LAHONTAN STATE RECREATION AREA

DEVELOPMENT PLAN

1991

PLAN PARTICIPANTS:

DONALD NAQUIN, Parks and Recreation Planning Specialist

STEVE WEAVER, Chief of Planning and Development

BOB FRANCKE, District Ranger

BRAD KOSCH, Park Supervisor
<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAPTER ONE INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>PURPOSE OF PLAN</td>
<td>1-1</td>
</tr>
<tr>
<td>DESCRIPTION, LOCATION AND PARK SETTING</td>
<td>1-7</td>
</tr>
<tr>
<td>PARK HISTORY</td>
<td>1-9</td>
</tr>
<tr>
<td>PLANNING PROCESS</td>
<td>1-16</td>
</tr>
<tr>
<td>CHAPTER TWO REGIONAL INFLUENCES</td>
<td></td>
</tr>
<tr>
<td>DEMOGRAPHICS</td>
<td>2-1</td>
</tr>
<tr>
<td>RECREATIONAL DEMAND</td>
<td>2-2</td>
</tr>
<tr>
<td>RECREATIONAL SUPPLY</td>
<td>2-8</td>
</tr>
<tr>
<td>SUPPLY/DEMAND ANALYSIS</td>
<td>2-11</td>
</tr>
<tr>
<td>LAND USE TRENDS</td>
<td>2-13</td>
</tr>
<tr>
<td>CHAPTER THREE THE EXISTING PARK</td>
<td></td>
</tr>
<tr>
<td>NATURAL RESOURCES</td>
<td>3-1</td>
</tr>
<tr>
<td>CULTURAL RESOURCES</td>
<td>3-33</td>
</tr>
<tr>
<td>SITE ANALYSIS</td>
<td>3-37</td>
</tr>
<tr>
<td>EXISTING FACILITIES AND USE</td>
<td>3-40</td>
</tr>
<tr>
<td>CHAPTER FOUR DEVELOPMENT PLAN</td>
<td></td>
</tr>
<tr>
<td>PROCESS</td>
<td>4-1</td>
</tr>
<tr>
<td>PLAN</td>
<td>4-5</td>
</tr>
<tr>
<td>IMPLEMENTATION</td>
<td>4-16</td>
</tr>
<tr>
<td>SIGN PLAN</td>
<td>4-20</td>
</tr>
<tr>
<td>CHAPTER FIVE PARK MANAGEMENT PLAN</td>
<td></td>
</tr>
<tr>
<td>ADMINISTRATION AND STAFFING PLAN</td>
<td>5-1</td>
</tr>
<tr>
<td>SERVICES PLAN</td>
<td>5-</td>
</tr>
<tr>
<td>LAW ENFORCEMENT PLAN</td>
<td>5-</td>
</tr>
<tr>
<td>MAINTENANCE PLAN</td>
<td>5-</td>
</tr>
<tr>
<td>RESOURCE MANAGEMENT PLAN</td>
<td>5-</td>
</tr>
<tr>
<td>RECREATIONAL MANAGEMENT PLAN</td>
<td>5-</td>
</tr>
<tr>
<td>CONCESSIONS PLAN</td>
<td>5-</td>
</tr>
</tbody>
</table>
CHAPTER SIX
GENERAL OPERATIONAL PLAN
ADMINISTRATION AND STAFFING .................................. 6-1
SERVICES ....................................................................... 6-
LAW ENFORCEMENT ..................................................... 6-
MAINTENANCE ............................................................ 6-
RESOURCE MANAGEMENT ............................................. 6-
RECREATION ............................................................... 6-
CONCESSIONS ............................................................. 6-

REFERENCES

APPENDIX

APPENDIX 1: PUBLIC COMMENTS
APPENDIX 2: SUMMARY OF ALTERNATIVES
APPENDIX 3: PROPOSED PLAN

TABLES

TABLE 2-1 REGIONAL DEMOGRAPHICS
TABLE 2-2 ACTIVITY PREFERENCES LAHONTAN STATE RECREATION AREA
TABLE 2-3 LAKES AND RESERVOIRS OFFERING WATER-BASED RECREATION
TABLE 2-4 PLANNING REGION I FEDERAL/STATE RECREATIONAL ACREAGE
TABLE 2-5 PLANNING REGION I PUBLIC/PRIVATE RECREATIONAL ACREAGE
TABLE 2-6 REGIONAL I SUMMARY OF SUPPLY, DEMAND AND NEED
TABLE 2-7 WILD HORSE POPULATION DATA
TABLE 3-1 LAHONTAN RESERVOIR SURFACE WATER INFLOW (AC FT) 1964-1969
TABLE 3-2 LAHONTAN RESERVOIR WATER QUALITY DATA
TABLE 3-3 YEARLY HIGH/LOW WATER LEVELS
TABLE 3-4 HIGH/LOW STORAGE CAPACITY BY YEAR
TABLE 3-5 RECREATION QUALITY vs RESERVOIR VOLUME
TABLE 3-6 WATER VOLUME vs RESERVOIR ELEVATION
TABLE 3-7 RECREATION DEVELOPMENT LIMITATIONS BY SOILS
TABLE 3-8 TEMPERATURE
TABLE 3-9 PRECIPITATION
TABLE 3-10 RESTROOM LOCATIONS AND TYPES
TABLE 3-11 LAHONTAN STATE RECREATION AREA VISITATION SUMMARY
TABLE 4-1 PRIMARY PROGRAM ELEMENTS
TABLE 4-2 FACILITY LOCATIONS (NEW)
TABLE 4-3 RECOMMENDED PLANT SPECIES
GRAPH 3-1 DAYS/YEAR RESERVOIR EXCEEDS 200,000 ac. ft. (OPTIMUM LEVELS)
GRAPH 3-2 VISITATION RATES BY YEAR vs OPTIMUM WATER LEVEL (DAYS/YEAR)

FIGURES

FIGURE 1-1 VICINITY MAP
FIGURE 1-2 PLANNING PROCESS
FIGURE 2-1 OWNERSHIP/MANAGEMENT
FIGURE 2-2 LAND USE/ZONING
FIGURE 2-3 CIRCULATION/ACCESS
FIGURE 3-1 SLOPES
FIGURE 3-2 DRAINAGE/VEGETATION TYPES
FIGURE 3-3 BATHYMETRIC/HYDROLOGY
FIGURE 3-4 SOILS COMPOSITE
FIGURE 3-5 COMPOSITE SITE ANALYSIS
FIGURE 3-6 UTILITIES/FACILITIES
FIGURE 3-7 DETAIL PLAN A - CHURCHILL BEACH COMPLEX
FIGURE 3-8 DETAIL PLAN B - SILVER SPRINGS BEACH COMPLEX
FIGURE 4-1 PROGRAM RELATIONSHIP DIAGRAMS
FIGURE 4-2 RECOMMENDED PLAN
CHAPTER I: INTRODUCTION

A. PURPOSE OF PLAN

1. WHY THE PLAN IS BEING WRITTEN

The purpose of this plan is to update the long-range development plan for Lahontan State Recreation Area. The past plans, written in 1966 and 1974 addressed recreation issues in broad terms; little attention was focused on major issues, detailed objectives, regional influences, and natural resources. This plan will realistically address the present and projected needs, as well as outline operating procedures for the recreation area. In addition, this master plan is an element of the comprehensive Nevada State Parks System Plan.

The plan begins with an introductory chapter which covers the description, location and setting of the park. Also included in this chapter is a section on the park's history. Chapter Two addresses the regional influences that directly or indirectly affect the area. In Chapter Three, the area's natural, historic, and cultural resources, along with the existing facilities and park uses are described. Chapter Four details the plan development process and the resulting master plan. Discussion of the recreational program, proposed facilities and their locations, as well as development phasing will be presented. The remaining two chapters deal exclusively with the management, operation and maintenance of the recreation area's facilities and resources. Chapter Five recommends the proposed operations and management plan and Chapter Six describes procedures which are currently practiced.

2. ISSUES - MAJOR

The main issues addressed during the planning process fall into two general categories: recreation need, and resource/user conflicts. In addition to these, health and safety, tourism, and environmental considerations must be evaluated.

a. SCORP Identified Issues

The 1987 Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies many aspects of recreational needs appropriate to Lahontan State Recreation Area.
1) The state and other government agencies should foster the awareness and sensitivity among all Nevadans toward the state's rich natural resources.

2) Opportunities to participate in recreational activities should be provided to all citizens through informative programs and literature. On-site educational programs should be encouraged to assist the visitors in their enjoyment of the outdoor experience.

3) Natural resources should be maintained and protected for future generations to enjoy. When appropriate, additional land should be secured through selective acquisition to meet future needs.

   It was noted in the SCORP that the population of Nevada has surpassed the one million mark far ahead of predictions. The rapid increase in population will cause increased demands for quality outdoor recreation.

4) Special emphasis should be given to developing linear recreational trail corridors that serve as transportation connectors between various parklands and recreation areas and also provide recreation opportunities.

5) Efforts should be made to make recreational opportunities available to all of Nevada's citizens including those who are handicapped or have other special needs. (SCORP, 1987)

b. User Conflicts/Visitor Impacts

   Efforts should be made to plan and locate together activities with similar demands. Conflicts arise when active sports such as jet skiing and water skiing impact passive activity such as fishing and beach swimming/sunbathing. The park is patrolled on a regular basis, however, late night music and noise is a problem to campers who would like peace and quite.

c. Public Identified Issues

   Surveys of park users and public workshops have provided input into this plan. The surveys were conducted before the planning process was initiated. The results of the 1987-88 Park User Survey will be presented in Chapter Two of the plan.
Four public workshops were conducted during the planning process for the park. Workshops 1 & 2 were held in Fallon and Silver Springs and the presentation was centered around resource analysis and inventory. The number of people who attended the first two workshops were mixed. The workshop in Fallon was very low (1) but several good ideas were discussed including; the establishment of a low water boat ramp, improvement of navigation markers and actively removing the existing stumps during low water. The second workshop was held in Silver Springs and an excellent turn out (23) attended the meeting. Participants voiced concerns including; removal of stumps, under utilization of the day use facilities, support for unstructured (free form) camping, increasing staff patrols, the establishment of some type of concessionaire and expansion to the existing Silver Springs dump station.

In association with these first two meetings, a total of 500 public comment forms were sent to the public, agencies and media outlets. A total of 10 comment forms were returned. The written comments included; clearing the beaches of seedling trees and other vegetation, clearing dead stumps, better enforcement of camping areas at night, confining jet skiers to specific beaches, limiting future development, paving and upgrading the day use area at Silver Springs.

The third and fourth workshops were also held in Fallon and Silver Springs and the planning alternatives were presented at these meetings. Attendance at the third workshop at Silver Springs was fair (12) and several key issues were discussed. A majority of those in attendance were adamant against any restrictions to jet skiers. Other important comments were: improving water quality and the fishery, re-design of the day use area, improving primitive camping, preservation of the riparian vegetation along the Carson River and increased staffing.

The fourth workshop at Fallon also had fair attendance (9). However the Nevada Department of Wildlife had four representatives present and they offered some excellent comments. Comments included: improving the alignment of the Silver Springs road, coordination between NDOW and NDSP on reservoir issues such as buoys, protection of wetlands for hunting, campsite locations, providing fish cleaning stations and beacon lights at
every developed boat ramp and the establishment of active interpretive tours or classes.

In association with the last two workshops an alternative brochure was prepared and sent to approximately 250 individuals, agencies and media outlets. The plans were printed in several area newspapers. A total of 11 public comment forms were received and comments suggested that alternatives two and three were the most popular. Comments on the alternatives included: water quality/fishery management, support for primitive camping, late night problems with noise, against restrictions for jet skiers and boaters, providing additional staff, paving existing roads and providing a marina concessionaire.

The location and size of the recreation area make it an excellent target for vandalism and unauthorized entry. The park is divided into two major development areas Silver Springs Beach Complex and Churchill Beach Complex. Consequently, the park has two bases of operation, one in Silver Springs and the main office/maintenance facility near the dam. This separation of development areas tends to compound management problems and reduces efficiency. The safety of the public is also a concern due to size of lake and its intense use.

d. Governor's Tourism Program Identification Issues

The Governor's Tourism Program provides three additional issues the Division of State Parks considers when updating or creating master plans (Nevada Commission on Tourism, 1987). The first two are directly related to general tourism goals as stated by the Nevada Commission on Tourism: 1) increasing awareness of the state’s wide variety of activities and 2) increasing the length of stay of each visit. State Parks protects historical, scenic and habitat areas, and promotes a wide variety of outdoor recreational experiences. This contributes to promotion of the "other Nevada" and can provide interesting activities to encourage visitors to lengthen their stay.

The third issue derived from the Governor's Tourism Program involves an inventory of places or activities that draw tourists to the state. All eight inventory items warrant attention during a park master planning process. They are: historic sites, natural heritage sites, recreation sites, museums, special events, wildlife, trails, and accommodations.
e. Environmental/Cultural Considerations

The reservoir offers an excellent water based recreational resource. In addition to the recreational resources of the park, an important cultural resource is the presence of important petroglyphs. These petroglyphs are found in scattered locations and are for the most part located away from areas which have heavy visitor use. Environmentally sensitive habitats are located along the Carson River upstream of the reservoir. This fragile riparian area is significant regionally and statewide. The surrounding private ranch properties have helped to isolate this area and protect it from development.

3. GOALS AND OBJECTIVES

a. Legislated Goals and Objectives

The Nevada State Legislature has developed the following goals and objectives for the Division of State Parks:

"to acquire, protect, develop, and interpret a well-balanced system of areas of outstanding scenic, recreational, scientific, and historical importance for the inspiration, use, and enjoyment of the people of Nevada and that such areas shall be held in trust as irreplaceable portions of Nevada's natural and historic heritage (NRS 407.013)."

b. Natural/Cultural Resource Objectives

1) All natural components of the park (flora, fauna, soils, and geology) shall be identified so that they may be protected, interpreted, and managed adequately.

2) Endangered, rare, or protected species shall be identified, located, and protected as benefits the situation.

3) Cultural resources shall be protected and maintained in an appropriate manner; visitor safety and convenience should be secondary when considering maintenance projects on historical structures.

4) Since the site contains major works of prehistoric petroglyphs, great care should be taken to prevent destruction of these resources.
c. Management Objectives

1) Operation and Maintenance procedures will be identified to ensure that changes in staffing do not lead to deterioration of facilities and resources.

2) Patrol and law enforcement procedures will be identified to ensure the protection of visitors, facilities, and resources.

3) Administrative procedures will be outlined to ensure completion of routine reports and assignments according to established schedules and standardized formats.

4) Interpretative facilities, programs, and needs will be identified to assure that quality programs or services are offered to the public.

5) Staffing procedures will be identified to provide supervisory guidelines, and to serve as a baseline for future needs.

4. PART OF STATE PARK SYSTEM PLAN

As previously stated, the Lahontan State Recreation Area Recommended Plan will contribute to the Nevada State Park System Plan. The State Park System Plan is a composite of individual park master plans with unifying goals and objectives. As such, it will provide a broad overview of long-range development plans for the various Nevada Division of State Parks administered areas and will serve as an information source for political subdivisions, state and federal agencies, legislators, etc. The System Plan is also intended to assure that the development themes, activities, and facilities of the various parks complement one another, providing optimum variety with minimal duplication.

a. Description of the Division of State Parks

The Division of State Parks is one of eight agencies within the Department of Conservation and Natural Resources. As stated above, the division has the legislated intent to acquire, protect, develop, and interpret a well-balanced system of parks which have scenic, recreational, scientific, and historic importance (NRS 407.013).

The Division is charged with preparation and maintenance of the Statewide Comprehensive Outdoor Recreation Plan (SCORP) that
encompasses public recreation opportunities at all levels of government, as well as providers of privately owned public recreation lands or facilities.

In addition, the Division administers the awarding and disbursement of federal financial assistance programs to the state’s various political subdivisions for recreation facility acquisition and development.

B. DESCRIPTION, LOCATION AND SETTING

1. DESCRIPTION OF PARK AND LOCATION

Lahontan State Recreation Area and other public and private lands considered in this planning effort are located in Lyon and Churchill County, Nevada. The site can be reached by car taking State Highway 50, approximately 35 miles east of Carson City and 15 miles west of Fallon. Reno-Sparks, Nevada’s second largest urban center, lies approximately 55 mile to the northwest. (See Figure 1-1 Vicinity Map)

The reservoir stretches westward from the dam almost 9 miles to Silver Springs Beach and from Silver Springs 10 miles south to meet the Carson River. As U.S. 50 crosses Nevada, it passes along Lahontan’s north shoreline in several places; Alternate U.S. 95 proceeds southwest from its intersection with U.S. 50 at Silver Springs a few miles west of the lake’s meandering west shore. The northeastern third of the lake lies in Churchill County and the remaining two-thirds doglegs first west then southeasterly into Lyon County. The Recreation Area lies entirely within Townships 17 and 18 North, Ranges 25 and 26 East, M.D.B.& M. (SE&A, 1974)

The recreation area has two main points of access including one with direct access to U.S. Highway 50 and located on the north end of the lake. The other main access is located on Fir Street, along the southwestern end of the lake, near U.S. Highway Alternate 95.

The park currently encompasses 30,362 acres. The recreation area contains surface water acreage of 12,100 and 18,262 management acres. The area contains several inholdings which should be a top priority for land acquisition. There are no present plans for any major acquisitions or R&PP applications for Bureau of Land Management land. Developed facilities include a family campground, family and group
picnic areas, an information kiosk, scenic overlook, hiking and equestrian trails, swimming beach, boat launches with docks, public telephones, dump station, flush and vault toilets, and shower facilities.

2. PHYSICAL SETTING OF THE AREA

Lahontan Reservoir is approximately 19 miles long, and about 2.5 miles wide at its widest point. The irregularly shaped and sprawling reservoir follows the old Carson River channel, winding between the Virginia Range on the northwest and the Dead Camel Mountains on the southeast. The relatively wide northern and southern portions of the lake are separated by a narrow channel known as "The Narrows".

The Lahontan State Recreation Area lies in the Churchill Valley, a large intermontane basin bounded by the Virginia Range, the Dead Camel Mountains, the Desert Mountains, and Churchill Butte. The topography is mainly the product of the basin-and-range deformation that occurred from the early to late-middle Pleistocene and formed the area's horst mountains and graben basins. The land surrounding the Reservoir is characterized by long sandy beaches and gentle slopes except in the Narrows area which has a more rugged and steep topography. The area is generally flat, with sparse low shrubs and grasses typical of the high desert landscape.

The lake's principal sources of water are the Carson and Truckee River Basins. Both of these rivers originate in the Sierra Nevada Mountains, to the west. The winter snowpack provides the majority of water for both streams; however, minor amounts are contributed by local rainstorms. (DRI, 1983)

3. ADJACENT PROPERTY OWNERSHIP

The Recreation Area is surrounded by both private and public lands. The public lands consist primarily of Bureau of Land Management and Bureau of Reclamation holdings. The greatest numbers of private holdings are located on the western portion of the lake near Silver Springs.

The Recreation Area contains four inholding properties which are all private and total 280 acres. Three of the inholding parcels are located along the northwestern shoreline of the lake. One parcel of approximately forty acres is located in the southeast portion of the park.
C. PARK HISTORY

1. HISTORY OF AREA

a. Prehistory

The existing Lahontan Reservoir is the namesake of the ancient Lake Lahontan that once covered much of the state of Nevada. Lake Lahontan dates from the last glaciation of North America, which ended ten thousand years ago. The ancient lake was never a solid or symmetrical body of water. The lake was instead broken by mountain ranges into a number of long extended arms. The lake, at it largest, covered over 8,500 square miles and extended from the present Nevada-Oregon border on the north to the vicinity of present-day Hawthorne, about 250 mile south; it stretched from the Susanville-Honey Lake area of California on the west about 185 miles to the Stillwater Range in Nevada on the east, with one long arm reaching northeastward beyond the present town on Gloconda.

Stratigraphic detail indicates that the lake fluctuated greatly in water level, with two or perhaps three high-water marks and almost complete desiccation between. The drying-up process has continued since the latest high-water stage, and all that remains now of the once great lake are two bodies of water, Pyramid and Walker Lakes, and a number of playa, or dry-lake remnants, including the Humboldt and Carson sinks, the Smoke Creek, Granite Creek, and Black Rock deserts, and Winnemucca and Honey dry lakes.

Man first made his presence in the area known as Nevada between 11,000 and 13,000 years ago. Scientists generally believe that man reached America via a land bridge across the present Bering Strait during the deglaciation of western North America and passed into the High Plains through a corridor which opened between two great ice sheets. (Elliott, 1978)

The most dramatic feature of the archeology in this area is the abundance of rock art sites along the former Carson River channel. Like those on the Truckee River, several of these sites are located at low elevations on the river terraces. Other rock art sites are located at extremely high elevations, in association with overlooks of the river channel.
A pit-and-groove petroglyph site composed of two rock art boulders with motifs on the top and sides is situated high in the Dead Camel Mountains (approximately 4800'). Eighty percent of the recorded rock art sites in the Lahontan Reservoir area are pit-and-groove of faceted styles. This style of rock art is considered to be the most ancient of the Great Basin rock art traditions. (Pendleton, 1982)
b. History

Henry Engelmann, geologist for Captain James H. Simpson’s expedition was the first to recognize the shore features of Lake Lahontan as evidence of an ancient deep lake. Clarence King, a prominent American geologist, named the lake in the 1870s in honor of Baron Louis Armand de Lahontan, a French explorer. (Elliott, 1978)

The Lahontan area was the location of many trails and events during the period of American western expansion. The region surrounding the reservoir was a natural draw for pioneers due to the presence of water. Explorers traveling south from the Truckee River crossed the Carson River in the 1830’s and 1840’s, near what is now the west shore of the reservoir. Fremont’s parties crisscrossed through the Carson Valley, passing to the east, south and west of Lahontan.

The California trail traversed southward from the Humboldt to reach the Carson River at a place called Ragtown near the intersection of U.S. 50 and Alternate 95 and then turned westward up the Carson to cross the Sierra Nevadas.

Conflicts between Indians and whites marked the early days of settlement and Fort Churchill, 10 mile west of the reservoir, was built in 1860 as a protective measure. The fort was later abandoned as a military outpost in 1871.

