east of Cutler Reservoir. With the second highest growth rate in the state, Cache County's population is expected to increase to nearly 100,000 by the year 2000.

The area receives an annual average precipitation of 25 inches, with the majority occurring as snowfall during the winter months. Summer temperatures are moderate, reaching a maximum of 85 to 90 degrees F. in July. Winter temperatures reach a minimum of 0 to 20 degrees F. in January. During the day, winds blow from Cache Valley into the surrounding mountains. At night, cooler air flows into Cache Valley, primarily from the Bear River Range canyons.

Surficial soils in Cache Valley, which were inundated by Lake Bonneville approximately 22,000 years ago, are predominantly silty clays deposited as lake bottom sediment. Many of the soils in the Cutler Reservoir area are alkaline and/or saline. Cutler Canyon, located at the northwest end of the reservoir, is a narrow, steep rocky canyon that rises 200 feet above the elevation of the reservoir.

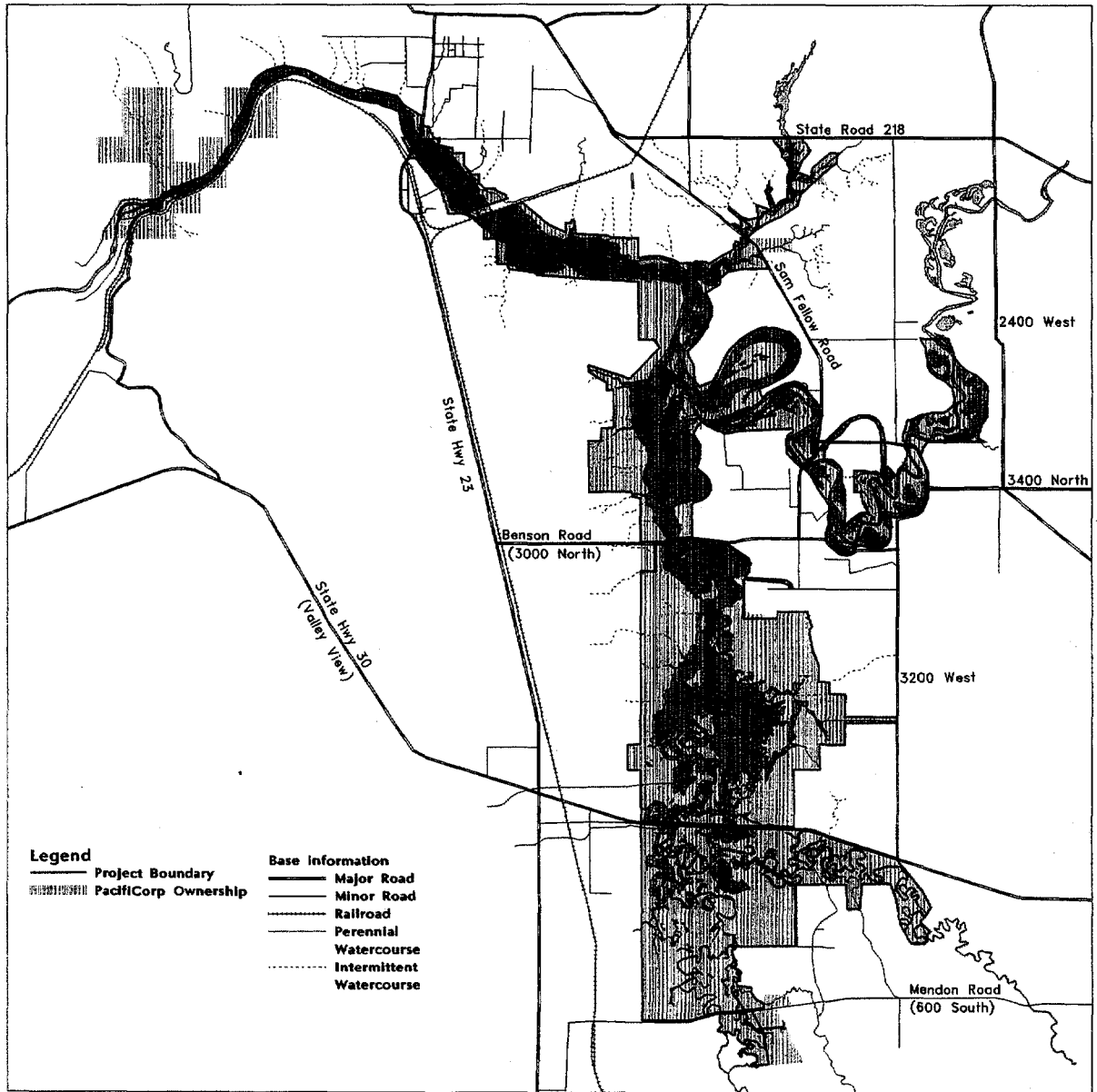
Due to the relatively level terrain surrounding most of the 12-mile long reservoir, it is not an obvious feature on the valley landscape. It is also difficult to locate its shoreline except from the highway bridges which cross it, primarily because of a lack of tall vegetation around its periphery. Since most of the surrounding lands are used agriculturally, there are few residential dwellings along the shoreline.

1.2 Purpose of the Cutler Reservoir Resource Management Plan

In December of 1991, PacifiCorp Electric Operations submitted an application to the FERC to relicense the Cutler Hydroelectric Project (No. 2420) on the Bear River near Logan, Utah. The application contained general recommendations regarding the protection and enhancement of aquatic, wildlife, botanical, cultural, recreational, and aesthetic resources in and around the reservoir on project and adjacent PacifiCorp lands. The proposed project area consists of approximately 9,700 acres of land, about 5,500 of which are below the high water elevation of the reservoir. This area is owned almost entirely by PacifiCorp (Figure 1-2). In addition to general resource management recommendations, the FERC application for a new license recommended changes in hydro operations and management of PacifiCorp lands after the preparation of an RMP. This RMP has two primary purposes:

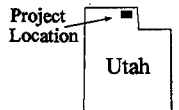
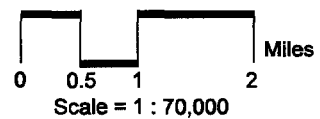
- 1) to provide the detail necessary to fully implement the recommendations contained within the FERC license; and
- 2) to address the management of the natural resources on PacifiCorp lands located within and adjacent to the project boundary (Figure 1-2).

Further, the RMP could serve as a regional model for resource agencies interested in multi-purpose, sustainable resource management emphasizing the following: improving wildlife habitat; providing dispersed recreation facilities, public access, and environmental education/interpretive opportunities; enhancing native vegetation, scenic resources, and water quality; implementing sound farming and grazing practices and minimizing wildlife depredation. It is designed to be specific but flexible so that the proposed management actions can be altered in response to monitoring results and changing needs and conditions.



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Cutler Reservoir Resource Management Plan



Study Area

Figure 1-2



North

PacifiCorp, 1995

The project boundary and PacifiCorp ownership are shown in Figure 1-2. The figure reflects a revised project boundary and changes in ownership since the application was filed in 1991. Since then, PacifiCorp has been conducting surveys of its property and negotiating land acquisitions and exchanges to resolve conflicts with adjacent property owners. These negotiations are being pursued to: 1) resolve property ownership discrepancies; 2) obtain property not currently owned by PacifiCorp that lies within the project boundary and may be affected by project operations; 3) straighten PacifiCorp's property lines to simplify management; and 4) achieve the goals and objectives described in the application and restated in this RMP. The project boundary shown in the Chapter 4 maps is modified from the FERC application, reflecting the property ownership changes since 1991 within the project area. These changes are described by management area in Chapter 4.

At the time of application filing, PacifiCorp leased land for agricultural and recreational purposes to 30 individual parties. During the development of the RMP, some of the lease boundaries were reconfigured to modify land use practices, protect important wildlife habitat, or make land improvements. All leases were terminated at the end of 1993 and new leases issued founded on sustainable and beneficial resource management goals. New lease conditions are detailed by management area in Chapter 4.

2.0 PROJECT HISTORY

The Cutler hydroelectric project is one of six hydroelectric plants owned by PacifiCorp on the Bear River. Beginning in 1909, the Telluride Power Company and entrepreneur L.L.Nunn began the initial construction to divert water into Bear Lake located on the Utah/Idaho border and build a system of power facilities and reservoirs along the Bear River. The original five hydroelectric plants, in order of construction, are Grace, Oneida, Cove, Soda, and Cutler. The sixth plant, Last Chance, was built by Last Chance Canal Co. in the early 1980s and was purchased in 1984 by Utah Power and Light Company.

The Cutler project was built in 1925 and put into operation in 1927, replacing the smaller Wheelon plant built in 1902. The combined generating capacity of the six projects is approximately 116 megawatts (MW); Cutler has a 30 MW capacity, the second highest in the Bear River system. During the irrigation season (April through October), there is generally no water available in Cutler Reservoir for power generation.

2.1 Pre-Application Filing

PacifiCorp initiated agency consultation for the Cutler Project on February 17, 1989. The Stage I information packet was sent for review and comment to 20 resource agencies and interested public. A joint agency meeting was held in March 1989, and public meetings in Logan and Tremonton, Utah in September 1989. The Cutler Advisory Council was created to obtain local input from diverse user groups and interested individuals regarding how project lands had been managed in the past and recommendations for future management. The Cutler Advisory Council also participated in the public meetings and review of the license application documents prior to filing.

Based on the comments, requests for additional information, and recommendations received during the Stage I consultation process, PacifiCorp initiated several Stage II studies, the results of which are highlighted in the next section. These results were presented at an

agency meeting held on May 15, 1991. Proposed recommendations for the application were also presented and discussed at this meeting. These were incorporated into a draft application which was distributed to all interested individuals who had received the Stage I information. A meeting was scheduled and held on September 12, 1991 to present the recommendations to the Cutler Advisory Council.

The resource agencies and other application reviewers were in general agreement with the issues as addressed in the application. The final application was prepared and submitted to the FERC on December 30, 1991. Copies of the document were made available for public review at the Logan city library and PacifiCorp's office in Smithfield.

2.2 Post Application Filing

On July 16, 1992, a public meeting was held in Logan to provide an update on the relicensing process by reviewing the studies conducted and recommendations proposed in the application. During this meeting, PacifiCorp announced the initiation of the RMP planning process and described how lessees, adjacent property owners, and others could become involved in the process.

Due to the number of concerns and questions raised at this meeting, a follow-up letter was mailed to those who had attended the meeting and other interested individuals. The letter attempted to answer the issues and concerns, detailed the RMP process, and solicited participants in the process.

During the fall of 1992, PacifiCorp personnel met individually with lessees and adjacent land owners to evaluate existing land use conditions, and discuss alternatives for implementing the recommendations proposed in the FERC application. A Technical Steering Committee was established to serve as an advisory group for developing the RMP. The Technical Steering Committee (TSC) consisted of representatives from resource agencies, local conservation groups, agriculture and Utah State University (Table 2-1). This group provided technical input to PacifiCorp in developing the enhancement measures proposed in the RMP.

**Table 2-1
Technical Steering Committee Participants**

Name	Organization
Jim Burruss	PacifiCorp
Dave Skinner	PacifiCorp
Vince Lamarra	Ecosystems Research Institute
Judy de Reuse	EDAW, Inc
Jed VanKampen	Vankampen Hereford Ranch, lessee
Larry Roundy	Roundy Farms, lessee
Al Trout	USFWS, Bear River Bird Refuge
Rory Reynolds	Utah Division of Wildlife Resources
Terry Messmer	Cooperative Wildlife Extension Service, USU
Roger Banner	Range Science Extension Service, USU
Alice Lindahl	Audubon

3.0 RESOURCES AT CUTLER RESERVOIR

3.1 Existing Conditions

Numerous environmental reviews were initiated during the five-year FERC relicensing process begun in 1988. These activities included describing historical and current resource conditions within the proposed project area and defining management or resource enhancement opportunities.

3.1.1 Water Use and Water Quality

The Cutler project, located 155 miles downstream of Bear Lake, is the furthest downstream of the six hydroelectric plants on the main Bear River system. The Bear River system is a coordinated operation of storage reservoirs, diversion dams, canals, and hydroelectric plants located within the lower Bear River Basin in Idaho and Utah. Water stored in Bear Lake is released back into the Bear River to supply irrigation water for agriculture in these two states. The water released for irrigation from Bear Lake is also used for power generation as it travels downstream toward the irrigators.

The river is regulated for multiple purposes including irrigation, power generation, recreation, fish and wildlife enhancement, and flood control. The total accumulative consumptive use water rights for irrigation on the Bear River below Bear Lake is 1,962 cubic feet per second (cfs) (Table 3-1). In addition, the U.S. Fish and Wildlife Service (USFWS) has a 1928 water right to divert up to 1,000 cfs of the natural flow of the Bear River on a year-round basis. However, the USFWS does not have a contract to receive Bear Lake storage water. Contractual agreements in Idaho and Utah require PacifiCorp to supply irrigation water upon demand from April 20 to October 31. Except during the periods of high runoff, virtually all natural flow in the Bear River and is diverted into Bear Lake for irrigation storage purposes.

Table 3-1.
Bear River Irrigation Water Rights (Consumptive); Bear Lake to Cutler Dam

<u>PRIORITY</u>	<u>STATE</u>	<u>NAME</u>	<u>FLOW(CFS)</u>
<u>YEAR</u>	<u>DECREE</u>		
1879	Idaho	Harris	2.2
1880	Idaho	Nelson Ditch	6.5
1882	Idaho	Riverdale Irr. Co.	13.0
1882	Idaho	Bosen-Smith Pump	5.5
1883		Anderson, Kay	2.0
1883	Idaho	Riverdale-Preston Irr. Co.	3.0
1883	Idaho	Battle Creek Irr. Co.	5.0
1889	Utah	Bear River Canal Co.	333.0
1889	Idaho	Johnson	4.0
1889	Idaho	Budge Land & Livestock	28.5
1889	Idaho	Gentile Valley	33.0
1894	Utah	Goodwin	0.5
1895	Idaho	Williams	2.4
1897	Idaho	Last Chance Canal	200.0
1898	Idaho	Ellsmore	1.0
1898	Idaho	Harris	0.9
1899	Idaho	West Cache	186.0
1899		Munk-Jorgenson Pump Co.	1.5
1900	Idaho	Johnson	1.5
1901	Idaho	Thatcher Irr. Co.	35.0
1901	Utah	Bear River Canal Co.	133.0
1901	Idaho	Last Chance Canal	240.0
1902	Idaho	Riverdale-Preston Irr. Co.	6.5
1904	Idaho	Pond Bros. et al.	12.0
1904	Utah	Bear River Canal Co.	95.0
1909	Idaho	Bench Canal	138.2
1909	Idaho	Bench Canal	25.6
1910	Idaho	Tanner Canal	54.0
1914	Utah	Bear River Canal Co.	43.0
1914		Club River Pump	100.0
1915	Utah	LDS Church	2.0
1916		West Cache Irr. Co.	6.0
1916		Hoffman	2.0
1916		Thain	2.0
1916		Munk-Jorgenson Pump Co.	3.0
1917	Utah	Smith-Tarbet	3.0
1917	Utah	Reese-Ballard	2.0
1917	Utah	Ballard	2.0
1917	Utah	Benson-Bear Lake Irr. Co.	7.0
1917		King Irr. Co.	5.0
1917	Utah	Spackman	4.9
1918	Utah	Simmonds-Chambers	3.0
1918	Utah	Cronquist	6.0
1919	Utah	Goodwin	1.5
1919		Pitcher, Larry	0.2
1919	Utah	Smithfield West Bench	5.0
1919		Falslev	2.5
1920		LDS Church	3.0
1920	Utah	Hill Irr. Co.	4.0
1920	Utah	Wood	2.2
1920	Utah	Wood Irr. Co	2.0
1920	Utah	Wheeler	2.5
1922		Falslev	2.5

Table 3-1. (continued)

<u>PRIORITY YEAR</u>	<u>STATE DECREE</u>	<u>NAME</u>	<u>FLOW(CFS)</u>
1927		Reese-Ballard	2.0
1929		Munk	1.0
1930		Wheeler	2.5
1932		Wattersson	2.3
1955		Allen	1.9
1955		Rigby	3.0
1956		Falslev	3.0
1957		Falslev	2.0
1960		Rigby	2.0
1960		Johnson	2.0
1960		Bullen	3.1
1966		Reese-Clark Pump	2.0
1969		Gossner	0.7
1973		Spackman	2.0
1973		Pitcher	0.5
1974		Larkin	1.5
1975		Cowley	2.5
1975		Cache Valley Dairy	2.8
1975		Bullen	3.8
1976		Buttars-Spackman	1.8
1976		Ballard Pump	2.0
1976		Ballard	0.2
1976		Hoffman	2.0
1976		Thain	1.7
1976		LDS Church	0.5
1976		Marchant	2.0
1977		Dorius	1.1
1977		Griffin	0.7
1977		Benson	0.5
1977		Hansen	2.0
1979		Cache Meadow Farms	1.0
1980		Rich	3.4
1980		Cub River Pump	25.0
1981		Munk	4.0
1981		Seamons	1.5
1981		Lindley	1.5
1981		Benson	0.7
1982		Rasmussen	2.0
1982		Munk	3.0
1900		Bear River Silt Lands	30.0
1915		Ferry, J. Y.	1.2
1917		Bangerter, Jack	2.0
1917		Jensen, Kent R.	3.0
1917		Anderson, Verl H.	3.5
1918		Cheney, Frank	2.0
1919		Thompson, Maurice	3.0
1920		Stander, Alvin, et al.	3.5
1920		Mann, L. S.	2.4
1920		Thompson, Roger & Robert	1.9
1920		Petersen, Earl Lewis	1.1
1925		Hansen, Wesley R.	3.5
1925		Thompson, Eugene	2.5
1925		Hatch, Amos	1.5
1928		U.S. Fish & Wildlife Service	1,000.0
1955		Cutler, Newell B.	1.9

Table 3-1. (continued)

<u>PRIORITY YEAR</u>	<u>STATE DECREE</u>	<u>NAME</u>	<u>FLOW(CFS)</u>
1955		McMurdie, Glifford H.	1.5
1956		Hammons, Sherie Rae	3.0
1956		Lazy B. Land & Cattle	2.0
1957		Harold Selman, Inc.	2.0
1958		Adams, Golden	2.0
1959		Haycock, Warren L.	1.0
1960		Hansen, Warren E.	1.8
1966		Earl, C. Leo	3.0
1971		J. Y. Ferry & Sons	2.0
1976		Selman, Harold	2.0

Water Rights For The Cutler Project (Non-Consumptive)

<u>PRIORITY YEAR</u>	<u>STATE DECREE</u>	<u>NAME</u>	<u>FLOW(CFS)</u>
1903		UP&L	270
1906		UP&L	135
1908		UP&L	135
1912		UP&L	500
1917		UP&L	1434
1924		UP&L	75,000 ac. ft. and 2,500 cfs

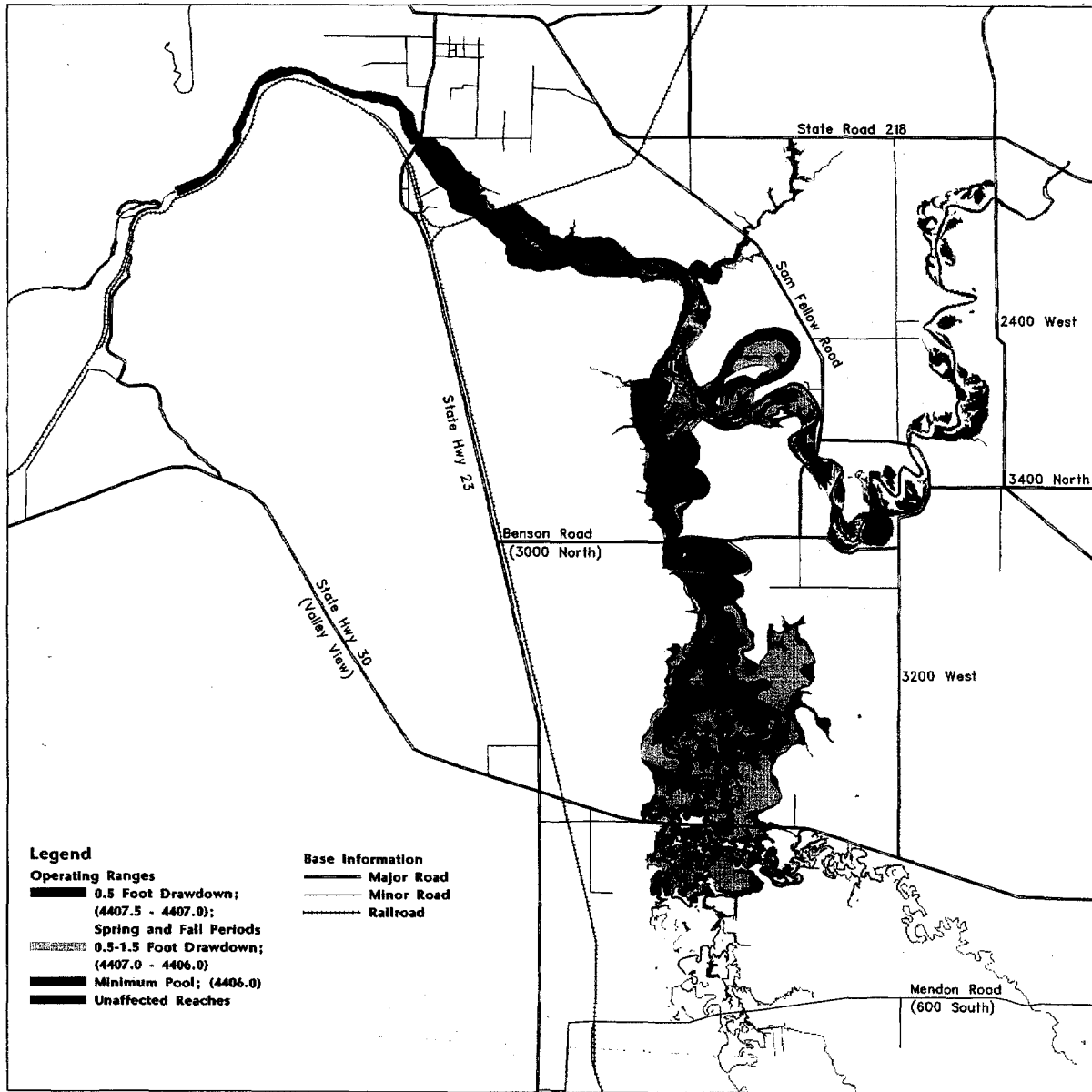
The most senior right and largest block of water is delivered to the Bear River Canal Co. irrigation canals located at Cutler Dam. Delivery of the irrigation water usually precludes power generation at Cutler.

Cutler Reservoir, in addition to inflow from the Bear River system, receives significant inflow from several smaller tributaries. These tributaries include Spring Creek and Little Bear, Logan, and Blacksmith Fork Rivers. During spring runoff, this inflow can cause the reservoir to exceed the full pool elevation (4,407.5 feet, as measured at the dam). During the summer irrigation period, when there is no surplus water available for power generation or other uses in the Bear River below Cutler Dam, withdrawals can exceed the inflow, causing the reservoir surface elevation to drop. Under current operating procedures (1987-1994) water has been held within 1.5 feet of full pool 90 percent of the time, and in the top two feet 98 percent of the time. However, fluctuations within the 1.5 foot range frequently have occurred within a 24-hour period. Changes in inflows, irrigation water delivery and power demand, have caused as much as three-foot

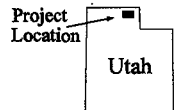
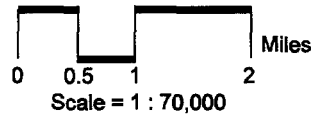
changes in elevation. At full pool (4407.5), the reservoir covers 5,500 surface acres and has the capacity to impound only 13,200 acre feet of water (Figure 3-1). At elevation 4406, the proposed minimum pool (see Section 3.2.1), the reservoir covers approximately 3,000 surface acres and contains 5,200 acre feet of water. The limited storage capacity and vertical difference is most apparent at the southern end where the reservoir is shallowest.

The water quality of Cutler Reservoir is adversely impacted by land use practices and point source discharges along the Bear River and other tributaries. The major water quality problems experienced by the reservoir include concentrations of suspended sediments and increased phosphorus, nitrogen levels, and bacterial counts. The Logan City sewage lagoon discharge represents the single largest nutrient point source to the reservoir. However, within the Bear River, Logan River, Little Bear River, and Spring Creek systems, there are a number of point sources such as wastewater effluent which account for a significant portion of the nutrients entering Cutler Reservoir.

Water turbidity is increased by shoreline erosion due mainly to the combination of fine clay soils, vertical shoreline banks, lack of vegetative cover, wave action, agricultural activities and water level fluctuations. Historically, concrete and car bodies were used by farmers and Utah Power as a measure to reduce shoreline erosion. More recently PacifiCorp has utilized rock gabions, rip-rap, geotextiles, and grass seeding/shrub planting with better success. Shoreline erosion still exists in the oxbows of the Bear River and portions of the reservoir located between the Bear River and the dam. Approximately three-quarters of a mile of eroded shoreline between Benson Road and the abandoned railroad trestle was stabilized through a 1992 Utah Department of Transportation (UDOT) and PacifiCorp wetland mitigation and bank revetment project.

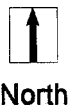


**Cutler Reservoir
Resource Management Plan**



**Proposed Reservoir
Elevation Operating Ranges**

Figure 3-1



PacifiCorp, 1995

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3.1.2 Fishery

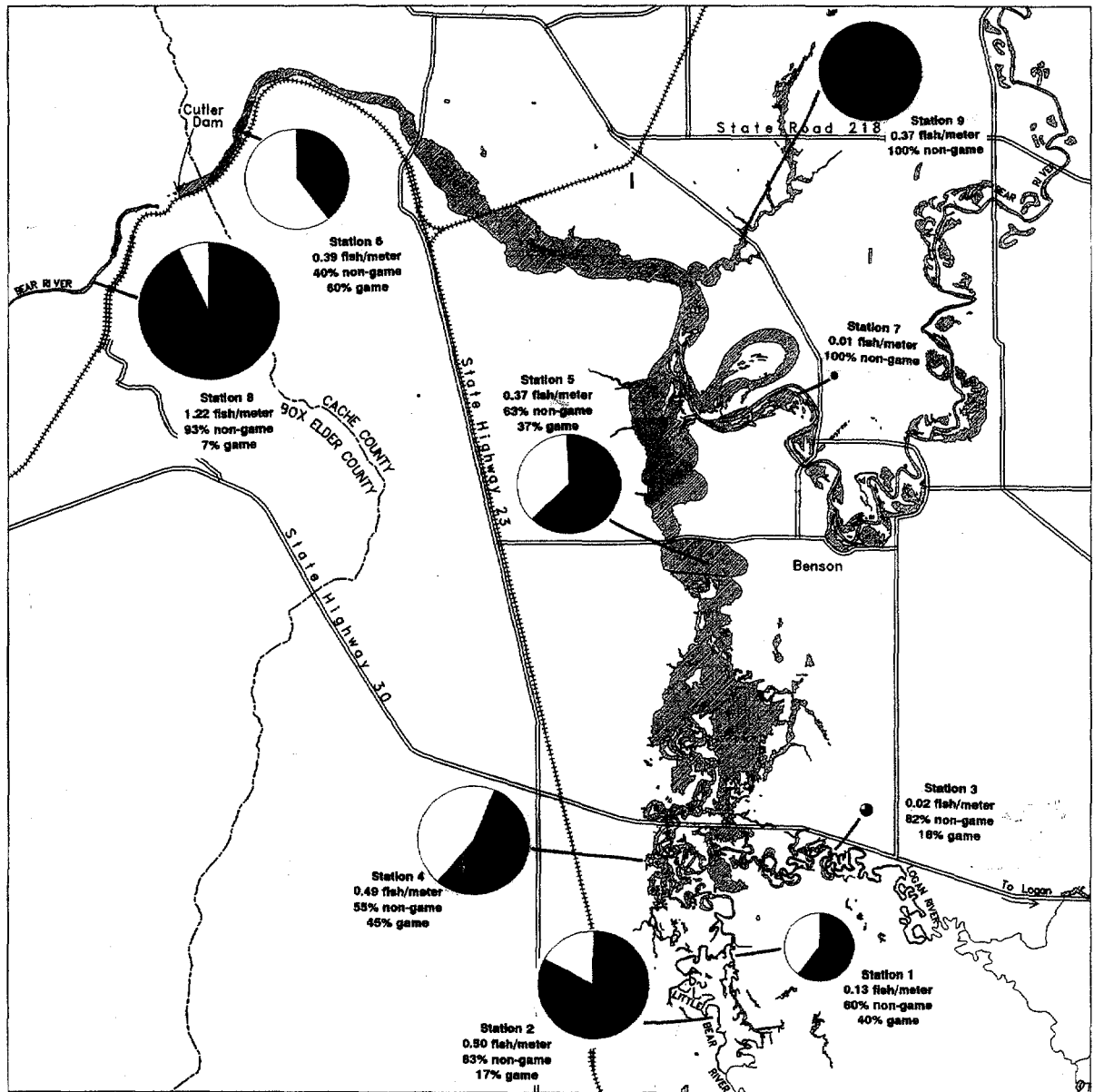
Game fish are not as abundant in Cutler Reservoir when compared to other reservoirs, due to the reservoir's shallow water depth, water level fluctuations, poor water quality (especially high turbidity), and lack of cover and forage for game fish. For example, at the maximum reservoir elevation (4,407.5) only 1,200 of the 5,500 surface acres have depths greater than three feet.