The Pony Express of 1860-61 crossed near the area known as Silver Springs Beach and continued eastward toward Austin. The Williams Station was located near the river and has since been covered by the reservoir. (SE&A,1974)

The early history of Lyon County was centered around the development of Dayton and its mining resources. The area of Lyon County which surrounds Lake Lahontan more closely follows the development of western Churchill County. This portion of Lyon County is part of Churchill Valley which also contained historic Fort Churchill.
Churchill County's first residents specialized in two services, freight and forage. Individuals slowly displaced Indian bands from the hay meadows and hired themselves and their equipment out to mining firms, the Pony Express, Union Telegraph, and Overland Stage companies.

The first mining districts in Churchill County were organized in 1862. None of the discoveries were significant and they had scant impact on mining developments within the state. The largest mineral producer of minerals was the Humboldt Salt Company. Large sums of salt were produced and supplied the growing Virginia City market.

As agriculture developed cautiously during the 1860's, the mining frontier swept through Churchill County. The effect was a short-
lived boom and bust cycle, but the farmer-freighters realized unexpected profits by hauling hay to the new camps at prices occasionally reaching $150 per ton.

The use of the Carson River for irrigation was very erratic. In 1862 the river sustained one of its greatest flows which resulted in severe flooding. Before this flood the river flowed from Ragtown to Carson Lake as a single channel with several small sloughs. An outlet released any overflow from Carson Lake into Stillwater Slough and thence to Carson Sink. The flood in 1862 caused the river to divide below Ragtown, into a northeastward trending channel called Old River, a new branch that flowed almost due east from St. Clair to Stillwater Slough named New River, and the South Branch that continued to flow into Carson Lake. This new drainage pattern, which was deepened by subsequent floods in 1867 and 1869, persisted throughout the 19th century.

The 1870's were prosperous for the Lahontan Valley and the markets of the Comstock and California provided dependable and expanding markets for the county's agricultural products. During the decade the county constructed a school, a courthouse in Stillwater, a church was built, existing ranches were expanded and new ranches established.

By the late 70's there was a steady decrease in irrigation water reaching the lower Carson River. Upstream use by other agricultural interests was consuming virtually the entire stream in the middle to late summer.

The 1880 census showed that Churchill County's population had doubled to 500 persons over the last decade. Even with this population increase, the county was still the smallest in the state. The prosperous county was the envy of neighboring Lyon and Washoe counties. The efforts to attach Churchill County by its neighbors was ended by the legislature in 1885.

In 1889-90 the U.S. Geological Survey studied the water within the area and showed that the Truckee River water could be brought to Lahontan Valley by canal. This water, combined with the flow of the Carson River, could reclaim an estimated 200,000 acres. Despite a drought in 1888, county leaders successfully lobbied in the 1889 legislature for an act to provide for this water storage. However, this plan as well as many other plans for business expansion were terminated by the "White Winter" of 1889-90. The
winter was so severe that half of the livestock in Nevada perished. Entire herds disappeared under a deep blanket of snow.

The "White Winter" was followed by drought years in the early 1890's. By the middle of the 1890's drought conditions improved and herds once again approached the numbers present before the winter of 1889-90.

In 1899 the county again debated the issue of creating a reclamation district which would include a reservoir and a Lahontan dam. Supporters pointed out that the project would cost half the amount needed to construct a canal which was previously proposed. This plan also would avoid the anticipated litigation concerning use of Truckee River water. The plan was never implemented because no agreement could be reached by the various factions.

Advocates of federally-supported reclamation projects succeeded in framing the National Reclamation Act on June 17, 1902. Work under this act would be administered by the U.S. Geological Survey's Reclamation Service. The Geological Survey had been surveying possible Nevada reclamation sites since 1889 and the most favorable project was the combination of the Truckee and Carson River flow to irrigate 400,000 acres of Lyon and Churchill counties. After President Theodore Roosevelt signed the reclamation act into law, the Reclamation Service privately submitted a list of the six most feasible western sites to the secretary of the interior. The Truckee/Carson project was on the list but before any federal expenditures were made in the state the legislature would have to indicate its good intentions by enacting an effective water management statute and create a state engineer's office. This was accomplished in large part due to the work of Senator Francis G. Newlands of Nevada. The project was to be the first federal reclamation project and was named the Truckee-Carson Irrigation Project. The project was among five sites approved on March 14, 1903 and was greeted with an enthusiastic public reaction. (Townley, 1977)

c. History of the Truckee-Carson Irrigation Project

The Truckee-Carson Irrigation Project was the first federal agricultural irrigation project built under the 1902 Reclamation Act. The project includes Lahontan Dam and Reservoir on the Carson River, a dam and outlet works on the Truckee River at Lake Tahoe,
three diversion dams, and nearly 900 miles of canals, laterals, and drains, including the 31 mile long Truckee Canal. The project was initially built to provide agricultural irrigation to approximately 400,000 acres of land throughout western Nevada.

Construction on Derby Dam and the Truckee Canal began in 1903. The dam and canal were opened on June 17, 1905. The project supplied water for the first time in 1906 to 108 ranches in the Lahontan Valley.

The Lahontan Dam was started in 1911 by the Reclamation Service to provide late summer irrigation water to the valley. The dam was completed in 1914 for a cost of approximately $1,000,000. The project also included a powerhouse which provided revenues which were applied to the cost of operation and maintenance. The Lahontan Dam is a zoned, earthfill dam with a height of 162 feet. The spillway-crest has an elevation of 4,162 (1917 datum) feet above sea level. The addition of the 20 inch flashboards bring the total maximum storage elevation to 4,164 feet (1917 datum).

The Truckee-Carson Irrigation Project was renamed the Newlands Project in 1919 in honor of Senator Francis G. Newlands.

In 1926, the U.S. Department of the Interior transferred the operation and maintenance of the project to the newly formed Truckee-Carson Irrigation District. The U.S. Bureau of Reclamation still set the maintenance standards for the project. (DRI, 1983)

2. HISTORY OF THE PARK

The reservoir has been used for recreation since the project was completed. The recreation around the lake was always informal and the location of various activities were a product of access and available sand beaches. The facilities were incorporated into the state recreation area when recreation management of the reservoir was turned over to the state in 1971.

A Management Agreement was signed on March 12, 1976 between Nevada State Parks, Truckee-Carson Irrigation District and the Federal Bureau of Reclamation concerning the development, administration, operation and maintenance of recreation at the Lahontan Reservoir. This agreement superseded and replaced the interim management agreement which was dated August 17, 1973. The present agreement has a term of fifty years. This agreement states that the primary use of the reservoir
is for irrigation and as such the water level is subject to wide fluctuations as water is needed. These traditional recreation activities include sightseeing, hiking, public water access, other water-associated recreation, picnicking and overnight and short-term vacation camping. The provisions of the agreement provide for the addition of private concessionaires which enhance these recreational activities. The agreement allows for the development of oil, gas, coal and other minerals through leases or permits issued by the Bureau of Reclamation and the Truckee-Irrigation District. State Parks will be given full consideration concerning any mining proposals prior to their permit. (Management Agreement, 1976)

The major use areas resulted from use patterns of the public in Churchill and Lyon counties. These use areas provided residents with access to the lake, beaches and boat launching.

When the state assumed management of the recreation area there were two major use areas, one in Churchill County and one near Silver Springs in Lyon County. The Churchill area included the Cove (North Shore Marina) which is located near U.S. Highway 50 and provided concession marina facilities including a restaurant, boat launching, boat rentals, slips and a bar. West of the Cove was an area known as Drum Point which was named after a local contractor, Andy Drum, who graded a road to the point in the mid 60’s. East of the cove is Blackbird Beach which is used primarily for shore fishing. Another use area which was inherited by the state is the Churchill Beach area south of the dam. This area had several beaches, outhouses and picnic tables.

The second major use area on the lake was found near Silver Springs and was popular primarily for the number of beaches available and its ease of access. (Francke, 1990)

3. WHEN THE PARK WAS AUTHORIZED

Lahontan State Recreation Area was created during the 1971 legislative session. The enabling legislation for recreation area became effective on July 1, 1971. (Draft System Plan, 1987)
D. PLANNING PROCESS

1. PAST PLANS FOR THE AREA

Numerous plans were produced since the inception of the reservoir. The earliest plan was produced by the National Park Service in 1965 and was authorized by the Lake Lahontan Recreation Committee. The report was prepared based on the assumption that the reservoir would be turned over to state parks for development and management. This report cited four major assets of the reservoir including: attractive natural beaches; an established tree growth around most of the periphery of the reservoir and along the Carson River; excellent access provided by two U.S. highways; and abundant terrain suitable for recreation developments except where U.S. Highway 50 parallels the north shore.

In addition to these major assets the NPS study indicated the natural setting of the lake has been retained with only a minimal amount of scarring by human activities; its location is convenient to the populated areas of western Nevada; the water and air temperatures are compatible with major recreation activities; the water is fresh rather than highly mineralized, brackish or salty, like most Nevada lakes; and the waters support a variety of fish life.

Detracting from the assets is the quality of the water which is turbid and supports extensive algae during the summer months. The seasonal changes in lake level also has a negative impact on recreation.

The study’s recommendations include water quality improvement, minimizing the private development along the lake waterfront and acquisition of private inholdings. (National Park Service, 1965)

One year later a General Recreation Development Plan was prepared by Mitchell J. Serven and Associates. This plan was sponsored by the Bureau of Reclamation and the Division of State Parks. The plan was written pursuant to Public Law 89-72 (79 Stat. 213) which states that, "full consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation and for fish and wildlife enhancement and that, wherever any such project can reasonably serve either or both of these purposes consistently with the provisions of this Act, it shall be constructed, operated and maintained accordingly."

This General Recreation Development Plan evaluates the opportunities the lake offers for outdoor recreation and development needed to service anticipated recreation. The plan concluded that development should
occur in both Churchill and Lyon counties. The plan calls for
development at Silver Springs Beach and Churchill Beach.

The next recreation development plan was produced eight years later by
SE&A Inc. in 1974. The study was prepared for Nevada State Parks to
provide a development plan for the Lahontan Reservoir. This study
divided development into two phases 1970-75 and 1975-85. The use
projections of this study were overstated and development did not follow
the projected need. The study called for extensive land acquisitions
totaling 5,842 acres and some of these recommendations have been
followed. (SE&A, 1974)

The last recreation development plan was produced for Nevada State
Parks with assistance from the U.S. Department of Agriculture in 1975.
The plan was focused on the development of the Silver Springs Beach
area of the lake. The plan calls for development in two areas of Silver
Springs with a third site used as an alternative. The study suggested the
increase of facilities to relieve recreation pressures within the area.
(RC&D Measure Plan, 1975)

In addition to these development plans many other studies have been
conducted concerning Lahontan Reservoir. Most of these studies were
oriented toward water quality. An archeological study was also
completed in 1976 which surveyed several sites for archeological
remains. This plan concluded that there are significant finds, including
pictographs, but that the location of these areas are away from
established use areas. The survey further recommends that these areas
should be avoided for potential development. A major concern would be
the destruction of these finds by the general public if they were
promoted. (Nevada State Museum, 1976)

2. PROCESS FOR THIS PLAN UPDATE

The planning process for this update was initiated in the fall of 1990. It
has been written with the assistance of the Park Supervisor, District
Ranger, Division Park Administrator, and Planning and Development staff.

Information for the master plan was collected while on-site at the park as
well as through research of other available resources. Information
collected includes: air quality, archeology, circulation, climate, geology,
historical data, hydrology, land use, ownership, perceptual attributes,
slopes, topography, utilities, vegetation, and wildlife. Chapter Two,
Regional Influences and Chapter Three, The Existing Park, details the
findings in these categories. Chapter Four, Development Plan, details the
proposed plans for the park including the alternatives and summaries. (See Planning Process, Figure 1-2)

The last two chapters of the plan, Chapter Five, Park Management Plan, and Chapter Six, General Operational Procedures, are presented to give direction for operation and maintenance of the park.

Information from Chapter One through Three was analyzed and development constraints and opportunities identified. The resulting Composite Site Analysis, brings together all this information and presents it as a single drawing.

The planning team, consisting of planners and field staff from State Parks, presented site inventory and analysis information at public workshops held on June 24th and 25th. The information collected at these workshops provided the basis for the third and fourth workshops held on August 26th (Silver Springs) and August 27th (Fallon).

Three alternatives represented a wide range of planning options with Alternative 1 containing the minimum amount of development and Alternative 3 the greatest amount of development. A descriptive account of each of the alternatives is presented within Chapter Four, Development Plan.

A wide range of discussions took place at the meeting but it was the consensus of the participants as well as park staff that Alternative 3 with several minor modifications, held the most appealing elements for future development. State Parks also obtained additional feedback on the three alternatives by sending out reduced planning alternative maps. This brochure of alternatives was sent to all area newspapers and a portion of the mailing list. The maps were reproduced in area newspapers and did generate some useful responses.

After collecting written comments, staff comments and workshop comments a Proposed Plan was prepared and sent to the all the participants who were involved in the planning process. Additional public comments were incorporated into the Recommended Plan which was produced for the Lahontan State Recreation Area.

In addition to the public’s comments obtained at these four workshops, the planning staff solicited written comments after each meeting. This information along with the 1987-88 Park User Survey also helped to provide the foundation for the master planning process.
INIMATE PROCESS
* PURPOSE OF PLAN
* GOALS & OBJECTIVES

PARK USER SURVEY

SITE INVENTORY & ANALYSIS
* EXISTING PARK
* POTENTIAL ACQUISITION
* INVENTORY OF EXISTING CONDITIONS
* ANALYSIS OF EXISTING RESOURCES
  (PHYSICAL & HISTORICAL/CULTURAL)

COMPOSITE SITE ANALYSIS

PUBLIC INPUT
* WORKSHOP
* WRITTEN COMMENTS

ALTERNATIVES

PUBLIC INPUT
* WORKSHOP
* WRITTEN COMMENTS

PROPOSED PLAN

PUBLIC INPUT
* WRITTEN COMMENTS

RECOMMENDED PLAN

Figure 1-2
PLANNING PROCESS
3. PARTICIPANTS IN THIS PLAN

In addition to State Parks personnel, comments and information were solicited and provided by the public, the State Park Advisory Commission, the Bureau of Land Management, Bureau of Reclamation and Nevada Department of Wildlife.

4. PUBLIC INVOLVEMENT

This planning effort facilitated public involvement in several ways: at public workshops where discussion on the existing park and future development proposals was carried out, through written comments, direct mailers and the results of the Park User Survey.
CHAPTER II. REGIONAL INFLUENCES

A. DEMOGRAPHICS

1. HISTORIC

The population growth of Churchill and Lyon counties was very slow in the 19th century. However, the area was used extensively by immigrants heading west to California and the population of the area increased with discovery of the Comstock Lode near Virginia City. The area's first residents were engaged in two enterprises, freight and forage. Along the lower Carson River, individuals slowly displaced Indian bands from hay meadows and hired themselves and their teams out to mining firms, the Pony Express, Western Union Telegraph and the Overland Stage Company. The 1880 census showed that Churchill County was the least populated county in the state with only 500 residents. (Townley, 1977)

Churchill County's population increased during the past decade from 13,917 to a total of 17,938 in 1990. This constitutes a population increase of 28.9% making Churchill County the 7th largest county in the state.

Lyon County experienced a 47.1% increase in population over the past decade. The county grew from 13,594 in 1980 to 20,001 in 1990. This increase in population made Lyon County the 6th largest county in Nevada.

Nevada leads all states in population growth over the past decade with a net population increase of 311,000 or a 38.9% increase from 1980-1989. (Nevada Statistical Abstract, 1990)

2. EXISTING/PROJECTED

Population studies indicate a net migration into the state of Nevada. Annual population increases have involved two and one-half times as many immigrants as new residents compared to those resulting from a natural population increase. This natural increase will become a greater factor in the next fifty years when added to the increasing immigration.

Trends in population for Nevada show distinct patterns of rapid increase in some counties and slow or even decline in others. The state is projected to have a population of 1,303,000 by the year 2000.

The population for Planning Region I which includes Churchill, Lyon, Carson City, Douglas, Storey and Washoe counties shows a projected increase in population from 329,980 in 1986 to over 431,720 by the year 1995. This
increase reflects a percentage increase in population of 30.8%. (Nevada Statistical Abstract, 1990)

Churchill County is expected to have a population of 23,770 by the year 1995. This would constitute a percentage increase of 50.4% from 1986 to the year 1995. During the same time period Lyon County’s population is projected to increase to 29,480 by the year 1990 from the 1986 level of 18,040. This will constitute a percentage increase of 63.4% from 1986 to the year 1995. (Nevada Statistical Abstract, 1990)

The area surrounding the park is not undergoing rapid growth and is considered relatively stable at present and into the foreseeable future. Growth figures for all counties in Planning Region I are presented in Table 2-1. The figures presented are updated from the 1990 Nevada Statistical Abstract.

**TABLE 2-1**

**REGIONAL DEMOGRAPHICS**

<table>
<thead>
<tr>
<th>REGION</th>
<th>1986</th>
<th>1990</th>
<th>1995</th>
<th>% INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson City</td>
<td>36,040</td>
<td>41,330</td>
<td>47,590</td>
<td>32.0</td>
</tr>
<tr>
<td>Churchill</td>
<td>15,800</td>
<td>20,490</td>
<td>23,770</td>
<td>50.4</td>
</tr>
<tr>
<td>Douglas</td>
<td>26,170</td>
<td>32,080</td>
<td>41,180</td>
<td>57.3</td>
</tr>
<tr>
<td>Lyon</td>
<td>18,040</td>
<td>23,030</td>
<td>29,480</td>
<td>63.4</td>
</tr>
<tr>
<td>Storey</td>
<td>1,960</td>
<td>2,670</td>
<td>3,560</td>
<td>81.6</td>
</tr>
<tr>
<td>Washoe</td>
<td>231,970</td>
<td>257,660</td>
<td>286,140</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>329,980</td>
<td>377,260</td>
<td>431,720</td>
<td>30.8</td>
</tr>
</tbody>
</table>


B. **RECREATIONAL DEMAND**

The Division of State Parks uses recreational demand as one criteria in the programming of activities in state parks. That demand is determined by identifying popular activities, conducting user surveys, as well as other techniques. A Park User study was completed in 1988 and provides a wealth of site specific information for all Nevada State Parks.
1. EFFECT OF POPULATION IN CREATING DEMAND

The information provided by regional demographics, indicates recreational demands will increase in Planning Region I through the end of the century. Population centers for the region will remain in Carson City and Washoe County with populations of 44,993 and 324,041 by the year 2000, respectively. Reno is approximately 55 miles by road to the Lahontan Reservoir and Carson City is approximately 35 miles west of the reservoir along U.S. Highway 50. The closest city to the park is Fallon which is 15 miles east along U.S. Highway 50. (SCORP, 1987)

The expansion of population within this planning region will result in an increased demand on all recreational facilities within the area. Population growth should be mirrored by increased numbers of recreational facilities offered by the cities and counties of the region. These facilities will typically include; baseball, soccer, football fields, tennis courts and swimming pools. Assuming recreational needs are met by these and other public subdivisions, there will still be an expanded demand for the recreational opportunities offered by parks and recreation areas with scenic and water based recreation.

2. EFFECT OF SOCIOECONOMIC DATA ON DEMAND

According to the 1988 State Park User Survey, the largest number of visitors to Lahontan State Recreation Area were from Region I (89%) which contains the park and the urban centers of Reno and Carson City. The second highest percentage of visitation came from Northern California (3%). The state's remaining regions provide less than (3%) of the recreation area's visitation. Other states and foreign countries provided the remaining (5%) visitation. Thus, Lahontan State Recreation Area receives a very strong visitation from the local population and very low visitation from other regions of state and abroad.

According to the Park User Survey, (94%) of the visitors chose the lake as their primary destination. This is the highest percentage of any of the parks or recreation areas in the Nevada State Parks system.

The number of repeat visitors (92%) was again the highest percentage in the state system. Twenty seven percent of the return visitors indicated they had visited the park between 3-5 times. The percentage of visitors who frequented the recreation area more than 20 times was also high with (17%) returning.
Repeat visitation depends heavily on the quality of the visitors’ recreational experience. Increasing desired activities will help to increase the number of repeat visitors.

The Park User Survey provides data concerning the two major use areas of the park, Churchill Beach and Silver Springs Beach. This breakdown will provide a more accurate picture of visitor use within each of these locations.

a. Churchill Beach

A visitor profile indicates that visitors to Churchill Beach are of all ages with the highest percentage (22%) under 16 years of age. This indicates a high degree of family use at the lake. The second highest percentage of visitors (21%) were in the 26 to 35 year old age group. The lowest percentage (8.8%) were in the 46 to 59 year old age group and seniors (60+) made up only (10%) of total usage. This would indicate that the recreation area users are young and active.

These age groups reflect the need for both physical recreation activities such as water sports and passive recreation such as picnicking.

A large number of the visitors to this beach (38.8%) were from households which earned an income of between $15,000 to $30,000 a year and only (8.5%) were from households with combined incomes of over $51,000.

The majority of visitors considered their recreation experience to be very satisfying (60.4%). Very few (2.0%) were very dissatisfied with their visit. Visitors found out about the park predominately via word of mouth (84.2%).

b. Silver Springs Beach

A visitor profile indicates that visitors to Silver Springs Beach are of all ages with the highest percentage (24%) under 16 years of age indicating a high degree of family use at the lake. The second highest percentage of visitors (23%) were in the 26 to 35 year old age group. The lowest percentage (7.2%) were in the over 60 years of age category. This would indicate that the recreation area users are young and active at
both Silver Springs and Churchill Beaches. These age groups reflect the need for both physical recreation such as watersports and passive activities such as camping and picnicking.

A large number of the visitors to this beach (29.8%) were from households which earned an income of between $15,000 to $30,000 a year. Another large segment of visitation (28.1%) comes from visitors with incomes between $31,000 and $50,000. A total of (19.1%) were from households with combined incomes greater than $51,000. This represents a higher income level compared with Churchill Beach.

An even higher percentage of visitors considered their visit to the recreation area to be very satisfying (69.7%). This is higher degree of satisfaction than at Churchill Beach. No visitors were very dissatisfied with their visit. Visitors found out about the park predominately via word of mouth (91.5%).

This data indicates that overall, the typical Lahontan visitor has a lower income level than at most other state parks in Nevada. Consequently, they are likely to have less discretionary income and would be impacted to a greater degree by any fee increases.

3. ACTIVITY PREFERENCES

The preferred activity at Lahontan State Recreation Area is relaxing outdoors (90% Churchill & 88% Silver Springs). Visitors to the lake have a strong preference (58.9% Churchill & 65.8% Silver Springs) for swimming. Although this is considered a high activity percentage, visitors also like other water based recreational activities. Motor boating is very popular at both beaches (28% Churchill & 53% Silver Springs). Skiing is a more popular activity at Silver Springs (43.7%) than at Churchill Beach (17.3%). The second most popular non-water based, physical activity is hiking/walking at the Churchill Beach (46%). The second most popular non-water based activity at Silver Spring Beach is family picnicking (59%).