Fish sampling on Cutler Reservoir during the spring and summer of 1990 identified a fishery resource dominated by carp. Fathead minnows and green sunfish were abundant throughout the reservoir wherever suitable habitat was found. Game fish were limited to small populations of largemouth and smallmouth bass, black crappie, and channel catfish associated with large rock substrate, vertical structure, riparian vegetation, and deeper water areas of the reservoir. The highest densities of game fish species were found at sites No. 4, 5, and 6. All three locations had densities of about 0.40 fish per linear meter of edge sampled (Figure 3-2). Bare bank and rock cliff areas in the reservoir were almost devoid of fish, although smallmouth bass were found almost entirely at the cliff areas. The lowest densities (less than 0.10 fish per linear meter) and percent composition of game fish were found at sites No. 3 and 7.

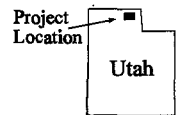
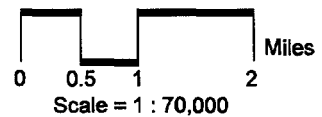
3.1.3 Wildlife

The Cutler Reservoir area provides habitat for a large variety of wildlife species, birds being the most abundant and diverse wildlife group. A large number of birds use the reservoir during spring and fall migration, and some use the area for nesting. A smaller number of bird species use the area during the winter. Few, if any, of these species are permanent residents.

There is a variety of wildlife habitat around the reservoir, including upland and agricultural lands, meandering river channels and oxbows, large marshy areas with emergent vegetation, and scattered large trees. The area primarily supports fish-consuming birds or those which use the area for nesting while feeding elsewhere.



**Cutler Reservoir
Resource Management Plan**



Fishery Resource

Figure 3-2



North

PacifiCorp, 1995

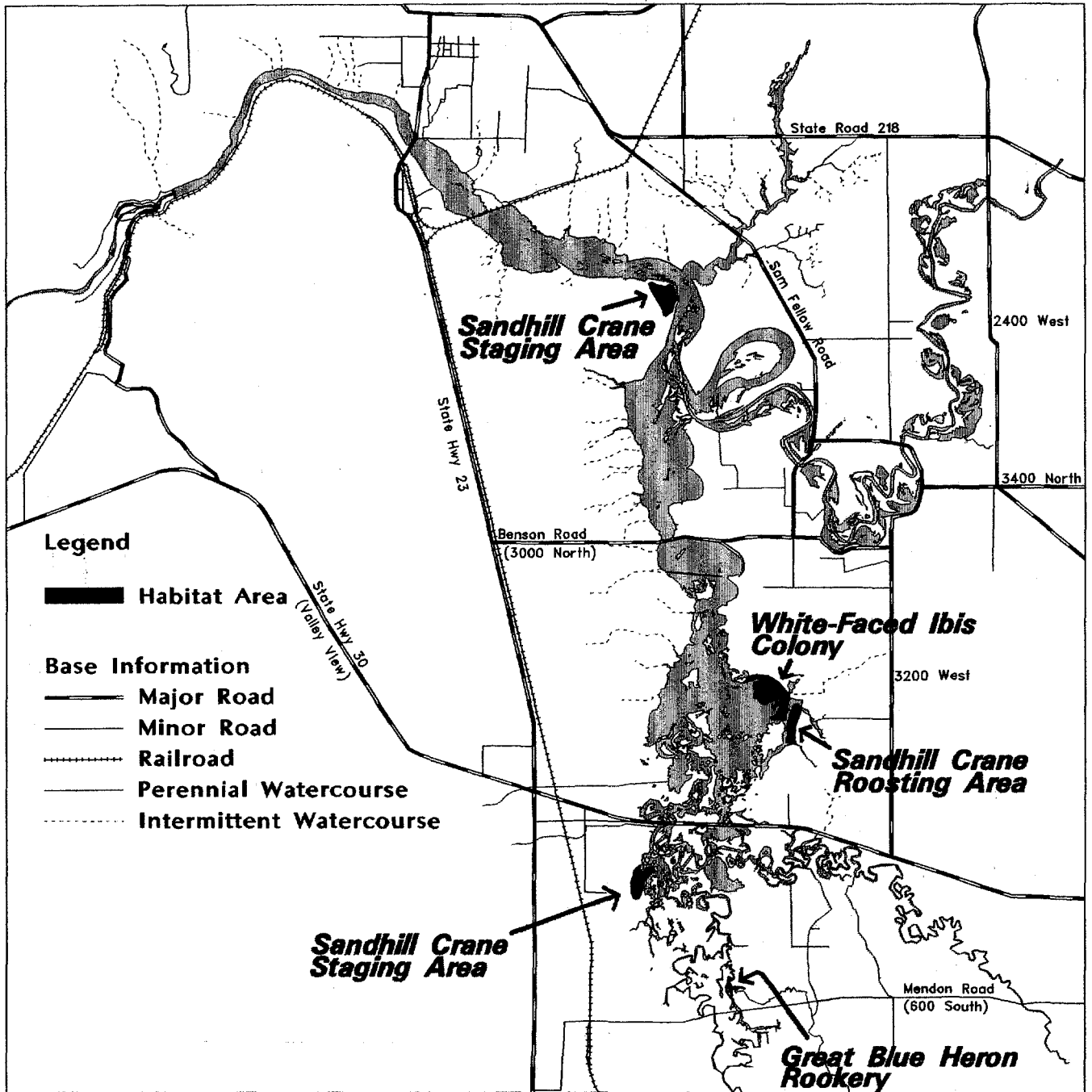
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Additionally, many species of ducks such as mallards, gadwalls, redheads, and cinnamon teal are present and use the area mostly for feeding or loafing. The area also supports nesting colonies of white-faced ibis, Franklin's gull, Forster's tern, black-crowned night heron, snowy egret, cattle egret, and great blue heron. Other water oriented birds inhabiting the project area include sandhill crane, white pelican, double-crested cormorant, and grebes. The most common species of mammals found in the Cutler Reservoir area are muskrat, deer mouse, mountain vole, longtail weasel, striped skunk, red fox, and vagrant shrew. Some mule deer and beaver are also present.

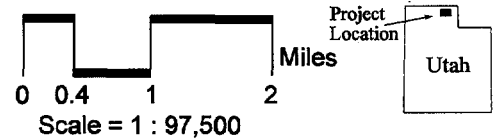
The Cutler Reservoir area does not contain critical habitat for any threatened or endangered species, but peregrine falcons and bald eagles have been seasonally observed within the protection area. Although potential nesting habitat may exist for peregrine falcons in the canyon area, no peregrine nesting activity has been observed. Bald eagles which feed in the marshes generally roost in the canyons of the Bear River Range to the east. Some bald eagles utilize the cottonwood trees at the south end of the reservoir.

Category 2 bird species observed in the area (future listing under the Endangered Species Act is possible) include the white-faced ibis, western snowy plover, long billed curlew, and ferruginous hawk. White-faced ibis nest in an isolated area of bulrush in the central east side of the reservoir. Snowy plovers and long-billed curlews nest at the north end of Clay Slough just outside of the RMP study area. Ferruginous hawks are a rare but regular migrant through the Cache Valley.

The most critical nesting habitat at Cutler Reservoir is that of the white-faced ibis and great blue heron. The nesting habitat of the white-faced ibis and other colonial nesting species is located north of State Highway 30 in an isolated area of bulrush; the great blue heron rookery is located south of this highway in a cluster of mature willow trees (Figure 3-3). The numbers of white-faced ibis at Cutler Reservoir increased dramatically after colonies on the Great Salt Lake were



**Cutler Reservoir
Resource Management Plan**



**Critical and Important
Wildlife Habitat**

Figure 3-3



PacifiCorp, 1995

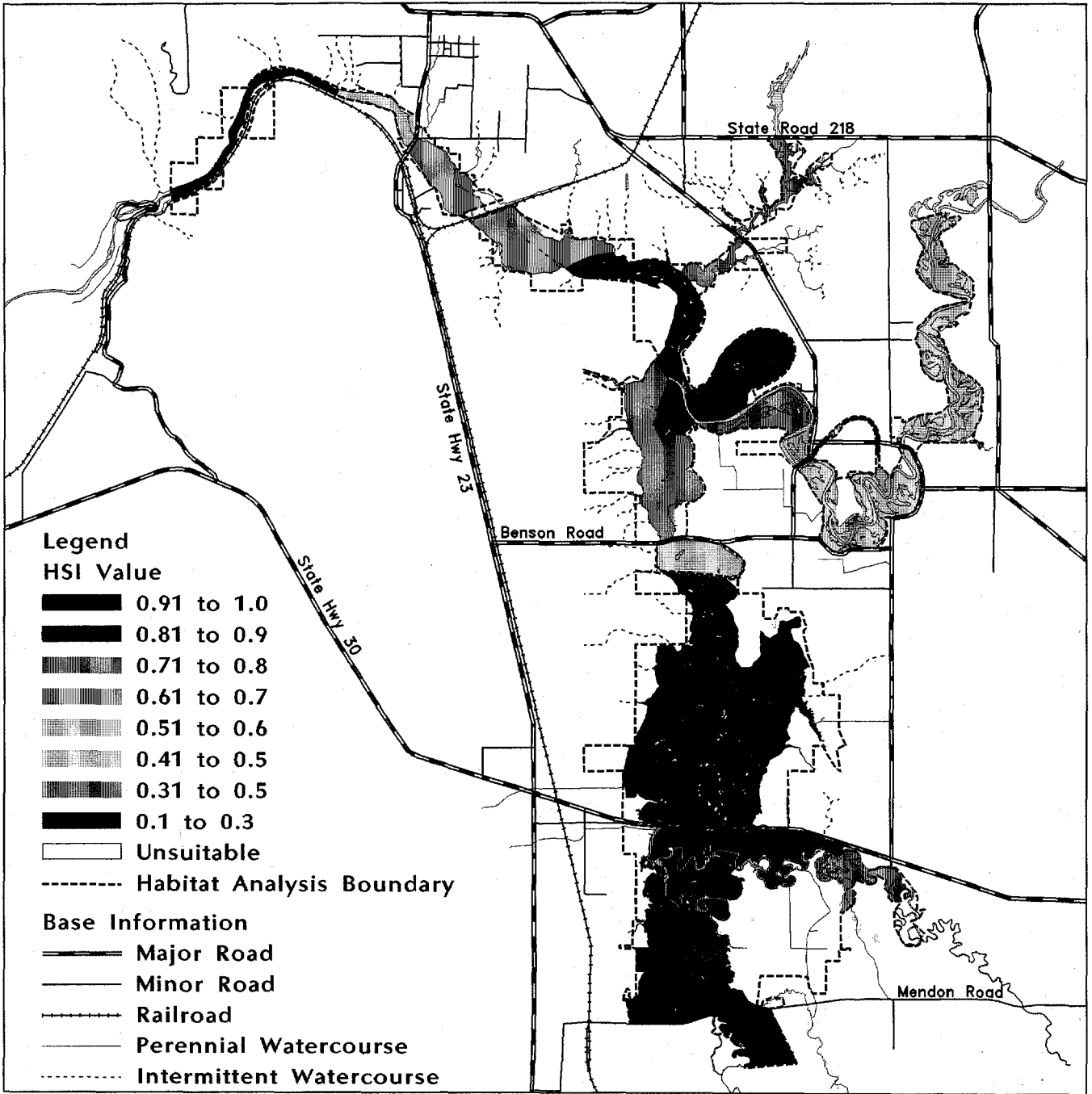
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flooded from 1984 through 1986. In contrast, the numbers of nesting great blue herons has declined since the early 1970s; a rookery once located north of Benson Marina no longer exists due to the loss of the nesting trees. Figure 3-3 also shows important usage areas of sandhill cranes. All of these species are sensitive to human intrusion during the nesting season (April through July).

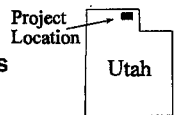
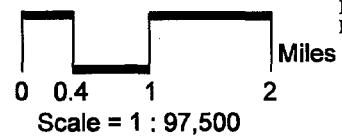
Habitat Suitability Index (HSI) models were utilized as a means of summarizing and assessing available habitat features within the Cutler Reservoir area for terrestrial and aquatic species. The HEP (Habitat Evaluation Procedure, USFWS) process uses HSI models to provide a numerical rating of habitat value for a certain wildlife species throughout its life stages. Habitat with the lowest value was assigned a low value such as 0.1, with mid range values as 0.5, and highest values as 1.0. Species models were selected for fourteen important or special management species or certain wildlife guilds. The HSI models indicated the existing habitat values.

Canada goose populations have generally increased at Cutler Reservoir since the mid-1980s, as the area provides nearly ideal breeding and rearing conditions. Prime habitat for Canada geese and sandhill cranes exists on the main reservoir south of the Cache Junction Bridge (State Highway 23) (Figures 3-4 and 3-5). The adjacent pastures and agricultural fields provide ample food while the open water and islands provide protection from predators. Increase in numbers of Canada geese and sandhill crane has resulted in more reports from farmers of crop damage caused by foraging birds.

While some duck breeding occurs in the area, it is very limited. The large amount of open water with poor water quality and lack of nesting cover limits waterfowl habitat throughout the northern half of the reservoir above the abandoned railroad trestle. A small number of pothole-sized ponds with good water quality surrounded by vegetative cover are the most successfully utilized habitat in the project area for redheads, gadwall, and cinnamon teal (Figure 3-6). Some of this habitat exists south of State Highway 30; however, grazing has limited the height of available cover.



**Cutler Reservoir
Resource Management Plan**



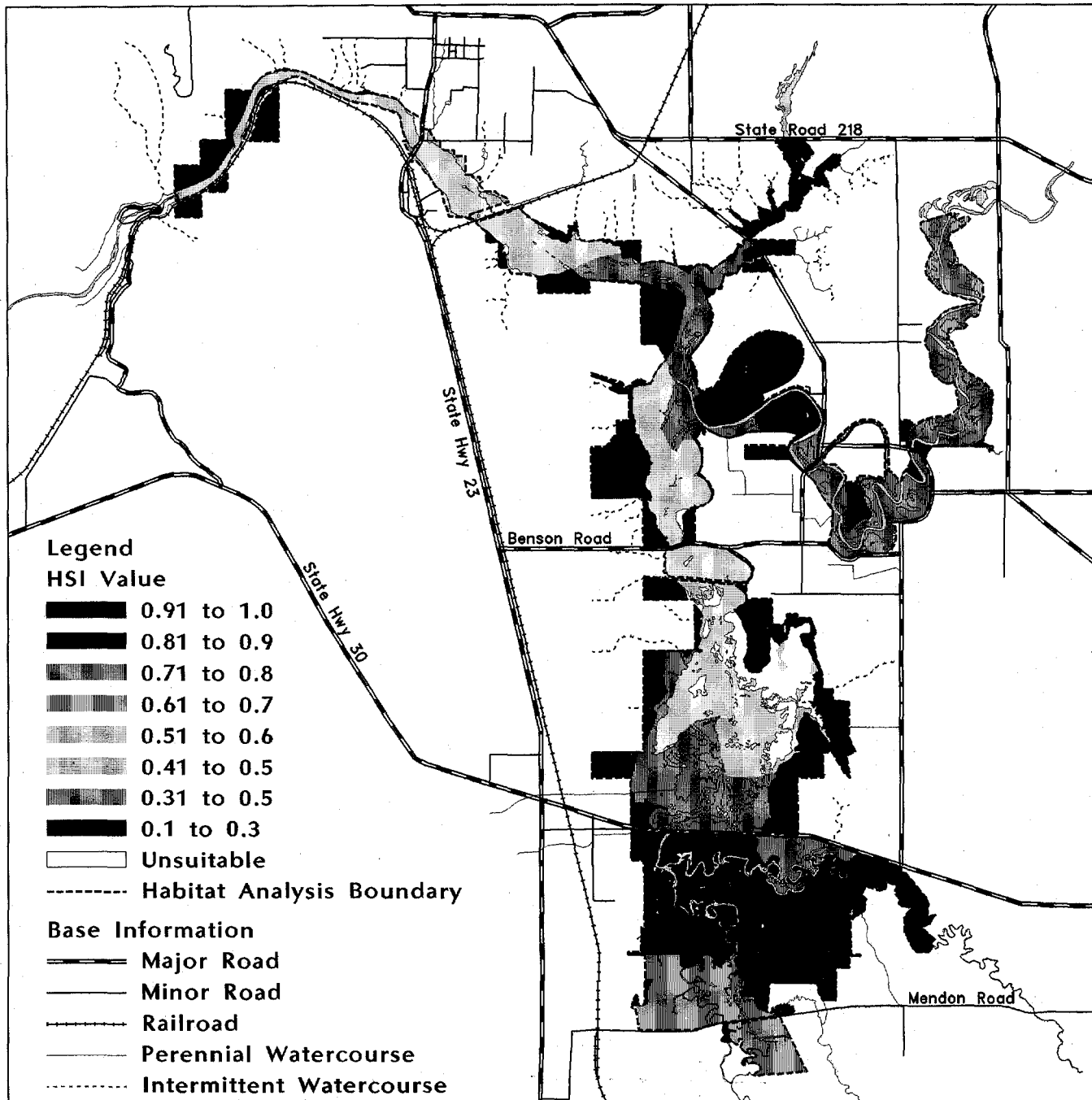
**Habitat Suitability Index
for Canada Goose**

Figure 3-4

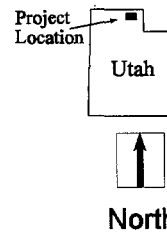
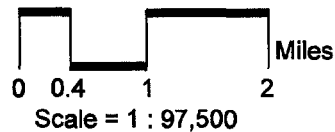


PacifiCorp, 1995

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**Cutler Reservoir
Resource Management Plan**

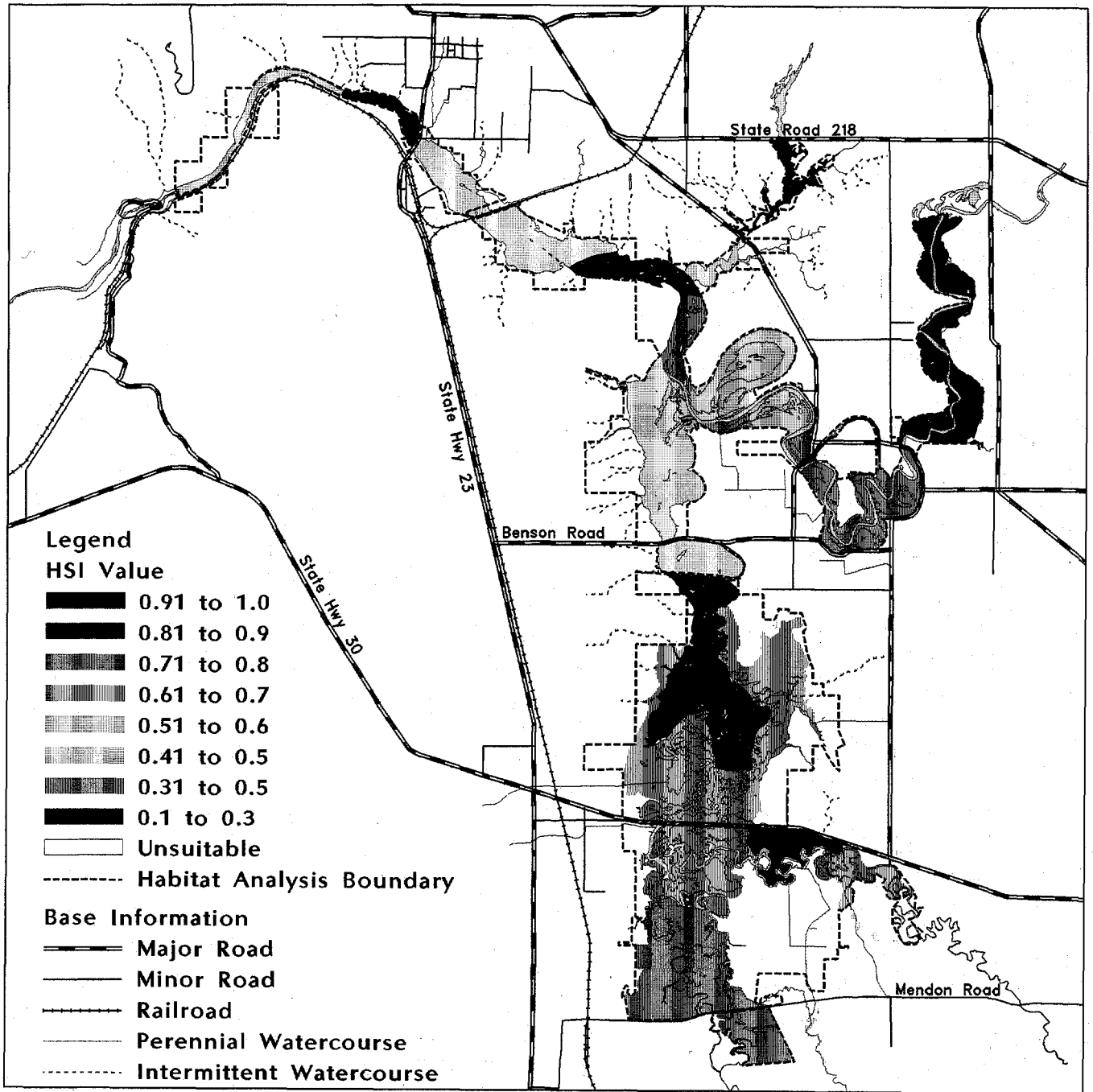


**Habitat Suitability Index
for Sandhill Crane**

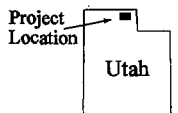
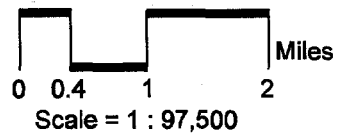
Figure 3-5

PacifiCorp, 1995

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**Cutler Reservoir
Resource Management Plan**



**Habitat Suitability Index
for Gadwall**

Figure 3-6



PacifiCorp, 1995

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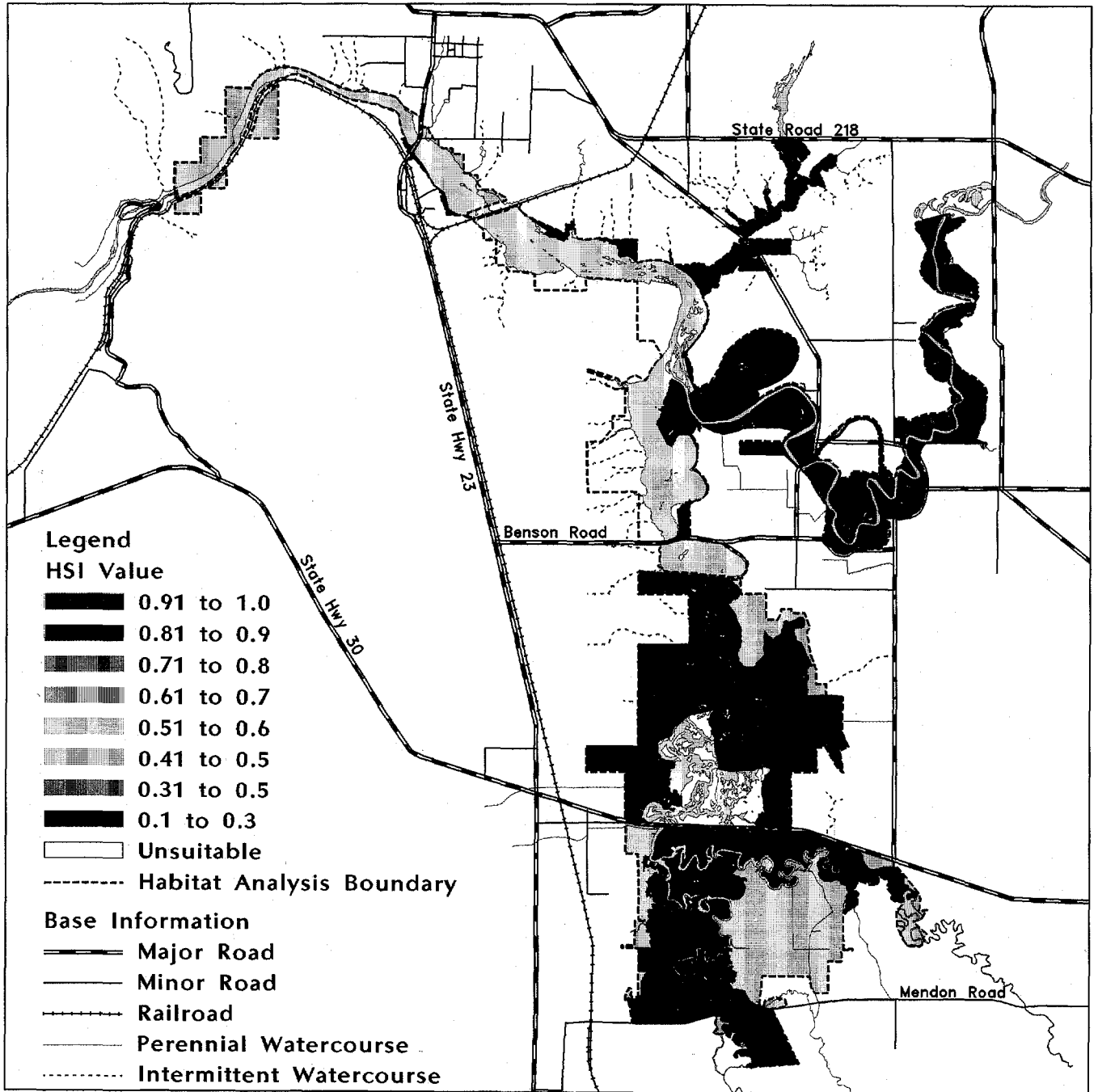
The main body of the reservoir has potentially good waterfowl nesting habitat, but poor water quality limits submerged plant and invertebrate production, thus making food resources scarce. Predation by fox, skunk, raccoon, and black-crowned night herons also affect duck reproduction. Water level fluctuations during the nesting season (April to June) has flooded nests and further reduced nesting success.