A complete list of Top Ten Recreational Activities was produced from the Park User Survey and can be found in Table 2-2.
4. DEMAND FOR EXISTING ACTIVITIES

The Park User Survey indicates that the largest percentage of visitors (37.1%) to the Churchill Beach area rated the park facilities to be only average. The largest percentage of visitors (35.0%) found the facilities at the Silver Springs Beach to be above average and (32.0%) found them to be excellent. Visitors who found the facilities at both beaches to be poor constituted one percent or less. The largest percentage of respondents (41.1%) found the cleanliness of facilities at Churchill Beach to be excellent. The cleanliness of facilities at Silver Springs Beach was found by the largest percentage of visitors (39.0%) to be above average.

When asked, those visitor who were very dissatisfied cited the poor quality of park roads (Churchill Beach) and the low water level (Silver Springs Beach) as their main complaint. The majority of respondents in both locations rated the helpfulness of park employees as excellent (67.3% Churchill & 53.8% Silver Springs). The user survey indicated that a large percentage (72.8% Churchill,
74.4% Silver Springs) of visitors would like to see fully equipped peace officers on patrols.

An increase in shore facilities would be appropriate considering the high number of respondents participating in water-based activities. The large number of hiking visitors (46%) in the Churchill Beach area would support making beaches more accessible within the recreation area. Hiking within the park is primarily along beaches and not through the surrounding desert.

5. LATENT DEMAND FOR VARIOUS ACTIVITIES

The most important need according to respondents in the Churchill Beach area (15.7%) was for some type of concession/store. Other important needs in terms of either activities or facilities included improved roads (12.9%), more showers (12.4%) and ATV trails (7.8%).

Visitors to the Silver Springs Beach cited more restrooms (15.5%) as the activity/facility which is most needed. Other needs listed by visitors include more showers (14.6%) and more picnic tables (7.8%). These needs closely parallel the favorite activities for visitors and indicate an increase in facilities is needed.

The Park User Survey also addressed some very park specific issues concerning potential recreation facilities at the lake. In one instance visitors at Churchill Beach were asked if they would favor development of a recreational vehicle campground concession with full utility hookups near the North Shore Marina. The response to this question was overwhelmingly positive (80.7%) indicating they would be in support of such a facility. Visitors were also very interested (87.6%) in the establishment of dockside gas service at the Cove marina. The survey also indicated that a bait and tackle shop was supported by 66.7% of the visitors. When visitors were asked what type of foods services they would like to see, the largest response (42.1%) was for snacks and picnic supplies.

The visitors to Silver Springs did support the creation of a RV campground near the North Shore Marina but support (61.5%) was not as strong as visitors from Churchill Beach. The establishment of a gas dock was also highly supported (78.9%) by Silver Springs visitors.

Past plans for the recreation area showed the development of equestrian facilities for the park. Only (3%) of respondents enjoyed horseback riding at Silver Springs Beach and none at Churchill Beach. Horseback riding was not in the top ten preferred activities. Providing equestrian facilities may result in increased equestrian use by the public.
C. RECREATIONAL SUPPLY

Lahontan State Recreation Area provides visitors with many recreational opportunities. The water-based recreation that the lake offers is a welcome relief from the surrounding desert environment. The location of the lake in the middle of the desert offers many other intangibles such as unique and interesting scenery. The climate of the desert makes water-based activities enjoyable for many months of the spring, summer and fall seasons. A major problem with the enjoyment of this desert lake is fluctuation of water levels which in drought years severely limits access and enjoyment of the lake by the public. Table 2-3 provides an overview of water-based recreation within Planning Region I.

Planning Region I contains a total of 5 state parks including; Washoe Lake State Park, Fort Churchill State Historic Park, Dayton State Park, Lake Tahoe Nevada State Park and Mormon Station State Historic Park. The parks provide a broad range of activities with a good mix between resource and historically oriented parks.

TABLE 2-3

LAKE AND RESERVOIRS OFFERING WATER-BASED RECREATION

<table>
<thead>
<tr>
<th>LAKE/RESERVOIR</th>
<th>*SURFACE ACRES</th>
<th>FISHING</th>
<th>WATERSKIING</th>
<th>MOTOR BOATING</th>
<th>NONMOTOR BOATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Soda Lake</td>
<td>400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ft. Churchill Ponds</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian Lakes</td>
<td>700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmos Reservoir</td>
<td>205</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Lahontan Reservoir</td>
<td>12,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paradise Lake</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyramid Lake</td>
<td>108,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheecker Reservoir</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stillwater Point</td>
<td>1,900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Tahoe*</td>
<td>36,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topaz Lake*</td>
<td>1,250</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracy Pond</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Lake</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washoe (Big &amp; Little)</td>
<td>6,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>168,334</strong></td>
<td><strong>167,943</strong></td>
<td><strong>165,250</strong></td>
<td><strong>167,360</strong></td>
<td><strong>168,050</strong></td>
</tr>
</tbody>
</table>

* Acreage shown here are estimated areas on the Nevada side of lakes.

= Activities available at given lakes.

R Restrictions as to speed, size of motor and areas allowed.

Source: SCORP, 1987
Washoe Lake State Park is one of many water-based recreation areas under state ownership and management. Washoe Lake is located on U.S. 395 between Carson City and Reno in the Washoe Valley. Activities at the park include nature study, horseback riding, picnicking, wind surfing, fishing and camping. The park includes a newly developed wetlands and bird watching area. The park is open year round.

Fort Churchill State Historic Park is located in Lyon County near Silver Springs. The fort was once a U.S. Army Fort built in 1861 and abandoned ten years later. The park contains a Visitor Center which interprets and provides information on the history of the fort. The Pony Express and Overland Telegraph once passed through the area. Fort Churchill is open year round and contains a picnic area, visitor museum and camping. The park is located on the Carson River which flows to the east and feeds into Lake Lahontan.

Another park in Lyon County is Dayton State Park which is located on U.S. 50 in Dayton, NV. Dayton was the first known site (Gold Canyon) where gold was discovered in Nevada. The area was first settled in 1849 and for years was nothing more than a tent village. The park consists of 160 acres and includes picnic areas, a campground and the historic Rock Point Mill site. Popular park activities include picnicking, camping, horseback riding, fishing, hiking and bird watching. The park is open throughout the year.

Lake Tahoe-Nevada State Park is located on Lake Tahoe and provides many recreational opportunities including beaches, swimming, picnicking, boat launching, visitor station, cross country skiing, mountain biking, sightseeing and hiking. The park has many different areas which offer differing recreational opportunities. Lake Tahoe units include Sand Harbor, Spooner Lake, Cave Rock, Backcountry, Highway 28 beaches and the Henry Van Sickle unit. The park is located on State Highway 28 on the eastern shore of Lake Tahoe and is open year round.

Mormon Station State Historic Park is the site of Nevada’s first permanent white settlement. A replica of a trading post built in 1851 it now houses a small museum. Mormon Station is the location where emigrants paused before their last push over the Sierras to California. Facilities include a picnic area, stockade and museum. Mormon Station is located in the town of Genoa 12 miles south of Carson City. The park is open from May through October.

Federal agencies manage lands around Lake Lahontan and include the Bureau of Land Management, U.S. Forest Service, U.S. Fish & Wildlife and Tribal Reservations. The Bureau of Reclamation has turned recreation management of the lands in the region over to Nevada State Parks. Table 2-4 provides a summary of these agencies and the recreational acreage they manage.
### TABLE 2-4

PLANNING REGION I FEDERAL/STATE RECREATIONAL ACREAGE

<table>
<thead>
<tr>
<th>REGION I</th>
<th>BUREAU OF LAND MANAG.</th>
<th>U.S. FOREST SERVICE</th>
<th>U.S. FISH AND WILDLIFE</th>
<th>NEVADA STATE PARKS</th>
<th>NEVADA DEPT. WILDLIFE</th>
<th>TRIBAL LANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson City</td>
<td>2,500</td>
<td>79</td>
<td>2,357</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Churchill</td>
<td>3,380</td>
<td></td>
<td>163,000</td>
<td>7,980</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Douglas</td>
<td></td>
<td>6,065</td>
<td></td>
<td>711</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Lyon</td>
<td></td>
<td></td>
<td>21,603</td>
<td>25,685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washoe</td>
<td></td>
<td>11</td>
<td>173,102</td>
<td>17,018</td>
<td>2,672</td>
<td>112,100</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>5,880</strong></td>
<td><strong>6,155</strong></td>
<td><strong>336,102</strong></td>
<td><strong>49,669</strong></td>
<td><strong>28,357</strong></td>
<td><strong>112,110</strong></td>
</tr>
</tbody>
</table>

Source: SCORP, 1987

Local recreation providers in the region include the cities of Reno, Carson City and Fallon. Typical facilities include swimming pools, ballfields, golf courses and picnic sites. With limited numbers of recreational facilities, local agencies usually try to coordinate their recreational programs with school districts to maximize the use of recreational facilities.

Private recreation suppliers in the region provide activities such as downhill skiing, horseback riding, golfing, softball, water amusement parks and camping. The following table, Table 2-5, indicates the recreational acreage managed and owned by local government and private suppliers.

### TABLE 2-5

PLANNING REGION I PUBLIC/PRIVATE RECREATIONAL ACREAGE

<table>
<thead>
<tr>
<th>REGION I</th>
<th>COUNTIES</th>
<th>CITIES</th>
<th>SCHOOL DISTRICT</th>
<th>PRIVATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson City</td>
<td>543</td>
<td></td>
<td>75</td>
<td>290</td>
</tr>
<tr>
<td>Churchill</td>
<td>177</td>
<td></td>
<td>53</td>
<td>125</td>
</tr>
<tr>
<td>Douglas</td>
<td>698</td>
<td></td>
<td>39</td>
<td>6,254</td>
</tr>
<tr>
<td>Lyon</td>
<td>97</td>
<td></td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Storey</td>
<td>3</td>
<td>1</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Washoe</td>
<td>3,095</td>
<td>1,000</td>
<td>1,212</td>
<td>2,922</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>4,613</strong></td>
<td><strong>1,030</strong></td>
<td><strong>1,412</strong></td>
<td><strong>9,696</strong></td>
</tr>
</tbody>
</table>

Source: SCORP, 1987
D. SUPPLY/DEMAND ANALYSIS

1. SCORP

The 1987 SCORP identifies supply, demand and needs for recreational activities in Planning Region I. Since these figures are compiled for the entire region, it is difficult to isolate the needs for a specific park. Also, because the natural and cultural resources of each park or recreation area differ, activities that may be possible and appropriate in one park may not be in another.

2. PROJECT NUMBERS AND TRENDS

Nevadans in this Region reported that their favorite outdoor recreational activities were lake fishing, swimming, hiking/walking and downhill skiing. (SCORP, 1987)

| TABLE 2-6 |
| REGION I SUMMARY OF SUPPLY, DEMAND AND NEED |
| --- | --- | --- | --- |
| Camping, Tent - Number of Sites |
| Demand | 1781 | 2083 | 2394 | 2724 |
| Supply | 297 | 297 | 297 | 297 |
| Need | 2078 | 1786 | 2097 | 2427 |
| Picnicking - Number of Tables |
| Demand | 1498 | 1732 | 1973 | 2295 |
| Supply | 1457 | 1457 | 1457 | 1457 |
| Need | 41 | 275 | 516 | 772 |
| Hiking/Backpacking combined - Miles of Trails |
| Demand | 517 | 602 | 691 | 784 |
| Supply | 131 | 131 | 131 | 131 |
| Need | 386 | 471 | 560 | 653 |
| Bicycling - Miles of Trail |
| Demand | 487 | 571 | 658 | 750 |
| Supply | 22 | 22 | 22 | 22 |
| Need | 509 | 549 | 636 | 728 |

Source: SCORP, 1987

Table 2-5 indicates activities which would be considered appropriate to Lahontan State Recreation Area for which needs analysis data is available. The table indicates increased needs in all activities with the largest percentage...
need as bicycling trails; only 2.9% will be supplied in relation to demand by the year 2000. By the year 2000, 10.9% of camping sites will be provided and only 16.7% of hiking trails. The category which comes closest to meeting projected needs is picnic sites with 65.3% of demand met by the year 2000.

Although State Parks does not provide swimming pools as part of its recreation program, the region will have a shortfall of these facilities (17.7%) by the year 2000. The inadequate number of pools in this region is partially compensated by the availability of lake swimming at Lake Tahoe and Lake Lahontan.

3. IMPACT ON PARK AND CARRYING CAPACITY

Carrying capacity can be defined as the number of visitors a given resource can accommodate without causing degradation of the resource and without losing the quality of the recreational experience.

Due to the number and sizes of existing beaches there are no areas which are reaching carrying capacity. However, during peak visitation the existing campground can exceed capacity. The addition of developed campsites north of the existing camping loop would be appropriate and should not adversely affect the overall visitor experience. Additional restrooms/showers should be established to help service the number of visitors who prefer to engage in free form camping along beaches.

4. ROLE OF PARK IN CREATING DEMAND

Lahontan State Recreation Area offers several activities included in the 1987 SCORP analysis. These activities include hiking, picnicking and limited tent camping. Opportunities exist for expanding these activities at several locations within the park. Lake fishing is also a very popular activity with visitors and opportunities exist to enhance this activity.

Activities not included in this analysis, though appropriate and provided in the recreation areas include: motorboating; relaxing outdoors; nature study; group picnicking; and pleasure driving. Lack of data in these activities requires that the recreational need for these activities be evaluated through discussion with park staff and visitors. Information provided by the 1988 Park User Survey indicates Lahontan State Recreation Area has helped to meet demand for a number of activities including; hiking, motorboating, lake fishing, picnicking, pleasure driving, photography, nature study, relaxing outdoors, games and vehicle camping.
E. LAND USE TRENDS

1. OWNERSHIP

Lahontan State Recreation Area is not owned by the state of Nevada but is instead leased to the state by the Bureau of Reclamation and is managed by the state for recreation purposes. In addition to this 50 year lease with Bureau of Reclamation another 25 year lease is also in effect with the Bureau of Land Management on Recreation & Public Purposes application lands totaling 960 acres.

The state does own scores of lots which are found predominately in the Silver Springs area. These lots are typically small; most were purchased in the late 70's. Larger tracts of contiguous state ownership resulted from the purchase of adjoining lots. Parcels were purchased to help protect existing roads and access within the park. Only three parcels of land have been purchased in Churchill County. (See Figure 2-1 Ownership/Management)

The recreation area is predominately bordered on the south by public lands managed by the Bureau of Land Management. The land along the recreation area is bordered on the west by private land and the town of Silver Springs. The northern boundary has mixed ownership along its border including the Bureau of Land Management, Bureau of Reclamation and private ownership. Several inholdings are located in the northern portion of the lake and ownership is split between BLM and private ownership. The Lahontan Dam Reclamation Zone is the southeast quarter of Section 33 which surrounds the dam site and the area downstream along the Carson River. This area and in particular the campground is managed by State Parks but with a restricted authority since development in this area is not controlled by the state. (See Figure 2-1 Ownership/Management)

2. LAND USE

Land use in the area surrounding and including the park reflects uses associated with agriculture and federal multiple-use land holdings. Agricultural land uses are found primarily along the Carson River and areas surrounding Fallon northeast of the park. The remaining land is subject to various restrictions associated with federal lands.

A portion of the federal lands which border on the park is dedicated to the Lahontan Herd Management Area. This is located east of the reservoir and includes 11,029 acres of grazing area for wild horses. The reservoir and the Carson River are the only source of water for the wild horses. The boundary
for the HMA is not a legal description but is instead an inexact line that is drawn through the Lahontan Allotment Boundary. (Loomis, 1990) (See Figure 2-1 Ownership/Management)

The latest complete census (entire allotment) was conducted in April, 1989, and documented that a minimum 84% of the wild horses have moved out of the HMA. Many of the horses currently spend all or part of the year outside of the HMA and at times on lands not being administered by the Bureau of Land Management. Since there is no available water within the HMA horses search out water at Lahontan Reservoir and the Carson River. Fencing of the state recreation area has taken into account the need for these wild horses to enter the park. The fencing program calls for large openings within the fence to provide the horses with access.

The herd has been growing at a rate of about 15% and with ideal forage rates could reach 24%. Table 2-7 provides census data on wild horses from 1982 to 1989. (Final Lahontan Herd Management Area Plan, 1991)

**TABLE 2-7**

<table>
<thead>
<tr>
<th>Census Year</th>
<th>Number of Horses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>42</td>
</tr>
<tr>
<td>1984</td>
<td>21</td>
</tr>
<tr>
<td>1986</td>
<td>130</td>
</tr>
<tr>
<td>1987</td>
<td>143</td>
</tr>
<tr>
<td>1988</td>
<td>172</td>
</tr>
<tr>
<td>1989</td>
<td>185</td>
</tr>
</tbody>
</table>

Source: Final Lahontan Herd Management Area Plan, 1991

3. ZONING

The area surrounding the park in Churchill County is primarily zoned R-R for Rural Resource District. This is a broad classification which is defined as all of the unincorporated areas of the county not specifically placed in any other zoning district. It is the intent of this district classification to protect and enhance all natural resources including historical and archaeological sites by limiting, controlling and prohibiting certain use of lands. Permitted uses for this district includes the use of the land for single-family dwellings including mobile homes, farms for the raising of commercial livestock and field crops, buildings
for the sale of products grown or raised on the premises and watershed protection. Other uses are permitted but require special use permits. The issuance of special use permits will be by the planning commission and proposed uses may not be detrimental to those uses currently existing in the planning zone. (Churchill County Planning Commission, 1989)

Another zoning district adjoins the park along the extreme northern boundary. This zoning directly adjoins the park on the north and east of Section 34, Range 26 East, Township 18 North. The area is zoned A-3 for Third Agricultural District. A Third Agricultural District permits the use of the land for single-family dwellings including mobile homes, one guest dwelling, farms for raising livestock and field crops and buildings for the sale of products raised on the premises. The planning commission has the authority to grant special use permits within this zoning district. The district is slightly more restrictive than RR. A-3 regulates front, side and rear yards of buildings. This zoning district will not allow uses such as hazardous manufacturing (acid byproduct, etc.), junkyards, asphalt processing, rifle ranges, airports and race tracks. (Churchill County Planning Commission, 1989) (See Figure 2-2 Land Use/Zoning)

The zoning in Lyon County is somewhat more detailed due to the location of the town of Silver Springs near the lake's western shore. The largest portion of the lake is located within Lyon County with only the northern third of the lake in Churchill County. The predominant class of zoning is RR-4 & 5. Zone RR-4 requires a minimum lot size of 10 acres and includes permitted uses such as single family dwellings, hunting, fishing, game farms, home occupations and farms. Other uses may be allowed through the granting of Special Use Permits. Such special uses include public uses, recreational uses, churches, educational uses, airports, sand & gravel pits, feed lots, campground and commercial kennels. Another major county zone within the area of the park is the RR-5 zone. RR-5 has the same allowed uses as zone RR-4 but requires a minimum lot size of 20 acres. (Lyon County Zoning, 1990)

Several areas of M-1 zoning are located along U.S. Highway 50 and this zoning designation includes more commercial applications. The M-1 zone includes permitted uses such as manufacturing, rebuilding, processing, assembly, etc. The minimum lot size within the M-1 zoning is 7,000 square feet. (Lyon County Zoning, 1990)

The area which surrounds U.S. Highway Alternate 95 through Silver Springs is zoned C-1 & 2. The minimum lot size in C-1 is 5,000 square feet and uses include offices, services, restaurants and retail sales. Zone C-2 includes the
uses permitted in C-1 and in addition includes repair, rental and outside storage. The C-2 zone has no minimum lot size requirements. (Lyon County Zoning, 1990)

A minor planning unit which is located near the lake’s eastern shore is the NR-2 classification. This classification allows uses including single family dwellings, home occupations, residential industry, duplexes, apartments and condominiums. Other allowed uses through Special Use Permits include parks, churches and child care facilities. (Lyon County Zoning, 1990)

Zoning within Churchill and Lyon counties should not have a negative impact on the recreation area. The only area where zoning may become a problem would be in the establishment of commercial sand and gravel pits within the Lyon County RR-4 & 5 zones. Since this use can occur only with the issuance of a Special Use Permits by the planning commission, Nevada State Parks should monitor applications for such activities and protect the lake’s scenic viewsheds.

4. ACCESS/TRANSPORTATION

Access to the recreation area is via U.S. Highway 50 and U.S. Alternate Highway 95. The Silver Springs Beach Complex is reached by taking Alternate 95 south of Silver Springs to Fir Avenue. A main entrance sign and entry station is located approximately 2 miles east of U.S. Alternate 95. Access to the Churchill Beach Complex is via U.S. Highway 50 near the Lahontan Dam. Another major access point is located along U.S. Highway 50 at the North Shore Marina.

Several minor entrances are also located along U.S. Highway 50 at the Overlook, Drum Point and Blackbird Point. Several dirt roads and jeep trails are located throughout the recreation area but can usually be accessed only by 4 wheel drive vehicles. (See Figure 2-3 Access & Circulation)

5. TRAILS

The park has no identified trail system but the long expanses of beaches are used as a trail corridor. Visitors enjoy combing the shoreline as opposed to walking in the desert or on roads away from the lakeshore.
6. UTILITIES

a. Water

Potable water is provided to the park through three main distribution systems. The main source for the Churchill Beach Complex is a series of surface springs which run into a collection basin. The spring water is then pumped into an elevated 100,000 gallon storage tank which provides water pressure for domestic use. This storage tank is located north of U.S. Highway 50 in the extreme northern end of the park. The water flows from this tank to the maintenance area, offices, Beach number one restroom and to the west to North Shore Marina. This water system has been experiencing problems due to the low water levels which are a result of the current four year drought.

The Silver Springs Beach Complex has potable water supplied by two wells which pump into an above ground 100,000 gallon storage tank located near the intersection of Fir Avenue and Tamarack Avenue in the extreme western end of the park and a 2,000 gallon pressure tank at Beach #7.

b. Power

Electricity is generated at the hydroelectric power station near the Lahontan dam and this power is tied into the Sierra Pacific Power grid. Electricity is provided to limited areas of the Churchill Beach Complex, North Shore Marina and Silver Springs Beach Complex.

c. Telephone

Public telephones are available at three locations within the park. One phone is located at the entrance to the Silver Springs Beach Complex near the fee booth. Public phones are also available at Churchill Beach Complex at Beach #1 in the northern portion of the park. The third public phone is located at the North Shore Marina located off of U.S. Highway 50. Telephone service is provided to the Churchill side of the lake by the Churchill County Telephone Company. Service to the Lyon County area is provided by Nevada Bell.