Ring-necked pheasant populations are low due to a lack of woody cover, limited winter food resources, and predation. Potential ring-necked pheasant habitat around the reservoir is either cultivated or actively grazed, which reduces cover. Presently, the best pheasant habitat is located in the woody riparian zones along the river banks (Figure 3-7).

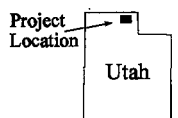
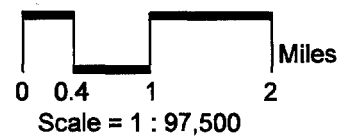
3.1.4 Vegetation

The most prevalent vegetation type in the area is bulrush/cattail, followed by meadows and cultivated lands (Figure 3-8). Bulrush and cattails dominate the shallow portion of the reservoir between the abandoned railroad trestle and State Highway 30, while the area south of State Highway 30 contains a diverse assemblage of bulrush/cattail, native and seeded pasture, wet meadow, upland grasses, and large trees. In general, grains and alfalfa are the dominant vegetative cover around the main body of the reservoir between Benson Road and the State Highway 23 bridge. On the steep slopes of the canyon near the dam, the predominant vegetation types are mesic shrubs, xeric upland grasses, shrubs and trees.

Based on vegetation survey data, historical botanical records and consultation with the USFWS, no endangered, threatened, or rare plants were expected to occur within the project area and none have been found.



**Cutler Reservoir
Resource Management Plan**



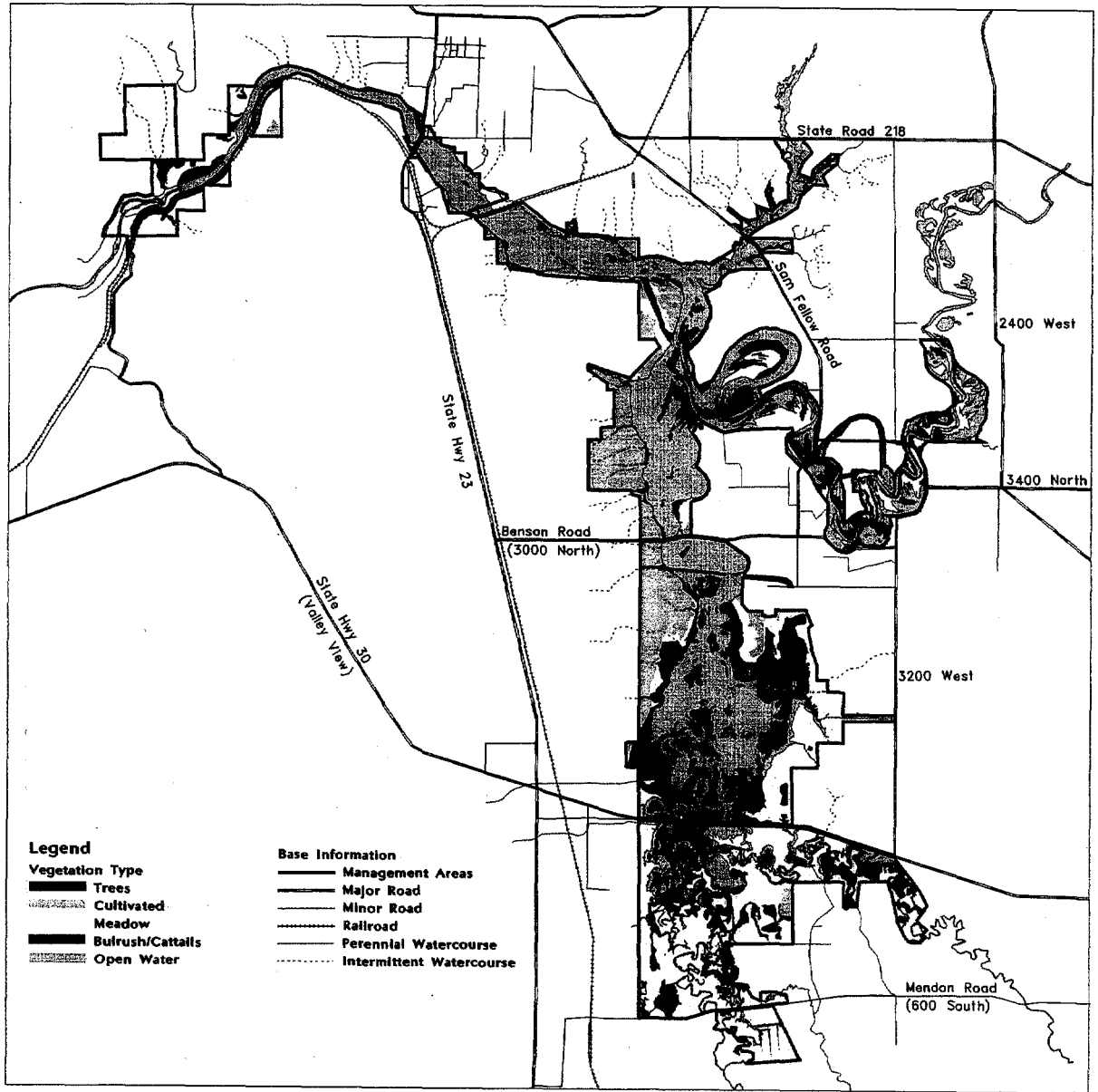
**Habitat Suitability Index
for Ring-neck Pheasant**

Figure 3-7



PacifiCorp, 1995

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**Cutler Reservoir
Resource Management Plan**

Vegetation

PacifiCorp, 1995

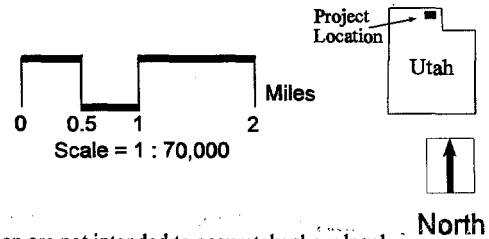


Figure 3-8

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3.1.5 Historic and Archaeological Resources

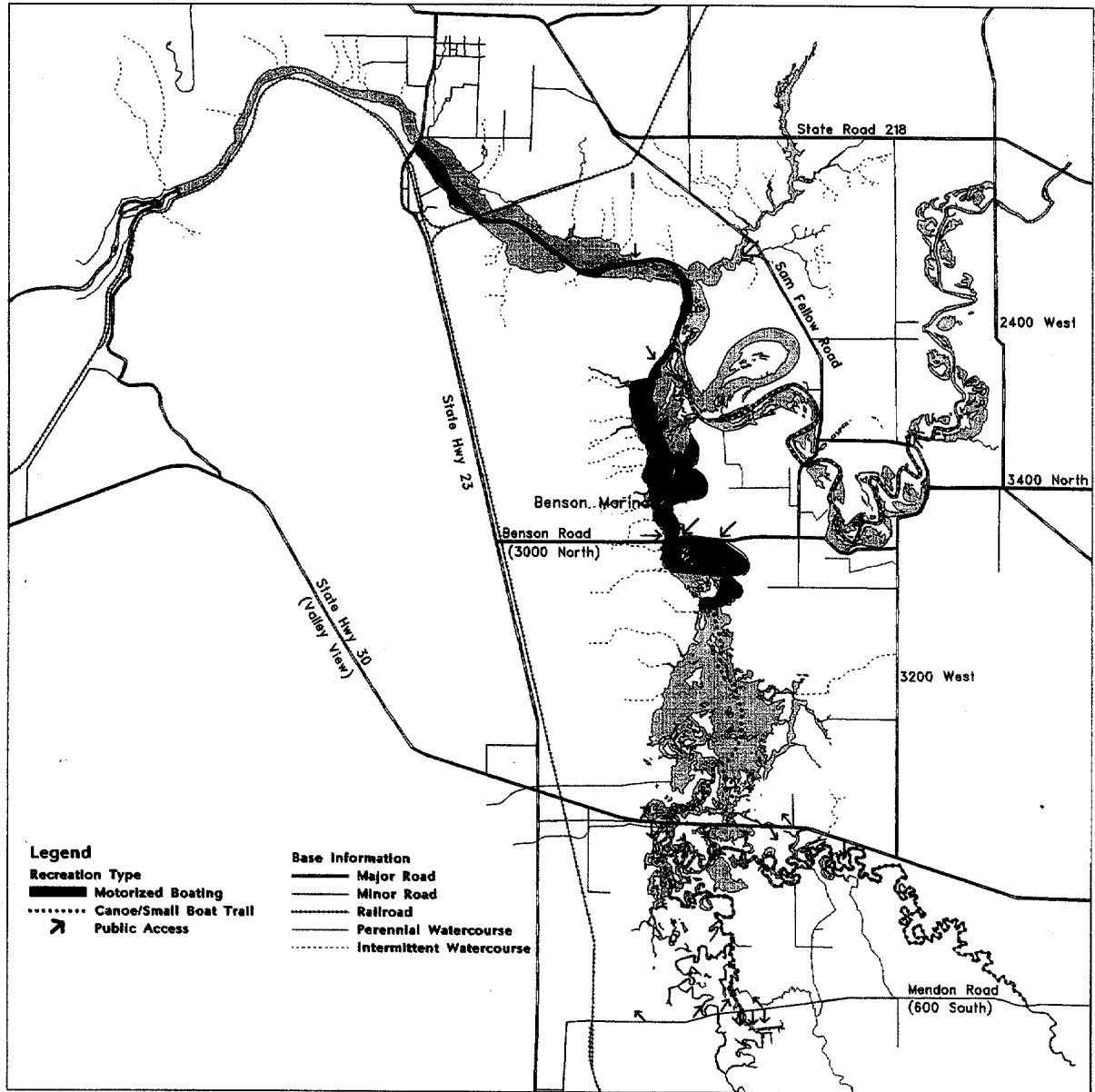
The Cutler Dam, Cutler Powerhouse, and other buildings associated with the project have been identified as Cutler Station and were listed on the National Register of Historic Places following a 1988 evaluation of hydroelectric projects by PacifiCorp and the Utah Division of State History. The Utah State Historic Preservation Office (SHPO) files and literature review did not indicate the existence of any archaeological sites on PacifiCorp property.

3.1.6 Recreation

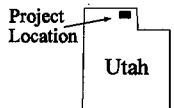
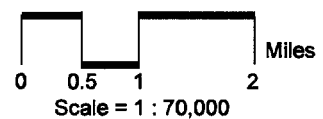
Cutler Reservoir and its adjacent land provides many recreational opportunities, with wetlands playing one of the most important roles. The marshes to the north and south of State Highway 30 receive considerable use by boaters, anglers, hunters, and bird watchers and have long been recognized for their wildlife habitat and related interpretive values.

Figure 3-9 shows where various recreation activities occur at Cutler Reservoir. Canoes and small boats are generally restricted to a relatively small portion of the reservoir and to the river channels due to limited access, shallow water depth, and daily water level fluctuations. Canoeing is popular among bird watchers and other nature enthusiasts. Also, much of the hunting and fishing activity is conducted from non-motorized boats, especially in the marshes. Fishing is a popular activity, but catch rates are low, primarily because of the small numbers of game fish. Very little swimming occurs due to shallow water depth and poor water quality. No camping or trail use occurs as there are no facilities for these uses, and picnicking is limited to Benson Marina.

Benson Marina is the only developed recreation facility at the reservoir and serves as the main launch site for water craft. Power boating is not a significant use, but some local residents do fish from power boats and waterski on occasion. Power boats are confined to the area around the Benson Marina due to the existing boat launch and limited deep water. The site has a concrete boat launch, a small picnic shelter, portable restrooms, and a graveled parking lot.



**Cutler Reservoir
Resource Management Plan**



Existing Recreational Use

Figure 3-9



North

PacifiCorp, 1995

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The parking lot is too small during periods of peak demand and visitors park on adjacent PacifiCorp property or along the narrow shoulders of Mendon Road, Benson Road, State Highway 30, and other roads due to a lack of designated parking. Other than at Benson Marina, there are no sanitary facilities on the reservoir. No docks are available for boaters, anglers, and other recreationists. Visitor use data was not collected for Cutler Reservoir as part of the relicensing application. However, in 1973, Utah State University in Logan conducted a study which estimated that Cutler Reservoir received approximately 5,000 visitors annually. The study indicated that most use occurred from October to December with a peak in October. This use was predominantly waterfowl and pheasant hunting. Visitation picked up again in April and continued through the summer months when there was more boating, fishing, and bird watching activities. While the total number of visitors is thought to have increased since 1973, overall use has not significantly changed, except for a minor increase in snowmobiling and ice fishing during the winter. The number of waterfowl and pheasant hunters is also assumed to have fluctuated based on game bird abundance. The majority of users are from the Cache Valley area.

3.1.7 Aesthetics

The visual character of the reservoir area is rural and undeveloped with the presence of cattle grazing, agricultural crops, and scattering of farm buildings.

The visual setting of the reservoir is particularly attractive from spring through fall when the surrounding snow-capped mountains contrast with the verdant valley floor. The mountains dominate the views immediately around the reservoir and are the most noticeable and important visual elements in the area. The reservoir itself is not highly visible due to the relatively flat terrain around all but the canyon portion. Because there is no tall vegetation delineating the shoreline, the periphery of the reservoir cannot be discerned from any distance. During most of the winter, the reservoir is frozen and covered with snow.

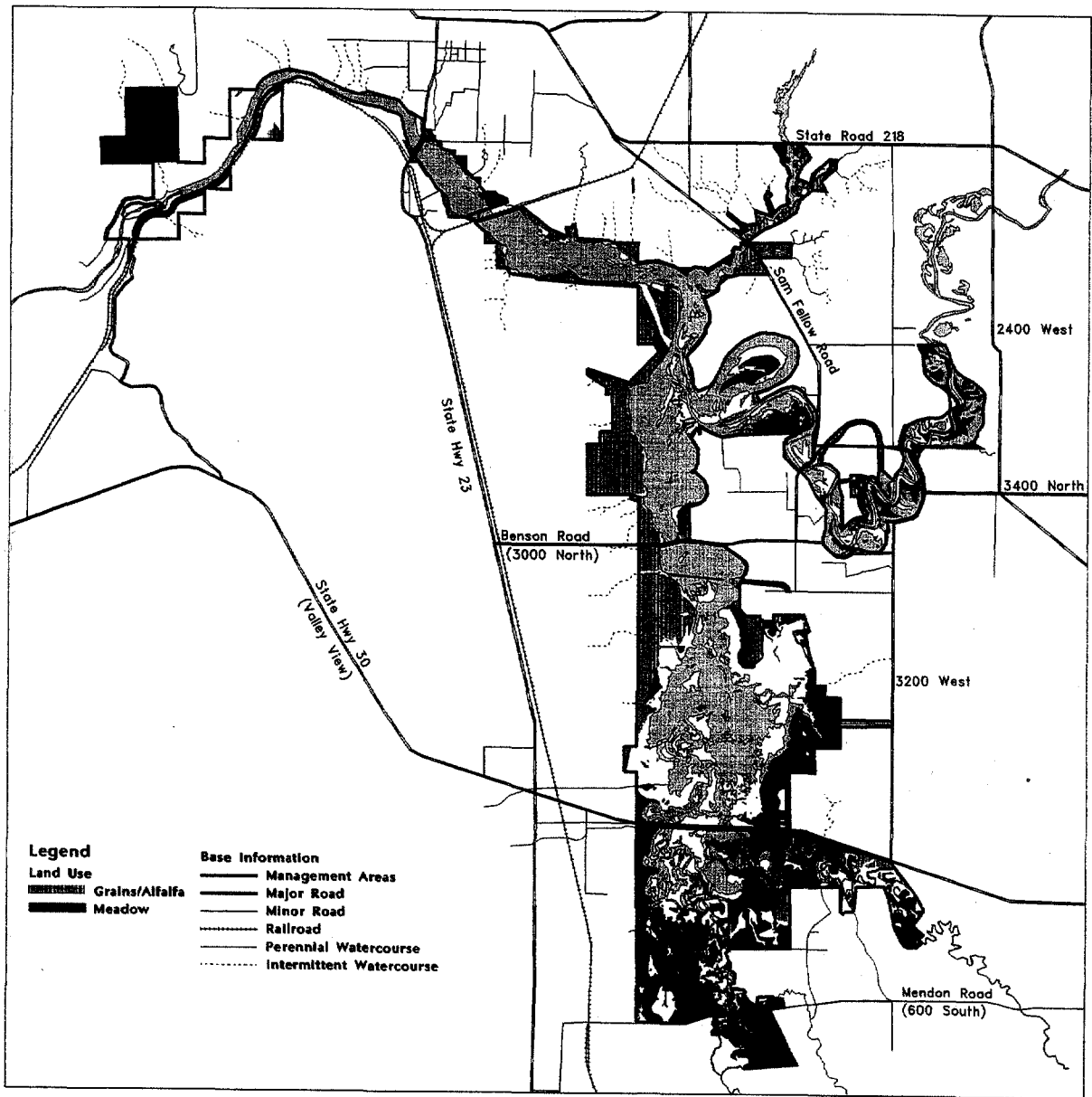
Shoreline conditions around the main body of the reservoir are unattractive where the banks are eroded and lack vegetative cover. Rusted car bodies, and agricultural debris which were once used by farmers as an erosion control measure, scattered along sections of the shoreline further degrade the reservoir's aesthetic values. PacifiCorp has begun to address this issue by removing old car bodies and debris, and using other methods for erosion control in selected areas.

3.1.8 Land Use and Management

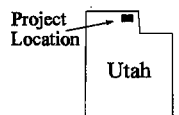
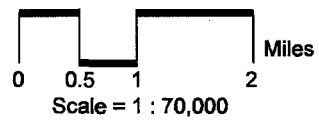
Hydroelectric generation, recreation, agriculture, and conservation/open space are the primary uses of PacifiCorp land. All of the hydroelectric facilities (i.e. powerhouse, penstock, surge tank) are located in the canyon near the dam. In the past, grazing has been permitted in meadow areas on the east side of the reservoir south of the old Union Pacific railroad trestle and around the entire southern end of the reservoir where cattle had broad access to the water (Figure 3-10). Virtually all the grazing pastures are native grasses. PacifiCorp lands around the upper (except in the canyon) and middle portions of the reservoir have been leased for farming; small grains, alfalfa, and meadow hay are the most common crops. Lands in the canyon are generally unused and undeveloped, with the exception of several small areas set aside in the CRP program.

The predominate industries located within the immediate vicinity of the reservoir are several dairies, cheese processing plants, and stockyards. Logan's secondary sewage treatment facility is located approximately one mile away, and treated wastewater is released via a ditch into the reservoir at a point on the eastern shore approximately one and one-half miles south of the Benson Marina site.

At the time of application filing, PacifiCorp owned approximately 9,700 acres of land at Cutler Project, of which about 4,200 acres were above the high water line. PacifiCorp ownership extends for a distance of up to one and one-half miles from the high water line to encompass upstream portions of Clay Slough, Bear River, Logan River, and the Little Bear River.



**Cutler Reservoir
Resource Management Plan**



Land Use

Figure 3-10

PacifiCorp, 1995

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A portion of the Bear River extending 3,500 feet downstream from Cutler Dam is also included. In addition, PacifiCorp owns approximately five square miles of wetlands located between State Highway 30 and Mendon Road (600 South). Of the 4,200 acres of PacifiCorp land above the high water line, 3,650 acres are within the proposed project boundary and 550 are beyond it. Approximately 200 acres of private land was identified as being within the proposed project boundary. As discussed in the introduction, PacifiCorp ownership has undergone a number of changes since 1991 and will continue to do so until the project boundary is finalized.. These are further described, by management area, in Chapter 4.

Of the 9,700 acres owned by PacifiCorp at the time of application filing, 5,415 acres were leased to 30 different leaseholders for grazing, farming, and recreational use. Nearly all the leases were renewed annually. Of this, 4,225 acres were leased for grazing and another 1,190 acres were leased for farming. Land suitable for agricultural use represented less than 46 percent of the total leased acreage. Because of this, and in an effort to achieve other resource management goals, all leases were canceled as the draft RMP was being developed so that new leasing programs could be established in accordance with the recommendations of this RMP (see Section 4.2.5 in the next chapter).

3.2 Identified Resource Issues and PacifiCorp Proposals

During the FERC relicensing process when the application was being developed, many issues were raised by the advisory groups, resource agencies, and the public. Investigation of these resource issues led to the development of specific proposals for enhancement which are presented in Chapter 4. Following is a discussion, by topic, of these resource issues.

3.2.1 Water Use and Water Quality

Issues directly related to the reservoir concerned project operations and water quality. The results of the relicensing studies and comments from resource agencies indicated that minimizing water level fluctuations in the reservoir south of Benson Marina would benefit fish and wildlife resources, reduce soil and shoreline erosion, and improve recreation opportunities (as discussed in the following applicable sections). To minimize adverse impacts, PacifiCorp proposed a reservoir elevation operating range in its filing with FERC (Table 3-2). PacifiCorp is currently conducting a study to determine if it is possible to operate within the proposed elevation ranges.

**Table 3-2
Proposed Mid-Reservoir Elevation Operating Ranges**

Time Period	Operating Range (El. ft)	Tolerance (Ft.)	Meet Target Operating Range	Purpose
March 1 through June 15	4407.5 to 4407.0	+0.25 -0.25	95%	Bird nesting and fish spawning season
June 15 through September 30	4407.5 to 4406.5	+0.25 -0.25	95%	Irrigation and recreational boating
October 1 through December 1	4407.5 to 4407.0	+0.25 -0.25	95%	Waterfowl hunting season
December 2 through February 28	4407.5 to 4406	+0.25 -0.25	90%	Power Operations

PacifiCorp proposed and has since initiated the Bear River Basin Study to aid in the evaluation of the proposed elevation operating ranges and the development of new operating procedures for reducing reservoir water level fluctuations south of Benson Marina. The study will be complete by April 29, 1997 and would include the following components:

1. A basin-wide irrigation call system requiring irrigators to place their water orders one week in advance of planned diversion with their respective water masters. Each water master would then let PacifiCorp know what the projected total demand for the following week would be; this would allow PacifiCorp to more accurately regulate Bear Lake releases, and thus stabilize Cutler Reservoir elevations.
2. The development of a statistically based operational model to improve the water balance between supply and demand within specific reaches of the river and minimize reservoir fluctuations.
3. An assessment of reservoir levels at Cutler Dam, Cache Junction, the Watterson's property, Benson Marina, and State Highway 30 and relationships among these areas to refine the proposed operating plan, to best meet the goals and objectives of the RMP.
4. Test the elevation operating ranges to assess reservoir elevation fluctuations from mid-reservoir (Benson Marina) south.
5. Provisions that a drawdown of the reservoir below the minimum target elevation (4406.0) would be done only after consultation with the appropriate state and federal resource agencies.

The water quality of Cutler Reservoir is poor due to the water quality of tributary inflow associated with agricultural land uses, sewage effluent, industrial discharges and bank erosion upstream of the reservoir. There are also several point sources of urban and agricultural wastes directly entering

the reservoir from adjacent or nearby private land. Turbidity and sedimentation adversely affects the aquatic life, reduces the potential for recreation, and reduces water storage capacity.

The water quality of the reservoir cannot be significantly improved without changes in upstream point and non-point discharges and off-site land uses. Some amount of improvement in specific areas of the reservoir is achievable by controlling direct impacts around the reservoir shoreline. Those impacts include shoreline erosion caused by water fluctuations, cattle grazing along embankments, and the tillage of fields to the edge of the reservoir. Increased nutrient loading is caused in part by cattle grazing below the high water line and the lack of shoreline vegetation to filter sheet runoff. Lack of shoreline vegetation is primarily due to farming up to the reservoir's edge and in drainages.

PacifiCorp's application recommended that a permanent vegetative buffer strip be established around the reservoir to reduce shoreline erosion and help to prevent sediment and nutrients from entering the reservoir. Within this buffer strip, existing native vegetation would be protected and areas that are currently tilled would be replanted with grasses and woody shrubs. The successful establishment of vegetative buffer strips would require changes in land use practices to control livestock grazing and farming encroachments and require PacifiCorp to acquire additional private land. New fencing was recommended to control livestock grazing and protect the buffer strip. PacifiCorp also recommended continuing its ongoing efforts to remove old car bodies and employ other erosion control techniques.

3.2.2 Fishery

The two primary issues raised by the resource agencies regarding the reservoir's fishery were: 1) frequent water level fluctuations which may limit natural spawning or rearing of fish (see Table 3-2 in Section 3.2.1); and 2) improvement of angler access needs. Sportsmen and conservation groups also requested that the numbers of carp be reduced.

In-depth fishery studies conducted during the Stage II relicensing process indicated that heavy sedimentation, shallowness of the reservoir, and the lack of open water cover, forage fish, zooplankton, and invertebrates are all major factors limiting the development of a successful warm water fishery.

To minimize the effects of water level fluctuations on the fishery during the spring spawning season, PacifiCorp proposed to maintain reservoir levels between 4407.5 and 4407.0 feet as measured south of the Benson Marina. This range is proposed as an interim goal pending the results of the comprehensive Bear River Basin water needs study discussed in Section 3.2.1. The establishment of a buffer strip as described in the previous section will reduce shoreline erosion and improve aquatic habitat. PacifiCorp also proposed to create more open water fish cover in the Benson Marina area near the abandoned railroad trestle. An opportunity for creating a fishery in a specific area of the South Marsh area where there is a natural pond; will be further evaluated as part of the RMP process.

No reservoir-wide carp control or eradication measures were considered feasible. Clay Slough has the potential of serving as a cooperative demonstration area in which carp control may be tested. Bank erosion control measures and vegetative plantings may also be performed as an experimental project to evaluate changes in water quality.

The development of additional recreation access points for anglers are summarized in Section 3.2.6.

3.2.3 Wildlife

Water level fluctuations, livestock grazing, and agricultural land use practices were three conditions identified by resource agencies as negatively impacting wildlife. During the nesting season (March 1 through June 15), reservoir water level fluctuations flood the nests of many waterfowl and shorebirds. Poor water quality, influenced by changes in the water level

and agricultural land use, limits submerged aquatic vegetation and insect development, which serve as important food sources for wildlife. Areas grazed by cattle has provided limited wildlife cover for many species, except Canada geese which have thrived in these areas. The use of herbicides, seasonal burning, tree cutting, and tillage to the edge of the reservoir has also reduced wildlife habitat and adversely affected wildlife populations. Canada geese and sandhill cranes have caused crop depredation to grains and alfalfa grown on PacifiCorp property and on adjacent private property. Crop sharing programs for PacifiCorp leaseholders are being considered to offset farmers' losses from wildlife depredation.

To protect and enhance wildlife habitat (particularly waterfowl and upland game bird species), PacifiCorp proposed a permanent vegetative buffer as described in Section 3.2.1. PacifiCorp also proposed to protect established wildlife habitat beyond the buffer strip wherever possible on its property. Tilled ground could be planted with native vegetation to provide food and cover for a variety of wildlife species.

Wildlife recommendations included proposals to cancel existing agricultural leases and modify land use practices to improve habitat conditions. Land use practices such as tree cutting, grazing, burning, herbicide spraying, and public access would be discontinued in areas of critical habitat, some of which is utilized by candidate species for listing under the Endangered Species Act. Fencing was proposed to help regulate grazing livestock and human disturbance to enhance wildlife habitat.

The proposed interim water level management plan described in Section 3.2.1 (Table 3-2) would help maintain water levels within one-half foot of the normal maximum elevation during the spawning and nesting seasons to enhance wildlife resources.