The staff has telephone service at the park offices/maintenance areas and the District office. Telephones are also found at the fee booths and all residences.
d. Sewer

Due to its rural and isolated location the park is not tied into any municipal waste treatment plants. However, the Silver Springs campground is served by a sewage lift station and disposal field. Restrooms include flush, vault (Clivus) and many pit toilets. Recent health codes have precluded the use of the pit toilets which will be taken out of service.
CHAPTER III: THE EXISTING PARK

A. NATURAL RESOURCES

1. PHYSIOGRAPHY/SLOPES

a. Physiographic Features/Geographical Location

The Carson River basin is characterized by contrasting physiographic features. For example, rugged peaks and steep slopes of the Sierra Nevada contrast with the vast, flat playa surface of the Carson Sink; lush vegetated highlands of the Sierra Nevada contrast with barren rocky peaks of the southern Stillwater Range; and the green vegetated floor of the Carson Valley contrasts with the barren, salt-encrusted valley floors of Eightmile and Fourmile Flats in the Carson Desert. (Clancy/Katzer, 1975)

Lahontan Reservoir and the surrounding area is in the northwestern part of the Great Basin. It is essentially the southern part of a northeastward trending intermontane basin that borders the surrounding foothills and mountains.

Most of the area is below an elevation of 4,000 feet. The highest area of interior lowlands is an old delta that borders the area near Lahontan Dam, at an elevation of about 4,100 feet. (SCS, 1975)

A major portion of the reservoir is situated between the Virginia Range to the north and the Dead Camel Mountains to the south. The southern half of the reservoir is situated between the Dead Camel Mountains to the north and the relatively flat land which includes the town of Silver Springs.

The highest elevation within the State Recreation Area is a high point of 4,960 located in the Virginia Range, south of U.S. Highway 50. The low point within the park is a fluctuating figure since the level of the reservoir changes. The all time low for the reservoir was reached in September of 1929 after a prolonged drought. The current five year drought could possibly set new record low levels.

b. Slopes/Aspects

Slopes in the park range from level to very steep depending on their location around the reservoir. The northern and southern ends of the reservoir are both situated in relative flat areas. The
central portions of the reservoir have more relief. This is in evidence especially in the area known as the Narrows. The Narrows is located in the north central portion of the reservoir and is less than a thousand feet in width. The Narrows which resembles a river channel is formed by the steep topography of the Virginia Range to the north and the Dead Camel Mountains to the south. (See Figure 3-1 Slopes)

2. GEOLOGY

Sediments of the Upper Truckee formation constitute the oldest rocks exposed in the vicinity of the reservoir. Prior to deposition of the Truckee formation, the relief of the surrounding basins had a low profile. The Carson Basin was much larger than it is today. Added material for the Truckee formation was provided by the formation of the Sierra Nevada range which provided increased relief.

The area experienced a considerable amount of volcanic activity as evidenced by the many beds in the Truckee formation. These formations are typical of tuffaceous stream lain sediments. The belief among geologist is that the basin floor was much lower during the Tertiary period and the Sierra Nevada had not formed sufficiently to prevent drainage to the ocean.

During the late Pliocene Epoch (Upper Tertiary period), faulting continued and the basins deepened and relief became more prominent. Mafic volcanism began at about the end of the Truckee deposition. The andesitic and/or basaltic lava interfinger with the Truckee in some areas and unconformably overlays the Truckee in others.

In the vicinity of the Lahontan State Recreation Area, these mafic volcanic flows are known as the Buneuj formation. They are the volcanics seen on the mountains surrounding the reservoir and particularly in the area known as the Narrows.

Contemporaneously high-angle normal faulting took place creating new highlands and basins that are generally as we see them today. Both the Truckee and Buneuj formations have been deformed by faulting and tilting.

There were intervals of extensive block faulting and regional uplift during the Pleistocene Epoch (Lower Quaternary period). Drainage to the ocean was blocked and internal basin drainage began. At the end of the basin and range faulting, the relief was much greater than today because
during late Quaternary time, the basins were filled with sediment eroded from the surrounding mountains.

During the Upper Pleistocene Epoch, the Paiute formation was deposited in the canyons and basins. The Paiute formation was during a period of erosion and deposition when there was great relief. As a result, large alluvial fans were formed and coarse grained sediments were deposited around the edges of the basins. In the Carson Basin, these sediments are believed to be deeply buried by the Lahontan sediments. (Waterresource, 1974)

Recent stratigraphic studies indicate that Lake Lahontan occurred 45,000 year before present (B.P.). Research suggest that there were two high-water periods in the last 25,000 years. The first of these high-water periods occurred from 25,000 to 22,000 years B.P., at which time the lake reached an approximate level of 4,362'. The second, maximum high-water period occurred from 13,500 to 11,000 years ago. This second high-water mark was also at a level of 4,362'. From 20,000 to about 15,000 years ago, a moderate high stand filled the lake to 4,132'.

A long dry interval followed when the lake was very low. From 9,000 to 5,000 years B.P., warm arid conditions prevailed, and the lake's level dropped dramatically.

The levels of Lake Lahontan are thought to be closely related to a period of glaciation in the Sierra Nevada. The maximum lake levels occurred during times of minor glaciation and low lake levels during times of extreme glaciation. (Eissmann, 1990)

3. Water Resources

The current topography in the vicinity of the Lahontan State Recreation Area was established, with the exception of greater relief, prior to the deposition of Lahontan sediments. Lahontan sediments in the vicinity of the reservoir should contain sand and gravel and provide a water supply of good quality. (Waterresources, 1974)

a. Watersheds/River Flow

Principal sources of water for the reservoir are the Carson and Truckee River basins (about 3,120 square miles). Both of these rivers originate in the Sierra Nevada Mountains, to the west. The winter snowpack provides the majority of water for both rivers. (See Figure 3-2 Drainage/Vegetation Types & Table 3-1)
<table>
<thead>
<tr>
<th>WATER YEAR (1)</th>
<th>CARSON (RIVER) (2)</th>
<th>TRUCKEE (CANAL) (3)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>136,000</td>
<td>(4) 255,000</td>
<td>391,000</td>
</tr>
<tr>
<td>1965</td>
<td>382,000</td>
<td>244,000</td>
<td>626,000</td>
</tr>
<tr>
<td>1966</td>
<td>171,000</td>
<td>289,000</td>
<td>460,000</td>
</tr>
<tr>
<td>1967</td>
<td>449,000</td>
<td>209,000</td>
<td>658,000</td>
</tr>
<tr>
<td>1968</td>
<td>162,000</td>
<td>114,000</td>
<td>276,000</td>
</tr>
<tr>
<td>1969</td>
<td>561,000</td>
<td>107,000</td>
<td>668,000</td>
</tr>
<tr>
<td>Avg. 1964-69'</td>
<td>310,000</td>
<td>203,000</td>
<td>513,000</td>
</tr>
<tr>
<td>Avg. 1969-69'</td>
<td>252,000</td>
<td>(5) 108,000</td>
<td>(5) 430,000</td>
</tr>
</tbody>
</table>

(1) October 1 to September 30.
(2) Excludes return flow from the Buckland Ditch.
(3) Excluded diversions to KX Lateral Ditch.
(4) First year of measured flow in Truckee canal below turnouts to the River.
(5) Estimated (Lamke, R.D., oral commun., 1970 (Katzer, 1972))

Minor amounts of water are contributed by local rainstorms through surface runoff. The Carson River has no major regulating structures above Lahontan Dam; however, there are numerous irrigation diversions upstream. There are six major impoundments on the Truckee River system upstream from Lahontan Reservoir, used for flood control and storage of water for irrigation and other purposes. In addition, there are several irrigation diversions in the Truckee River basin.

The Carson River system flows northeast from the Sierra Nevada to Lahontan Reservoir, irrigating about 51,000 acres upstream from the reservoir, and then through the Fallon farming area downstream from the reservoir and terminates in the Carson Sink about 20 miles northeast of Fallon. Several small surface-water reservoirs provide about 15,000 acre-feet of storage upstream from the reservoir. The
river is gaged near Fort Churchill, approximately 10 miles upstream from the reservoir, and the flow has averaged about 264,000 acre-feet per year for the past 58 years. (Katzer, 1972)

Mercury, normally a trace constituent of stream waters, is of special concern in the Carson River. Before 1900, about a dozen mills along the river used mercury in the so-called "Washoe Process" for the milling of silver and gold ore from the Comstock Lode. During that time, almost 15 million pounds of the mercury escaped recovery, much of it being incorporated in the mill tailings. Today, downstream from the mill sites, measured concentrations of mercury are as much as 200 times the normal "background" level in shallow, fine-grained sediment from the bottom of streams, canals, and Lahontan Reservoir. The greatest concentrations have been encountered in sediments of the Carson River, within and immediately upstream from the reservoir. (Clancey/Katzer, 1975)

The most recent surface sediment samples were collected from nine transects in Lahontan Reservoir on May 2, 1985. Total mercury concentration ranged from 2.8 to 30.5 µg/g and averaged 15.0 µg/g. Lowest values occurred in "The Narrows" and the maximum concentration was collected from the deep northern arm near the dam. Only those samples collected from the "mercury rich" layer in the river had higher concentrations. Reservoir sediments had a much higher proportion of clays, silts, and organic material than river sediments; many samples had a texture of pudding and smell of hydrogen sulfide.

Previous studies also reported high sediment mercury concentrations within the reservoir. Three samples collected by the U.S. Geological Service in 1972 ranged in concentration from 5.3 to 20 µg/g. Five samples collected by Desert Research Institute in 1980 ranged in concentration from 1.2 to 23 µg/g. The higher concentrations found in the most recent tests (1985) may be attributed to the extremely high 1983 runoff which increased the loading and subsequently the concentration of mercury in the reservoir's sediments.

Mercury levels in the water were relatively low above historic mining sites but relatively high in the river between Dayton and Lahontan Reservoir. At the Weeks testing station, just 7 miles above the reservoir, mercury levels reached a mean of 15.0 µg/g which are similar to the levels entering the reservoir. The Truckee Canal, which enters the northern end of the Lahontan Reservoir, never
carried mercury above the detectable level. (Cooper, Thomas & Reed, 1985)

Lahontan Reservoir is under a Health Advisory issued by the Department of Human Resources, Health Division. This Health Advisory states that a public health problem exists from eating fish from Lahontan Reservoir due to elevated levels of mercury found in gamefish.

The Health Advisory further states:
- No one should eat more than one meal (8 ounces) per month of fish caught in the reservoir.
- No child under age 12 should eat fish from the reservoir.
- Children 12 to 15-years-old should eat no more than one four-ounce meal per month of fish caught in the reservoir.
- Pregnant women, nursing mothers and women who may soon become pregnant should not eat the fish.
- Walleye over 21 inches in length should not be eaten.

Truckee River water is stored in six main reservoirs upstream from the diversion to Lahontan Reservoir and is used to irrigate approximately 23,000 acres. Water is transferred from the Truckee River basin to Lahontan Reservoir in the Carson River basin through the Truckee Canal, which heads at Derby Dam. The inflow to Lahontan Reservoir is measured at a gage on the Truckee Canal near Hazen. There is one diversion from the canal, the KX Lateral, between the gage near Hazen and Lahontan Reservoir. (Katzer, 1972)

b. Impoundments/Water Storage

Lahontan Reservoir is just over 17 miles in length, with a maximum width of 2.1 miles. The reservoir has a maximum surface area of 18.6 square miles, and a maximum shoreline of about 69.5 miles. The reservoir's maximum depth is 85 feet, which occurs near the dam; the mean depth (volume/surface area) is 26.6 feet. The bathometric information is set at the 1917 datum which is in common usage, however, the more accurate 1929 datum is 3.73 feet higher than the 1917 datum. (See Figure 3-3 Bathometric/Hydrology)
<table>
<thead>
<tr>
<th>Sampling Sites (in downstream order) See Figure 3-3</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature (°C)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>27.0</td>
<td>24.0</td>
<td>24.0</td>
<td>22.0</td>
</tr>
<tr>
<td>Average</td>
<td>20.0</td>
<td>18.0</td>
<td>18.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>10.0</td>
<td>12.0</td>
<td>10.0</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>8.6</td>
<td>8.3</td>
<td>8.3</td>
<td>8.6</td>
</tr>
<tr>
<td>Average</td>
<td>7.8</td>
<td>8.0</td>
<td>8.1</td>
<td>7.9</td>
</tr>
<tr>
<td>Minimum</td>
<td>7.5</td>
<td>7.6</td>
<td>7.6</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Dissolved Oxygen (mg/l)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>15.0</td>
<td>9.1</td>
<td>9.7</td>
<td>9.2</td>
</tr>
<tr>
<td>Average</td>
<td>8.2</td>
<td>7.7</td>
<td>7.8</td>
<td>7.7</td>
</tr>
<tr>
<td>Minimum</td>
<td>5.4</td>
<td>6.1</td>
<td>6.4</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Orthophosphate (PO₄, in mg/l)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>0.73</td>
<td>0.85</td>
<td>1.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Average</td>
<td>.42</td>
<td>.49</td>
<td>.52</td>
<td>.88</td>
</tr>
<tr>
<td>Minimum</td>
<td>.28</td>
<td>.20</td>
<td>.20</td>
<td>.30</td>
</tr>
<tr>
<td><strong>Nitrate (NO₃, in mg/l)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>1.2</td>
<td>4.8</td>
<td>4.8</td>
<td>10.0</td>
</tr>
<tr>
<td>Average</td>
<td>.8</td>
<td>1.5</td>
<td>1.8</td>
<td>2.4</td>
</tr>
<tr>
<td>Minimum</td>
<td>.0</td>
<td>.0</td>
<td>.0</td>
<td>.0</td>
</tr>
<tr>
<td>*<em>Dissolved solids <em>(mg/l)</em></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>200.0</td>
<td>233.0</td>
<td>238.0</td>
<td>183.0</td>
</tr>
<tr>
<td>Average</td>
<td>161.0</td>
<td>168.0</td>
<td>167.0</td>
<td>152.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>121.0</td>
<td>129.0</td>
<td>116.0</td>
<td>119.0</td>
</tr>
</tbody>
</table>

Based on samples collected during spring and summer, 1966-69. Samples were collected from a boat, at about 0-1 foot depth.

* residue on evaporation 105°C, in mg/l (Katzer, 1972)

Lahontan Reservoir is a multipurpose reservoir, with uses including irrigation water storage, power generation, and recreation. Its primary function, however, is the storage of irrigation water. This results in a yearly fill-and-release cycle (See Table 3-3). The water
is stored in the winter and spring then released during the summer growing season. These effects are especially pronounced in dry years. (DRI, preliminary)

### Table 3-3

**Yearly High/Low Water Levels**

<table>
<thead>
<tr>
<th></th>
<th>82'</th>
<th>83'</th>
<th>84'</th>
<th>85'</th>
<th>86'</th>
<th>87'</th>
<th>88'</th>
<th>89'</th>
<th>90'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>February</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>March</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>April</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>May</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>June</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>July</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>August</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>September</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>October</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>November</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>December</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- = High water level  □ = Low water level

**Source:** Truckee-Carson Irrigation District, Lahontan Storage

Since the water level within the reservoir fluctuates, there is a point when too little or too much water becomes detrimental to recreation. Based on the observations of park staff, a reservoir water volume of 200,000 acre feet is considered optimum for most recreation. Too little water exposes obstacles which become a problem and too much water results in beach flooding. The past several years have been extremely low as is evidenced by Table 3-4.
TABLE 3-4

HIGH/LOW STORAGE CAPACITY BY YEAR

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HIGH STORAGE (ac ft)</th>
<th>LOW STORAGE (ac ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>300,359</td>
<td>164,062</td>
</tr>
<tr>
<td>1983</td>
<td>307,543</td>
<td>168,545</td>
</tr>
<tr>
<td>1984</td>
<td>265,648</td>
<td>99,561</td>
</tr>
<tr>
<td>1985</td>
<td>276,648</td>
<td>98,469</td>
</tr>
<tr>
<td>1986</td>
<td>310,394</td>
<td>142,006</td>
</tr>
<tr>
<td>1987</td>
<td>288,896</td>
<td>58,465</td>
</tr>
<tr>
<td>1988</td>
<td>178,203</td>
<td>6,012</td>
</tr>
<tr>
<td>1989</td>
<td>214,016</td>
<td>28,215</td>
</tr>
<tr>
<td>1990</td>
<td>208,784</td>
<td>13,575</td>
</tr>
</tbody>
</table>

Obstacles to navigation begin to appear when the reservoir level hits 175,000 acre feet. At 140,000 acre feet significant numbers of obstacles exist. 120,000 acre feet is the minimum necessary for reasonable use of existing boat ramps. Below this level, only very small boats can be launched. Below 90,000 acre feet, virtually no boat use is possible. Table 3-5 provides recreation quality as it relates to reservoir volumes.

TABLE 3-5

RECREATION QUALITY vs RESERVOIR VOLUMES

<table>
<thead>
<tr>
<th>Reservoir Volume</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 290,000 acre ft</td>
<td>FAIR</td>
</tr>
<tr>
<td>200,000 - 290,000 acre ft</td>
<td>OPTIMUM</td>
</tr>
<tr>
<td>175,000 - 200,000 acre ft</td>
<td>GOOD</td>
</tr>
<tr>
<td>140,000 - 175,000 acre ft</td>
<td>FAIR</td>
</tr>
<tr>
<td>120,000 - 140,000 acre ft</td>
<td>POOR</td>
</tr>
<tr>
<td>90,000 - 120,000 acre ft</td>
<td>VERY POOR</td>
</tr>
<tr>
<td>&lt; 90,000 acre ft</td>
<td>UNUSABLE</td>
</tr>
</tbody>
</table>

A major study of the Newland Project was completed in December of 1987. The Final Environmental Impact Statement for the Newlands Project Proposed Operating Criteria and Procedures
(OCAP) provides a selected alternative. OCAP's were designed to maximize use of Carson River flows to satisfy project requirements and minimize diversions from the Truckee River. According to the selected OCAP Alternative E reservoir volumes will be held at 215,000 acre feet from January through June or 6 months. (FEIS, OCAP 1987)

During the remaining months, future water levels are expected to fall below historic levels. This would have the ultimate effect of shortening the average recreation season by up to three weeks.

The current five year drought has had a severe effect on the number of days the reservoir can sustain optimum capacity of 200,000 ac ft or more. (See Graph 3-1)

GRAPH 3-1

DAYS/YEAR RESEVOIR EXCEEDS 200,000 ac. ft. (OPTIMUM LEVELS)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
</tr>
</tbody>
</table>

SOURCE: Truckee-Carson Irrigation District, Lahontan Storage
Although the reservoir capacity is measured in volume, the measurement which most affects recreation is reservoir elevation. The following table, Table 3-6, provides a correlation of water volume in acre feet to actual reservoir elevation. (OCAP, 1987)

**TABLE 3-6**

<table>
<thead>
<tr>
<th>RESERVOIR VOLUME (ACRE FEET)</th>
<th>RESERVOIR ELEVATION (FEET &gt; MSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90,000</td>
<td>4,132</td>
</tr>
<tr>
<td>120,000</td>
<td>4,139</td>
</tr>
<tr>
<td>140,000</td>
<td>4,143</td>
</tr>
<tr>
<td>175,000</td>
<td>4,148</td>
</tr>
<tr>
<td>200,000+ (OPTIMUM)</td>
<td>4,152</td>
</tr>
<tr>
<td>250,000</td>
<td>4,158</td>
</tr>
<tr>
<td>300,000(+ )</td>
<td>4,162</td>
</tr>
</tbody>
</table>

c. Groundwater/Aquifers/Wells/Springs

Construction of Lahontan Dam changed ground water patterns and levels of the surrounding area. As the reservoir filled, water seeped into the ground water system causing a rise in nearby ground water levels. Some water is currently seeping from the reservoir, through the volcanic rocks and sediments that are present in the eastern subsurface of the reservoir, into the ground water supply of the surrounding vicinity.

Ground water levels measured in June, 1970 in the vicinity of the reservoir were all within a few feet of the reservoir surface. These high ground water levels indicate that the reservoir water recharges at least the upper part of the local ground water system. The magnitude of the response of ground water levels to changes in the reservoir levels varies inversely with distance from the reservoir. Direction of flow of underground water is generally toward the Carson Sink. (Resource Management Plan, 1978)
Sediments in the vicinity of the Lahontan Reservoir contain sand and gravel which provide a source of groundwater. The Dead Camel Mountains of the Virginia Range form a restriction in the Carson River drainage. The Dead Camel Mountains are composed of Truckee sediments, overlain with Bunejung volcanics. At the Narrows the volcanics reach the water line of the existing reservoir. Immediately under the Bunejung, the Upper Truckee consists of coarse deposits of sand, gravel, and boulders.

A water supply investigation was completed by Waterresources in 1974 and provided information on six well sites near the Lahontan Reservoir. All test wells yielded water with varying rates and depths. In general, the report found that the development of a brackish groundwater source requires expensive treatment for the northern portions of the recreation area. Areas in the vicinity of the Silver Springs Beach and Bourbon Beach offer excellent groundwater supplies.

Potable water is available within the SRA from two basic sources. The first source is located near Lahontan Dam and consist of three springs which are collected at a single point next to the dam power house. The second source of potable water is located in Silver Springs and is provided by well. Both sources contain separate 100,000 gallon water tanks. (Resource Management Plan, 1978)

d. Water Rights

Nevada State Parks holds a total of six certifications for water appropriation of water rights. This certifications are for underground water rights and include the following certificates with the description of works.

Certificate #10616 (Well #1)
Water is developed in 185 foot well, thence conveyed via a 900 gallon hydropneumatic tank, pump house, 500 feet of 4 inch PVC pipe and 580 feet of 3" PVC water mains. The system services a 28 unit campground consisting of 2 comfort stations, sinks (2), restrooms, showers and eight seasonal trailer sites where the water is used for recreational and domestic purposes.

Certificate #10025 (Well #2)
This system consists of a 400 foot deep well, 10 inch casing, pump and motor controls; 100,000 gallon storage tank; 2
each, booster pumps; 900 gallon hydropneumatic tank, pumphouse, 15,000 feet of water mains. The system services yard areas; three restrooms; ranger residence; park office; a maintenance shop; sanitary disposal stations; fire hydrants; water for turf and trees; a boat launch and day use area consisting of hose bibbs, drinking fountains and beach showers.

Certificate #10026 (Well #3)
This well serves as the backup for the system described in certificate #10025. This system consists of a 120 foot deep well, 8” casing, pump and motor: 220 gallon hydropneumatic tank, 15,000 feet of water mains, pumphouse and pump controls. This system services three restrooms; fire hydrants, a boat launch and day use area consisting of hose bibbs, drinking fountains and beach showers.

Certificate #10024, #10023, #10022
Springs #1, 2# and #3 are integral parts of this water system, which consists of the three springs, a collection box; pump station; pump controls; a 100,000 gallon storage tank and approximately 14,300 feet of water mains. The system services two restrooms, four residences, a maintenance shop, park office, sanitary disposal station, fire hydrant, day use areas, campgrounds and watering turf and trees.

4. VEGETATION

a. Native (LSRA, Resource Management Plan)

The parks native trees are currently being heavily impacted by the current five year drought. Large stands of Cottonwoods and Willows are dead along the reservoir’s shoreline and many other trees are exhibiting signs of extreme stress. The consistently low lake levels have impacted all trees which have not established deep feeder roots.

1. Little Greasewood - Shadescale Association

Found on well drained soils developed from Lahontan sediments, also residual volcanic soils. Soils are sandy loams or silt loams with scattered gravel which are alkaline (ph 9). Shrub coverage is between 5 and 12%.
Sacrobatus baileyi
Atriplex confertifolia
Artemisia spinescens
Sarothamnus lanata
Lycium cooperi
Oryzopsis hymenoides
Sphaeralcea ambigua
Eremothecium alipes
Astragalus spp.
Opuntia pulchella
Dalea polyandenia
Opuntia erinacea
Cryptantha circumscissa
Coltonia nutallii
Gilia leptomeria
Eriogonum vimincum
Glyptopleura marginata
Cleome lutea
Pediodacutus spp.
Cryptantha micrantha
Oenothera clavata
Abronia turbinata
Bromus tectorum
Sphagneticola longirostris
Descurainia spp.
Iva axillaris
Salsola kali
Halocnemon glomeratus

Little Greasewood
Shadscale
Bud sage
Winterfat
Peach thorn
Indian rice grass
Desert globemallow
Hermodium
Locoweed
Pricklypear
Nevada dalea
Hedgehog cactus
Cryptantha
Nuttal
Gilia
Eriogonum
Keysia
Yellow beeplant
Hedgehog
Cryptantha
Brown-eyed primrose
Abronia
Cheatgrass
Twist flower
Tansy mustard
Poverty weed
Russian thistle
Halogeton

2. Dalea Association

Found on light colored, siliceous, aeolian sand with a depth of between 5 and 20 feet. These plants thrive on a pH of 7 - 8 and provide coverage of between 8 - 28%.

Dalea polyadenia
Atriplex canescens
Tetradymia comosa
Tetradymia glabrata
Penstemon acuminatus
Cryptantha circumscissa
Goldenia nuttallii
Gilia leptomeria
Abronia turbinata
Euphorbia ocellata

Dalea
Four-winged saltbrush
Horsebrush
Hairy horsebrush
Penstemon
Cryptantha
Nuttal
Gilia
Sand verbena
Euphorbia
Cryptantha micrantha  
Oenothera deltoides  
Phacelia bicolor  
Eriogonum pusillum  

Purple-rooted forget-me-not  
Dune primrose  
Phacelia  
Eriogonum

3. Big Greasewood Association

These plants occur on soils made up of very fine fractions which vary from silt loams to clays. These soils have a high soluble salt content and have a pH of 8.5 - 9.5. These plants provide from 4 - 24% coverage.

*Sarcobatus vermiculatus*  
*Atriplex lentiformis*  
*Dondia nigra*  
*Distichlis stricta*  

Big Greasewood  
Quailbrush  
Seepweed  
Saltgrass

4. Big Greasewood - Shadscale Association

Occurs between playa communities and upland associations but is not very common. Soils are solonetz with loamy top, low in salts and a pH of 7 in the topsoil and 9 in the subsoils. (Combination of previous associations 1 and 3.)

*Sarcobatus vermiculatus*  
*Atriplex lentiformis*  
*Artemisia spinescens*  
*Atriplex confertifolia*  
*Tetracygium spinosa*  
*Grayia spinosa*  
*Seratoides lanata*  
*Kochia americana*  
*Dondia nigra*  
*Thelypodium sagittatum*  

Big greasewood  
Quailbrush  
Bud sage  
Shadescale  
Cottonhorn horsebrush  
Spiny hopsage  
Winter fat  
Red molly  
Seepweed  
Thelepyodium

5. Rabbitbrush Association

Plant typically found only on well drained or disturbed sites. Not a very common association.

*Chrysothamnus nauseous*  
*Distichlis stricta*  
*Echinopsilon hyssopifolius*  
*Salsola kali*  
*Heliotropium curassavicum*  

Rabbitbrush  
Salt grass  
Echinopsilon  
Russian thistle  
Heliotropium

3 - 15
6. Sagebrush Association

This association replaces the little greasewood - shadescale association above the highest Lahontan beaches on hills. Also some plants are found in flood plains.

*Artemisia tridentata* | Big sagebrush
---|---
*Tetradymia galbrata* | Hairy horsebrush
*Grayia spinosa* | Spiny hopsage
*Chrysothamnus spp.* | Rabbitbrush
*Sitanion hystric* | Squirreltail
*Poa secunda* | Kentucky blue-grass
*Delphinium andersonii* | Larkspur
*Zygodenus venenosus* | Death camas
*Bromus tectorum* | Cheatgrass
*Bromus rubens* | Brome
*Amsinckia tessellata* | Checker fiddleneck
*Collinisa parviflora* | Collinisa
*Mimulus monticoides* | Monkey flower
*Phacelia adenophora* | Phacelia

7. Miscellaneous Native Vegetation

*Allenrolfera occidentalis* | Iodinebrush
*Salicornia rubra* | Samphire
*Puccinella fasciculata* | Alkali grass
*Scirpus americanus* | Bulrush
*Scirpus chilensis* | Bulrush
*Scirpus paludosus* | Bulrush
*Scirpus actus* | Bulrush
*Typha angustifolia* | Cat-tail
*Eleocharis macrostachya* | Spike-rush
*Xanthium spp.* | Cockleburrs
*Populus fremontii* | Cottonwood
*Salix spp.* | Willow
*Rosa woodsii* | Woodrose

b. Introduced

Plants have been introduced onto the site during various facility improvement projects. The actual number of actual plants are unknown due do various projects done at various times and losses of plant materials due to various causes.

*Elaeagnus angustifolia* | Russian Olive
*Populus fremontii* | Freemont Cottonwood
*Robinia pseudoaccacia* | Black Locust
Ulmus pumila  Siberian elm
Cornus stolonifera  Red twig dogwood
Prunus pumila besseyi  Sand cherry
Ribes aureum  Golden currant
Crataegus phaemopyrum  Washington hawthorne
Gleditsia triacanthus inermis  Thornless honeylocust
Rosa rugosa  Ramanas rose
Purshia tridentata  Bitterbrush
Ephedra nevadensis  Ephedra

c. Uncommon, Sensitive or Endangered

There are no known plants which are rare, threatened or endangered located within the park boundaries. (NV Natural Heritage Program, 1991)

d. Communities/Location of Vegetative Types

The park has several broad categories of vegetative types which correspond directly to their location in respect to water. The first type found within the reservoir itself are primarily algae and other plants which thrive in water. The next type is found immediately adjacent to the water. These plants are located and thrive in areas which are subject to controlled inundation. In conjunction with this category is the vegetation which occurs in areas which are designated as intermittent lake. These two areas are the lowest areas and are always found directly adjacent to existing water. Low areas which are essentially devoid of any vegetation are natural beaches and dry alkali lake beds which are found throughout the park.

Another broad location category is wooded areas which occur within lands that are subject to controlled inundation. Tree and other shrubs grow in these areas which are essentially low and provide sporadic wet dry cycles.

The next vegetative types are the woods or brushwood areas which are not subject to flooding. These areas occur primarily along the Carson River and the shores of the reservoir where adequate water is available.

The largest vegetation type is located at all higher elevations and which depends on annual rainfall for growth. This area is dominated by high desert plants such as sage. (See Figure 3-2, Drainage/Vegetation Types)
5. SOILS

a. Description

A complete soil survey for Lyon County has been published and soil surveys have been published for the Fallon-Fernley area but this survey does not include the entire park. Another survey is presently under production for Churchill County which will provide coverage of the entire park. Advance unpublished data was incorporated into the soils map and provides a complete survey of existing soils.

The soil association which is dominant in the northeastern portion of the park is the Biddleman-Bango-Stumble association. This association is found on nearly level to strongly sloping, well-drained and somewhat excessively drained areas. The association consists of moderately coarse textured and coarse textured soils on high terraces and alluvial fans with elevations ranging from 3,800 to 5,000 feet. The soils of this association are used mainly for grazing and for food and cover for wildlife. Bango and Stumble soils are suitable for irrigation if water is available. The substratum of the Biddleman soils is a source of gravel. (SCS, 1975)

The areas which surround the "Narrows" portion of the reservoir consists of the Theon-Singatse-Mirkwood association of soils. These soils are considered a minor association due to the limited size of coverage within the park. This association is located on strongly sloping to very steep slopes. They are typically shallow, well drained and somewhat excessively drained soils. The association is found on hills and low mountains. The Theon soils are dominantly gravelly and stony, medium and moderately coarse textured within the surface layer. The subsoil which is over bedrock are very gravelly and moderately textured. The Singatse soils are dominantly very gravelly, moderately coarse textured material over bedrock. Mirkwood soils have a very cobbly and extremely stony, moderately coarse textured surface layer. This subsoil is typically found over bedrock. This unit is used for livestock grazing and rangeland wildlife habitat. The main limitations are the low average annual precipitation, very low available water capacity and very shallow rooting depth for vegetation.

Another major association is located in the southern portion of the park. The Patna-Hough-Rusty association is found on nearly level to moderately steep slopes. The association includes very deep, well drained, and somewhat excessively drained soils. They are found on dunes, high lake terraces and lake plains. The Patna soils are dominantly coarse textured surface layer and moderately coarse textured to coarse textured subsoil.
The Hough soils consists of a dominantly coarse textured surface layer, moderately fine textured subsoil, and coarse textured substratum. Rusty soils have a coarse textured surface layer and a medium or moderately fine textured subsoil over stratified coarse to medium textured lake sediments. This unit is moderately suited to homesite development. The main limitation is the instability of excavations. The Patna and Hough soils may have inadequate filtration capacity for septic tank effluent.

The extreme southeastern portion of the park is dominated by the Lahontan-Orizaba-Wabuska association which is found on nearly level areas on lake plains and alluvial flats. They are affected by salt and alkali and are subject to rare periods of flooding. The soils are somewhat poorly drained. The Lahontan soils are on old lake plains and are textured throughout the profile. The Orizaba soils are on alluvial flats and old lake plains. These soils are dominantly stratified and moderately fine to coarse textured. The Wabuska soils are on alluvial flats and are dominantly stratified and medium textured to coarse textured throughout the profile. This unit is used for livestock grazing and rangeland wildlife habitat.

The association found on both sides of the Carson River is the Dithod-East Fork-Fallon. This association is found on nearly level slopes in flood plains and low stream terraces. The soils are very deep and are somewhat poorly drained soils. Some areas are subject to rare or occasional periods of flooding. Diathod soils are stratified and moderately fine textured to coarse textured throughout the profile. East-Fork soils are on alluvial flats, flood plains and low cut stream-cut terraces. These soils are dominantly moderately fine textured and have a dark colored surface layer. The Fallon soils are located on low stream terraces and are dominantly stratified and medium textured to coarse textured throughout the profile. The unit is used mainly as irrigated cropland and pasture and for homesite development and wetland wildlife habitat. (SCS, 1981)

b. Soil Limitations & Constraints

The soils of the survey area are rated in Table 3-1 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope and texture of surface layer. Susceptibility to flooding is considered. In the table the degree of soil limitation is expressed as slight, moderate or severe. Slight means the soils are generally favorable and limitations are easily overcome. Moderate means that limitations can be overcome or alleviated by
<table>
<thead>
<tr>
<th>Soil Name &amp; Symbol</th>
<th>Camp Areas</th>
<th>Picnic Areas</th>
<th>Play Areas</th>
<th>Paths Trails</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rusty (601,603)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Isolode (661,662)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Patna (516,517)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fallon (291)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Fallon (294)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Hough (361)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Dithod (264,266)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Wabuska (724)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>East Fork (272)</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>East Fork (275)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Dia (254)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Orizaba (481,484)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Lahontan (401)</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Delp (233)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Pizene (524)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Pirouette (792,200,201,202)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Malpais (751)</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Rawe (551)</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Patna (514,517)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wabuska (724)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Bango (BK,220)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Biddleman (BM,210)</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Tipperary (TPB)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Alluvial (Ad)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Sagouspe (Sb)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Appians (AR)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Badlands (BA)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Hawsley-Gamgee (143)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Playas (826)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Shaded areas represent severe limitations to development
Slight Limitations = 1 / Moderate Limitations = 2 / Severe Limitations = 3

Source: Churchill & Lyon County SCS Soil Surveys
planning, design or special maintenance. Severe means that soils are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use or by a combination of these measures. (See Figure 3-4 Soils Composite)

The recreation components of Table 3-7 are defined by the Soil Conservation Service and include various types of recreation activities and facilities.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry, are free of flooding during the season of use; do not have slopes or stones that greatly increase the cost of leveling sites or of building access roads.

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Sand beaches which follow the shore of the reservoir provide excellent recreational opportunities which are not included in a soil survey. The beaches which are by definition shifting sand do not lend themselves to a high degree of development. This soil type includes Isolde (661) and Tipperary (TnC) which are highly sandy and occur along the lakeshore.

A main limitation for soils in the park is erosion. Lahontan State Recreation Area experiences moderate problems with erosion along roadways of the park and along the shorelines of the reservoir. These problems are further complicated by intense summer thunderstorms. The erosion along roadways occurs as a result of runoff from the pavement. The sandy soil is often completely washed out from under the road. The dirt roads at the park are frequently lined with gullies as a result of precipitation runoff. The sandy soils leading to the reservoir are easily eroded by running water. Gullies three feet in depth are not uncommon after a severe storm. The sandy shores of the reservoir are subject to slumping and erosion from wave action. (LSRA, Resource Management Plan, 1978)
6. Wildlife

The following list is presented as a compilation of species which may be found within the park area. Some species are year round residents, while others may be seen on a seasonal basis. Mammal, amphibian, and reptile species are categorized by order.

This list is constantly being updated as sightings occur.

a. Mammals

Yuma myotis
California myotis
Silver-haired bat
Western pipistrel
Hoary bat
Long-eared bat
Pallid bat
Mexican freetail bat
Small-footed myotis
Raccoon
Longtail weasel
Badger
Spotted skunk
Stripted skunk
Coyote
Kit fox
Bobcat
Townsend ground squirrel
Whitetail antelope squirrel
Beechey ground squirrel
Valley pocket gopher
Little pocket mouse
Longtail pocket mouse
Pale kangaroo mouse
Ord kangaroo rat
Desert kangaroo rat
Merriam kangaroo rat
Chisel-toothed kangaroo rat
Beaver
Western harvest mouse
South. Grasshopper mouse

Myotis yumanensis
Myotis californicus
Lasionycteris noctivagans
Pipistrellus hesperus
Lasiurus cinereus
Myotis subulatus
Antrozous pallidus
Tadarida brasiliensis
Myotis subulatus
Procyon
Mustela frenata
Taxidea taxus
Spilogale putorius
Mephitis meohitis
Canis latrans
Vulpes macrotis
Lynx rufus
Spermophilus townsendi
Ammospermophilus leucurus
Spermophilus beecheyi
Thomomys bottae
Perognathus longimembris
Perognathus formosus
Microdipodops pallidus
Dipodomys ordi
Dipodomys deserti
Dipodomys merriami
Dipodomys microps
Castor canadensis
Reithrodontomys megalotis
Onychomys torridus
Deer mouse
Desert woodrat
Bushytail woodrat
Sagebrush vole
Musk rat
House mouse
Porcupine
Blacktail jackrabbit
Mountain cottontail
Mule deer

Peromyscus maniculatus
Neotoma lepida
Neotoma cinerea
Lagurus curtatus
Ondatra zibethica
Mus musculus
Erethizon dorsatum
Lepus californicus
Sylvilagus nutalli
Odocoileus hemionus

b. Birds

Common loon
Eared grebe
Horned grebe
Western grebe
Pied-billed grebe
White Pelican
Double-crested cormorant
Great blue heron
Black-crowned night heron
Common egret
Snowy egret
Least Bittern
American bittern
Whistling swan
Canada goose
Snow goose
Mallard
Gadwall
Pintail
Cinnamon teal
Green-winged teal
Blue-winged teal
American widgeon
Shoveler
Wood duck
Redhead
Ring-necked duck
Canvasback
Lesser scaup
Common goldeneye
Bufflehead

Gavia immer
Podiceps nigricollis
Podiceps auritus
Aechmophorus occidentalis
Podilymbus podiceps
Pelecanus erythrorhynchos
Phalacrocorax auritus
Ardea herodias
Nycticorax nycticorax
Casmerodius albus
Egretta thula
Ixobrychus exilis
Botaurus lentiginosus
Olor columbianus
Branta canadensis
Chen caerulescens
Anas platyrhynchos
Anas strepera
Anas acuta
Anas cyanoptera
Anas crecca carolinensis
Anas discors
Anas americana
Anas clypeata
Aix sponsa
Aythya americana
Aythya collaris
Aythya valisineria
Aythya affinis
Bucephala clangula
Bucephala albeola
Greater scaup
White-winged scoter
Ruddy duck
Hooded merganser
Common merganser
Red-breasted merganser
Turkey vulture
Sharp-shinned hawk
Copper's hawk
Red-tailed hawk
Swainson's hawk
Rough-legged hawk
Ferruginous hawk
Marsh hawk
Prairie falcon
Peregrine falcon
Sparrow hawk
Golden hawk
Bald eagle
California quail
Ring-necked pheasant
Chukar partridge
Sora
Common gallinule
American coot
Killdeer
Black-bellied plover
Common snipe
Willet
Greater yellowlegs
Lesser yellowlegs
Long-billed dowitcher
Marbled godwit
American coot
Black-necked stilt
Northern phalarope
Sandpiper
California gull
Ring-billed gull
Forster's tern
Domestic pigeon
Mourning dove
Barn owl
Great horned owl

Aythya marila
Melanitta deglandi
Oxyura jamaicensis
Lophodytes cucullatus
Mergus merganser
Mergus serrator
Cathartes aura
Accipiter striatus
Accipiter cooperii
Buteo jamaicensis
Buteo swainsoni
Buteo lagopus
Buteo regalis
Circus cyaneus
Falco mexicanus
Falco peregrinus
Falco sparverius
Aquila chrysaetos
Haliaeetus leucophalus
Lophortyx californicus
Phasianus colchicus
Alectoris chukar
Porzana carolina
Gallinula chloropus
Fulica americana
Charidrius vociferus
Pluvialis squatarola
Cappella gallinago
Catoptrophus semipalmatus
Tringa melanoleuca
Tringa flavipes
Limnodromus scolopaceus
Limosa fedoa
Recurvirostra americana
Himantopus mexicanus
Lobipes lobatus
Calidris spp.
Larus californicus
Larus delawarensis
Sterna forsteri
Columba livia
Zenaida macroura
Tyto alba
Bubo virginianus
Pygmy owl  Glaucidium gnoma
Short-eared owl  Asio flammeus
Burrowing owl  Speotyto cunicularia
Poor-will  Phalaenoptilus nuttallii
Common nighthawk  Chordeiles minor
Rufous hummingbird  Selasphorus rufus
Belted kingfisher  Megaceryle alcyon
Common flicker  Colaptes auratus
Downy woodpecker  Dendrocopos pubescens
Hairy woodpecker  Dendrocopos villosus
Yellow-bellied sapsucker  Sphyrapicus varius
Red-shafted flicker  Colaptes cafer
Western kingbird  Tyrannus verticalis
Say’s phoebe  Sayornis saya
Gray flycatcher  Empidonax wrightii
Horned lark  Eremophila alpestris
Tree swallow  Iridoprocne bicolor
Barn swallow  Hirundo rustica
Cliff swallow  Petrochelidon pyrrhonata
Bank swallow  Riparia riparia
Scrub jay  Aphelocoma coerulescens
Common crow  Corvus brachyrhynchos
Common raven  Corvus corax
Black-billed magpie  Pica pica
Mountain chickadee  Parus gambeli
Bewick’s wren  Thryomanes berwickii
Canyon wren  Catherpes mexicanus
House wren  Troglodytes aedon
Sage thrasher  Oreoscoptes montanus
Robin  Turdus migratorius
Mountain bluebird  Sialia currucoides
Western bluebird  Sialia mexicana
Blue-gray Gnatcatcher  Polioptila caerulea
Ruby-crowned kinglet  Regulus calendula
Cedar waxwing  Bombycilla garrulus
Loggerhead shrike  Lanius ludovicianus
Starling  Sturnus vulgaris
Audubon’s warbler  Dendroica auduboni
House sparrow  Passer domesticus
Western meadowlark  Stenella neglecta
Yellow-headed blackbird  Xanthocephalus xanthocephalus
Red-winged blackbird  Agelaius phoeniceus
Brewer’s blackbird  Euphagus cyanocephalus
Bullock’s Oriole  Icterus bullockii
Brown-headed cowbird  Molothrus ater
Western tanager  Piranga ludoviciana
Lesser goldfinch  Spinus psaltria
American goldfinch  Spinus tristis
Rufous-sided towhee  Pipilo erythrophthalmus
House finch  Carpodacus mexicanus
Savannah sparrow  Passerella sandwichensis
Black-throated sparrow  Amphispiza bilineata
Sage Sparrow  Amphispiza belli
Dark-eyed junco  Junco hyemalis oreganus
Brewer's sparrow  Spizella breweri
Golden-crowned sparrow  Zonotrichia atricapilla
White-crowned sparrow  Zonotrichia leucophrys
Fox sparrow  Passerella iliaca
Song sparrow  Melospiza melodia

c. Reptiles, Amphibians & Snakes
Zebra-tailed lizard  Callisaurus draconoides
Collared lizard  Crotaphytus collaris
Long-nosed leopard lizard  Crotaphytus w. wislizenii
Yellow-backed spiny lizard  Sceloporus magister uniformis
Great Basin fence lizard  Sceloporus occidentalis biseriatus
Northern desert horned lizard  Phrynosoma platyrhinos p.
Northern side-blotched lizard  Uta stansburiana s.
Great Basin whiptail  Cnemidophorus tigris tigris
Sagebrush lizard  Sceloporus graciosus
Desert spiny lizard  Sceloporus magister
Red racer  Masticophis flagellum piceus
Desert striped whipsnake  Masticophis taeniatus t.
Mojave patch-nosed snake  Salvadoria hexalepis mojavensis
Great Basin gopher snake  Pituophis melanoleucus deserticola
Western long-nosed snake  Rhinocelis lecontei lecontei
Wandering garter snake  Thamnophis elegans vagrans
Western ground snake  Sonora semiannulata
Desert night snake  Hypsiglena torquata deserticola
Great Basin rattlesnake  Crotalus viridis lutrosus
Common king snake  Campropeltis getulus
Bullfrog  Rana catesbeiana
Leopard frog  Rana pipiens

d. Fish
brown trout  Salmo trutta
rainbow trout
   - Salmo gairdneri
   - Cyprinus carpio

Lahontan redside shiner
Sacramento blackfish
speckled dace
tui chub
mountain sucker
Tahoe sucker
mosquito fish
yellow perch
walleye
black bullhead
brown bullhead
channel catfish
white catfish
bluegill
green sunfish
largemouth bass
Sacramento perch
white crappie
white bass
striped bass
   - Richardsonius egregius
   - Orthodon microlepidotus
   - Rhinicythys osulius
   - Siphateles bicolor
   - Pentosteus platyrhynchus
   - Catostomus tahoensis
   - Gambusia affinis
   - Perca flavescens
   - Stizostedion vitreum
   - Ictalurus melas
   - Ictalurus nebulosus
   - Ictalurus punctatus
   - Ictalurus catus
   - Lepomis macrochirus
   - Lepomis cyanellus
   - Micropterus salmoides
   - Archoplites interruptus
   - Pomoxis annularis
   - Morone chrysops
   - Morone saxatilis

e. Rare and Threatened

The park contains only one rare, threatened, or endangered species of flora or fauna. The Yellow-billed cuckoo (Coccyzus americanus occidentalis) has been sighted near the outlet of the Carson River at the southern end of Lahontan Reservoir. The last sighting was in 1988 and this is the only location in Nevada where this bird has been recorded. The species is a Category II and is being considered by the federal government for listing as endangered species. The reservoir is also the site for migration of all types of waterfowl and raptors including the bald eagle. (Nevada Natural Heritage Program Database, 1991)

f. Habitat

The park provides excellent habitat for many mammal and bird species with abundant availability of water and food. A variety of habitats exist from open desert to moderately dense woods. The size and relative remoteness of the park offers migrating birds good habitat and an abundant food source.
7. Climate

a. Temperature

The park is located in a semi-arid climate characterized as a mid-latitude steppe. This mid-latitude steppe encompasses more than half of the state. The temperature is continental, the winter months average above freezing and the summers are warm to hot. As in many desert areas the effects of radiational cooling are great due to the lack of clouds through most of the year.