3.2.4 Vegetation

During the agency consultation process, botanical issues focused on two areas of concern: the impacts of land use practices on native vegetation; and the loss of shoreline/streambank vegetation and changes in species composition caused by water level fluctuations. The protection of special plants was not an issue because no endangered, threatened, or rare plants were found in the area.

To help assess these impacts, the agencies requested that the existing vegetation types be inventoried and mapped. The Utah Division of Wildlife Resources (UDWR) and Cutler Advisory Council also requested a list of suitable native plant species for planting to improve wildlife habitat, the establishment of a buffer zone around the shoreline to protect vegetation, the reduction of shoreline erosion, the minimization of herbicide spraying to prevent the loss of important wildlife habitat, and the preservation of trees and wetlands.

In response to these concerns and requests, vegetation types were inventoried and mapped as part of the relicensing studies, and a number of recommendations were proposed in the FERC application. One recommendation was the establishment of a vegetative buffer strip. This buffer (between State Highway 30 and State Highway 23 bridge) should extend for up to 200 feet from the high water line if feasible. Areas currently within this buffer strip which are tilled or eroded would be seeded with a variety of native grasses and forbs, and interplanted with shrubs and trees (particularly hydrophytic species such as willow, cottonwood and dogwood) selected from an approved list of plant species. These areas would provide food and cover for a variety of wildlife species and would help control erosion. Existing vegetation would be allowed to rejuvenate naturally. Periodic management of these strips would include use of control of noxious weeds and livestock grazing to maintain vegetative height. Native vegetation would be encouraged by adjusting current land use practices. Recommendations regarding land use practices are discussed in Section 3.2.8. Reservoir level fluctuations would also be minimized to the greatest extent possible to prevent the loss or alteration of vegetation along the shoreline.

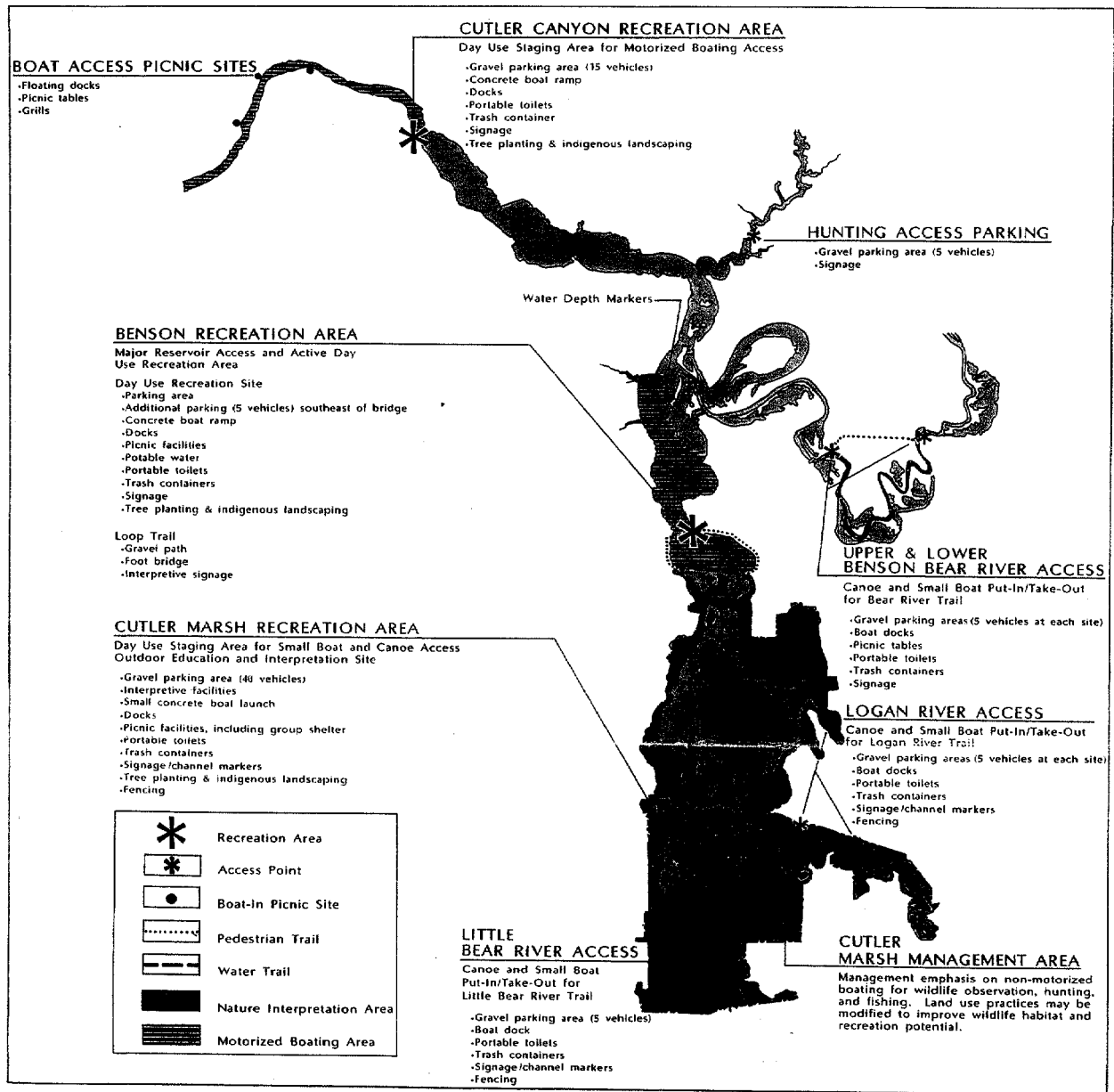
3.2.5 Historical and Archaeological Resources

In cooperation with the State Historic Preservation Office (SHPO) PacifiCorp has prepared a Cultural Resource Management Plan (CRMP) for the management and protection of project associated cultural resources. The CRMP compliments this document, but is separate and distinct.

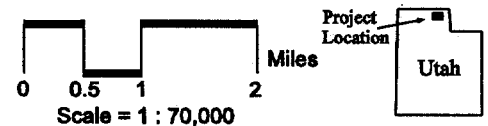
3.2.6 Recreation

During the relicensing process, a number of recreation issues were identified. They included: 1) greater public access to the reservoir and project lands; 2) conflicts between recreation and agricultural uses and between various recreation user groups; 3) lack of recreational facilities; and 4) more opportunities for nature appreciation and environmental education.

In response to agency and public input, PacifiCorp evaluated recreational demands and site opportunities or constraints, and developed a conceptual recreation master plan for the reservoir (Figure 3-11). A total of eight day use recreation sites, which would also provide small boat and canoe access, were proposed in the FERC application. Three of these, the Benson, Cutler Marsh, and Cutler Canyon Recreation Areas, would accommodate small boat launching and would be more extensively developed. The remaining sites would provide small boat and canoe access to the Logan, Little Bear, and Bear Rivers. Canoe trails with interpretive and directional signs would be developed along the two tributaries in Cutler Marsh, the marsh north of State Highway 30 to Benson Recreation Area, and the Bear River. In addition, PacifiCorp proposed to develop a land based loop trail from the Benson Recreation Area south to the abandoned railroad trestle, across the trestle and dike to the west side of the reservoir, and north back to the recreation area. The existing railroad trestle pilings would be used to support a pedestrian bridge for fishing and other activities.



**Cutler Reservoir
 Resource Management Plan**



**Conceptual Recreation
 Master Plan**

Figure 3-11

PacifiCorp, 1995

Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.



During the RMP planning process, alternative river access sites, bike trails and public access to the pedestrian bridge were considered. The feasibility of implementing all the recreation development proposals was also more closely scrutinized in terms of PacifiCorp's ability to acquire necessary road rights-of-way and land for development. No other developments were proposed due to access limitations or adjacent landowner conflicts.

PacifiCorp proposed that the Cutler Marsh Recreation Area receive first priority because of an ongoing UDOT bridge reconstruction project on State Highway 30. The bridge replacement project eliminated the only designated unimproved parking and boat launch site that provided public access to the southern marsh area of the reservoir. Maintaining the water level of the reservoir within one-half foot of the normal maximum elevation during the waterfowl hunting season (see Table 3-2 in Section 3.2.1) would also provide another important enhancement to recreational activities.

Within two years of completing the development of the proposed recreational facilities, PacifiCorp would conduct a visitor use survey to establish baseline data for annual use. The survey would assess recreational use of project facilities and forecast future needs.

It is PacifiCorp's intent to continue to allow managed public use on its property as long as use does not interfere with project operations or RMP goals. Facilities for overnight camping, no-hunting zones, and restricted boating regulations were not proposed because they would require a strong management presence and/or enforcement authorization.

3.2.7 Aesthetics

While the scenic quality of the reservoir was not a significant issue, PacifiCorp proposed to make the shoreline more attractive by removing old car bodies and debris, altering land use practices, reseeding with dryland grasses, and planting woody vegetation in selected areas Proposed

recreation development sites would be landscaped with indigenous or compatible plants to minimize visual impacts on the area's rural and undeveloped landscape.

3.2.8 Land Use and Management

In addition to issues discussed in the previous sections that relate to the use of PacifiCorp's property, concerns were raised regarding PacifiCorp's property leasing program and associated agricultural uses for the past 60 years.

Concerns were expressed over the effect of uncontrolled and prolonged grazing, especially south of State Highway 30 where UDWR has recently acquired land for wildlife management purposes adjacent to PacifiCorp property. UDWR has suggested that all unmanaged grazing leases along the Logan River, as well as some other areas be permanently canceled. PacifiCorp believes that grazing is a tool that can enhance wildlife habitat and reduce goose damage if properly managed. PacifiCorp proposed to develop a livestock grazing program which recognizes wildlife habitat and recreation as equally important land uses.

Farming operations on PacifiCorp property around the reservoir were evaluated. Current farming practices increase erosion, adversely affect scenic values and water quality, and prevent the growth of cover for wildlife. Wildlife utilize crops grown along the edge of the reservoir which also create conflicts with farmers. PacifiCorp proposes to improve vegetation, enhance recreation opportunities, and maintain some amount of agricultural use. To accomplish this, the terms and conditions of leases are being modified. PacifiCorp's new lease program is designed to protect and enhance natural resources and to improve revenue. Unleased PacifiCorp property presently serves as conservation lands. While most of these lands will remain idle, some could be put into agricultural production.

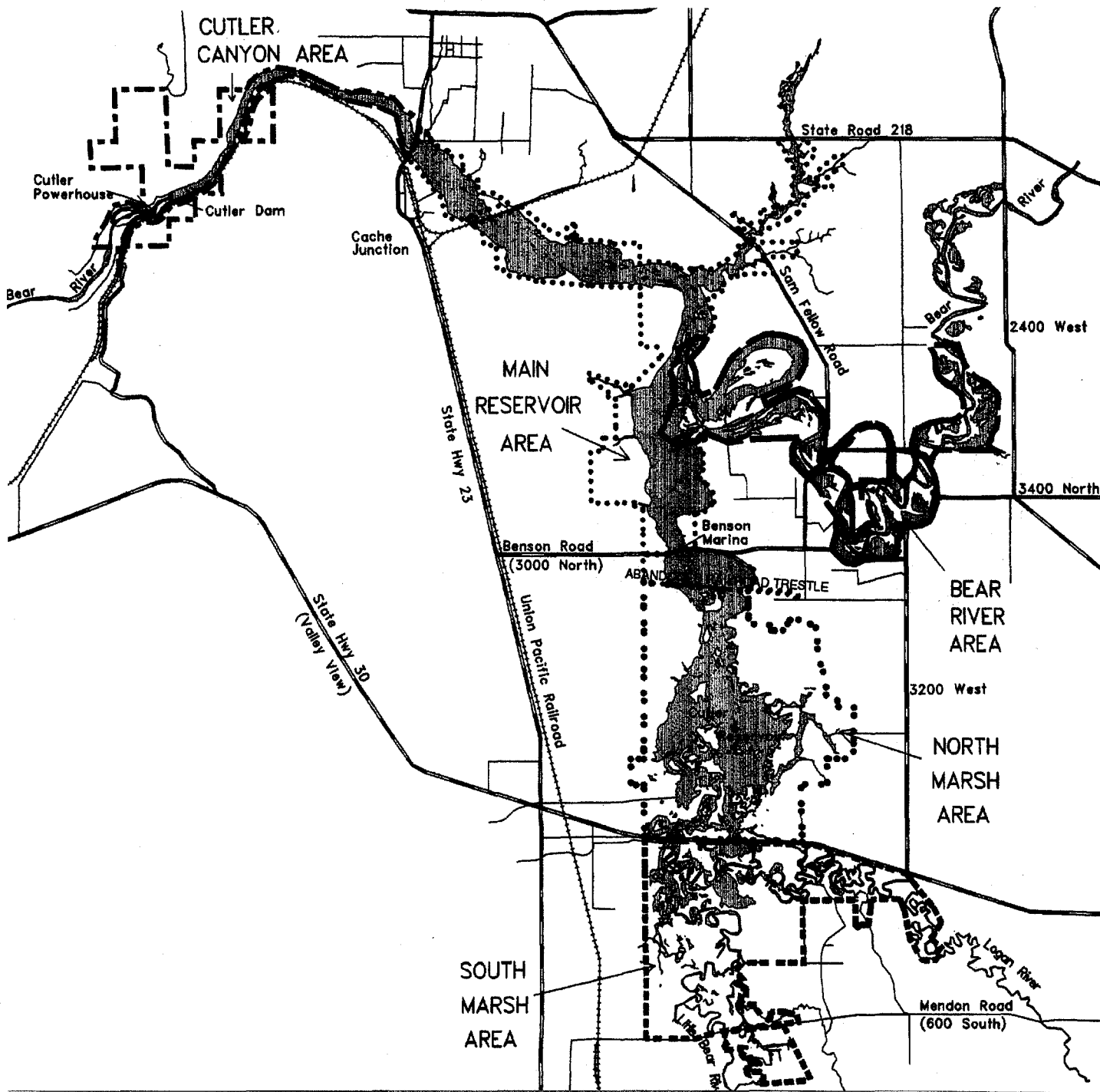
4.0 RESOURCE MANAGEMENT PLAN

The Cutler Reservoir RMP was prepared to include all PacifiCorp owned property within and adjacent to the FERC project boundary around the reservoir. It does not apply to other private property or public lands in the area. Its purpose is to provide guidelines for the protection, enhancement, development, and management of water, fish, wildlife, botanical, cultural, recreational, and aesthetic resources and agricultural land uses on PacifiCorp lands at Cutler Reservoir. The RMP incorporates conditions listed in the FERC license, Article 402, agency recommendations, and goals from the advisory group in the various programs described in Section 4.3. PacifiCorp's intent is to implement the RMP during the next 5 years and continue to manage the lands over the 30 year life of the new license.

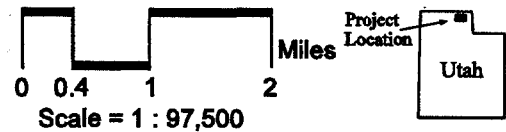
Cutler Reservoir and the surrounding PacifiCorp property is divided into 5 distinct resource management areas for management purposes. These are delineated according to relatively unique physical and biological characteristics or other management issues. The 5 areas include: Cutler Canyon; Main Reservoir; Bear River; North Marsh; and South Marsh (Figure 4-1).

The RMP's actions for each management area are specific to meet the stated goals and objectives but are intended to remain flexible to respond to changes in resource needs or changes in management policies. Coordination meetings will be held with resource agencies as needed to review monitoring results or modify goals, actions or objectives contained in the RMP.

Implementation programs were developed to achieve the goals in the FERC application and comply with license Article 402. These programs include: 1) vegetation enhancement; 2) agricultural leases for livestock grazing and farming; 3) recreation site development; 4) wetlands mitigation for recreation sites; and 5) fish habitat enhancement.



**Cutler Reservoir
Resource Management Plan**



**Resource Management
Areas**

Figure 4-1



PacifiCorp, 1995

Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.

The following sections include: overview of RMP goals and overview of programs and management actions as they apply to the five resource management areas. Management actions are then discussed for each of the management areas. A map showing locations and table which describes the specific actions is included for each management area.

4.1 RMP Goals

The following five overall goals were developed in consultation with the Cutler Advisory Council and the Cutler Technical Steering Committee, and from public input. The specific objectives and program actions were also developed to achieve each of the goals, which are described in the subsequent sections.

Goal 1: Enhance Water Quality

To improve water quality to the extent possible by minimizing reservoir water level fluctuations, reducing shoreline, streambank, and sheet erosion, and modifying agricultural land use practices on PacifiCorp property.

Goal 2: Protect, Enhance, and Develop Wildlife Habitat

To protect and enhance nesting habitat of white-faced ibis, other colonial nesting birds and the great blue heron which exists on PacifiCorp lands near the reservoir.

Goal 3: Encourage Public Access and Improve Recreation Opportunities

To allow public access to PacifiCorp property and improve and develop recreation facilities to support boating, fishing, hunting, bird watching, hiking, and environmental education around the reservoir.

Goal 4: Enhance Scenic Quality

To reduce the visual impact of erosion and debris and enhance the area's rural, undeveloped landscape. More abundant and mature plant growth of riparian vegetation will add color, texture, and definition to the landscape, improving its overall attractiveness.

Goal 5: Provide Agricultural Land Use Opportunities

To continue farming and grazing on PacifiCorp property where it does not conflict with the other RMP goals.

4.2 Overview of Programs and Management Actions

PacifiCorp proposes to implement the RMP as outlined in Article 402 of the new FERC license, which identifies five distinct programs. These programs are: 1) vegetation enhancement; 2) farming and livestock grazing ; 3) recreation site development ; and 4) wetland mitigation for recreation sites; and 5) fish habitat enhancement. These are described in the following sections. Specific management actions have also been developed for the various programs to meet the goals and objectives of each management area. Some actions may help to achieve more than one goal and may be part of several programs.

4.2.1 Vegetation Enhancement Program

Existing native vegetation has been impacted in two primary ways: 1) shoreline erosion; and 2) adverse land use practices.

PacifiCorp's vegetation enhancement program is focused on reducing the two primary impacts and reestablishing shoreline vegetation to improve water quality, wildlife habitat, recreation opportunities, and scenic quality.

Reservoir water level fluctuations have contributed to shoreline erosion and affected shoreline vegetation. To reduce these impacts, PacifiCorp proposes to stabilize water levels through project operations.

PacifiCorp also proposes to reduce shoreline erosion by planting vegetation along embankments in areas that are currently sloughing. Slopes will be recontoured or erosion control structures will be constructed. Hydrophilic plants such as; willow, cottonwood, dogwood, hawthorn, rush, and sedges, would be planted along or above the high water line.

Current agricultural land use activities have also significantly altered the native vegetation around the reservoir. Most tillable lands are farmed to the water's edge and in swales to maximize grain or alfalfa production and minimize competition from weed and native plants. Lands which are not tilled are often treated with herbicides to remove competing vegetation. Uncontrolled livestock grazing also impacts the growth of native vegetation along the shoreline and streambanks, where cattle congregate.

In the spring of 1994, PacifiCorp developed new agricultural leases on its property around Cutler Reservoir with new terms and conditions and reconfigured lease descriptions. In some areas, the reservoir shoreline and tributaries will be removed from the leasable areas and protected with fencing so existing woody vegetation can naturally rejuvenate and new vegetation can flourish. In the remaining areas, setbacks from the reservoir and drainages will be established for farming and grazing.

PacifiCorp will enhance tilled and eroded areas that are no longer leased. A permanent vegetative buffer strip will be established by reseeding with dryland perennial and annual grasses and forbs, and interplanting with a variety of shrubs and trees to provide food and cover for wildlife. Pockets of woody vegetation will also be established in areas currently void of shrubs and trees, where soils can support such vegetation (Figure 4-2). These will be planted in 1- to 3-acre blocks with small openings in the middle of the plantings to enhance upland game bird habitat.

A grass buffer strip with pockets of woody vegetation will be established on leased tilled or disturbed lands adjacent to the reservoir between State Highway 23 at the north end to State Highway 30 at the south end. Approximately ten miles of shoreline (125-150 acres) will be enhanced with a vegetative buffer strip up to 100 feet wide. Approximately ten to 15 pockets of shrubs and trees will be planted to establish 0.5- to 3- acre blocks of woody vegetation. These blocks of woody vegetation will enhance habitat for pheasants and a variety of wildlife species.

Vegetation at Cutler Reservoir will also be enhanced by landscaping all the recreation sites (see Section 4.2.3, below). The landscaping is primarily intended to increase the attractiveness of these sites, providing shade, and reducing wind. The trees and/or shrubs planted at the recreation sites will also benefit wildlife. These are identified by site in the Cutler Reservoir recreation site construction drawings, in Appendix A. Areas that are disturbed by construction activity will be seeded with native grasses and forbs. An irrigated turf area will be developed and maintained only at the Benson Recreation Area.

4.2.2 Agricultural Lease Program

Grazing

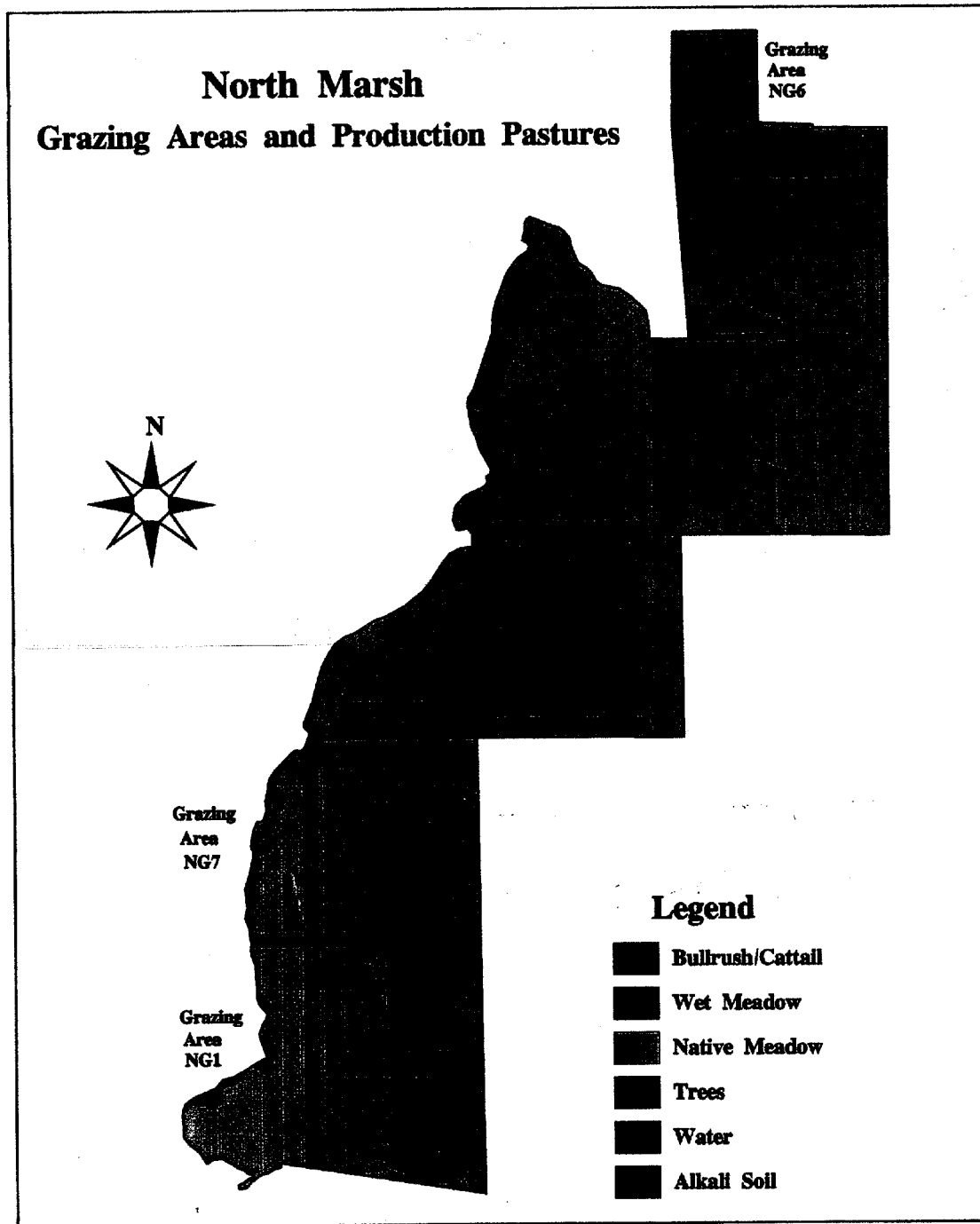
During the development of this RMP, 6 new grazing leases were issued as part of the new grazing program.

The historical season-long, single pasture grazing program that was utilized on PacifiCorp's property at Cutler Reservoir resulted in overutilization of available forage. It also adversely affected the reservoir's water quality, native vegetation, wildlife habitat around the shoreline and tributaries, and the overall scenic quality of the area.

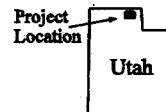
The new leasing program for cattle grazing has been implemented to improve water and scenic quality, protect wildlife and recreation resources, and provide livestock forage. The recommended program is based on a short duration, high intensity, rotational pasture system. New lease terms and conditions, lease descriptions, and fees that reflect current competitive market values are required. The program provides leaseholders long-term planning advantages by extending annual leases to five-year periods.

Under the new grazing program a total of 1,282 acres have been made available for grazing; 307 acres in the North Marsh Resource Management Area and 975 acres in the South Marsh Resource Management Area. Grazing will be allowed on a total of 20 rotation pastures for short durations ranging from 61 to 120 days. These pastures have been delineated according to availability of suitable forage and carrying capacity, water and road access. A specified number of animals, based on an assumed forage consumption, will be permitted to graze in the various paddocks. Animals will be rotated every 10-15 days from one paddock to another. The grazing program will be monitored and adjusted as needed to ensure the desired effects.

The North Marsh Resource Management Area, contains 307 leaseable acres subdivided into ten grazing pastures containing 258 acres of useable forage (Figure 4-3). Three of these serve as meadow hay production pastures (NP). The pastures provide spring and summer forage for geese, as well as fall aftermath grazing for livestock. A rotational grazing system has been developed to utilize between 40 and 80 percent of the plant growth depending on specific RMP goals and objectives (Table 4-1).