Although the area does not experience four very distinct seasons, it does offer more variety than areas in the extreme southern tip of the state. The greatest range in high/low temperatures occur during the summer months (May through August) and average a differential of 29.1 degrees. Table 3-8 presents the most recent monthly averages as well as historic averages by month.

<table>
<thead>
<tr>
<th></th>
<th>AVERAGE TEMPERATURES*</th>
<th>1989-90 TEMPERATURES*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>January</td>
<td>45.3</td>
<td>23.0</td>
</tr>
<tr>
<td>February</td>
<td>50.9</td>
<td>27.7</td>
</tr>
<tr>
<td>March</td>
<td>56.2</td>
<td>31.8</td>
</tr>
<tr>
<td>April</td>
<td>54.1</td>
<td>37.9</td>
</tr>
<tr>
<td>May</td>
<td>73.7</td>
<td>46.4</td>
</tr>
<tr>
<td>June</td>
<td>83.2</td>
<td>54.7</td>
</tr>
<tr>
<td>July</td>
<td>93.0</td>
<td>62.4</td>
</tr>
<tr>
<td>August</td>
<td>91.0</td>
<td>60.5</td>
</tr>
<tr>
<td>September</td>
<td>81.8</td>
<td>52.0</td>
</tr>
<tr>
<td>October</td>
<td>70.0</td>
<td>41.9</td>
</tr>
<tr>
<td>November</td>
<td>55.1</td>
<td>31.2</td>
</tr>
<tr>
<td>December</td>
<td>46.4</td>
<td>24.2</td>
</tr>
<tr>
<td>ANNUAL</td>
<td>67.7</td>
<td>41.1</td>
</tr>
</tbody>
</table>

[* all temperatures degrees F measured at Lahontan Dam / DRI, 1991]
[ Extremes for 55 year record: High/110/1930 Low/-17/1937]
b. Precipitation

Rainfall within the park is slight which is typical of most high desert areas. The entire state is located within the rain shadow of the Sierra Nevada range, which claims most of the moisture as storms pass from west to east. The majority of precipitation falls during the summer and winter months (See Table 3-9). Winter precipitation is occasionally in the form of snow which sometimes exceed several inches.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>AVERAGE PRECIP.* 1951 - 1985</th>
<th>AVERAGE SNOWFALL* 1951 - 1985</th>
<th>1989 - 90 PRECIP.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>.46</td>
<td>3.1</td>
<td>.13</td>
</tr>
<tr>
<td>February</td>
<td>.39</td>
<td>1.2</td>
<td>1.07</td>
</tr>
<tr>
<td>March</td>
<td>.31</td>
<td>1.6</td>
<td>.46</td>
</tr>
<tr>
<td>April</td>
<td>.32</td>
<td>0.3</td>
<td>.06</td>
</tr>
<tr>
<td>May</td>
<td>.54</td>
<td>0.2</td>
<td>1.08</td>
</tr>
<tr>
<td>June</td>
<td>.46</td>
<td></td>
<td>.31</td>
</tr>
<tr>
<td>July</td>
<td>.24</td>
<td></td>
<td>.11</td>
</tr>
<tr>
<td>August</td>
<td>.40</td>
<td></td>
<td>.54</td>
</tr>
<tr>
<td>September</td>
<td>.28</td>
<td>T</td>
<td>.92</td>
</tr>
<tr>
<td>October</td>
<td>.26</td>
<td>T</td>
<td>.29</td>
</tr>
<tr>
<td>November</td>
<td>.45</td>
<td>.04</td>
<td>.17</td>
</tr>
<tr>
<td>December</td>
<td>.38</td>
<td>1.7</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**TOTALS:** 4.49 6.5 5.14

[* all precip./snowfall measured in inches at Lahontan Dam] [T = Trace amounts]
[ Extreme for 55 years of record: 10.92 inches/1983]
SOURCE: Western Climate Center, DRI, 1991

The average annual precipitation at Lahontan Dam is 4.49 inches based on 35 years of Western Climate Center & U.S. Weather Bureau records. The highest amount of precipitation occurred in 1983 with a total of 10.92 inches. (DRI, 1991)
c. Sunshine

The park receives full sun an average of 77% of the time. Summer days exhibit a higher amount of solar radiation which in part is due to the length of days. The sparse cloud cover and higher elevation combine to give the area more sunshine than is typically found at similar latitudes. (Houghton, Sakamoto, Gifford, 1975)

d. Wind

Surface winds in Nevada are governed primarily by the prevailing storm tracts and the basin-range topography. The prevailing winds for the park are northerly and northwesterly.

The diurnal effects of wind result in calm morning winds with winds strengthening in the afternoon. This is typical to most valleys in Nevada with upslope heated air in the day and downslope movement of air at night.

Records from 1945-1977 at the nearby Naval Air Station in Fallon, Nevada, show windspeeds varying between 4 MPH and 62 MPH. Prevailing winds are from the south during the fall and winter, and from the west or north during the spring and summer months. Sudden strong windstorms are common in the spring and early fall, and "dust devils" occur frequently in the summer. (DRI, 1983)

e. Evaporation

The mean annual evaporation for the 16 years prior to 1950 was about 74 inches, determined by a standard floating pan at Lahontan Dam. The annual average evaporation from a BPI (Bureau of Plant Industry) pan set in the ground at the Agricultural Experimental Station near Fallon from 1908 to 1916 was 64 inches; this is equivalent to a free-water evaporation of 58 inches. (DRI, 1983)

f. Electrical Storms

Although infrequent, powerful thunderstorms may occur within the park. These storm are typically of a very short duration. Tornados and funnel clouds are possible but are very rare and no known sightings exist.
8. Air Quality

a. Existing

Lahontan State Recreation Area is located at the boundary of two Air Quality Control Regions (AQCR's). The reservoir is located at the eastern edge of AQCR 148 and western edge of AQCR 147. One of the monitoring stations within AQCR 147 is located in Fallon and is the closest testing site to the park. The monitoring site is located on the roof of the Churchill County Telephone Company's Office. The Fallon area is surrounded on all sides by farming operations. During the spring and fall, fields are being worked which tends to increase particulate levels as more bare ground is exposed and traveled on. The residential areas are characterized by good ground cover and paved roads. The roads surrounding the park are in most cases not paved and as such provide some particulate pollution.

In 1987 the maximum particulate measured in Fallon over a 24 hour period was 137 μg/m³. The number of annual samples were 31 and none were over the Nevada or Federal standards. (Nevada Bureau of Air Quality, 1988)

b. Projected

Increasingly stringent permitting by Nevada and the Federal government should help to control any future sources of pollution. The park is located within an attainment area in accordance with the 1977 Clean Air Act Amendments (Section 107). The nearest nonattainment area is Carson Desert for nonattainment in suspended particulate. (Nevada Bureau of Air Quality, 1988)

9. Perceptual

a. Scenic Attributes

The expansive size of the park offers a variety of scenic views. The predominate viewsheds are wide open vistas of the reservoir and high mountain desert. These views are found on all beaches in both the northern and southern portions of the park. Certain inaccessible parts of the park provide vistas which incorporate all portions of the reservoir and park.
The Narrows portion of the reservoir which joins the northern and southern portions of the reservoir provides interesting canyon like views. The Narrows provides very lineal views along its entire length. The steep slopes to either side provide a sense of enclosure which is not experienced in other parts of the park.

b. Location and Direction of Views

The Lahontan Dam and ancillary structures are visible from most locations in the northern reaches of the park. The dam structure and in particular the intake tower and Truckee Canal outlet are interesting in design and are considered visual assets.

The southern portion which surrounds the Carson River provides views of wooded areas which provide a broad background for views. The beaches on the western shore of the reservoir have expansive views of the Dead Camel Mountains and the Virginia Range.

Views throughout the park are enhanced depending on the sun’s angle. Late afternoon and early morning typically provide the most color and contrast.

c. Significant Areas Outside Park Boundaries

There are no significant scenic areas outside the park’s boundary. The reservoir provides the focal point for all views in the surrounding area.

d. Sounds, Smells, and Sources

Most recreation areas of the park are located away from main highways and the noise of passing car and trucks does not present a problem. One area which is affected by highway noise is the boat launch area at the North Shore Marina.

The park is not located under a direct flight path but the location of the Naval Air Station at Fallon does account for some low level jet exercises. The sounds of airplanes are only heard on a sporadic basis.

Since the reservoir is drained down on an annual basis there can be a musky smell right after the water recedes but this occurs after the primary use season is over.
e. Spatial Patterns

Since day use occurs primarily along reservoir beaches the visitor
experiences wide open expanse with little enclosure. Existing and
planted trees do provide some degree of enclosure but these areas
are primarily located along the shoreline.

The Narrows provides a sense of enclosure due to the steep
surrounding slopes to either side and the narrow passage which is
created.

B. CULTURAL RESOURCES

1. Archaeological

In 1914 a major portion of the Carson drainage system was dammed to
create the Lahontan Reservoir as part of the Newlands Project. Several
archaeological sites which were situated on the banks of the Carson
River, were recently reestablished when the water in the reservoir was
low.

The most dramatic feature of the archaeology in this area is the abun-
dance of rock art sites along the former river channel. Like those on the
Truckee River, several of these sites are located at low elevations on the
river terrace. Other rock art sites are located at extremely high eleva-
tions, providing excellent overlooks of the river channel.

A pit-and-groove petroglyph site composed of rock art boulders with
moifs on the top and sides is located high in the Dead Camel Mountains
at approximately 4,800'. The site has a commanding view of the
surrounding terrain and as such was probably used during antelope
hunts.

Another similar site is at an elevation of 4,500' overlooking the former
river channel. This site consists of several pit-and-groove rock art
boulders associated with several stone circles.

A University of California Archaeological Survey Team, in 1974, discov-
ered a site consisting of faceted rock art located on the east side of a
narrow draw. Although no artifacts were found at the above sites, the
extreme weathering and smooth rounded surfaces suggest great antiqutiy.
South of these sites on the western terrace of the reservoir, several tufa boulders are situated with pecked glyphs in curvilinear abstract and representational styles. A fish motif on one panel is unique to the area.

Directly across the river channel from this site are a series of rock art boulders on a basalt covered slope. The glyphs are curvilinear abstract and pit-and-groove; they have been subjected to severe vandalism.

Of the recorded rock art sites in the Lahontan reservoir area, 80% are of the pit-and-groove or faceted styles, presumably the most ancient of the Great Basin rock art traditions.

Twelve archaeologic sites have been located along the east and west shores of the reservoir and four others were noted with no collections made. Of all the sites which were located only the rock art which featured a fish motif was considered for National Register nomination. (Cultural Resource Series #5, 1982 : IMACS Site Study, 1991)

2. Historical

a. Structures and Buildings

Lahontan State Recreation Area contains several elements of the historic Newlands project which was started in 1903. The Lahontan Dam and the Powerhouse are both on the National Register of Historic Places as historic structures. The two structures were officially accepted onto the list on March 25, 1981.

1. Lahontan Dam

The Lahontan Dam is an earthen dam 120' high with an overall length of 5,400 feet. The main embankment, built in the bed of the Carson River, has a crest length of approximately 1,300 feet including an overflow spillway crest 250 feet in length at each end. The spillway steps down with the terrain, curves and converges on a circular pool 220 feet in diameter. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three quarters of a mile. The cross section of the dam has a top width of 20 feet and a maximum base width of 660 feet. The upstream slope is 3 to 1 while the downstream slope is 2 to 1 broken 12 feet above the spillway pool wall by a circular berm 10 feet in width. The 12 foot roadway at the top of the dam is carried across each spillway by means of a
five-span continuous reinforced concrete arches with 50-foot spans and 5-foot rises. A concrete railing guards the roadway and carries electric wire conduits for lighting the dam, gatehouse and roadway. (National Register, 1981)

The outlet tower is a massive reinforced concrete structure in which are set 12 gates at two different elevations. Water from Lahontan Reservoir, which has an active capacity of 295,000 acre-feet, is let into the central chambers for discharge into the spillway pool via a 9-foot diameter conduit controlled by a hydraulically balanced cylindrical valve at the bottom of the tower. A six and a half foot diameter steel penstock, also controlled by a cylindrical valve, carries water to the power plant. A concrete penstock and separate outlet at the left or north side of the dam was abandoned in 1924. All of the gates in the tower are controlled by hydraulic oil pressure provided by an electrically operated pump. Access to the gatehouse is by means of a suspension footbridge extending from the top of the dam. (National Register, 1981)
2. Powerhouse

The powerhouse is a rectangular stone and concrete structure containing three generators with a combined capacity of 1,920 kilowatts. The fall from the Truckee Canal, which terminates at Lahontan Dam, was first utilized for hydro-electric generation at the powerhouse. This installation provided power for much of the dam construction (1911-1915). Since completion of the dam, the turbines driving the generators have been supplied by means of the steel penstock from the outlet tower in addition to the penstock from the Truckee Canal. A new power plant was built in 1987 and continues to supply electric power to the surrounding area.

The Lahontan Dam and powerplant retains its original appearance, having undergone only minor modifications since its construction. (National Register, 1981)

b. Historic Trails

Two major historic routes are found along the north and south boundary of LSRA (See Figure 2-3 Circulation/Access). The route which passes along the northern boundary is known as the California Emigrant Trail (Carson River Route) and roughly follows the existing alignment of U.S. Highway 50. The trail extended to the east to Ragtown and to the west to Stockton Wells. The Carson River Route had differing alignments depending on the year and the individuals using it. Leaving Ragtown, the emigrants traveled up the river a few miles and then made a detour to avoid a difficult canyon which is now called the Narrows. The remains of Haws Station is on this detour and the trail leading to the river. Haws Station was named after Bert Haws, the proprietor. The stone walls of the station can still be seen along the north side of U.S. Highway 50. Haws Station was one of the earliest stations along the emigrant trail. A historical marker has been placed at the station (C.R.R. Marker #11) another historical trail marker (C.R.R. Marker #10, Lahontan) is located approximately 4 or 5 mile east of Haws Station. This marker was placed to identify an excellent one mile section of the emigrant trail as it leads southwest. (Nevada Place Names, 1974) (Nevada Historical Sites, 1965) (Nevada Emigrant Trail, 1975)
Near the river, at the end of this Haws Station detour, was later built Williams Station. Williams Station was established in 1859 on the north bank of the Carson River, as a facility for trading with westbound emigrants. The station was named for three brothers, James, Oscar and David Williams. It became well-known as the site where, on May 7, 1860, some white men were murdered by Paiute Indians in retaliation for kidnapping one or more Indian women. The station was burned to the ground. The killings resulted in a civilian army being raised and marched to Pyramid Lake where the volunteer army was badly defeated. After the Pyramid Lake Indian War another station, Honey Lake Smiths, was built a short distance from the original Williams Station in 1861. Smith was originally from Honey Lake, California. Mark Twain described his arrival at this way station, where he had to remain for eight days because the Carson River flooded. Smith operated the station for several years, until the construction of the Central Pacific Railroad and the use of other trails caused it to fall into disuse. Williams Station and Honey Lake Smiths are now submerged by the water of the Lahontan Reservoir. The remains for these stations are still in evidence during low water years when the reservoir is drawn down. (Nevada Places and Names, 1974) (Nevada Historical Sites, 1965)

The second major route passed along the south of the existing Lahontan Reservoir. The route is known as the famous Pony Express and Overland Stage Route. The trail led eastward to Carson Sink Station and westward to Buckland Station until Fort Churchill was built in the summer of 1860. Two stations are known to exist along this stretch of the Pony Express and Overland Stage Routes. Desert Station is located 12 miles east of Highway 95 alternate and recently the site was excavated by archaeologists from the University of Nevada, Reno. The station was built as a Pony Express stop in the early 1860's. This station, constructed by Bolivan Roberts, has been frequently confused with another station located approximately one mile away know as Hooten Wells. Hooten Wells is located on a slight detour which was used by the Overland Stage Line. (Nevada Historical Sites, 1965) (Pony Express in Nevada, 1990)

C. COMPOSITE SITE ANALYSIS

The Composite Site Analysis indicates the constraints and opportunities available within the park. This analysis identifies areas which offer good views,
points of interest and recreational opportunities. Potential recreation areas are also highlighted in this analysis. (See Figure 3-5 Composite Site Analysis)

Several recreational opportunities can be identified from this composite information. In the Churchill Beach Complex, a potential exist for some type of camping facilities along beach 10 which would provide boat access to campers. The beach is protected from the prevailing summer winds and would make a good mooring area for campers to leave their boats overnight. Camping at beach 10 would present a few problems including the need for electricity and water. Water could be provided from a potable well located nearby but some method would be needed to pump this water. The nearest available electricity is in close proximity but these lines are high tension and providing transformers to bring the current down to domestic needs would be cost prohibitive. Electricity from other parts of the park would have to travel approximately four miles and again this would be a costly proposition. Two possibilities would be the use of a gas powered pump which could pump water to elevated holding tanks or the use of new solar pump technology.

Beach 7 at Churchill is also a potential location for a campground; restroom facilities are presently located there. This area would share all the same problems found at beach 10 but would not provide the advantage of protected moorings.

Beach 1 is a prime use area for the Churchill Beach side of the reservoir and as such the improvement of the beach may be appropriate to encourage swimmer use. The amount of group day use activity may warrant the construction of a group use shelter at beach 1. Beach 3 is best of the beaches in the area but it is not located in direct proximity to the bathrooms and group use area.

The potential need exists for a low water boat launch within the northern end of the park at Churchill Beach. This may present competition to any potential concessionaire at the North Shore Marina and the site location may be a problem due to prevailing winds. However, deep water access is good at this location which could keep a ramp open even during low water periods.

The Dam Overlook provided the initial access to the reservoir and facilities in this area, especially the restrooms, are in poor condition. The dump station is not in a well used area. Closure of both these facilities and simplification of the this area may be the most appropriate use. However, day use and fishing access are appropriate uses for this area and the construction of a new restroom may be warranted. The Overlook area also provides a possible location for a low water boat launching ramp. The area is located next to the deepest water and as such has a relatively steep drop off.
The opportunity exists within the Narrows portion of the park to establish a boat-in campground in this location. This would provide boaters with primitive camping directly from their boat and provide a different, more intimate camping experience than is provided in the wide open areas of the park.

The North Shore Marina, Drum Point, Blackbird Point, and Virginia Beach are all accessed directly off of U.S. Highway 50. These areas are, with the exception of the North Shore Marina, undeveloped and primarily used for fishing and day use access. Virginia Beach provides day use and also primitive overnight camping. These areas provide adequate day use, overnight and fishing access.

The most recent master plan called for an elaborate marina facility at the North Shore Marina. The need as indicated in chapter two still exists, however, a scaled down facility may be more appropriate. This facility should at a minimum provide boat slips and a fuel dock. Future plans could include a full RV campground at the adjacent Drum Point and a small restaurant. The drought conditions will make attracting an elaborate facility difficult but a small operation should be able to get started and grow as conditions warrant.

The Silver Springs Beach Complex provides the balance of all other facilities for the park. The campground at beach 7-9 is adequate at the present time and the present design allows for future expansion to the north. The infrastructure is in place making it the most economic location for expansions. Previous plans called for establishment of a campground at beach 4 but this would include additional cost for bringing utilities to the area. Another problem with this location is that the development would have to occur in the open sage areas above the beach, away from the existing trees which are in the floodplain. If camping were to be proposed a possibility would be to provide a combination of primitive campsites near the beach with bathrooms and showers located outside the floodplain.