**Cutler Reservoir
Resource Management Plan**



**North Marsh Grazing
and Production Pastures**

Figure 4-3



PacifiCorp, 1995

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Table 4.1**North Marsh Grazing and Production Pastures**

Grazing Area	Total Acres	Grazing Period (Total Days)	Forage Utilization (%)
*NG1	7.31	120 - 152	80
NG2	20.8	120 - 152	60
NG3	40.56	120 - 152	60
NG4	43.45	120 - 152	60
NG5	24.2	120 - 152	60
NG6	10.86	120 - 152	60
NG7	10.36	120 - 152	80
*NP1	47.39	30 - 61	40
NP2	32.79	30 - 61	40
NP3	41.62	30 - 61	40

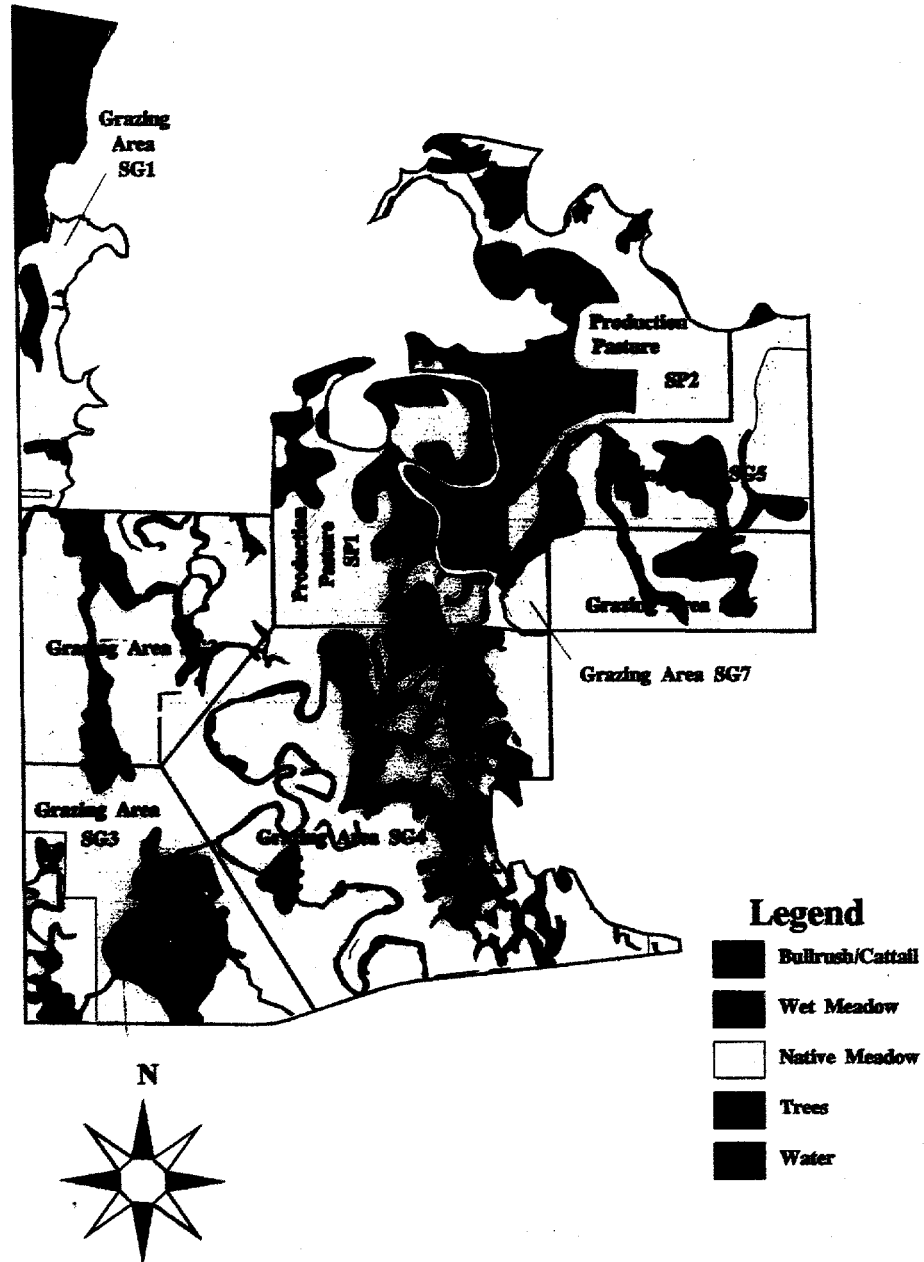
*NG North Grazing

*NP North Production

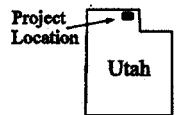
The new South Marsh Resource Management Area grazing program will contain 975 leaseable acres subdivided into nine pastures containing 685 acres of suitable forage. (Figure 4-4). Two of these will also serve as meadow hay production pastures (SP). The pastures will provide spring and summer forage for geese, as well as fall aftermath grazing for livestock. A rotational grazing system will be developed to utilize between 40 and 60 percent of the plant growth to meet RMP goals and objectives (Table 4-2).

South Marsh

Grazing Areas and Production Pastures



Cutler Reservoir Resource Management Plan



South Marsh Grazing and Production Pastures

Figure 4-4



PacifiCorp, 1995

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Table 4.2**South Marsh Grazing and Production Pastures**

Grazing Area	Total Acres	Grazing Period (Total Days)	Forage Utilization (%)
*SG1	69.52	120 - 152	60
SG2	103.24	120 - 152	60
SG3	129.82	120 - 152	60
SG4	275.05	120 - 152	60
SG5	82.49	120 - 152	60
SG6	62.67	120 - 152	60
SG7	28.08	120 - 152	60
*SP1	101.67	31 - 61	40
SP2	124.19	31 - 61	40

* SG South Grazing

* SP South Production

Some of the pastures will also be used to produce native meadow hay. During the summer, the production pastures will be irrigated, and the hay harvested by the leaseholders. A lessee will be given the option to purchase the company's portion of the hay, or deliver it to a place designated by PacifiCorp that is located within two miles of the pasture. The remaining hay may be used by the leaseholder. In the fall, the production pastures will be grazed by livestock to utilize the plant regrowth. The goal is to utilize 80 percent of the forage prior to the start of winter. Pastures will be sufficiently short in the spring to provide Canada geese suitable forage to lure them from adjacent farmlands.

Pasture perimeter fencing will be five-strand barb wire constructed by PacifiCorp. Interior paddock fencing will be portable electric fencing. PacifiCorp will supply all portable fencing materials to leaseholders at the beginning of each season. All fencing and authorized site improvements will be maintained by the leaseholders.

Dust bags, oilers, or other insecticide treatment and sprays will not be permitted unless authorized by PacifiCorp. Mowing and burning on project lands will also be restricted.

To qualify for the grazing lease program, potential livestock leaseholders must be willing to work with PacifiCorp in ensuring that applicable RMP goals and objectives are being met. PacifiCorp has contracted with Utah State University to develop a grazing monitoring program to assess the forage utilization of livestock and nesting response of various bird species.

Farming

Prior to the cancellation of farming leases around Cutler Reservoir in the fall of 1993, PacifiCorp annually leased 1,190 acres of cropland to eight leaseholders. All lands were used to grow small grains and/or alfalfa. Historically, farming practices included tilling to the water's edge and in drainage swales to maximize crop production, and reduce weeds and woody vegetation, leaving little vegetation for erosion control and wildlife habitat.

To minimize or eliminate adverse environmental impacts and to accommodate the demand for agricultural leasing, PacifiCorp proposes to reestablish the farming lease program under new terms and conditions and to reconfigure leased parcels. Five parcels located in the North and South Marsh Resource Management Areas are proposed as hay production pastures, but will also be grazed under a separate lease agreement.

The new conditions and configurations will ensure that tilling does not occur immediately along the reservoir shoreline or in drainage swales. There will also be new restrictions regarding herbicide and pesticide use and burning of stubble. No subleasing will be permitted, and leases will be renewed on a 5-year basis rather than annually, an advantage to both the leaseholders and PacifiCorp. Lease fees will be increased to current market values, in part to offset management costs.

Lease fees will be based on the productive yield through a sharecropping agreement. Canada geese, sandhill crane, and waterfowl crop damages will be evaluated on leased project lands and deducted from PacifiCorp's percent of yield.

New fences or boundary markers are being installed in areas where it is desirable to clearly define the boundaries of the leases. In some circumstances it may be desirable to control public access to some agricultural fields. Only permitted irrigation pumps, diversions, and other site improvements on PacifiCorp property will be allowed. The maintenance of all existing and new improvements will be the responsibility of the leaseholders.

4.2.3 Recreation Site Development Program

PacifiCorp will improve public access and develop recreation facilities at 8 sites around the reservoir (Figure 3-11). Three of these will have a variety of day use facilities including parking lots (varying from 16 to 39 spaces), concrete boat ramps, floating docks, picnic tables, barbecue grills, picnic shelters (except at Cutler Canyon), vault toilets, dumpsters, and interpretive signs.

The other five recreation sites will be less developed and will provide boating and sportsmen access to Clay Slough and the Bear, Little Bear, and Logan Rivers. Each site is able to offer some unique recreation opportunities due to its location in the project area. Facilities will be designed to provide access for the physically challenged in compliance with current state and federal regulation.

The Cutler Canyon Recreation Area will be located at the east end of the canyon off of State Highway 23 at the north end of the reservoir. It will provide access to the canyon area for boaters and other recreational visitors.

The Benson Recreation Area located near the middle of the reservoir includes the old Benson Marina site, the abandoned railroad dike and trestle, and a proposed trail along the shorelines between these two areas. The trail and pedestrian bridge, using the abandoned railroad trestle, will offer opportunities for hiking, fishing, bird watching, and environmental education.

The Cutler Marsh Recreation Area will be located on the west side of the South Marsh Resource Management Area off State Highway 30. New opportunities for boating, fishing, picnicking and environmental education will be created. The boat launch will serve as a new take-out for canoeists using the river trails in the South Marsh and as a put-in for the canoe trail through the North Marsh to the Benson Recreation Area.

The five boating and sportsmen access sites will provide a small amount of parking (5 to 8 spaces), graded boat ramps, fixed shoreline docks, portable toilets, and signs. One will be located on the south side of Clay Slough off Sam Fellow Road. Two river accesses are planned on the Bear River. The existing upper access, located along the river just north of the community of Benson, will be improved. A lower access will be developed several river miles downstream, just off Sam Fellow Road. It is only a mile by road between the 2 accesses. These two sites will be connected by a canoe trail. River accesses will also be built on separate rivers in the South Marsh Resource Management Area (Section 4.3.5.). One will be developed on the north side of the Logan River off State Highway 30, and the other on the north side of Mendon Road on the east side of the Little Bear River. Each will have a storm shelter, signs and a canoe trail leading to the Cutler Marsh Recreation Area.

The first recreation site planned for development will be the Cutler Marsh Recreation Area, located near the confluence of the Little Bear and Logan Rivers. The entrance to the recreation area will be located west of the new bridge on State Highway 30. The Bear River access sites and canoe trails will also be developed in the second phase of recreation facility construction along with the Cutler Canyon Recreation Area.

The last development phase will be the Benson Recreation Area, including the pedestrian bridge and trail, and the Clay Slough, Logan and Little Bear River access sites.

Recreation management will include: 1) the seasonal removal of trash and snow on the roads and parking lots; 2) the seasonal placement and removal of portable toilets and floating docks; and 3) periodic repair and maintenance of facilities.

Waterfowl hunting will be allowed in all resource management areas and will be regulated by the Utah Division of Wildlife Resources. No camping will be allowed anywhere around Cutler Reservoir on PacifiCorp lands. Power boats (other than small boats with low horsepower outboard motors), jet skis, and other motorized water craft will be discouraged in the Bear River, North Marsh, and South Marsh Resource Management Areas; and achieved through signs and public information/environmental education materials. The local Chamber of Commerce, environmental organizations, and other interested entities will be solicited to assist in the preparation and distribution of such materials.

PacifiCorp will conduct a visitor use surveys after completion of all recreation facilities to establish baseline use levels, patterns, and future needs.

4.2.4 Wetland Mitigation Area

The development of the 8 recreation access sites (See Figure 3-11 and Section 4.2.3) may impact up to 2 acres of wetlands. The UDWR and USFWS review of a report titled, the Wetland Delineation of the Eight Proposed Recreation Access Points at Cutler Reservoir (UDWR June 2, 1993, USFWS May 28, 1993 letters) indicated; 1) the access site impacts to wildlife would be minimal; 2) the recreation sites would provide substantial recreational benefits, and 3) that mitigation could be achieved by the enhancement of lands within the project boundary that would include bank stabilization, vegetation plantings and cattle enclosure fences.

To meet the requirements of the license Article 402 and obtain a Section 404 permit, wetlands will be developed to replace the affected wetlands in consultation with the UDWR and the USFWS. A 6.02-acre improved wetland will be located on the Bud Phelps Wildlife Management Area, (UDWR lands) adjacent to the South Marsh Management Area; the design drawings are found in Appendix A (Figures A-9 and A-10). This site will be made up of 2 islands with a total surface area of 1.57 acres and 4.45 acres of open water. It will be contained by the 1,220 foot existing Spring Creek Canal dike and 1,047 feet of new dike.

The wetland will use the existing Spring Creek canal as a water source. Water depth can be controlled in the area, up to at a 2 foot maximum depth, through several water control head gates (see Figure A-11). Water levels will be managed to promote desired vegetation growth and macroinvertebrate production and provide open water areas for waterfowl. The islands are located 50 feet from the dikes to provide nesting waterfowl protection from predators.

4.2.5 Fish Habitat Structures

PacifiCorp will develop additional open water fish cover and improve fishing opportunities by placing fish habitat enhancement structures within the Main Reservoir Resource Management Area near the abandoned railroad trestle. This area contains the necessary deep water and angler access.

The dominant species of gamefish present in the reservoir are black crappie (*Pomoxis nigromaculatus*), pumpkinseed (*Lepomis gibbosus*) and channel catfish (*Ictalurus punctatus*). There will be 2 structure types used. Black crappie prefer vertical structures for escape and feeding cover. The structure to be used will be a 16 inch diameter, 4 foot tall plastic snow fence, placed on end with a plastic cover (see Appendix A, Figure A-11). Structures will consist of 8 to 12 modules clustered together, individually weighted with a concrete block. Wire or plastic ties will be used to secure the snow fence into tubes and the blocks to the structure bases. Channel catfish prefer horizontal structure located near or on the bottom. A catfish structure will consist

of 6, 3-foot long sections of 8-inch diameter polyethylene corrugated perforated drainage pipe secured into a 3-2-1 layer pyramid with plastic strapping (See Appendix A, Figure A-11). The tubes will be plugged at one end with about 6 inches of concrete. The open ends will be placed with three faces open per side. Four to six structures will be placed in close to one another at two locations in the reservoir, immediately north and south of the abandoned railroad trestle, (See Appendix A, Figure A-12).

Both structure types will be built on the shore and transported by boat to a desired location. A global positioning system (GPS) will be used to establish the permanent location of the structures.

4.3 Resource Management Areas

For the purposes of this RMP, Cutler Project lands and adjacent PacifiCorp property is divided into five distinct resource management areas (Figure 4-1). These are delineated according to relatively unique physical and biological characteristics. The five management areas, beginning at the north end of the reservoir and ending at the south end, are: Cutler Canyon; Main Reservoir; Bear River; North Marsh; and South Marsh.

For each resource management area, the following sections describe: 1) the major resource features with their constraints and opportunities; 2) the goals and objectives; and 3) the management actions. Tables and figures are also provided which summarize the goals, objectives, and management actions for each resource area.

In general, protection measures do not require specific actions other than to maintain the status quo. However, some areas lack fencing or other protection from human intrusion, grazing cattle, farming encroachment, or other resource disturbing activity and new measures may be necessary to ensure that the resource is protected.

Enhancement actions are those which will improve the condition of an existing resource or an existing resource based opportunity. Such measures generally require capital expense.

Actions which are development oriented and will create new resource conditions or opportunities typically are described with the terms "establish" or "provide", respectively. These commonly refer to the development of grass buffer strips, wildlife habitat, and recreation facilities where none currently exist. Like enhancement measures, these actions involve capital expense.

The term "manage" infers that additional actions will be made on an ongoing basis or periodically, as needed, to achieve the goals and objectives of the RMP.

4.3.1 Cutler Canyon Resource Management Area

Resources

The Cutler Canyon Resource Management Area includes project and nonproject lands approximately 0.5 miles downstream of the dam (Figure 4-1) and east of the dam to the State Highway 23 bridge. This management area is the smallest, with only 175 reservoir surface acres (at full pool) and 937 land acres. It has the highest proportion of shoreline erosion per shoreline mile (33 percent, or approximately three miles). This is due to the steep, talus unvegetated slopes, wave action and water level fluctuations which cause the sloughing of unstable shoreline segments. The water level fluctuations are caused by tributary inflows, water withdrawals for irrigation and Cutler hydroelectric power operations.

This management area contains the deepest water; over 75 percent of the area is greater than 4.5 feet deep. Fish populations in this area have the highest percentage of game fish of all the management areas. However, due to poor water quality and lack of suitable habitat and forage, game fish numbers are still considered to be low.

The management area has little critical or important wildlife habitat and there is limited suitable habitat for species like Canada geese, sandhill cranes, gadwalls, and ring-necked pheasant. The area supports wintering mule deer and a small population of sharptail grouse.

The largest amount (78 acres) of tree cover around the reservoir exists in this management area, primarily in the canyon on the northern side. These trees are predominantly chokecherries and junipers. Most of the management area is covered with upland grasses and xeric shrubs, with sparse wetland vegetation along the reservoir shoreline.

The single cultural resource at the reservoir, the Cutler Powerhouse and ancillary facilities, is located in this management area at the base of the dam.

PacifiCorp will install a gate to control vehicular traffic on the powerhouse access road.

The remainder of the management area is inaccessible by public road, except for the very eastern end at the State Highway 23 bridge crossing.

There are no developed recreation facilities. Due to the lack of roads and boat access, the canyon receives little recreational use. However, some visitors walk in on foot, or boat in from the Benson Marina boat ramp, located 6 miles to the south. Boating from Benson is difficult especially for deeper draft boats, because of shallow water and a meandering river channel in the main reservoir. The deeper water depth of the canyon portion of the reservoir and higher proportion of gamefish relative to the rest of the reservoir offer potential opportunities for boating and fishing with the establishment of recreation facilities.

Two areas were leased in this management area, one on the north side and one on the south side of the canyon. PacifiCorp cancelled both leases and does not intend to issue leases in this area. The north area supported some grazing, but it was limited because of the steep terrain and lack of irrigation and fences. Approximately ten acres of the south area was planted in vegetative cover for wildlife as part of the Conservation Reserve Program (CRP), and the remainder is unutilized.

Goals, Objectives and Management Actions

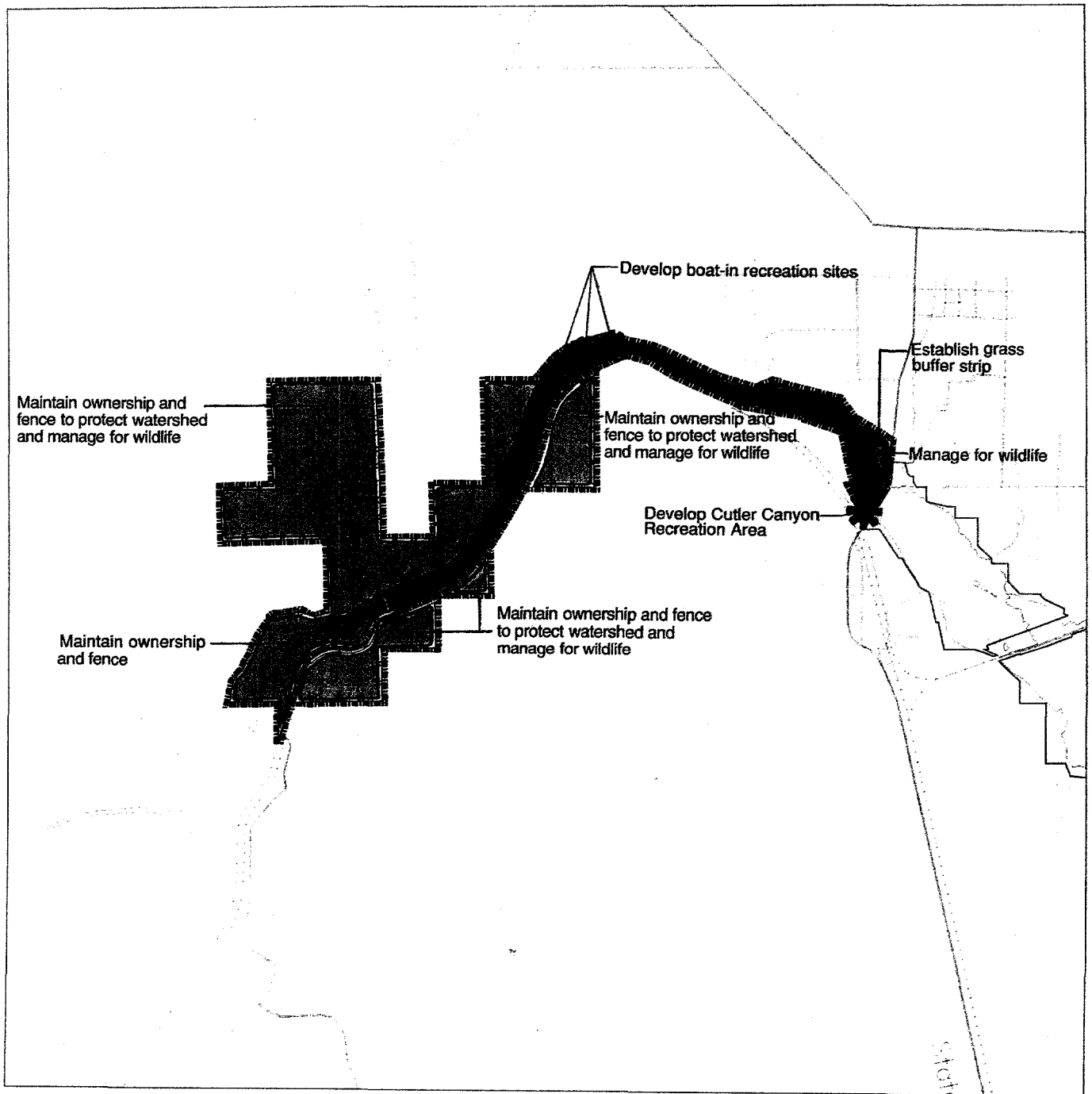
Actions plans were developed to achieve the four goals and objectives in the Cutler Canyon Resource Management Area. The goals include enhancement of: 1) water quality; 2) wildlife habitat; 3) recreational opportunities; and 4) scenic quality. PacifiCorp has developed specific actions to try to achieve the desired goals. Some of the management actions include new recreation facilities to improve boating access in the canyon, some fencing grass buffer strip and

landscaping. No shoreline erosion control, shrub and tree planting, or changes in ownership is planned. In order to protect the canyon watershed and benefit wildlife, no land will be available for leasing. The specific goals and actions for this management area are shown in Table 4-3 and Figure 4-5.

Table 4-3

Goals and Objectives and Management Actions for Cutler Canyon Resource Management Area

GOALS/OBJECTIVES	MANAGEMENT ACTIONS
1. Enhance Water Quality	
Characterize Discharge Sources	Cooperating with regulatory agencies
Stabilize Water Levels, As Feasible	Conduct the Bear River Study and Develop an operating plan to reduce water level fluctuations
2. Protect, Enhance and Develop Wildlife Habitat	
Enhance Upland Habitat	Develop and protect woody cover and upland grass buffer strips Regulate burning and spraying on PacifiCorp lands
3. Encourage Public Access and Improve Recreation Opportunities	
Improve Power and Other Boating Opportunities	Provide/expand parking, boat launch, and support facilities
Improve Fishing Opportunities Improve Day Use Opportunities	Provide better reservoir access Reduce water level fluctuations Provide signs for historic resources
4. Enhance Scenic Quality	
Landscape Proposed Recreation Area	Develop landscape plan for proposed recreation area using indigenous or compatible plant species
Protect and restore existing shoreline vegetation	Develop grass buffer strips Protect existing vegetation

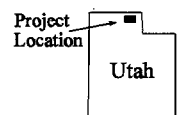


**Cutler Reservoir
Resource Management Plan**



**Cutler Canyon Resource
Management Area
Actions**

Figure 4-5



PacifiCorp, 1995

Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.

4.3.2 Main Reservoir Resource Management Area

Resources

This management area extends from State Highway 23 to the abandoned Union Pacific Railroad trestle (Figure 4-1). It includes Clay Slough and the Bear River delta at the northeast end. Much of this part of the reservoir contains the Bear River channel and is strongly influenced by the river. On either side of the channel, the reservoir is generally less than two feet deep, with deeper water found in the southern end of the management area at bridge crossings. Most of the shoreline (28 percent) in this area is characterized by low embankments which are unstable and subject to erosion. Shoreline erosion is caused by water fluctuations and wave action and is exacerbated by the lack of vegetative cover where crops and grazing abut the embankments.

The eroding shoreline has cut beyond project lands into adjacent property and will require purchase or trade of lands by PacifiCorp to control impacts. A powerline along the southern shoreline at the northwestern end of the management area may eventually require relocation if shoreline retreat is not halted.

Over thirty years ago Utah Power and other landowners attempted to control shoreline erosion by installing car bodies. The car bodies were somewhat effective in controlling erosion, but are no longer acceptable and detract from the reservoir's scenic quality.

PacifiCorp began in 1991 several shoreline stabilization projects in this area. Over 200 old car bodies were removed along the reservoirs eastern shoreline north of the Benson boat launch. Embankments along one half mile of shoreline were sloped and riprapped. Rock-filled gabion baskets were placed in the reservoir parallel to another one half mile of shoreline to reduce wave action and help create wetland habitat between the revetments and shore.

Approximately 500 feet of shoreline south and west of Benson Road was sloped, covered with

various types of erosion control fabric, and seeded to test another type of stabilization technique. During the 1991-92 period over one mile of shoreline was stabilized using a variety of methods.

Based on the findings of the erosion control work done in 1991-92, PacifiCorp worked cooperatively with the state highway department in 1993 to stabilize an additional 1/2 mile of shoreline. UDOT was required to mitigate wetlands destroyed by the reconstruction of the State Highway 30 bridge. The mitigation project involved enhancement and creation of wetlands by sloping the steep embankment, installing rock revetment (gabions), and planting the shallow protected area with emergent wetland vegetation. The project's success in establishing new wetland vegetation has been noted by various resource agencies. The rock revetment also provides cover for numerous small fish.

The lowest density of game fish relative to overall number of fish surveyed was found in this management area and along the Bear River. Low game fish populations are most directly related to poor water quality, shallow water and lack of forage. And opportunities for improving game fish habitat are limited. Small numbers of gamefish were found in areas which contained structure and depths greater than three feet. In contrast, carp numbers were high in most areas.

There is no critical wildlife habitat in this management area. However, there is a remote area that contains a mixture of farm ground and wetland vegetation located at a bend in the reservoir across from Clay Slough. This area is heavily used by sandhill cranes for staging during migration periods. The existing physical and biological features there also make enhancement opportunities for other wildlife species possible. Most of the remaining lands in this management area have high habitat values for sandhill cranes and Canada geese because of a mix of open water, wetland vegetation, and adjacent croplands. Ducks, pheasant, and other game birds are not abundant, primarily because of poor water quality and limited habitat.

Woody cover and grass buffer strips are extremely limited due to the agricultural practices of farming and grazing to the edge of the reservoir, along swales, and up to fences, as well as burning and the use of certain herbicides. Reservoir water level fluctuations during the nesting season also affect certain wildlife species.

Sandhill cranes and Canada geese have caused crop depredation on surrounding private and PacifiCorp leased farmland. Prior to cancellation six leases in this management area were farmed, representing the greatest amount of leased farmland in any of the management areas. Some of this leased land was also grazed after the crop was harvested. The largest (approximately 750 acres) non-contiguous lease at Cutler Reservoir was located on the western side of the management area, and used for cereal grains and alfalfa.

Recreational activities that occur in this management area include water skiing, canoeing, fishing, hunting, bird watching, and picnicking. Public access is generally limited to bridge crossings along State Highway 23 at the northwestern end, on Sam Fellow Road at Clay Sough, and along Benson Road at the Benson Marina. Trespassing occurs on some of the leased and adjacent private lands due to inadequate and uncontrolled access. Boat access is limited in the northern end due to shallow water, and water level fluctuations. The only recreational facilities at Cutler Reservoir are located in this management area, at the old Benson Marina site. The facilities include a concrete boat ramp, picnic shelter, two picnic tables, two barbecue grills, and parking for approximately a dozen vehicles. During periods of high activity, such as the waterfowl hunting season, there is insufficient parking. A parking area on the south side of Benson Road or to the east of the old railroad trestle will allow construction of a trail connecting the footbridge with the Benson Marina site. The abandoned railroad trestle pilings located just south of the marina site could support a pedestrian bridge, and provide fishing, bird watching, and hiking opportunities.