The last area to be considered is on the south shore of the reservoir. This backcountry area has no developed facilities but access is marked and signed for use. The size, location and nature of the area makes it a difficult problem for management by park staff. Although access should not be closed to the public, additional facilities or road improvement would only tend to increase usage. The area will tie directly into Question 5 land acquisitions along the Carson River. This area could be incorporated as a buffer/protective zone or natural area for the river corridor which will be planned in the future.

The Composite Site Analysis map indicates several constraints which need to be incorporated into the planning process. The map indicates two pool elevations, the higher one with a pool elevation of 250,000 ac ft is the optimum
level for all types of lake activities; anything over 290,000 ac ft increases beach flooding. At 90,000 ac ft the reservoir becomes unusable by boaters and large mud flats separate the water from established beaches. The mapping also provides a composite of the limitations provided by soil types and slope. The map only indicates areas which will provide severe limitations to most types of development. Although this does not preclude development in those areas, costly mitigation may be required for certain types of development.

D. EXISTING FACILITIES AND USE

The existing facilities at Lahontan State Recreation Area consists of two developed campgrounds, two developed picnic areas, group use areas, beach areas, trailer dump stations and restrooms. The park also contains staff facilities such as fee booths, maintenance shops/yards, offices and staff residences. (See Figure 3-6 Utilities/Facilities; Figure 3-7 Detail Plan A, Churchill Beach Complex; Figure 3-8 Detail Plan B, Silver Spring Beach Complex)

1. CAMPING

The camping facilities are located in two locations with a total of 41 developed campsites and 1,800 undeveloped campsites. The 41 sites are primarily located near Beach 7 at Silver Springs and include water, 28 paved designated spaces, grills and picnic tables. Restrooms and showers are located within the campground and are handicap accessible.

The other developed campsite area is located in the Churchill Beach Complex. This area is known as the Riverside Camp and is located along the Carson River just downstream of the dam site. The Riverside Camp is not actually part of the Lahontan State Recreation Area it is contained within the 1/4 section which is the Lahontan Dam Reclamation Zone. The 12 campsites were constructed by the Civilian Conservation Corps (CCC) in 1935. The CCC work is still in evidence primarily in the rock wall which was constructed along the river bank. A small foot bridge over a drainage way provides access to a portable vault restroom. The area although part of the Reclamation Zone is managed by NDSP.

The 1,800 undeveloped campsites were derived by the maximum camping load to use the facilities in a one day period. Most are situated on or adjacent to the 23 naturally occurring beaches along the lakeshore. These sites are not established with fixed sites and none have facilities other than toilets.
2. DAY USE/PICNICKING

Day use areas are predominately located along the lakeshore and share many of the 23 beaches utilized for informal campsites. The beach areas are located predominately in two areas of the park. The total number of picnic sites/tables in the park is 150 distributed primarily in these same two areas.

The first area is known as Churchill Beach which contains 11 separate beach areas along the northeast shore of the reservoir. Beach 1 provides the most comprehensive facilities including restrooms (6), picnic sites and handicap access. The remainder of the beaches along this shoreline are less developed with some composting and pit toilets but no developed picnic sites.

The second major day use area is located on the southern shore of the reservoir near Silver Springs. The Silver Springs Beach Complex includes 12 separate beach areas. The only developed picnic facilities occur at Beach 3 and include picnic tables, restrooms and handicap access. A boat launch ramp and parking area is located just south of the day use area of Beach 3. The remaining beach areas are undeveloped with some pit toilets and no developed picnic sites.

Virginia Beach has a day use beach which is located on the north shore of the reservoir west of the Narrows. This beach has direct access to U.S. Highway 50 and is not associated with either the Churchill or Silver Springs Beach Complexes.

Six Mile Beach is located on the south shore of the reservoir east of the Narrows. This is not a major day use area and has only limited road access through Churchill Beach.

Day use activities include swimming, unstructured play, sunbathing, fishing, boating, jet skiing, parasailing, wind surfing, walking and picnicking. Shallow access craft such as jet skis and boats are very popular and tie in strongly with beach use and activities. Boats are restricted to a maximum speed of 5 MPH within 100 feet of swimmers or swim beaches.

3. GROUP DAY USE/PICNICKING

The park has two locations for group day use, but none of the locations include a shelter structure. The group use site at Beach 1 in the Churchill Beach Complex is the largest and contains 8 picnic tables and
3 grills on a single slab. The group use area is located near the restroom and has paved parking and a public telephone.

The second group day use area is located at Beach 3 in the Silver Spring Beach Complex and consists of 5 tables and grills on a single slab. Paved parking and restrooms are available nearby.

4. PARK OFFICE

The park office is located in the northern portion of the park near the dam site, and adjacent to the maintenance facilities. The District III headquarters is also located within the park. The park has 23,832 square feet of enclosed buildings of various types from housing to storage sheds.

5. RANGER RESIDENCE

There are a total of four residences located in the northern portion of the park including three park staff residences and one residence used by Truckee Carson Irrigation District staff. An additional three staff residences are located in the southern portion of park in Silver Springs on Green Street. These staff structures consist of one modular home and two mobile homes. A seasonal camp area is located near the park boundary in the vicinity of the Beach 7 campground at Silver Springs. A kitchen/dining room and restroom are located within the seasonal structure.

6. MAINTENANCE SHOP

The park maintenance shop is located just off U.S. Highway 50 adjacent to the park office. In addition to the shop a large fenced maintenance yard is located adjacent to the shop.

A second park maintenance shop is located at Silver Springs on Tamarack Ave. This maintenance shop and yard provides service to the Silver Springs Beach Complex and areas to the south.

7. HISTORICAL STRUCTURES & RUINS

The Lahontan Dam and powerhouse are both on the National Register of Historic Places. The ruins of a ranch or way station is located along the Carson River channel but is typically covered by the reservoir's waters except in times of extreme low water. Some ruins of the old town of Lahontan are located across U.S. Highway 50 from the dam.
8. **ROADWAYS**

The park contains a total of 40 miles of roads including paved and unpaved. Paved and graded roads constitute approximately 17.5 miles of the total. A graded gravel road provides access from Highway 50 to the entry station. The paved road extends from the entry station to Beach 1 and on to Beach 5. The access road from Beach 5 to Beach 11 is a graded gravel road. The remaining roads in this area are unpaved and under varying degrees of improvement.

The Silver Springs Beach Complex has a paved road which provides access from Fir Street to the boat ramp and Beach 3. The paving also extends out to Beach 7 Campground. All other roads in the area are unpaved and are of varying degrees of improvement.

The North Shore Marina is fully paved with direct access from U.S. Highway 50. Other use areas such as Virginia Beach, Blackbird Point, Drum Point and other undeveloped beaches are served by unimproved dirt roads.

The park maintains two entry stations one at the Silver Springs and one at the entrance to the Churchill Beach Complex.

9. **BOAT LAUNCHES**

The North Shore Marina is located along U.S. Highway 50 southwest of the dam site. The marina contains a two lane boat launching ramp with a movable dock for access at different reservoir levels. It also provides paved parking, restroom facilities, an information structure and a public telephone.

The other developed boat ramp is located near Beach 3 in Silver Springs. This boat launch ramp has three lanes and a movable dock for access at different reservoir levels.

An undeveloped boat ramp is located within the Overlook area north of the dam and is used primarily by commercial fisherman. Shallow draft boat are also launched throughout the park along beaches. The Virginia Beach area has an appropriate slope and is considered one of the best areas for beach launching.
10. FISHING/HUNTING

The reservoir provides fishing access to the public along all of the accessible shoreline. A fishing guide brochure has been produced by the Nevada Department of Wildlife which gives locations and dates to fish for White Bass, Walleye, White Crappie and Catfish. Most fishing areas are away from established day use beaches.

Hunting is allowed within the park only during established seasons and with shotguns only. Hunting activities must conform to Nevada Department of Wildlife regulations.

11. UTILITIES

a. Water

Potable water is provided to the park through three main distribution systems. The main source for the Churchill Beach area is comprised of three surface springs which run into a collection basin. The spring water is then pumped into an elevated storage tank which provides water pressure for domestic use. This storage tank is located north of U.S. Highway 50 in the extreme northern end of the park. The water flows from this tank to the maintenance area, office, North Shore Marina and as far as the Beach 1 restroom and trailer dump station. This water system has been experiencing problems due to the low water levels which are a result of the current five year drought.

The Silver Springs Beach area has potable water supplied by two wells, one of which pumps into an above ground 100,000 gallon storage tank located near the intersection of Fir Avenue and Tamarack Avenue in the extreme western end of the park. The second well is pumped into a hydro-pneumatic tank located near Beach 7.

b. Public Telephones

Public telephones are located throughout the park at most heavy use areas. A telephone is located at the restroom near Churchill Beach 1 and at the North Shore Marina off of U.S. Highway 50. The Silver Springs area is serviced by a public telephone which is located near the entry station and one at the restroom/shower building at Beach 3. A temporary pedestal is provided in the day use area.
c. Comfort Stations

Restrooms are located throughout the park and include 9 flush, 3 composting and 36 pit toilets. The Churchill Beach Complex has several restrooms buildings including one at Beach 1, 7-8, 10-11 and all have an information kiosk. The remaining areas are serviced by many pit toilets located throughout. The following table, Table 3-10, details the number, type and location of restrooms/toilets at LSRA.

### TABLE 3-10

<table>
<thead>
<tr>
<th>LOCATION:</th>
<th>#</th>
<th>TYPE:</th>
<th>LOCATION:</th>
<th>#</th>
<th>TYPE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS Beach 3</td>
<td>5</td>
<td>Pit</td>
<td>C Beach 5</td>
<td>2</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Beach 3</td>
<td>1</td>
<td></td>
<td>C Beach 6</td>
<td>2</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Beach 4</td>
<td>1</td>
<td>Pit</td>
<td>C Beach 9</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Beach 5</td>
<td>2</td>
<td>Pit</td>
<td>6 Mile Beach</td>
<td>2</td>
<td>Pit</td>
</tr>
<tr>
<td>S Beach 6</td>
<td>1</td>
<td>Pit</td>
<td>Dam River Camp</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SS Beach 7</td>
<td>1</td>
<td></td>
<td>C Beach 10</td>
<td>1</td>
<td>△△</td>
</tr>
<tr>
<td>SS Beach 7</td>
<td>2</td>
<td>△</td>
<td>C Beach 7</td>
<td>1</td>
<td>△△</td>
</tr>
<tr>
<td>SS Beach 8</td>
<td>2</td>
<td>Pit</td>
<td>Dam Overlook</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SS Beach 9</td>
<td>3</td>
<td>Pit</td>
<td>Dam Gravel Pit</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Beach 10</td>
<td>2</td>
<td>Pit</td>
<td>Drum Pt.</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Beach 11</td>
<td>1</td>
<td>Pit</td>
<td>Blackbird Pt.</td>
<td>2</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Day Use</td>
<td>2</td>
<td>△</td>
<td>Virginia Beach</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>SS Boat Ramp</td>
<td>1</td>
<td>△</td>
<td>C Beach 11</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>C Beach 1</td>
<td>1</td>
<td>△</td>
<td>Dam Fisherman Bank</td>
<td>1</td>
<td>Pit</td>
</tr>
<tr>
<td>C Beach 2</td>
<td>1</td>
<td>Pit</td>
<td>Dam Office/Shop</td>
<td>1</td>
<td>△△</td>
</tr>
<tr>
<td>C Beach 3</td>
<td>2</td>
<td>Pit</td>
<td>Overlook</td>
<td>1</td>
<td>△△</td>
</tr>
<tr>
<td>C Beach 4</td>
<td>2</td>
<td>Pit</td>
<td>N. Shore Marina</td>
<td>1</td>
<td>△△</td>
</tr>
</tbody>
</table>

**SYMBOLS KEY:**
- SS = Silver Springs
- = (1X1) Flush
- △ = Single Flush
- △△ = (3X4) Shower
- △△△ = (1X1) Composting Clivirus
The North Shore Marina has one restroom structure with potable water available. The Silver Springs Beach Complex is serviced by a restroom building at the boat ramp, (2) at day use, (2) restrooms within the campground and restroom/shower buildings at Beach 7 and 3.

d. Showers
The park has a total of 3 shower facilities two at Silver Springs and one at the Overlook. The Silver Springs facilities are located near the camping area at Beach 7 and 3. The only other shower facility is located at the Overlook near U.S. Highway 50.

e. Dump Stations
Three trailer dump stations are located throughout the park. Two sites are available in the northeast part at the park. One is located near U.S. Highway 50 at the entrance to the dam site and the other is located near Beach 1 at Churchill Beach. The third dumpstation is located just north of the entry station at Silver Springs.

12. STATISTICS

During 1990 Lahontan State Recreation Area was visited by 258,691 visitors. This visitation represents a decrease of 5.8% over 1989 which had a visitor count of 274,483. The average visitation over the past nine years is 360,586 making visitation in 1990 well below average.

Although the park is located in a region which has a rapidly growing population visitation has not increased. The average visitation over the past nine years is somewhat misleading since the average of the best years is 449,388. 1987 had a visitor total of 435,569 and one year later the total was only 236,901 which was a year to year decrease of 45%. There is one main reason for this abrupt loss of visitation and that is the current drought which is affecting the western states. The dramatic drop in visitation rates can be attributed directly to the reduced water levels the reservoir and the number of days these levels were maintained. Graph 3-2 correlates this information by displaying yearly visitation along with the days the reservoir has been kept at optimum recreation levels. Optimum recreation levels start at around 200,000 ac ft or higher. The graph shows a distinct trend of low visitation corresponding to a low number of days at optimum levels.
The years 1982 through 1987 had an adequate number of days averaging about 218 days in which the reservoir was able to maintain an optimum levels. This corresponds to a high visitation rate averaging 410,000 ± visitors. In 1988 the reservoir never reached it's optimum level
and this lack of water corresponds with an all time low visitation rate of 230,000±. The last two years of the graph, 1989 and 1990 correspond strongly with fluctuations in visitation rates. It is expected that 1991 may be the lowest of all yearly visitation rates due to a lack of sustainable water levels.

The reservoir does not reach and is not allowed to stay at usable levels for the same length of time as in the mid 1980's. The drought severely reduces the number of days in which the reservoir is kept at both its optimum level or minimum (120,000 ac ft) level which is judged to be the minimum amount for intensive recreation use. Although Graph 3-2 was done using optimum levels, the use of good (175,000 - 200,000 ac ft) and fair water levels (140,000 - 175,000 ac ft) should yield similar results.

Based on a model established in the Amended Environmental Assessment for OCAP, a one percent decrease in reservoir content results in an approximate 0.7 percent decrease in visitation. (AEA, 1987)

Camping figures are also down for 1990 from 66,951 in 1989 to 54,466 in 1990, a decrease of 18.6% (See Table 3-11). The largest decrease in camper days was the North Shore Marina with a drop of 67.3% from 1989 to 1990. This drop in camping at the marina can be directly attributed to reduced launches at the ramps.

Boat launching is only down .1% park wide but this is a misleading figure. The number of launchings at the North Shore (Cove) Marina was down 32% while the launchings at Virginia Beach were up a considerable 127%. These two percentages point out two things which are symptomatic of drought conditions. The paved launching ramps at the North Shore (Cove) Marina are designed to launch boats at varying water levels but becomes useless once the water has receded past the toe of the ramps. The significant increase of launchings at Virginia Beach is due to the natural beach which will allow visitors to launch small boats after fixed ramps are closed. Table 3-9 provides the percentage of change for various areas of the park from 1989 to 1990. (NDSP, Visitation Summary, 1990)

The park has two entry stations which provide fairly accurate visitor counts. Information from areas which are not subject to counting at the entry stations are compiled by park staff using various methods.
### TABLE 3-11

**LAHONTAN SRA VISITATION SUMMARY**

<table>
<thead>
<tr>
<th>Total Visitors:</th>
<th>1990</th>
<th>1989</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lahontan SRA</td>
<td>258,691</td>
<td>274,483</td>
<td>-5.8%</td>
</tr>
<tr>
<td>Dam (Churchill)</td>
<td>55,032</td>
<td>58,925</td>
<td>-6.6%</td>
</tr>
<tr>
<td>North Shore Marina</td>
<td>48,533</td>
<td>58,251</td>
<td>-16.7%</td>
</tr>
<tr>
<td>Overlook (Dam)</td>
<td>27,207</td>
<td>26,871</td>
<td>1.3%</td>
</tr>
<tr>
<td>Remote (Beaches)</td>
<td>2,839</td>
<td>3,421</td>
<td>-17.0%</td>
</tr>
<tr>
<td>Silver Springs</td>
<td>122,598</td>
<td>123,929</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Virginia Beach</td>
<td>2,482</td>
<td>3,086</td>
<td>-19.6%</td>
</tr>
</tbody>
</table>

**CAMPER DAYS**

| Lahontan SRA        | 54,466 | 66,951  | -18.6% |
| Dam (Churchill)     | 5,363  | 6,055   | -11.4% |
| North Shore Marina  | 632    | 1,932   | -67.3% |
| Overlook (Dam)      | 387    | 819     | -52.7% |
| Remote (Beaches)    | 894    | 1,460   | -38.8% |
| Silver Springs      | 122,598 | 123,929 | -1.1%  |
| Virginia Beach      | 1,139  | 574     | 98.4%  |

**BOATS LAUNCHED**

| Lahontan SRA        | 11,159 | 11,172  | -0.1%   |
| Dam (Churchill)     | 779    | 711     | 9.6%    |
| North Shore Marina  | 831    | 1,234   | -32.7%  |
| Overlook (Dam)      | 169    | 158     | 7.0%    |
| Remote (Beaches)    | 118    | 212     | -44.3%  |
| Silver Springs      | 8,942  | 8,716   | 2.6%    |
| Virginia Beach      | 320    | 141     | 127.0%  |

Source: NDSP, 1991

A survey of monthly visitation covering the years 1985 through 1987 provides percentages broken down into months. Monthly visitation at the park is strongest in the month of July with 20.25% of the total yearly visitation. The other warm weather months accounted for most of the remaining visitation: May (17.1%), June (18.5%) and August (16.0%).

3 - 49
Together these four months account for 71.8% of all yearly park visitation. The season with the lowest visitation rates are in the winter with January (1.7%) being the lowest month of visitation. (System Plan, 1991)

Daily visitation distribution indicates that, as expected, weekend usage is by far the highest at 44%. Saturday and Sunday are equal in visitor usage with each accounting for 22%. Mid-week, Wednesday, has the lowest percentage of visitor use 8.7%. (System Plan, 1991)
CHAPTER IV: DEVELOPMENT PLAN

A. PROCESS

Chapter IV completes the development planning process by bringing together all the information that has been gathered. This information has been analyzed and applied directly to specific development plans. The initial development plan alternatives were produced so that the widest range of options could be considered before the park staff developed the recommended development plan.

1. ALTERNATIVES

The general planning process followed throughout this update was outlined in Chapter I, Introduction. At each step in the process, new information and input helped direct the plan to the next step. Predetermined criteria formed the basis of evaluation at each step insuring an orderly process. The following paragraphs provide more detail and insight into the planning effort. For a complete summary of public comments received throughout the process, see Appendix 1.

The first two of four public workshops were held in Fallon on June 24th, 1991 and Silver Springs on June 25th, 1991. These workshops started an intensive phase of the planning process. Although attendance at the Fallon workshop was low, the individuals that did attend provided direction to the planning staff. The Silver Springs meeting was well attended and several important development issues were voiced by the public. A resource analysis was presented and a discussion of the future direction of the park took place. Several themes were repeated throughout both workshops including: removal of navigational obstacles; improved park signage; improved navigational markers; road paving; and camping expansions.

With this information, staff comments and solicited written comments, staff evaluated suggestions for the park and started to generate alternatives. The alternatives provide a means of looking at park development from several points of view. Since none of the alternatives are mutually exclusive, the production of several alternatives often generate ideas that could be incorporated into the recommended plan.

The three alternatives represent several levels of development for the park. All alternatives were generated with a concern for resource conservation and an improved visitor experience. Appendix 2 contains a complete summary of the alternatives.
The lowest degree of development is contained within Alternative 1 and the greatest amount of development is found in Alternative 3. The degree of development influences the amount of impact new facilities and additional activities will have on the park.

All three of the alternatives strive to allow the public ease of access to and from the park. The three alternatives all share common general concerns including: improvement on the use of navigational nautical markers on the reservoir; removal of obstacles to navigation (tree stumps); acquisition of additional water rights; the building of a low water boat ramp at the Overlook and improvements to park signage.

All three of the alternatives also include the acquisition of private inholding and property that is within critical viewsheds. Protection and preservation of the natural Carson River corridor/flood plain was also considered in all three alternatives.

In addition to public concerns, each alternative addresses concerns and issues of the park staff. The revamping of the Churchill water system and elimination of all restrooms that do not meet health and building codes were considered important to park staff.

These issues and concerns are elements that should be addressed despite the selected alternative. The elements not common to all three were then identified in the respective individual alternatives. (See Appendix 2, Alternatives) All three alternatives were presented to the public at the last two of four workshops for the park. These workshops were conducted on August 26th, 1991 in Silver Springs and in Fallon on August 27th, 1991.

The public and staff review of these three alternatives resulted in the production of a Proposed Plan. After discussions at the workshops, written comments and staff discussions, it was determined that a variation of Alternative 3 would best represent the recreational needs and development requirements for the park. This alternative became the basis for the Proposed Plan. The Proposed Plan (Appendix 3) is the last avenue for public comments and is typically the last step before the production of the Recommended Plan.

2. PLAN CONCEPT

Lake level permitting, Lahontan State Recreation Area offers visitors excellent water based recreational activities including: water skiing, swimming, boating, fishing and jet skiing. In addition the park also offers
overnight and day use facilities. Continuation and expansion of these recreational opportunities comprises the basis for the recommended plan concept.

The park also offers an "oasis" like experience within a desert. The protection of this resource is a primary objective of State Parks. Resource conservation, habitat conservation, safety and increased water access are all elements that will be appropriate to a concept of broad recreational activities and conservation from the most passive to the more demanding recreational activities.