Goals, Objectives and Management Actions

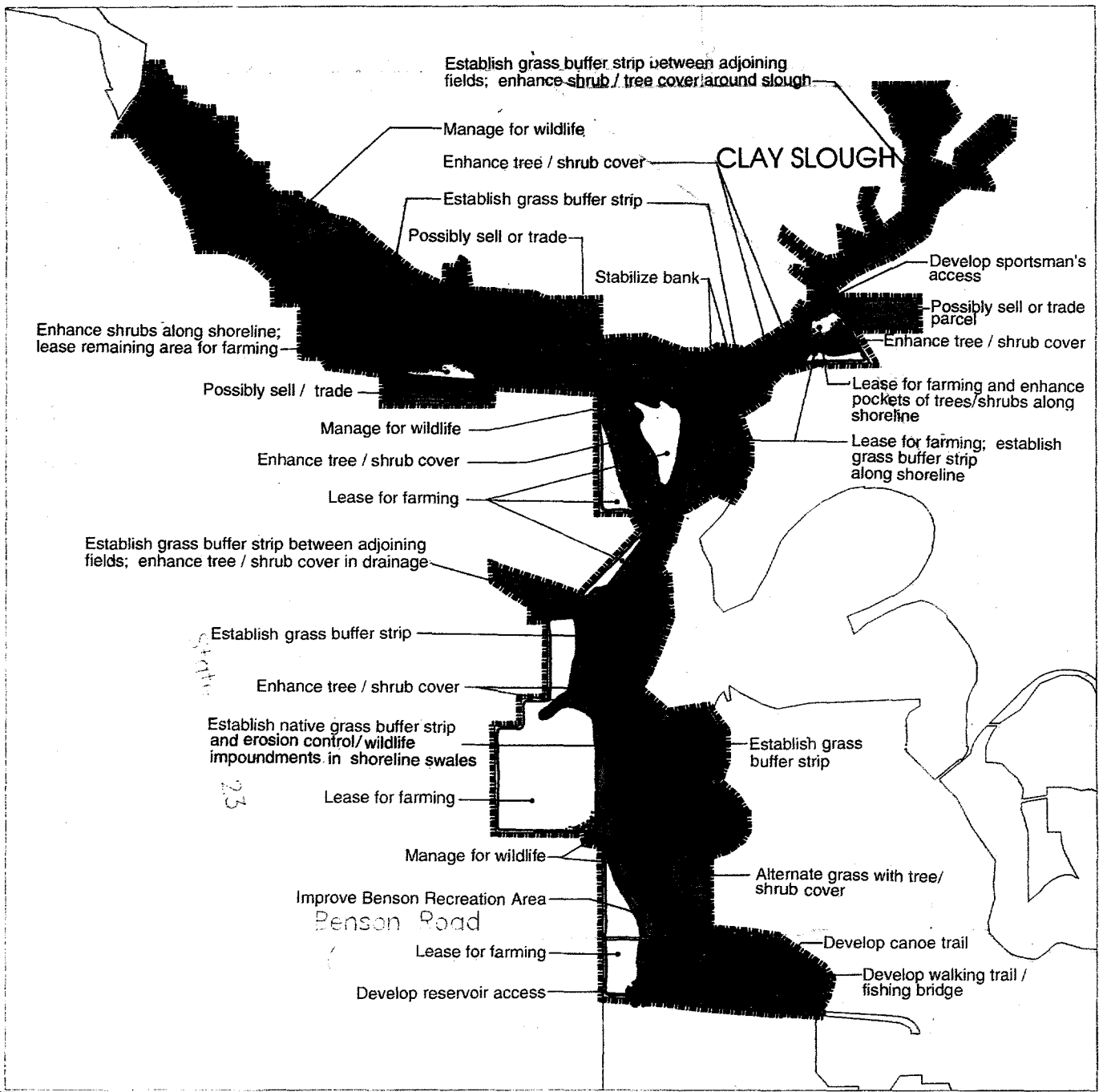
Action plans were developed to achieve all five of the goals in the Main Reservoir Resource Management Area. The goals included enhancement of: 1) water quality; 2) wildlife habitat; 3) recreational opportunities; 4) scenic quality; and 5) agricultural leases. PacifiCorp has developed some diverse management actions which will be utilized to control erosion, enhance wildlife habitat, improve recreation opportunities, enhance scenic resources, and accommodate farming interests. Management efforts benefitting fish and wildlife will be concentrated in Clay Slough and the low-lying area across the reservoir from the mouth of Clay Slough. Plantings in these and other areas along the shore will help establish and expand pheasant territories by providing woody cover. Recreation improvements are focused in the southern portion of the management area where existing facilities and good public road access exists. Changes in agricultural leases consist of reducing the number of leases changing lease descriptions and addressing wildlife crop damage. The goals and actions for this management area are shown in Table 4-4 and Figure 4-6.

Table 4-4

Goals and Objectives and Management Actions for Main Reservoir Resource Management Area

GOALS/OBJECTIVES	MANAGEMENT ACTIONS
1. Enhance Water Quality	
Characterize Discharge Sources	Cooperate with regulatory agencies
Stabilize Water Levels,	Conduct Bear River Basin Study and an operating plan to reduce water level fluctuations
Reduce Shoreline Erosion	Plant and/or slope embankments
Reduce Sheet Erosion	Develop grass buffer strips Reduce or eliminate grazing and tillage along shoreline Build sediment catchment basin
2. Protect, Enhance, and Develop Wildlife Habitat	
Protect Important Nesting/Spawning Habitat	Restrict or eliminate usage of pesticides and herbicides on PacifiCorp lands Stabilize reservoir water levels during nesting and spawning periods
Enhance Upland Habitat	Regulate grazing periods in upland areas Establish upland grass buffer strips and protect or develop woody cover Regulate burning and spraying on PacifiCorp lands
3. Encourage Public Access and Improve Recreation Opportunities	
Improve Power Boating Opportunities	Provide/expand parking, boat launch, and support facilities
Improve Canoeing and Small Boat Opportunities	Provide/expand parking, support facilities, and water-based trail
Improve Fishing Opportunities	Provide better reservoir access (see also above boating actions) Reduce water level fluctuations Develop additional open water fish cover
Improve Hunting Access	Provide parking and support facilities (see also above boating actions)
Improve Day Use Opportunities	Provide parking, picnic facilities, and other support facilities
Provide Hiking Opportunities	Provide parking, hiking trail, and support facilities
Provide Environmental Education/Bird Watching Opportunities	Provide parking, interpretive signage, and support facilities Promote opportunities with the assistance of local organizations
4. Enhance Scenic Quality	
Protect and Restore Shoreline Vegetation	Establish grass buffer strips and woody cover
Landscape Proposed Recreation Areas	Develop landscape plans for proposed recreation areas using indigenous or compatible
Clean Up Shoreline	Remove debris Remove old car bodies

5. Provide Agricultural Land Use Opportunities	
Address Wildlife Crop Depredation	Establish crop sharing program for small grains, alfalfa, and meadow hay
Continue Agricultural Leasing Program	Provide leases compatible with overall goals and objectives

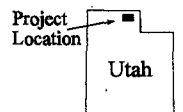


**Cutler Reservoir
Resource Management Plan**



**Main Reservoir Resource
Management Area
Actions**

Figure 4-6



PacifiCorp, 1995

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4.3.3 Bear River Resource Management Area

Resources

This management area runs approximately eight miles in length from north of the community of Benson to where the Bear River empties into Cutler Reservoir (Figure 4-1). The river corridor is generally defined by high embankments with an extensive wooded/wetland bottomland. There are over five miles of eroded shoreline. Erosion occurs in the outside bends of the river and where riparian vegetation is limited. Water level fluctuations in the river and heavy livestock usage along the shoreline has accelerated the erosion process. Adjacent landowners have used the river corridor for dumping or discharge of agricultural wastes which continue to degrade water quality.

Fluctuations in the water levels of the Bear River and Cutler Reservoir may adversely affect fish and wildlife diversity and reproduction. However, the management area has relatively high habitat values for certain species. The upper (eastern) two-thirds of the area is particularly suitable for ring-necked pheasant, because it has both food and dense woody winter cover. In addition, the lower third of the Bear River area which is grazed, is highly suitable for Canada geese. The entire corridor contains sandhill crane habitat. An old narrow oxbow on the north side of the river which consists of many potholes, provides the only high value duck habitat in this management area. There is no critical wildlife habitat.

Public access into this management area is difficult because of the terrain and surrounding private ownership. An unimproved boat launch with no support facilities located on the river's east bank just east of the old river oxbow is utilized by small boats to access the Bear River upstream of the Cutler project. This access point is also used as a put-in by those boating downstream, although the lack of a good take-out further downstream limits use in this direction. Canoeing and bird watching are the more popular recreational activities.

Similar to the Main Reservoir Area, segments of the shoreline in this management area could be aesthetically enhanced through the removal of car bodies and debris, the setback of livestock from the river corridor, and the protection and restoration of riparian vegetation on project lands.

In 1991 PacifiCorp allowed two grazing leases along the river corridor. Both leases have since been terminated, although a small portion of the downstream lease could be grazed with minimum adverse impacts on water quality, wildlife, and scenic resources. The downstream area is being grazed by the adjacent property owner until property and project boundary issues are resolved. Another small area of PacifiCorp property is partially irrigated and is being farmed by an adjacent landowner without a lease agreement until property issues are resolved. Crop depredation from geese and cranes occurs on PacifiCorp and adjacent private farmland.

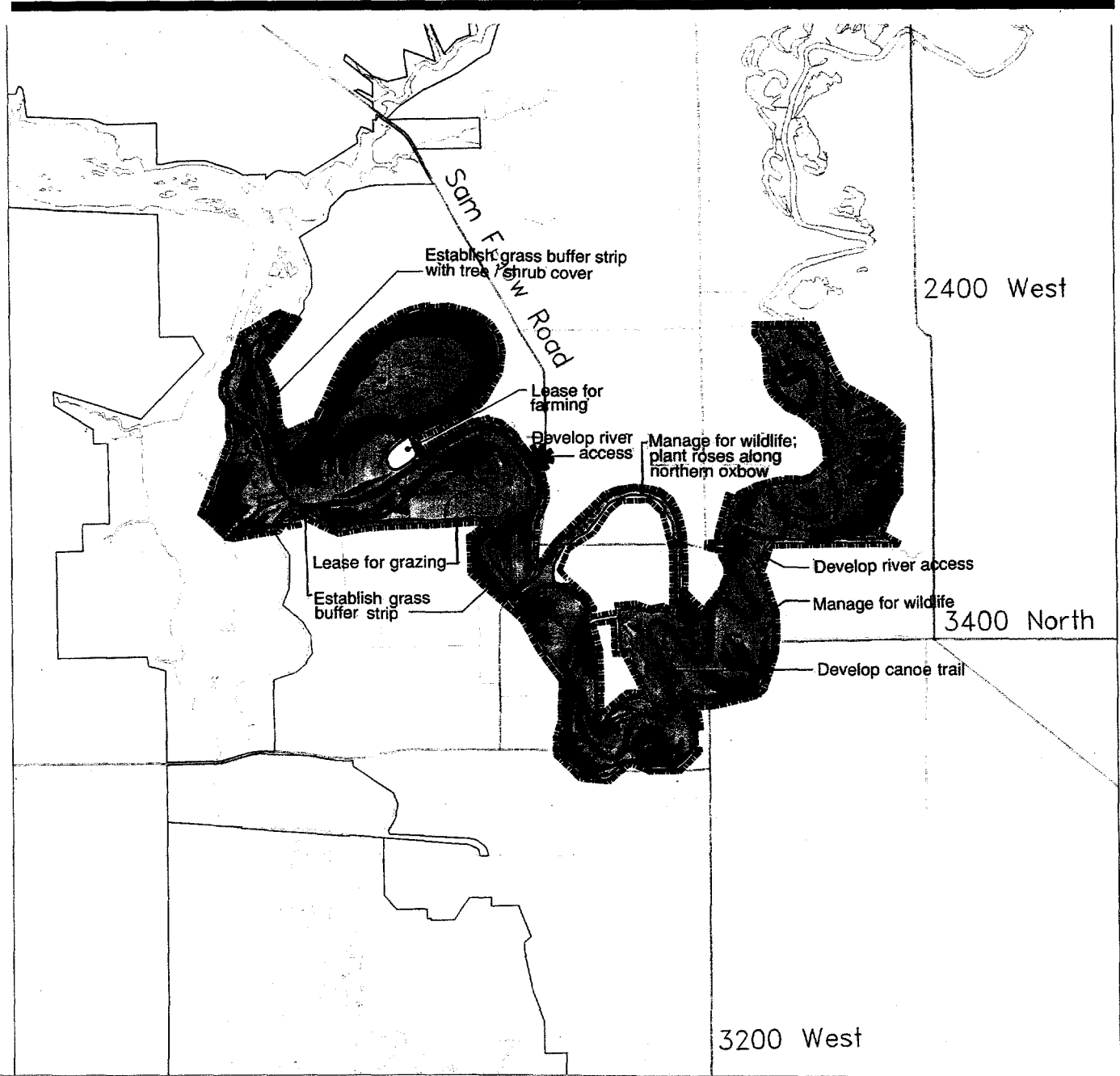
Goals, Objectives and Management Actions

Actions were developed to achieve all five goals in the Bear River Resource Management Area. The goals include enhancement of: 1) water quality; 2) wildlife habitat; 3) recreational opportunities; 4) scenic quality; and 5) agricultural leases. Some of PacifiCorps actions include planting buffer strips, the development of two river recreation access points with a canoe trail, a reduction in the amount of land leased for grazing, the establishment of a new farming lease, clean up of the shorelines and reduction of shoreline erosion. The specific goals and actions for this management area are shown in Table 4-5 and Figure 4-7.

Table 4-5

Goals and Objectives and Management Actions for Bear River Resource Management Area

GOALS/OBJECTIVES	MANAGEMENT ACTIONS
1. Enhance Water Quality	
Characterize Discharge Sources	Cooperate with regulatory agencies
Stabilize Water Levels, as Feasible	Conduct Bear River Basin Study and develop an operating plan to reduce water level fluctuations
Reduce Shoreline Erosion	Plant and/or slope embankments Use structural or vegetative means along shoreline
2. Protect, Enhance, and Develop Wildlife Habitat	
Protect Important Nesting/Spawning Habitat Areas	Restrict or eliminate usage of pesticides and herbicides on PacifiCorp lands Stabilize reservoir water levels during nesting and spawning periods
Enhance Wetland Habitat	Restrict or eliminate grazing in wetland areas Enhance and protect riparian vegetation
Enhance Upland Habitat	Regulate grazing periods in upland areas Protect or develop woody cover and establish upland grass buffer strips Regulate burning and spraying on PacifiCorp lands
3. Encourage Public Access and Improve Recreation Opportunities	
Provide and improve Canoeing and Small Boat Opportunities	Provide/expand parking, support facilities, and water-based trail
Provide and Improve Day Use Opportunities	Provide parking, picnic facilities, and other support facilities
Provide Environmental Education/Bird Watching Opportunities	Provide parking, interpretive signage, and support facilities
4. Enhance Scenic Quality	
Protect and Restore Shoreline Vegetation	Establish grass buffer strips and woody cover
Landscape Proposed Recreation Areas	Develop landscape plans for proposed recreation areas
Clean Up Shoreline	Remove debris Remove old car bodies
5. Provide Agricultural Land Use Opportunities	
Address Wildlife Crop Depredation	Establish crop sharing program for small grains, alfalfa, and meadow hay
Continue Agricultural Leasing Program	Provide leases compatible with overall goals and objectives

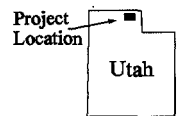


**Cutler Reservoir
Resource Management Plan**



**Bear River Resource
Management Area
Actions**

Figure 4-7



PacifiCorp, 1995

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4.3.4 North Marsh Resource Management Area

Resources

The North Marsh Resource Management Area (Figure 4-1) is the largest at the Cutler Project in terms of PacifiCorp property (2,571 acres) and water surface (1,772 acres at high water). Also, the reservoir is shallowest in this management area; 50 percent is 1.5 feet or less in depth. Water level fluctuations of the reservoir can affect boaters by making access difficult or stranding boaters when water levels suddenly drop. During the waterfowl nesting season, rises in water levels flood established nests, especially on the eastern side where the terrain is gently sloped. Drawdowns during fish spawning periods may also adversely impact game fish.

Shoreline erosion is not a significant problem on the east or west shore because of the gentle terrain. However, several areas are providing sediment input through sheet erosion from adjacent cultivated fields.

Limited fish sampling done in this management area found similar low numbers and diversity of fish as other areas. The North Marsh Resource Management Area has the greatest amount of critical and important wildlife habitat.

A variety of colonial birds including the white-faced ibis, Franklin's gull, Forster's tern, and cattle egret utilize bulrushes for nesting on the eastern shore.

The bulrush habitat is located near springs where the birds are rarely disturbed by the public. Nearby, sandhill cranes have established an evening roost area in a heavily grazed pasture and mud flat. Most of the management area is also prime Canada goose and sandhill crane habitat. Suitable duck nesting habitat is limited due to poor water quality, lack of brood forage, and poor nesting cover. There is little suitable pheasant habitat because past grazing and farming practices have eliminated food and dense woody cover near the shoreline.

The majority of vegetation in this area is bulrush and cattails, followed by upland pasture and cropland. When PacifiCorp filed its FERC application, this management area had two farming and four grazing lessees consisting of 1,528 acres. A small amount of crop depredation occurs in localized grain fields along the western shore.

Public access is generally restricted to the north and south ends of the management area. Benson Road provides access to the northern end; State Highway 30, the southern end. Public trespassing on leased land and adjacent private property occurs in these areas. Until UDOT began its recent bridge reconstruction project on State Highway 30, boat access to the reservoir was from an undeveloped boat ramp located just north of the bridge. This access site was eliminated with the construction of the new bridge.

Although the management area is used by boaters, anglers, hunters, and bird watchers, there are no recreational facilities or directional and interpretive signs to support these activities.

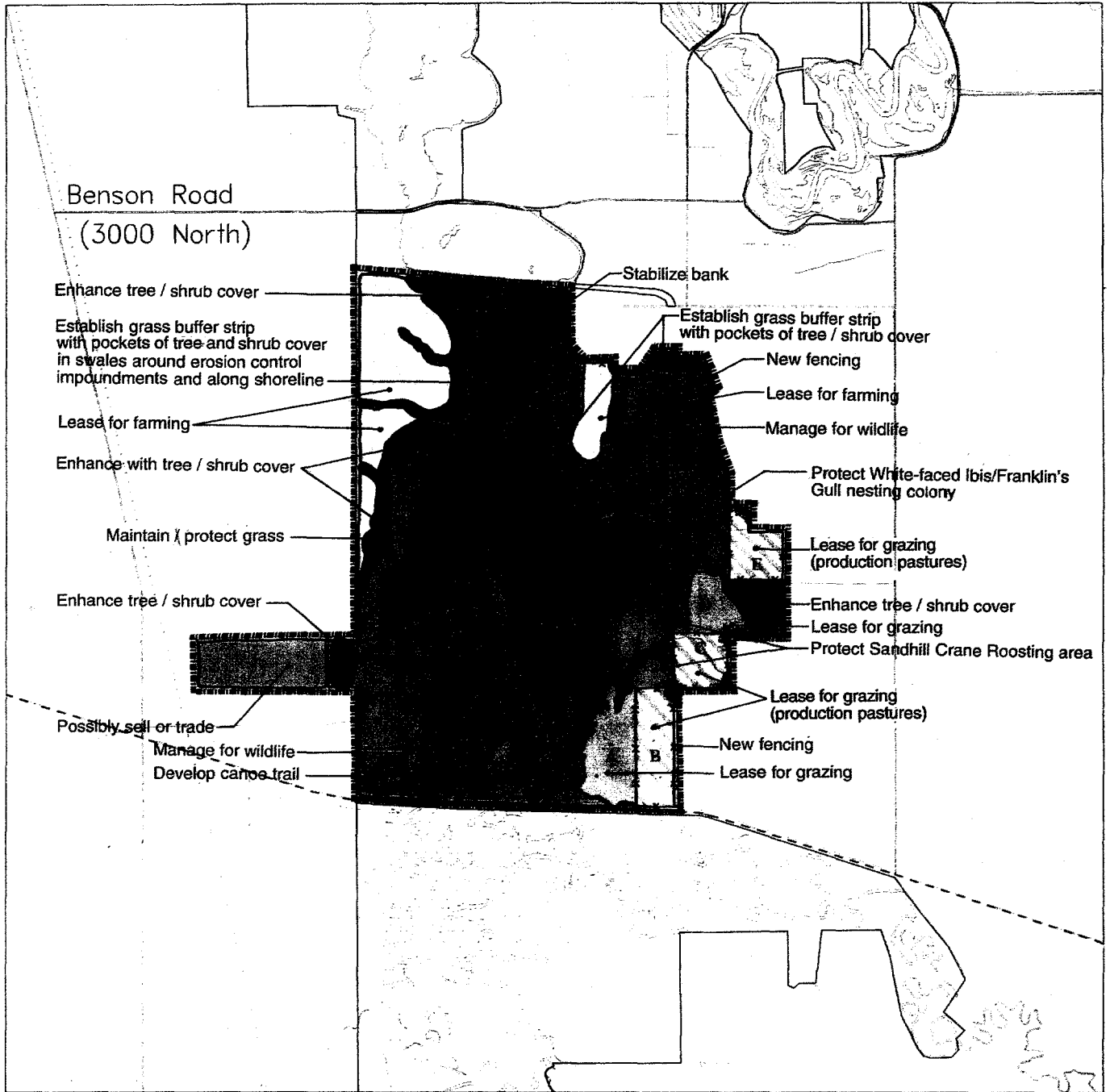
Goals, Objectives and Management Actions

Action plans were developed to achieve all five goals in the Bear River Resource Management Area. The goals include enhancement of: 1) water quality; 2) wildlife habitat; 3) recreational opportunities; 4) scenic quality; and 5) agricultural leases. PacifiCorp's management actions for this area are primarily directed towards protecting important wildlife habitat on the east side of the reservoir and enhancing wildlife habitat on both the east and west sides. This requires land use changes and reducing land available for cattle grazing and farming. Wildlife crop damages will also be addressed. Vegetation and water quality enhancements will be achieved by bufferstrips, wood vegetation and erosion control measures. Specific goals and actions are shown in Table 4-6 and Figure 4-8.

Table 4-6

Goals and Objectives and Management Actions for North Marsh Resource Management Area

GOALS/OBJECTIVES	MANAGEMENT ACTIONS
1. Enhance Water Quality	
Characterize Discharge Sources	Cooperate with regulatory agencies
Stabilize Water Levels, as Feasible	Conduct a Bear River Basin Study and develop an operating plan to reduce water level fluctuations
Reduce Sheet Erosion	Develop grass buffer strips Reduce or eliminate grazing and tillage along shoreline Build sediment catchment basins
2. Protect, Enhance, and Develop Wildlife Habitat	
Protect Important Nesting Habitat Areas	Fence areas to preclude grazing Restrict or eliminate usage of pesticides and herbicides on PacifiCorp lands Stabilize reservoir water levels during nesting and spawning periods
Discourage Public Access During Nesting Season	Install signs restricting public access during nesting periods Use local organizations and interpretive signs to inform the public about restrictions and wildlife sensitivity
Enhance Wetland Habitat	Restrict or eliminate grazing in wetland areas Enhance and protect riparian vegetation
Enhance Upland Habitat	Regulate grazing periods in upland areas Protect or develop woody cover and establish upland grass buffer strips Regulate burning and spraying on PacifiCorp lands
3. Encourage Public Access and Improve Recreation Opportunities	
Provide and improve Canoeing and Small Boat Opportunities	Provide water-based trail connecting Benson and Cutler Marsh Recreation Areas
Provide and Improve Hunting Access	Provide parking and support facilities
Provide Environmental Education/Bird Watching Opportunities	Promote opportunities with the assistance of local organizations
4. Enhance Scenic Quality	
Protect and Restore Shoreline Vegetation	Establish grass buffer strips and woody cover
Clean Up Shoreline	Remove debris Remove old car bodies
5. Provide Agricultural Land Use Opportunities	
Address Wildlife Crop Depredation	Establish crop sharing program for small grains, alfalfa, and meadow hay
Continue Agricultural Leasing Program	Provide leases compatible with overall goals and objectives

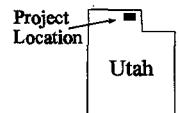


**Cutler Reservoir
Resource Management Plan**



**North Marsh Resource
Management Area
Actions**

Figure 4-8



PacifiCorp, 1995

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4.3.5 South Marsh Resource Management Area

Resources

The South Marsh Resource Management Area (Figure 4-1) is bordered on the north by State Highway 30 and Mendon Rd (600 South) on the south. The Logan River, Little Bear River, and Spring Creek flow into the area. The Logan River enters from the east with the Little Bear River and Spring Creek entering from the south. Inflows from these ungaged rivers during spring high runoff periods make it difficult to predict the elevation of the reservoir in this management area.

In general, the area is characteristic of a riverine environment, with a rich mosaic of riparian vegetation, trees, uplands, and emergent wetlands interspersed with open water. Water depth does not exceed 3.5 feet except in the river channels. Shoreline erosion is not a significant problem because of the relatively level terrain. Streambank erosion occurs where riparian vegetation is lacking due to grazing activities along the Little Bear and Logan Rivers.

The water quality in the South Marsh is poor due to soil erosion, impacts from agricultural sources and poor water quality from tributaries like the Logan River and Spring Creek which are also impacted by industrial, and agricultural sources.

The South Marsh Management Area has the second highest number of game fish, although populations vary within the unit. The fishery is limited by poor water quality, lack of forage, and shallow water. Game fish are most prevalent in the area where the Little Bear and Logan Rivers meet. A pond located near the center of the management area may have the potential for fish and waterfowl habitat enhancement if a water control structure could be economically constructed to provide greater water depth and control carp.

A great blue heron rookery, located in mature willows along Spring Creek, should be protected. Sandhill cranes are known to use upland areas on the western shore as staging areas, and most of the management area has high crane habitat values. The entire area contains highly suitable Canada goose habitat, primarily because of grazing and farming practices. Local populations of Canada geese have increased in recent years. While hunters have enjoyed the rise in goose numbers, farmers elsewhere around the reservoir complain of increased crop damage. UDWR, which has recently acquired land immediately to the east of this management area for wildlife purposes, would like to have grazing permanently eliminated to benefit wildlife species other than geese. Historically there has been little highly suitable habitat for ducks or pheasant, because the management area lacks good water quality, sufficient food, nesting habitat, and winter cover due to uncontrolled extensive grazing. Nesting wildlife, including geese, are adversely affected by rises in water levels that flood nests. Predation as well as recreation activities, may also affect reproduction rates if nesting wildlife are disturbed during the nesting season. Great blue herons, which are sensitive to disturbance during the spring, require protection from boaters on the Little Bear River.

The Mendon Road and State Highway 30 provide access for canoeists, bird watchers, anglers, and waterfowl hunters. Boaters access the Little Bear River from Mendon Road and float north to the highway at the confluence with the Logan River. Others put in upstream on the Logan River and take out at the confluence. The management area receives a considerable amount of use despite the lack of developed access, parking, boat ramps, and other support facilities. Visitors have expressed an interest in improved access and other facilities such as wildlife viewing areas and interpretive signs. The lack of designated public access and parking has resulted in trespass and property damage on adjoining private lands.

As the largest bulrush-cattail marsh in Cache Valley, the Cutler Project has considerable educational and scientific research potential. Classes at Utah State University and Cache Valley District schools make periodic field trips to the marsh. Also, various environmental groups have recommended that the area be set aside to promote the interpretation of the marsh's ecology for

both educational and general public recreational purposes. The development of facilities has been cited as the best means to accomplish this, along with accompanying public information.

However, the promotion of additional public use of the management area could potentially increase conflicts between wildlife and recreationists during the nesting season, and between hunters and other recreational users during hunting seasons.

Within the South Marsh Resource Management Area, there were ten grazing leases at the time of the FERC application filing. Hay was cut for supplemental feed on some of these leased areas. Recreationists expressed concern about adverse impacts of cattle in the waterways due to the lack of fences.

Through land trades, acquisitions, and sales, PacifiCorp recently "straightened" the western property boundary line, reduced the amount of ownership south of Mendon Road, and expanded ownership near Spring Creek and on the south side of the Logan River. PacifiCorp also recently fenced its property boundary.

Goals, Objectives and Management Actions

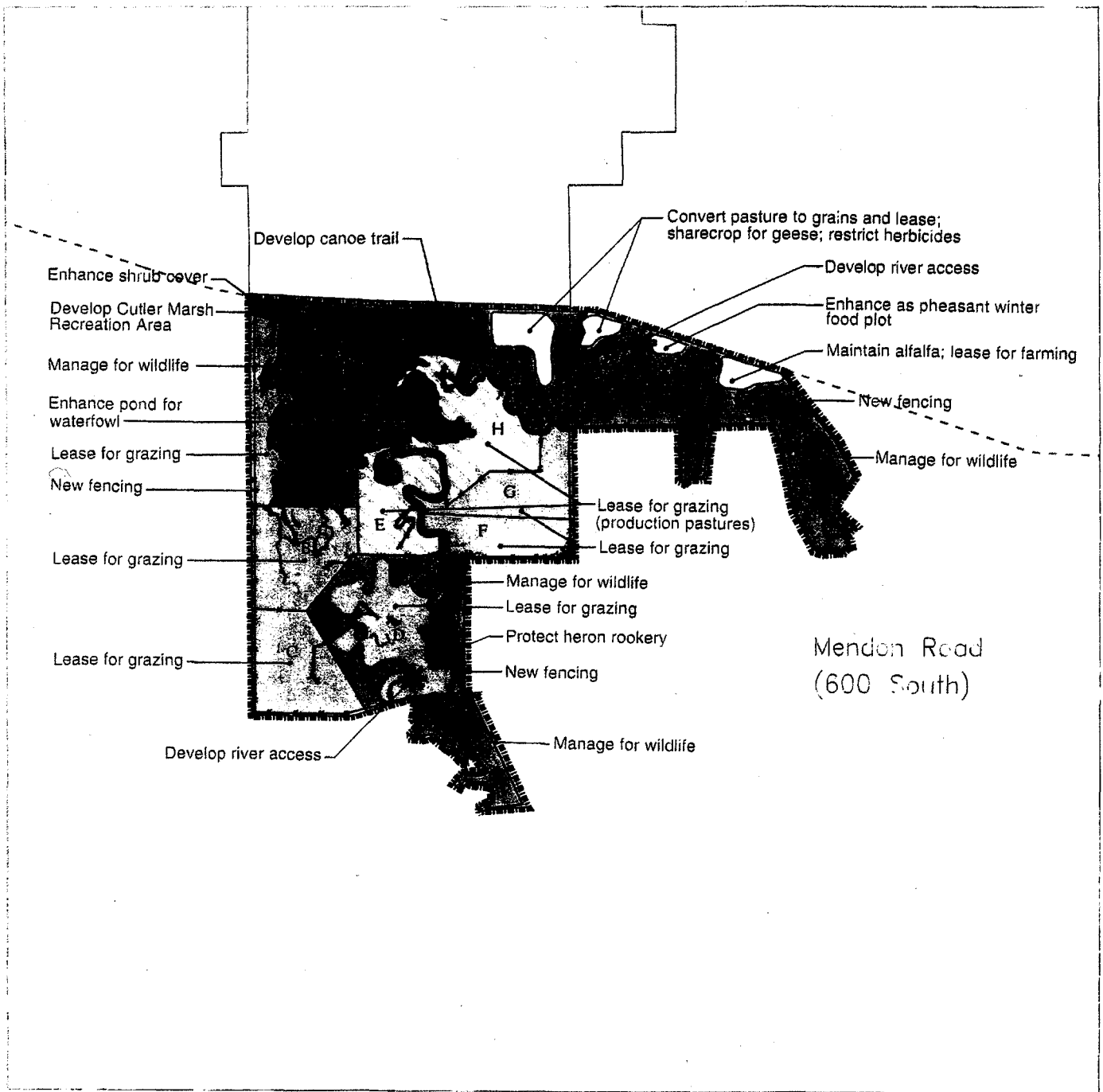
Action plans were developed to achieve all five of the goals in the South Marsh Resource Management Area. They include enhancement of: 1) water quality; 2) wildlife habitat; 3) recreational opportunities; 4) scenic quality; and 5) agricultural leases. The overall goal of this management area is to improve both wetland and upland habitat while accommodating a limited amount of grazing through changes in pasture acreage and configurations, reduced AUMs, the rotation of livestock, and more intensive management. Additional actions are planned to provide decoy cereal grain crops and production pastures for Canada geese to reduce crop depredation on adjacent farmlands. This will be accomplished through farming leases, crop sharing, and special arrangements with local organizations to manage food plots. The Cutler Marsh Recreation Area

and Logan and Little Bear river accesses with canoe trails will provide enhanced recreational opportunities. The great blue heron rookery trees and other important wildlife habitat will also be protected. Specific goals and actions are shown in Table 4-7 and Figure 4-9.

Table 4-7

Goals and Objectives and Management Actions for South Marsh Resource Management Area

GOALS/OBJECTIVES	MANAGEMENT ACTIONS
1. Enhance Water Quality	
Characterize Discharge Sources	Cooperate with regulatory agencies
Stabilize Water Levels, as Feasible	Conduct Bear River Basin Study and develop an operating plan to reduce water level fluctuations
2. Protect, Enhance, and Develop Wildlife Habitat	
Protect and Enhance Important Nesting/Spawning Habitat	Fence areas to preclude grazing Restrict or eliminate usage of pesticides and herbicides on PacifiCorp lands Stabilize reservoir water levels during nesting and spawning periods Protect/reestablish cottonwoods for rookery trees
Discourage Public Access During Nesting Season	Install signs restricting public access during nesting periods Use local organizations and interpretive signs to inform the public about restrictions and wildlife sensitivity
Enhance Wetland Habitat	Restrict or eliminate grazing in wetland areas Enhance and protect riparian vegetation
Enhance Upland Habitat	Regulate grazing periods in upland areas Protect or develop woody cover Regulate burning and spraying on PacifiCorp lands
3. Encourage Public Access and Improve Recreation Opportunities	
Provide and Improve Canoeing and Small Boat Opportunities	Provide/expand parking, support facilities, and water-based trails
Provide and Improve Hunting Access	Provide parking and support facilities (see also above boating actions)
Provide Day Use Opportunities	Provide parking, picnic facilities, and other support facilities
Provide Environmental Education/Bird Watching Opportunities	Provide parking, interpretive signage, and support facilities Help promote opportunities through cooperation with local organizations
4. Enhance Scenic Quality	
Protect and Restore Shoreline Vegetation	Establish grass buffer strips and woody cover
Landscape Proposed Recreation Areas	Develop landscape plans for proposed recreation areas
5. Provide Agricultural Land Use Opportunities	
Address Wildlife Crop Depredation	Establish crop sharing program for small grains, alfalfa, and meadow hay
Continue Agricultural Leasing Program	Provide leases compatible with overall goals and objectives

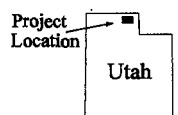


**Cutler Reservoir
Resource Management Plan**



**South Marsh Resource
Management Area
Actions**

Figure 4-9



PacifiCorp, 1995

Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.

5.0 IMPLEMENTATION SCHEDULE AND COSTS

This section of the RMP addresses the schedule of implementing the proposed enhancement, actions, monitoring, related licensing activities and estimated costs.

5.1 Priorities and Schedule

FERC issued PacifiCorp a 30 year license on April 29, 1994, to operate the Cutler Hydroelectric Project. The license contained various articles and implementation dates related to the RMP. PacifiCorp developed the following list of implementation priorities to insure compliance with license Article 402; 1) the vegetation enhancement program; 2) manage the agricultural leasing programs; 3) construct wetlands mitigation area; 4) construct recreational site developments; 5) install fish habitat structures; and 6) monitor RMP programs.

The RMP will be filed with the FERC by August 1, 1995 and be implemented within the first five years following approval by FERC. The RMP implementation and 5 year monitoring schedule is shown in Table 5-1.

5.2 Capital Improvements Costs

PacifiCorp currently estimates spending \$800,000 on implementation of the RMP with an annual maintenance cost of \$50-60,000. RMP implementation cost estimates have increased due to proposed recreation site design changes, upgrades, higher costs of property access and improvements, and current construction cost estimates. The current cost estimates may increase slightly as the remaining property issues are resolved.

Table 5-1

Cutler Resource Management Plan Implementation Schedule.

Year	Task
1	Preimplementation monitoring and vegetation test plantings Manage agricultural lease programs Install fish structures Construct the Cutler Marsh Recreation Area in the South Marsh Resource Management Area Construct wetland mitigation area
2	Adjust agricultural leasing programs in response to monitoring Complete 30% of vegetation enhancement program Construct recreation sites in the Cutler Canyon and Bear River Resource Management Areas
3	Conduct vegetation and wildlife habitat monitoring Complete 60% of vegetation enhancement program Construct the Benson Area Recreation Sites and river access sites along Clay Slough, Little Bear and Logan Rivers in the Main Reservoir and South Marsh Management Areas
4	Complete 100% of vegetation enhancement program Begin recreation-use survey
5	Conduct vegetation and wildlife habitat monitoring Complete recreation-use survey
10	Conduct vegetation and wildlife habitat monitoring (5 year intervals) Conduct recreation-survey (5 year intervals)

6.0 MONITORING

The purpose for monitoring is to evaluate whether program actions have achieved RMP goals and objectives. Monitoring will also provide background data needed for refining RMP practices or development of new practices.

The RMP divides Cutler Project into five resource management areas (Cutler Canyon, Main Reservoir, Bear River, North Marsh and South Marsh), each with different combinations of enhancement goals, objectives and management actions. Goals and objectives for the project management areas are described in Section 4.0 (Tables 4-5 through 4-9) and include: enhanced water quality, wildlife habitat, improved recreation sites, scenic quality and managed agricultural leases. A wide range of monitoring activities were developed to address one or more of these goals. Table 6-1 summarizes the relationship among goals, objectives, monitoring methods and corresponding resource management areas. A description of each of the monitoring methods is presented in the following section.

The monitoring plan is intended to be flexible and monitoring techniques or sampling intensity may be adjusted to accommodate any changes in RMP goals.

6.1 Monitoring Overview

Monitoring methods described below include: water level, water quality, vegetation, agricultural leases, fish habitat, recreation, wetland mitigation, and visual inspections. A schedule for some of the monitoring methods has been included in the methods description and in Table 5-1.

Table 6-1

Summary of goals and objectives and related monitoring methods by resource area.

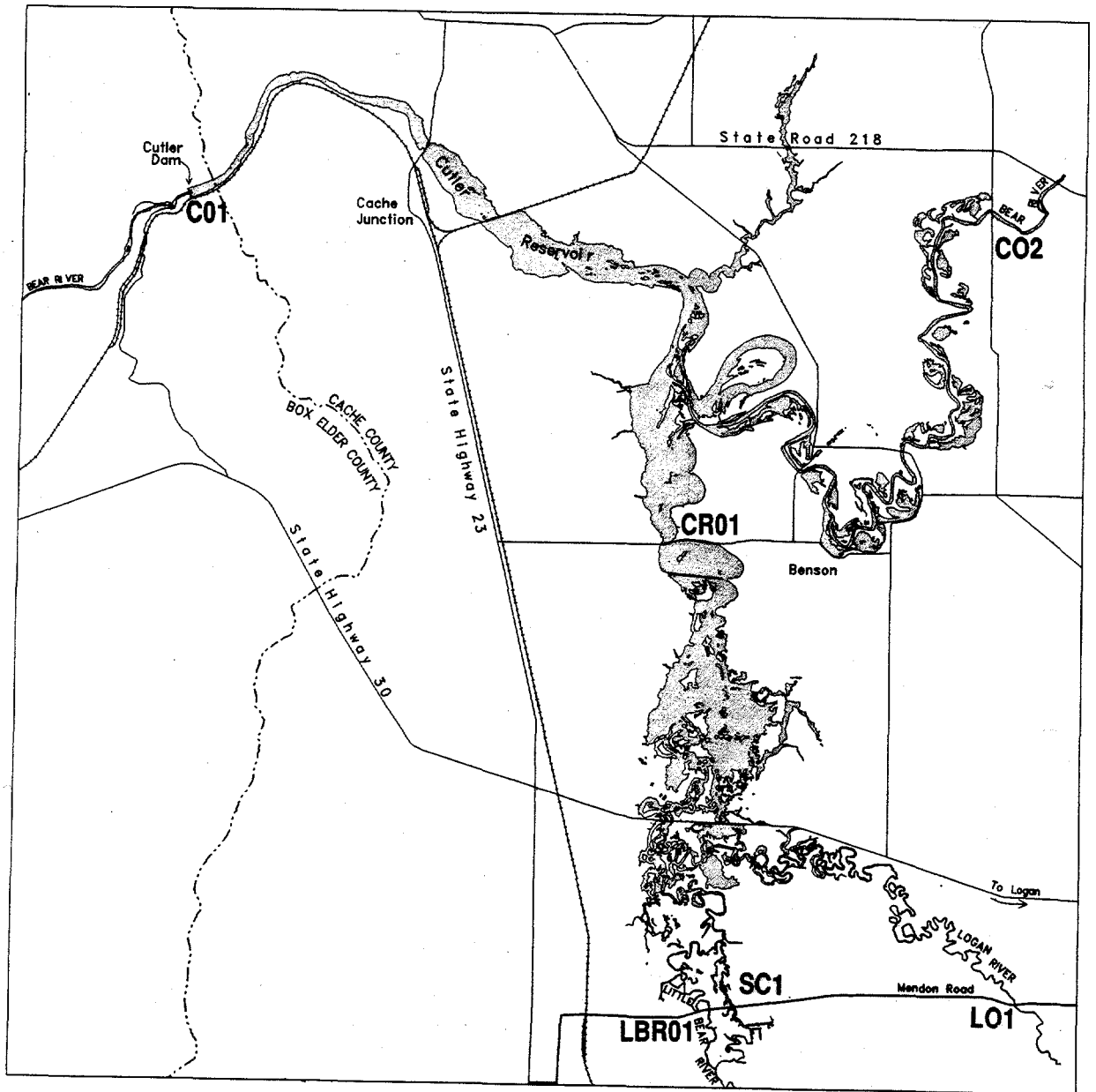
GOALS AND OBJECTIVES	MONITORING METHOD	RESOURCE AREA				
		Canyon	Main	Bear	N. Marsh	S. Marsh
1. Enhance water quality						
Characterize discharges	Water quality	X	X	X	X	X
Stabilize water level	Water level		X			
Reduce shoreline erosion	Vegetation		X	X		
	Visual inspection		X	X		
Reduce sheet erosion	Vegetation		X		X	
	Visual inspection		X		X	
2. Protect, enhance and develop wildlife habitat						
Protect nesting /spawning habitat	Vegetation			X	X	X
	Water level		X		X	
Discourage access	Visual inspection				X	X
Enhance wetlands	Vegetation			X	X	X
Enhance uplands	Vegetation	X	X	X	X	X
3. Encourage public access and improve recreation opportunities						
Improve boating opportunities	Visitor use survey	X	X	X	X	X
Improve fishing opportunities	Visitor use survey	X	X		X	
	Water level		X		X	
	Fish habitat structures		X		X	
Improve day use opportunities	Visitor use survey	X	X	X		X
Improve hunting access	Visitor use survey		X		X	X
Improve environmental education opportunities	Visitor use survey		X	X	X	X
4. Enhance scenic quality						
Landscape recreation areas	Vegetation	X	X	X		X
	Visual inspection		X	X		X
Protect and restore shoreline vegetation	Vegetation		X	X	X	X
	Visual inspection	X	X	X	X	X
Clean up shoreline	Visual inspection	X	X	X	X	X
5. Provide agricultural land use opportunities						
Address wildlife crop depredation	Leasing program		X	X	X	X
Continue agricultural lease program	Leasing program		X	X	X	X

Water Levels

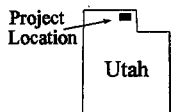
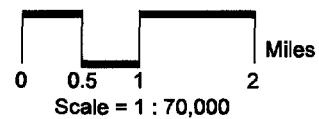
The water level monitoring program will evaluate the ability of the project to operate within the mid-reservoir elevation ranges described in Table 3-2. Changes in water elevation at Cutler Dam and at four sites on the reservoir: Cache Junction, Watterson, Benson, and Valley View Highway (Hwy 30) were monitored as part of the FERC relicensing efforts. A permanent site at the Benson bridge, located mid reservoir, has been chosen for a continuous recorder monitoring station. Water elevation data will be collected electronically in hourly intervals at the Benson station which reflects the average water levels within the middle part of the reservoir. This station will be integrated through PacifiCorp's system dispatch which will allow project operations to monitor and adjust mid reservoir water levels.

Water Quality

The water quality monitoring program conducted as part of the relicensing process has established a baseline water quality condition in Cutler Reservoir. Water quality monitoring will be conducted at six locations on tributaries and within the project area , (Figure 6-1). Sampling will be conducted on a quarterly basis for the first three years following FERC approval of this RMP, there after, quarterly sampling will be conducted every fifth year following RMP approval. Sampling will be discontinued when data trends are established or when management abjectives are reached. A mass balance for key water quality parameters (nitrogen, phosphorous, total suspended solids, and total coliform) will be developed for Cutler Reservoir. PacifiCorp will work cooperatively with regulatory agencies to help characterize point and non-point source discharges and share water quality monitoring data. Table 6-2 lists the sample locations, parameters and frequencies for monitoring.



**Cutler Reservoir
Resource Management Plan**



**Water Quality
Monitoring Stations**

Figure 6-1



PacifiCorp, 1995

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Table 6-2**Stations, parameters and frequency of collections for Cutler Reservoir.**

Station	Station Number	Parameters	Frequency
CUTLER OUTFLOW			
BEAR RIVER	CO1	N,P,TSS, flow, T. coli.	quarterly
CUTLER RESERVOIR			
BENSON MARINA	CR01	N,P,TSS, chlorophyll_a, T. coli.	quarterly
CUTLER INFLOW			
BEAR RIVER	CO2	N,P,TSS, flow, T. coli.	quarterly
LITTLE BEAR RIVER	LBR01	N,P,TSS, flow, T. coli.	quarterly
LOGAN RIVER	LO1	N,P,TSS, flow, T. coli.	quarterly
SPRING CREEK	SC1	N,P,TSS, flow, T. coli.	quarterly

Vegetation Enhancement

The vegetation monitoring will include : 1) update existing vegetation descriptions within the project areas to establish a baseline for later comparisons, 2) evaluating the success of vegetation plantings, 3) evaluating the effects of changes in land use practices, 4) comparing the changes in vegetation to the changes in available wildlife habitat, 5) evaluating the effectiveness of vegetation in controlling soil erosion on project lands, and 6) monitoring the development of target plant communities.

Vegetation parameters to be measured include: ground cover by herbaceous species; canopy cover by shrub species; plant species composition; survival of planted trees and shrubs; recruitment of tree species used for nesting; percent utilization of forage by livestock; invasion of noxious weed species; and visual obstruction and height of residual herbaceous cover. The size and distribution of important wildlife habitat like wetland areas, and foraging or nesting areas for target wildlife species would also be recorded.

Specific vegetation monitoring techniques will be developed by PacifiCorp with input by the resource agencies and will depend upon objectives and action plans for each management area. Some techniques may include: transect sampling, quadrant sampling, determination of livestock and wildlife forage utilization, aerial photo interpretation and visual inspection.

The timing and frequency of vegetation monitoring activities will vary depending on the specific management goals associated with the areas being monitored. Monitoring would begin after plantings or enhancement measures have been implemented. Generally, monitoring would be performed annually for a three year period and then reduced to a 5 year cycle once goals are achieved.

A description and frequency of the monitoring efforts for the various vegetation enhancement actions are as follows:

Buffer strip and reseeded areas; these areas will be monitored for cover, visual obstruction (density) and species composition during the spring and fall of the first three years following planting. The spring monitoring will take place early enough to allow for contingency measures, such as reseeded or weed control, if necessary. The results of the fall monitoring will be evaluated for the need for contingency measures before the following growing season. If after the third year, established vegetation meets the enhancement goals, monitoring of seeded areas may be reduced to a 5 year cycle to coincide with monitoring of wildlife habitat.

Tree and shrub areas; these areas will be monitored for survival of planted woody vegetation on the same schedule as specified for the seeded areas.

Wildlife habitat management areas; habitat suitability models for target wildlife species indicate that some of the vegetation factors contributing to habitat values are: 1) density and residual height of herbaceous cover, 2) shrub canopy cover, 3) presence of trees over 5 meters tall with an open canopy, 4) potential foraging areas comprised of plant species with specific residual heights, 5) zones free of disturbance around potential nesting and foraging habitat and 6) wetlands supporting emergent vegetation. Some limited monitoring would also be done before vegetation enhancement measures are implemented to establish baseline conditions. Wildlife habitat will be monitored for vegetative cover, species composition, and density using transects. Residual cover monitoring would be done with an approved method in the fall after the end of the growing season but before the first snowfall to characterize the habitat value for the target species.

Agricultural Leases

PacifiCorp has implemented a new agricultural leasing program which includes grazing and farming lands. New lease terms require the lessee to comply with the RMP goals. Monitoring will insure that the lessees land use practices are in compliance with the lease terms.

Leaseholder meetings and visual site inspections would also be held. The following describes the grazing and farming monitoring methods:

Grazing lease areas; herbaceous vegetation cover, species composition, and forage utilization would be monitored prior, during and at the end of each grazing season. Once a satisfactory grazing schedule is established and desired vegetation is achieved, cover and species composition monitoring would be conducted as necessary by PacifiCorp and the lessee to ensure that desired goals are maintained. Utah State University is helping to develop the grazing monitoring program which will be required of each grazing leasee. The program is scheduled to be implemented in 1996.

Farming lease areas; monitoring will be accomplished through annual site visits to inspect crops and ensure that the terms of the lease are followed. PacifiCorp will conduct an annual evaluation of lease compliance. The written lease agreements are for a five year term. Meetings will be held annually before and after each farming period to review the program and lease terms with each leaseholder. The lease will specify farming methods, crop rotations, wildlife depredation payments, buffer strip set aside areas, noxious weed control and overall land use goals.

Fish Habitat Structures

PacifiCorp will evaluate fish populations at the four selected locations of the fish habitat enhancement structures before and after installation. Approximately one year after installation, fish usage will be evaluated by electrofishing at the four locations. After the first year of monitoring population estimates will be done every other year for a five year period. PacifiCorp will conduct annual maintenance inspections of the four structures to determine their condition and whether any repairs are needed. The schedule for installation and monitoring of the fish habitat enhancement structures is as follows:

Cutler Reservoir bottom contour mapping	July, 1994, complete
Preinstallation fish sampling	May, 1995, complete
Structure construction and, installation	Summer, 1995
Monitoring and structure inspection	June, 1996, 1997 and 2002

Recreation

Within two years of completion of the recreational facilities, a visitor-use survey will be conducted to establish baseline annual use data. The survey results will consist of basic inventory data collected from existing records, mechanical traffic-counting devices, self-report questionnaires and personal interviews. Information collected may include personal data, level of participation in various recreation activities, attitudes and perceptions regarding aesthetics, recreational facilities, natural resources and other uses of the area. Additional recreational use monitoring would consist of use data randomly collected by state resource agencies or PacifiCorp staff.

Wetland Mitigation Site

PacifiCorp will develop 6.02 acres of enhanced wetlands to replace the estimated two acres impacted by construction of the recreation sites. The mitigation site will consist of 2 islands (1.57 acres) and 4.45 acres of open water. Water levels will be managed to maintain an average depth of 18" to provide a mix of open water and hard stem bulrush for waterfowl.

Monitoring of the enhanced site will be conducted by PacifiCorp annually for the first five years after completion. The monitoring will include photo points, wetland vegetation species diversity and presence of noxious plants. Adjustments to water levels or other management changes will be made upon the results of the monitoring and requests of Utah Division of Wildlife Resources. PacifiCorp will recommend alternative wetland mitigation if the wetland mitigation site is not successful after the 5 year monitoring period.

Visual Inspection; on site inspections of project lands would occur throughout the year, by personnel responsible for the management of the resources. Overall site conditions would be visually inspected during monitoring visits which would include evaluation of vegetation enhancement, recreation developments, bank stabilization and soil erosion, excessive trampling and browsing of vegetation near the shoreline by trespass livestock, wildlife depredation, condition of fences, presence of noxious weeds and any other conditions which might limit achieving the goals and objectives of the RMP.

7.0 Agency and Public Consultation

The following distribution list represents agencies, organizations and individuals who have participated in the consultation process of developing the Resource Management Plan. Those listed received a copy of the Draft Resource Management Plan for a 30 day review and comment period. A news release was made to the Logan Herold Journal on July 5, 1995 to inform the public of the availability of the draft Resource Management Plan.

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Appendix A

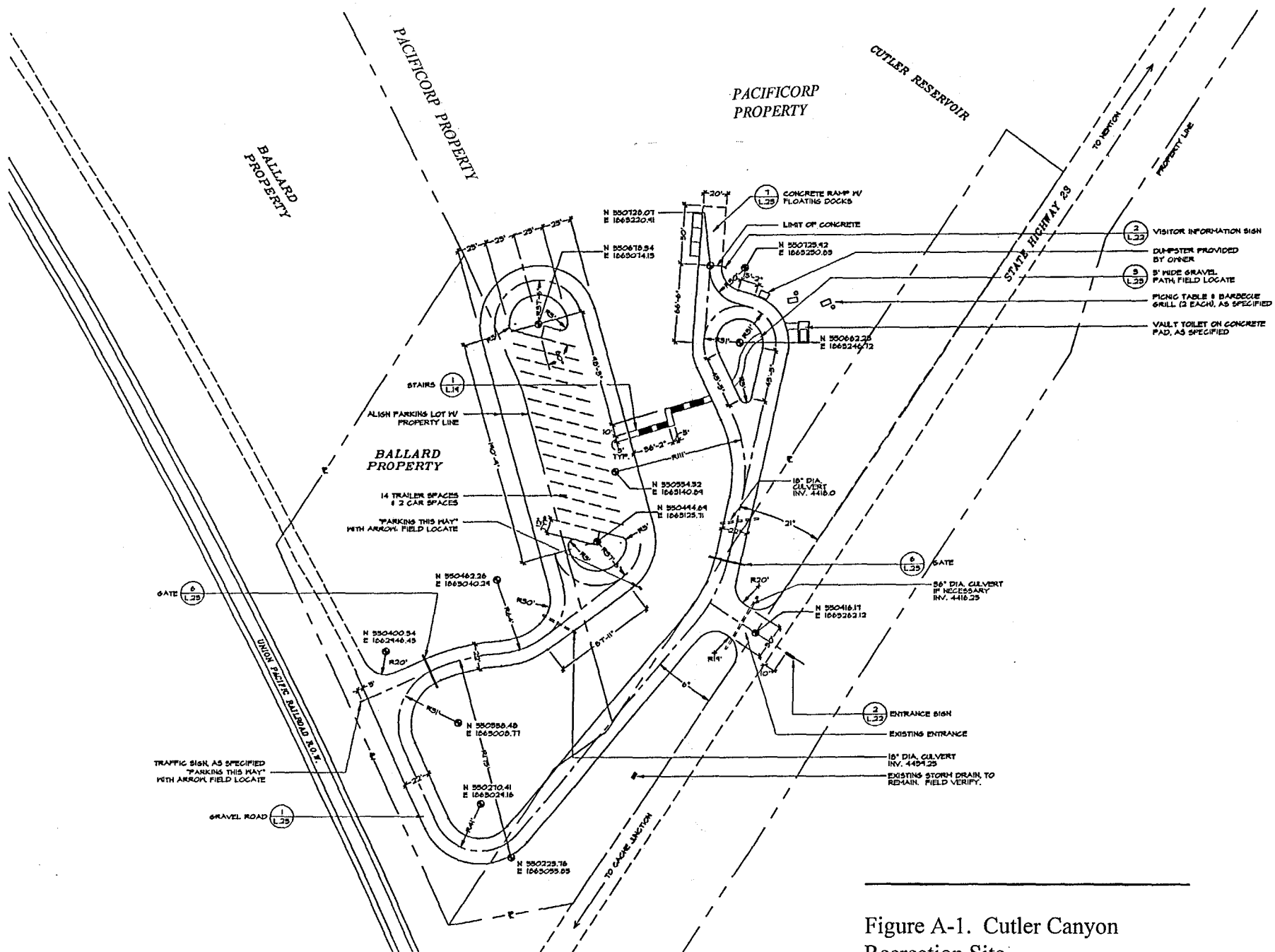


Figure A-1. Cutler Canyon Recreation Site

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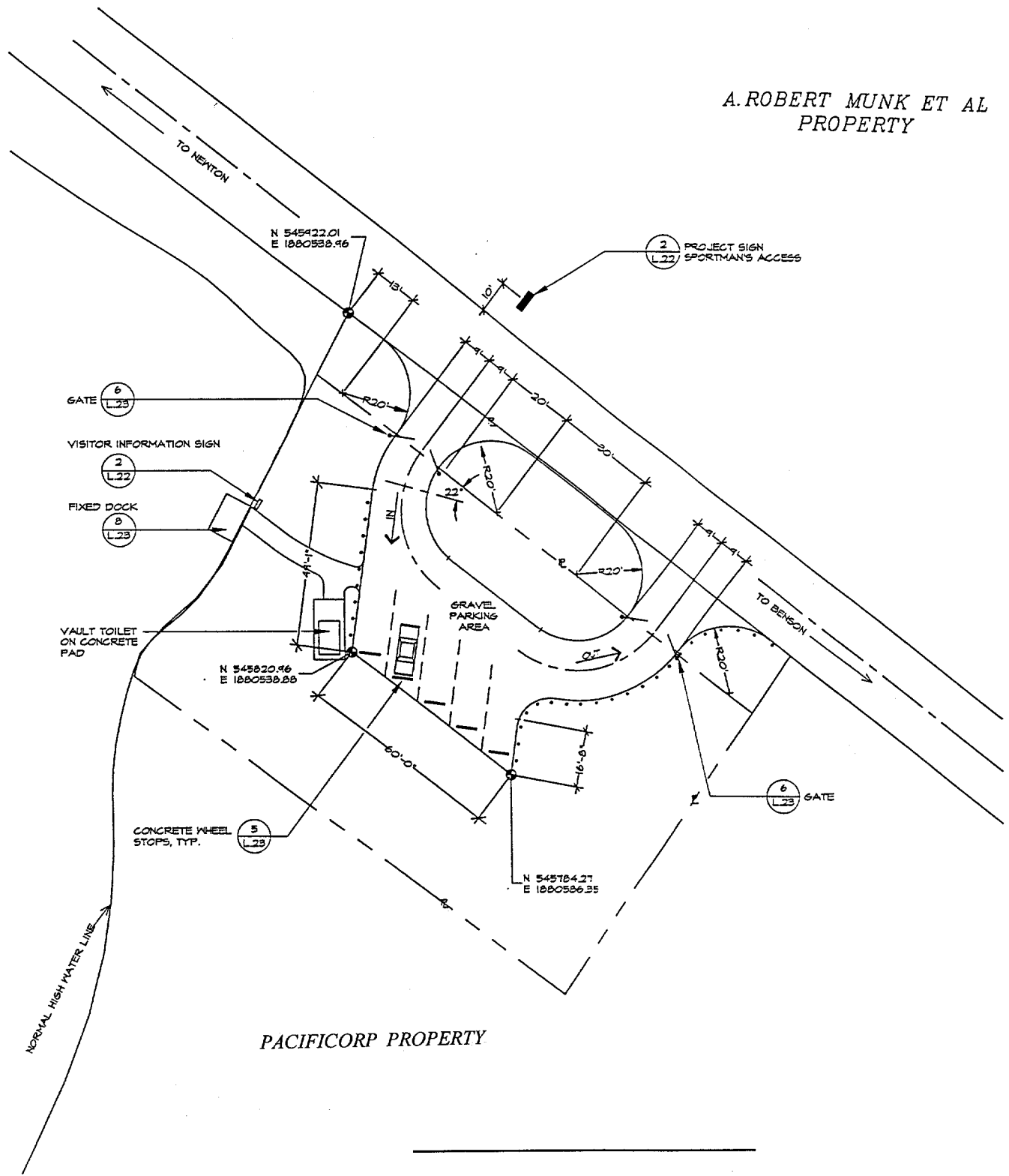
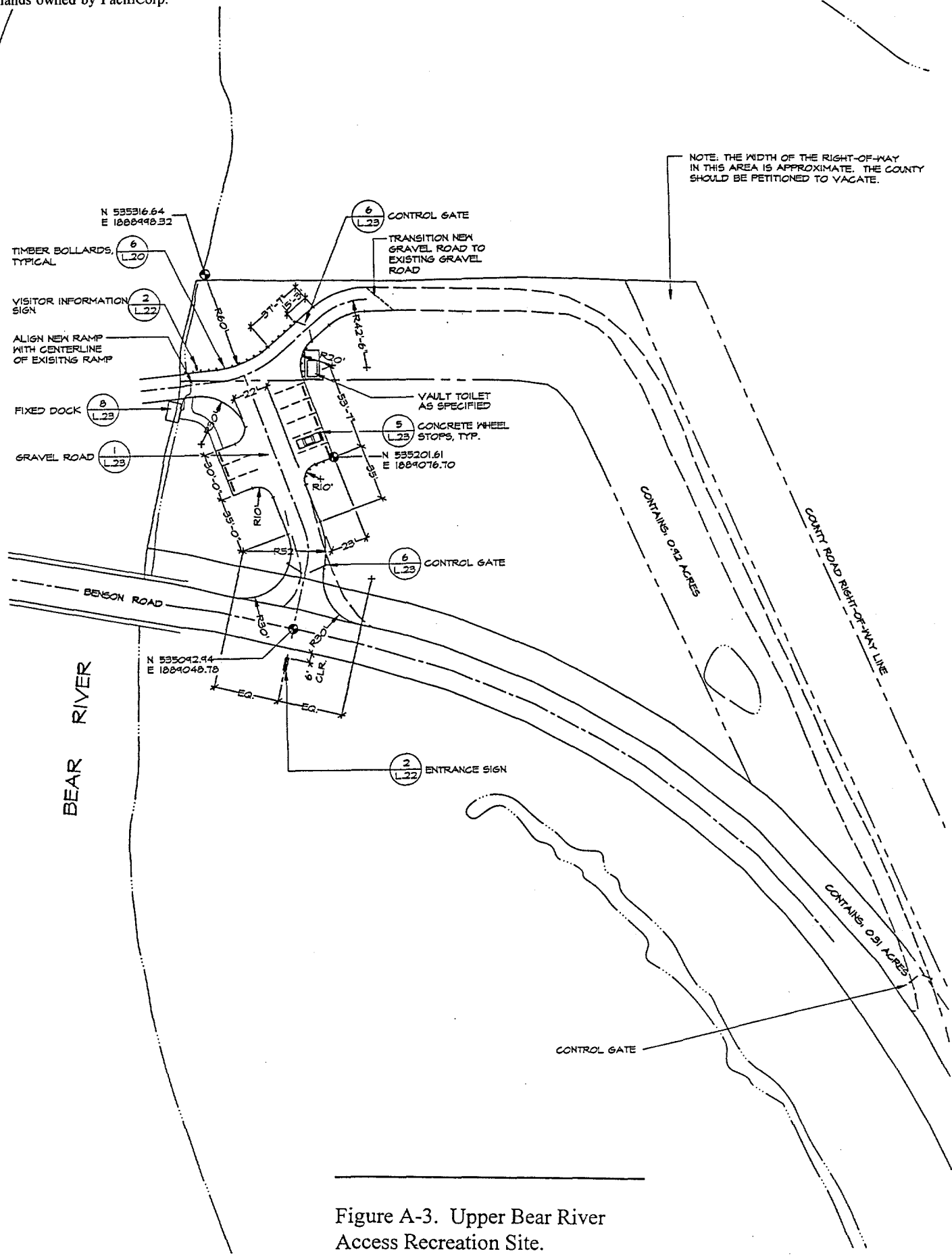


Figure A-2. Clay Slough Hunting Access Parking

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NOTE: THE WIDTH OF THE RIGHT-OF-WAY IN THIS AREA IS APPROXIMATE. THE COUNTY SHOULD BE PETITIONED TO VAGATE.

Figure A-3. Upper Bear River Access Recreation Site.

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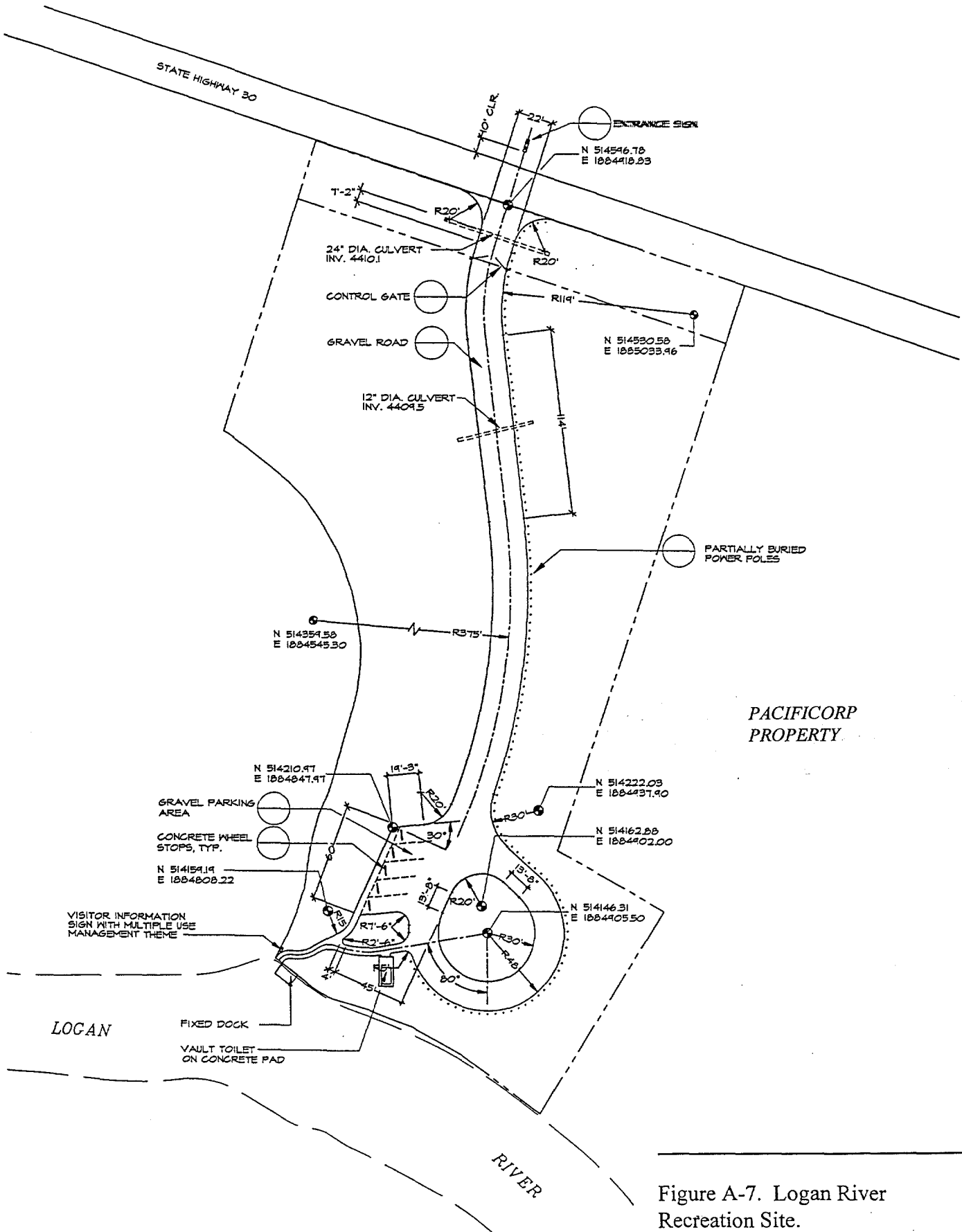


Figure A-7. Logan River Recreation Site.

PACIFICORP
PROPERTY

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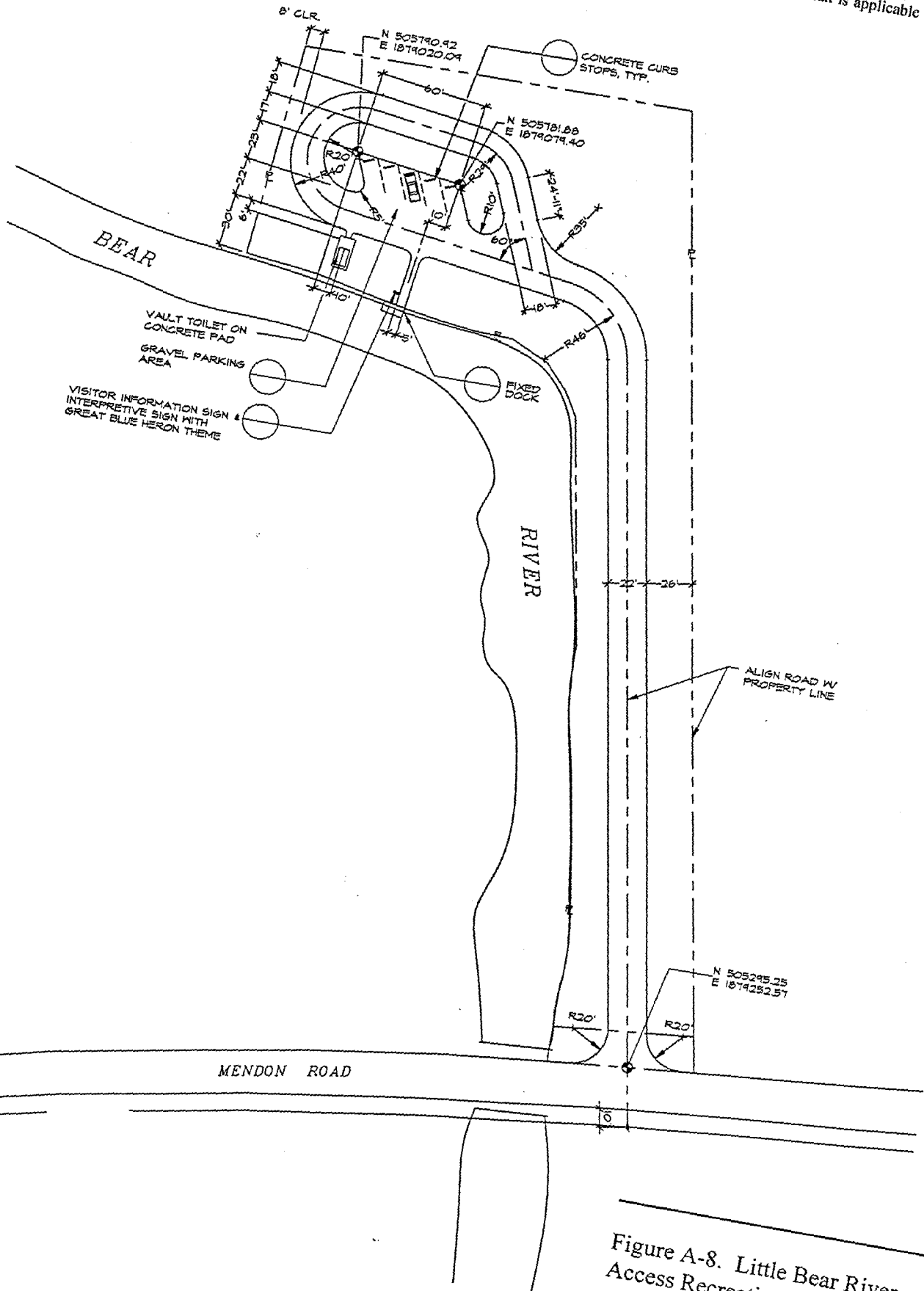
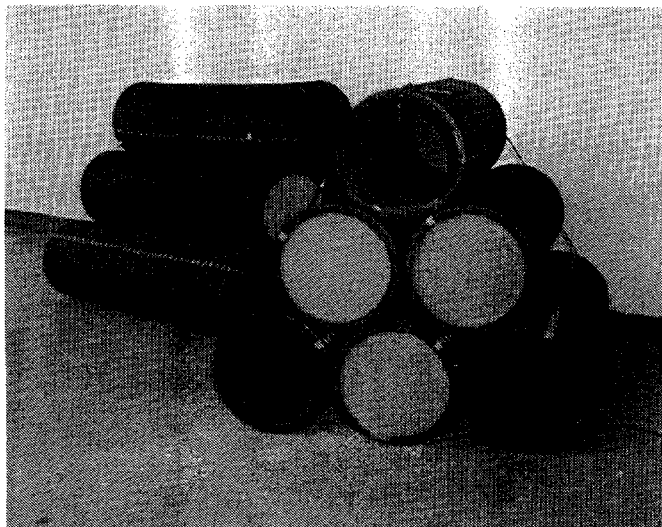


Figure A-8. Little Bear River Access Recreation Site.

977 Catfish Houses Pat. Pend.

Purpose: Catfish Houses provide spawning cover for channel catfish. They serve as hiding cover for the fry and other small fish.

Description: A catfish house consists of six three-foot long pieces of 8-inch diameter polyethylene corrugated perforated drainage pipe tied up into a pyramid. The bottom layer has three, the middle two and the top one. The tubes are plugged in one end with about 3 inches of concrete. The concrete pug is held in place by the corrugations in the pipe. The open ends are staggered in the pyramid so three face out one way and three face out the other. The bundle is tied with long lasting plastic strapping material. The unit weighs about 60-65 pounds. The most likely construction scenario will be to transport the pipe in 20-foot sections to the installation sites, cut the sections, bundle with plastic cord and compression sleeves and fill with concrete as follows: stand on end and fill 3; then flip over and fill the other 3. This will require transport of concrete and water to the installation sites.

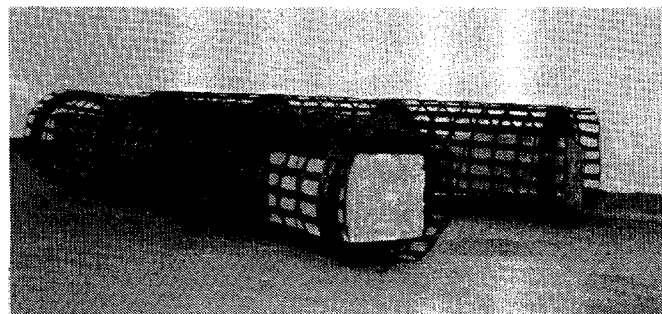


Generally, they will be placed around the margins of the project areas in about 10 feet of water. With the 3 to 4-foot diurnal fluctuation, they will usually be in at least 4 to 6 feet of water during the spawning season.

1329 Bass Bungalows Pat. Pend.

Purpose: Bass Bungalows provide security for spawning adult fish and escape and hiding cover for fry.

Description: A Bass bungalow consists of plastic snowfence similar to crappie condo material, back in color,



6-foot long rolled into a tube about 15 inches in diameter. The tube is formed and held by UV stabilized safety ties. To help the tube hold its round shape and not sag, four stiffner rings are placed along the length. These are corrugations from polyethylene drainage pipe 12 inches inside diameter and 15 inch outside diameter. The stiffner rings are held in place by nylon wire fasteners. The bungalows are held in place by inserting a full size (8" x 8" x 16") cinder block in each end. Each bungalow weighs about 60 pounds installed. The tubes are placed adjacent to and within 15 feet of natural beds of potamogeton waterweed.

148 Brush Piles

Purpose: Brush piles provide escape and hiding cover for small fish.

Description: A brush pile is a whole citrus, pecan or other tree or a 8' x 8' x 8' bundle of limbs and trunks. Trees will be transported from the orchard to the Butcher Jones area. From there, they will be lifted to the designated sites by helicopter. A quick release system will be used to reduce helicopter time. A number of choker cables will be needed so the helicopter can make several runs and not have to wait for each pile to be cabled. It also facilitates quick release drops.

9114 Crappie Condos Pat. Pend.

Purpose: Crappie Condos provide escape and hiding cover for small fish by simulating conditions in natural brush piles.

Description: The basic module is a 16 inch diameter plastic snow fence tube on end 4-feet tall with a plastic hat covering the top. Modules are clustered in groups of about 21 and weighted with one of two methods. The preferred is a one-piece column block (16" x 16" x 4" high). The alternative will be two half-blocks fastened together (8" x 16" x 4" high) fastening may be wire fasteners, package strapping or adhesive. The module weighs 35 pounds. They will always be placed adjacent to (within 20 feet) of a Fish 'N Forest unless otherwise noted.

This is to take advantage of the synergistic effects of having ambush and escape cover together. The Crappie Condo provides hiding and escape cover for small fish and the Fish 'N Forest provides cover and ambush sites for large fish.

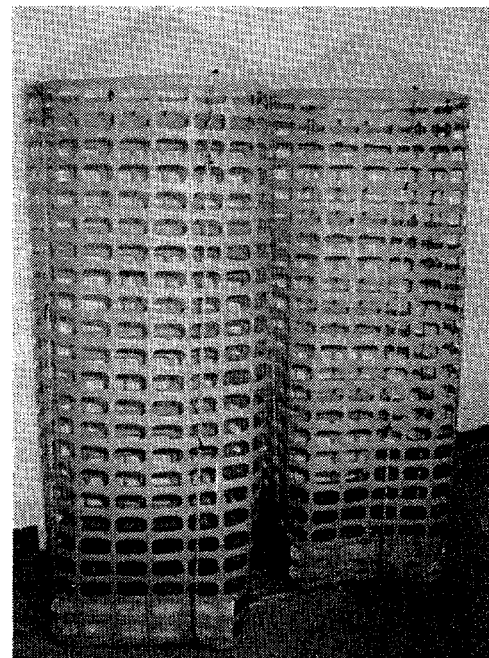
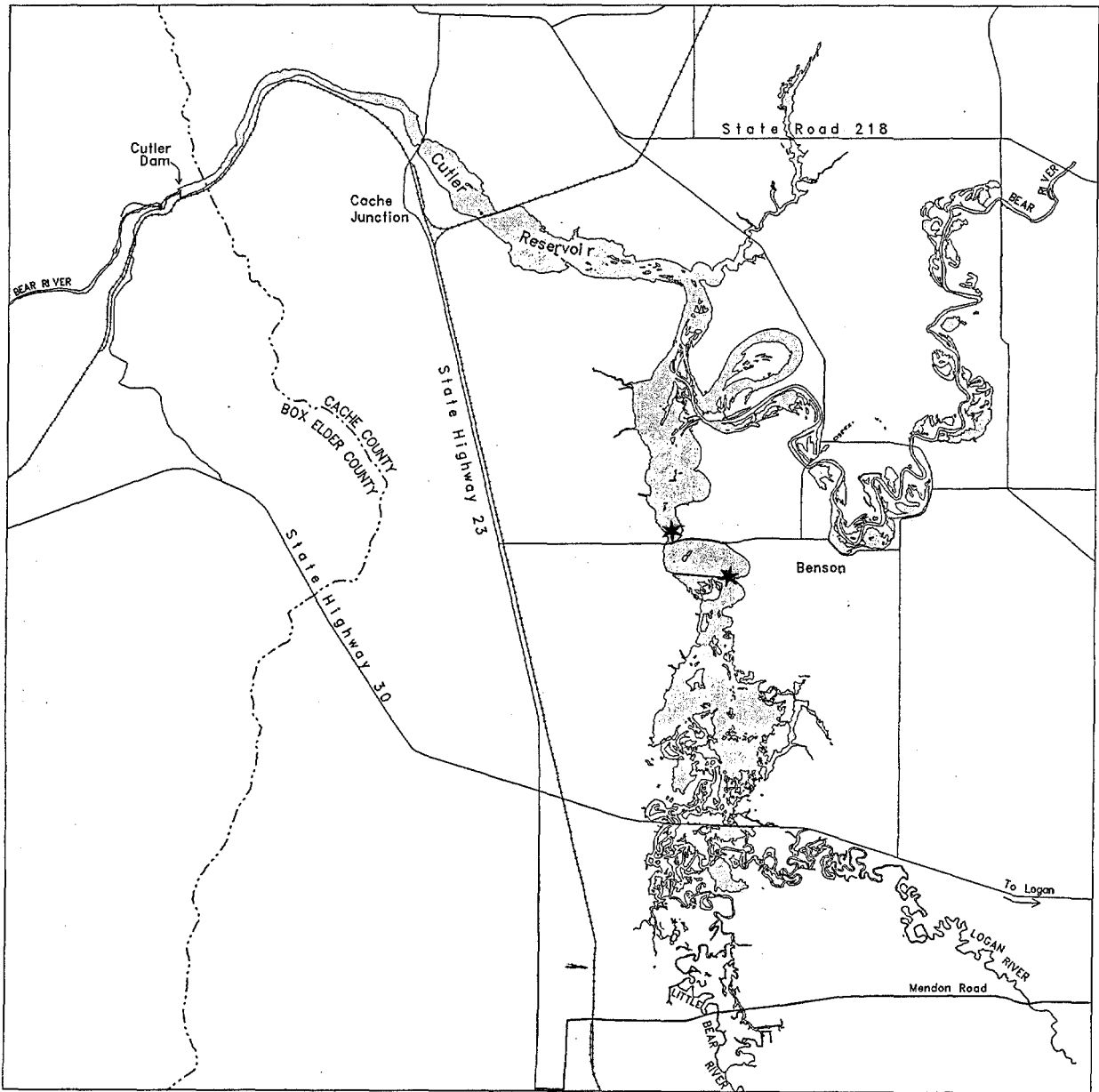


Figure A-11. Fish habitat structures, from Saguaro Lake Artificial Fish Habitat Structures, Purpose and Description.



Maps, plans, and figures contained in this Resource Management Plan are not intended to accurately show legal property boundaries between PacifiCorp and adjacent property owners and do not necessarily indicate the current FERC project boundary. This Resource Management Plan is applicable only to lands owned by PacifiCorp.

Figure A-12. Location of fish habitat enhancement structures (*), Cutler Reservoir.