3. RECREATION PROGRAM / PROGRAM RELATIONSHIPS

The recreational program (activities) and issues proposed by this plan for Lahontan State Recreation Area are based on the natural resources found at the park and the recreation needs of visitors. A complete listing of these program elements are found in the following table (Table 4-1). These program elements represent the widest possible range.

| TABLE 4-1 |
| PRIMARY PROGRAM ELEMENTS |

**GENERAL**
- Coordinate and support Nevada Division of Wildlife buoy plan.
- Provide a beacon light at all developed boat ramps.
- Build a fish cleaning station at all developed boat ramps.
- Improve on the use of navigational & nautical markers within the reservoir and around boat ramps.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights for the park.
- Eliminate all old restrooms that do not meet health or building codes and provide new facilities.
- Acquire private inholdings and land within critical viewsheds.
- Protect and preserve the natural Carson River corridor and floodplain above the reservoir.
- Improve wetlands/lake habitats and manage for hunting and fishing.
- Improve and increase the amount of park signage.
- Confine jet skiers to specific beaches.
- Provide equestrian parking area and trails.
- Develop a vegetation management plan.
- Improve road alignments at the Silver Springs Beach Complex.
CHURCHILL AREA
- Revamp the Churchill Beach water system.
- Replace staff residence (#3) near dam.
- Remodel existing park office/maintenance facilities at the damsite and develop new district office/maintenance facility.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Replace old restroom facilities at the Overlook with new facilities.
- Establish an interpretive area to inform the public about the lake, dam, fishing and the Newlands Project.
- Pave the road from U.S. Highway 50 to the Carson River Bridge within the Churchill Beach Complex and extend paving from Beach #5 to Beach #10.
- Establish a primitive "boat-in" campground along the Narrows.
  > Establish five primitive sites near Rattlesnake Point.
  > Provide campsite fire rings and trash receptacles for each site.
  > Restroom facilities (i.e. chemical toilets with a maintenance program or other acceptable facility).
- Establish a new boating oriented campground at Horseman's Point (Beach #10).
  > Construct a new restroom/shower facility to service the campground.
  > Provide water to 25 campsites (no utility hook ups).
  > Each site would have fire rings and trash receptacles.
  > Numbered boat mooring buoys corresponding to 10 lakeside campsites.
  > Handicap access will be provided to campground facilities.
  > Pave the road from Beach #5 to new campground.
  > Provide telephone service to Horseman's Point.
- Establish a group use structure at Beach #1 within the Churchill Beach Complex.
- Provide a new restroom/shower at Beach #2 (or at Beach #3,4 or 5), contingent on the availability of adequate water.
- Establish a concessionaire marina and facilities at the North Shore Marina.
  > Provide a phased development plan that would include but not limited to boat moorings, fuel dock, grocery store, restaurant and boat rentals.
- Establish an RV campground at Drum Point with full utility hook-ups (or) establish a State Parks campground at Drum Point if concessionaire campground is not built.
- Provide picnic tables for primitive camping beaches.

SILVER SPRINGS AREA
- Make use of the separate lane at the Silver Spring's fee booth for visitors who have season passes.
Expand the existing trailer dump station at Silver Springs.
- Build a new restroom/shower facility for primitive (free form) camping along Silver Springs Beach #4.
- Pave or improve gravel road to Silver Springs Beach #4 and/or all the way to Beach 10#.
- Provide picnic tables for primitive camping beaches.
- Build a group use structure in the Silver Spring's day use area.
  - Redesign the existing access to day use area.
- Provide an interpretive kiosk at Fisherman's Point.
- Convert two existing restrooms at existing campground (3X3) to handicap accessible shower/restroom combos (2X2X2).
- Build a new 25 campsite loop north of the existing loop in Silver Springs.
  - Existing restrooms/shower in place.
  - Provide freeze-proof water spigots.
  - Each site would have fire rings and trash receptacles.
  - Provide handicap access.
  - Provide telephone service to the campground.
- Provide a survey of park boundaries and establish fencing in key areas around Silver Springs and the Carson River.
- Expand Silver Springs boat ramp to four lanes serviced by three docks.
- Replace staff residences #1 and #2 at Silver Springs.

The program elements are interrelated to the resources and to one another. Before these program elements are physically located onto the site they must first be analyzed to decide how they interrelate despite site constraints and conflicts (See Figure 4-1 Program Relationship Diagrams). Once these relationships are studied the next step is to place the program elements onto the site in relation to the resource and in such a manner as to avoid program conflicts.

B. PLAN

1. PLAN SUMMARY

The Recommended Development Plan for Lahontan State Recreation Area (Figure 4-2) proposes activities that will increase the use of existing park resources and make available additional resources located within more remote areas of the park. The plan will allow increased use of existing facilities, provide new facilities and increase the amount of interpretive
Figure 4-1

PROGRAM RELATIONSHIP DIAGRAM
information. The Recommended Plan is similar to Alternative 3 that allows for an optimum amount of development with the park.

Elements of the plan include several issues that are not site specific and are of a general nature. Nevada State Parks will support and coordinate with the Nevada Department of Wildlife a buoy plan that will be developed in the future. The single greatest need of the park is to have a stable quantity and quality of water for recreation. Although the reservoir's Operating Criteria and Procedures (OCAP) dictate the drawdown of the reservoir for agricultural irrigation, NDSP should acquire water rights, when available, to help extend the recreation season.

To increase safety on the reservoir several steps will be taken by NDSP. Beacon lights will be provided at all developed boat ramps and obstacles to navigation will be removed from the reservoir as the opportunity arises. The realignment of roads in Silver Springs also will help in improving public safety. The replacement of all restrooms that do not meet health and building codes will improve public health, safety and handicap access.

Protection of the natural environment is also a key element of the Recommended Plan. The plan will protect and preserve the natural Carson River corridor and flood plain above the reservoir. The plan also will maintain wetlands and lake habitats for hunting and fishing. A vegetation management plan will be developed that will address the need to protect and maintain the park's native and introduced vegetation.

The plan will provide an equestrian trail system along the undeveloped east side of the reservoir and provide two trailheads, one near the Carson River in the southern portion of the park and another at Six Mile Beach. The plan also will implement an improved park signage system and provide fish cleaning stations at all developed boat ramps.

Elements of the plan will provide for increased overnight facilities, restrooms, showers and group use structures. A complete redesign of the park day use area will help to increase the use of these facilities.

Land acquisition for the park would follow a two tier approach. A high acquisition priority is placed on private inholdings and areas that have a high degree of impact on existing park facilities. A lower priority will be placed on the acquisition of private lands that are within critical viewsheds.
2. MANAGEMENT AREAS

This plan has been divided into two management areas that are presented as such for discussion purposes. The two areas are the Churchill Beach Complex and Silver Springs Beach Complex. The Churchill Complex includes all elements of the park located within Churchill County. These include all Churchill beaches, the North Shore Marina, Dam Overlook and Riverside Camp. The second management area is the Silver Springs Beach Complex that includes all the Silver Springs beaches, Virginia Beach and the undeveloped areas to the south.

a. Churchill Beach Complex

Churchill Beaches

The Churchill Beaches are located along the east shoreline of the lake and consist of a string of continuous beaches. The Recommended Plan calls for several improvements to this area including improvements for access. Access is currently off U.S. Highway 50 and the plan calls for paving the access road from the highway to the Carson River bridge. The beach areas have paved access through Beach #5 and this plan also will call for paving the park road from Beach #5 to Horseman's Point (Beach #11). These paving projects will provide paved access to all Churchill beaches.

Improvement will be made to several beaches including the construction of a group use structure at Beach #1 and a new restroom/shower at Beach #2. The new shower at Beach #2 would depend on the availability of an adequate water supply. A major overnight development of 25 campsites is proposed for Horseman's Point that will include a new boat oriented campground that will include 10 numbered buoy sites. These fixed buoy sites will correspond with 10 campsites and have properly lighted end buoys. The campsites will include fire rings/grills and trash receptacles.

A water spigot will be provided to service every four sites. A new restroom also will be built to service this campground. Handicap access and a public telephone will be provided. This campground is optional and will occur only if the development of a concessionaire RV campground at Drum Point is accomplished. In any event, the
recommended plan will provide state park camping in the Churchill area of the park regardless of the selected option. (See North Shore Marina/Drum Point)

The availability of water is a limiting factor in this area since none of the tested wells in the area are suitable. If water is provided to Horseman’s Point it must be provided through an extension of the existing park water system from Beach #1. This would be dependent on an adequate water supply from the existing springs or the addition of water supplied by a well located at Drum Point. All existing pit toilets will be replaced with permanent flush or composting toilets.

**Primitive Boat-In Campground**

The plan calls for the establishment of a primitive "boat-in" campground at the cove east of Rattlesnake Point. This campground, located in the Narrows, would have a total of five sites that would offer fire rings/grills and trash receptacles. A restroom will be provided to service the campground. The establishment of a chemical toilet at this remote location will require a maintenance program to pump the toilet on a regular basis. One option is the use of a small pumper located on a barge that could be towed to the site. Another option, if permitted, would be the establishment of a composting (Clivus) toilet that would not require pumping.

**Dam Overlook**

The Overlook was the original park entrance and as such many facilities are old and in poor condition. The existing restroom has settled unevenly and will be replaced by a new restroom facility. The Overlook is used by day use visitors primarily for fishing. This plan will enhance this day use area with an interpretive area that will inform the public about the reservoir, dam, fishing and the Newlands Project.

Due to the past five year drought the need for a low water boat ramp has increased and this plan will address this need by providing a graded boat ramp that will be accessible during periods of low water. The boat ramp also will incorporate a graded parking area. This ramp may need periodic maintenance since it will be inundated for a portion of the year during high water.
North Shore Marina/Drum Point

The Recommended Plan calls for the establishment of a concessionaire marina to be built at the North Shore (Cove) Marina. State Parks would like to attract a concessionaire to provide a phased development plan that would include but not be limited to boat moorings, fuel dock, convenience store, food service, boat rentals, fishing/camping supplies and restrooms/showers. Acquisition of private property adjacent to the marina should be a high priority.

Drum Point will be developed in one of two ways depending on whether it is done by a concessionaire or by State Parks. The preferred development would be the establishment of an RV campground by a concessionaire. The RV campground would have full utility hook-ups and boat moorings. The second option for Drum Point would be the establishment of a typical Nevada State Park campground. In this option, the state would establish one to three 25 campsite loop(s) complete with restrooms/showers. The campground also would have water spigots servicing every four sites, fire rings/grills, trash receptacles and tables for each site but no utility hook-ups. Handicap accessibility will be provided within the campground in either alternative.

Staff Facilities & Concerns

The Churchill Complex has several proposed additions that have a direct impact on the staff of the park. The plan proposes the construction of a new park residence to replace the existing residence #3 near the dam site. The plan also calls for the renovation of the existing office/maintenance facility to provide better accessibility to the public and the provision for a new on-site district office/maintenance facility.

The existing water system that supplies potable water for all Churchill facilities is in need of renovation. The system currently depends on three springs, a system of pipes and storage tank. Willow trees have over grown the spring site and the intrusion of their roots into the collection pipes has reduced the flow of the springs. This plan calls for the clearing of these intrusions to increase flow.

Two of the springs are dependent on the flow from the Truckee Canal and one is more dependent on reservoir levels. A future development
that may severely impact the flow of these springs is the plan by the Truckee Carson Irrigation District's (TCID) plans to eventually concrete-line the Truckee Canal. This would be expected to severely limit the seepage of the canal into the two primary springs. One possible way of alleviating this loss of flow is to tie the system into wells that were test drilled at Drum Point. The flows at Drum Point wells would not be able to meet peak demand but with the springs may provide an adequate supply of water. Test wells at other locations offer adequate flows but with extremely high mineral contamination levels that would be cost prohibitive to treat. All development in the Churchill beach complex depends on the success of revamping the existing water system.

b. Silver Springs Beach Complex

Silver Springs Beaches

This plan proposes the establishment of another 25 campsite loop north of the existing campground at Beach #7. Vehicular access through the proposed campground area may have to be redirected in order to accommodate day use beaches and primitive overnight camping. No utility hook-ups would be provided to the new campground but one water spigot for every four sites will be installed. Each site would have tables, fire rings/grills and trash receptacles. Handicap access and telephone service also will be provided to the campground. The two restrooms currently located in the existing campground will be converted to shower/restroom combos (2X2X2).

This plan proposes the expansion of the capacity of the existing trailer dump station near the Silver Spring’s entrance.

Primitive beach camping is a very popular activity at Lahontan and this plan will propose establishing new restroom facilities to replace all pit toilets. Beach #4 will have a new restroom with showers. In addition, the existing road to Beach #4 will be improved (graded) to provide better access to this area.

The plan also will provide for additional picnic tables. In the past theft and vandalism were a major problem. The type of table selected should be vandal resistant and some means of anchoring them should be investigated.
The day use area at Silver Springs is currently underutilized and the Recommended Plan proposes to redesign the area to make it more functional and attractive to day use visitors. A group use structure will be built on the point at the day use area. Redesign of the existing parking area/road will provide convenient access to the new group use structure.

An interpretive kiosk will be added to Fisherman’s Point with information about the reservoir, fishing and natural systems.

The boat ramp at Silver Springs will be enlarged to four lanes with three courtesy docks to meet future demands on this facility.

**Staff Facilities & Concerns**

The highest priority staff need in the Silver Spring’s area is the construction of two staff residences to replace the existing residences #1 and #2. The lack of clear and defined boundary through the Silver Springs area is a problem for enforcement. A survey should be conducted and fencing should be improved.

All efforts should be made to protect and enhance the habitat of the lake and surrounding lands for improved fishing and hunting. In addition, the protection of the riparian areas which surrounds the Carson River as it enters the reservoir is very important since this is a regionally unique resource. A survey of the park boundary is also needed in this area due to the encroachment of grazing cattle on this sensitive area. Fencing in certain location should be considered. This area is located outside the Wild Horse Herd Management Area and the wild horses should not be impacted by fencing in this area.

3. **FACILITIES LOCATION**

A complete listing of all proposed facilities and locations are presented in Table 4-2.
<table>
<thead>
<tr>
<th>Facility:</th>
<th>Churchill Beach Complex</th>
<th>Silver Springs Beach Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over-look</td>
<td>Beach Area</td>
</tr>
<tr>
<td>Park Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dump Station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ranger Residence</td>
<td>△[1]</td>
<td></td>
</tr>
<tr>
<td>Group Shelter</td>
<td>△[1]</td>
<td></td>
</tr>
<tr>
<td>Restrooms</td>
<td>△[1]</td>
<td>△[1]*</td>
</tr>
<tr>
<td>Shower</td>
<td>△[1]</td>
<td></td>
</tr>
<tr>
<td>Interpretive Exhibits</td>
<td>△[1]</td>
<td></td>
</tr>
<tr>
<td>Concessionaire RV Campground</td>
<td>△[25] Option</td>
<td></td>
</tr>
<tr>
<td>Concessionaire Marina</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Road Improvements</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>&quot;Boat-in&quot; Campground</td>
<td>△[5]</td>
<td></td>
</tr>
</tbody>
</table>

△ New Construction  
□ Renovation/Expansion  
○ Road Grading  
* Does not include the replacement of all pit toilets.

4. PLANTING SCHEME

a. Existing Areas

The areas that have been significantly landscaped or planted are in Silver Springs. The parking area surrounding the boat ramp is

4 - 12
the most recently planted. Other areas throughout the park have been landscaped during various development projects.

The impact of the present five year drought has severely affected the growth of Cottonwood trees which surrounds portions of the lakeshore. Many of these mature Cottonwoods are dead and many others are showing signs of severe stress. The sustained lower reservoir levels affected the water availability of the surrounding shoreline allowing only trees with the deepest root systems to survive.

High visitor use areas have also had negative impacts on the native vegetation of the park. Off road vehicles have made a network of undesirable roads and trails.

b. The Planting Concept

The overall concept for planting within the park should follow a policy of encouraging the growth of native vegetation in the sage zone above all beaches. The shore zone may need to be periodically cleared of seeding vegetation such as Willow to keep a clear sand beach. This plan calls for the development of a vegetation management plan that will help to encourage the growth of native vegetation, protect native vegetation from overuse and institute a plan for the replanting of dying trees. This vegetation management plan also should address the irrigation, maintenance and replacement of landscape planting within developed areas.

In the event a site has been damaged or is in need of revegetation, native trees/shrubs and grasses should be used. In determining plants to specify for revegetation, the staff should contract with the Division of Forestry to grow replacements and contact native nurseries to determine availability of transplants from existing healthy stands of vegetation. (See Table 4-3 Recommended Plants Species)

| TABLE 4-3 |
| RECOMMENDED PLANT SPECIES: |

| Recommended Trees: |
| Willow | (Salix spp.) |
| Freemont Cottonwood | (Populus fremontii) |

4 - 13
Recommended Shrubs:

Little Greasewood (Sarcobatus baileyi)
Big Sagebrush (Artemisia tridentata)
Shadescle (Atriplex confertifolia)
Saltbrush (Atriplex Spp.)

Recommended Grasses:

Cheatgrass (Bromus tectorum)
Indian Rice Grass (Onyza hymenoides)
Desert Globemallow (Sphaeralcea ambigua)
Cheatgrass (Bromus tectorum)
Nuttall (Goldenia nuttallii)
Winterfat (Seratoides lanata)

5. EVALUATION OF PLAN

a. Evaluation of the Plan Pertaining to Issues

Chapter One outlines several issues addressed during this update. Following is an evaluation of how the proposed plan addresses the various issues.

1) SCORP Identified Issues

According to the SCORP it is difficult to quantify the need for Environment-Related activities, but, it is clear the pursuit of nature study and environmental education should be fostered in all parks. This plan calls for an increase in amount of interpretive information at several locations. The Overlook area would primarily interpret the reservoir, dam and history of the Newlands Project and the new interpretive exhibits in the Silver Springs’ area will concentrate primarily on the natural environment including vegetation, wildlife and habitats. The plan also will propose the addition of nature study/environmental education classes within the park.

Interpretive elements will include information about fishing that is a popular activity at the park.
The protection and preservation of the park will be accomplished through the acquisition of additional lands that are within critical viewsheds. A higher acquisition priority will be placed on purchasing private inholdings. These new acquisitions will prevent resource degradation by preventing proliferation of unsuitable land uses adjacent to the reservoir. The rapidly expanding state population makes these acquisitions an important part of this plan.

The Recommended Plan will address the need for developing linear recreation trail corridors and connections between various parklands by protecting the Carson River floodplain west of the park. The Question 5 Bond Issue calls for the acquisition of three ranches west of the reservoir that would provide continuous state ownership from Lahontan State Recreation Area to Fort Churchill State Park. Although this plan does not attempt to address these ranch properties, the plan does allow for future trail access.

This plan also addresses the issue of handicap accessibility by making more of the park’s facilities available to this segment of the state’s population. Making facilities accessible to all disabilities will help address this identified issue.

2) User Conflicts/Visitor Impacts

According to conflicts cited in Chapter 1, the use of beach zones for jet skiing and water skiing has caused conflicts between these active sports and other passive beach activities. The control of these active sports will be addressed by the Nevada Department of Wildlife (NDOW) who have the ultimate responsibility for activities occurring on the lake. NDOW will be proposing a buoy plan in the near future that will address these activities and NDSP will actively participate.

The loud music that occurs late at night within the campground was cited as another conflict, but the solution to this would be increased enforcement that is currently not available within the park. The printing of campsite "quiet hours" on existing brochures and the establishment of signage may help to alleviate this problem.
3) Public Identified Issues

Public input helped to form a principal element in this plan. Identified issues include: providing improved visitor access, improving safety on the reservoir, protecting and improving park habitats, providing additional and improved camping experiences, addressing the underutilization of day use areas and boat access during low water periods.

The plan strives to accommodate different user groups including the addition of equestrian activities previously not offered at the park.

4) Governor's Tourism Program Identified Issues

Additional camping will be provided within the park to accommodate overnight visitation. This will help to encourage longer visitation by park users. Besides car/RV camping the plan also provides for primitive boat-in camping and campsites with convenient mooring buoys.

The plan also calls for recruitment of a concessionaire to run a marina facility at the North Shore Marina and a RV campground at Drum Point. These facilities will provide additional services not offered by the state.

5) Environmental Considerations

The park contains several petroglyph locations but due to the possibility of theft and vandalism the location of these sites was not reported to the public during the development of this plan. With a lack of adequate staffing and the remote location of these resources, the park should not encourage visitor access to these areas.

This plan also identifies the Carson River floodplain located above the reservoir as a unique wetland system that should be protected from any significant development. The protection of this area, the reservoir and the surrounding lands will provide a quality habitat for migrating waterfowl, raptors and other wildlife.
b. Evaluation of the Plan Pertaining to Goals and Objectives

Chapter One describes the goals and objectives for this update. This plan meets these requirements by providing increased recreational opportunities while providing protection for the existing environment and natural resources of the park.

Another objective of this plan is to provide more interpretive services that will educate the public about the history of the reservoir/dam, historic trails, fishing, and natural systems.

c. Evaluation of the Plan Pertaining to Plan Concept

The master plan for Lahontan State Recreation Area adheres in many ways to the plan concept. Resource conservation, habitat protection, safety and increased water access are all elements that are addressed in this plan. The plan provides a broad array of recreational activities and conservation from the most passive to the most demanding active recreational activities.

C. IMPLEMENTATION

1. DEVELOPMENT PHASES

PHASE 1:

General

- Coordinate and support Nevada Department of Wildlife buoy plan and use of navigational & nautical markers within the reservoir and around boat ramps.
- Provide beacon lights at all developed boat ramps.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights for the park.
- Replace all old restrooms that do not meet health, building codes and handicap accessibility.
- Protect and preserve the natural Carson River corridor and flood plain above the reservoir.
- Maintain wetland and lake habitats for hunting and fishing.
- Develop a vegetation management plan that addresses the maintenance and improvement of native vegetation.
- Purchase private inholdings as they become available and funds permit.
Churchill Area
- Revamp the Churchill Beach water system to improve flow.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Establish a group use structure at Beach #1 within the Churchill Beach Complex.
- Pave the road from U.S. Highway 50 to the Carson River Bridge.

Silver Springs Area
- Expand or increase the capacity of the existing trailer dump station at Silver Springs.
- Provide picnic tables for primitive camping beaches.
- Convert two existing restrooms at existing campground (3X3) to shower/restroom combos (2X2X2).
- Expand Silver Springs boat ramp to four lanes serviced by three docks.
- Build a group use structure on the point at the Silver Springs’ day use area.
  - Redesign day use area access and parking.
- Improve road alignments at Silver Springs along North Beach Road.

PHASE 2:

General
- Build a fish cleaning station at all developed boat ramps.
- Improve current park signage.

Churchill Area
- Replace staff residence (#3) near dam.
- Remodel the existing park office/maintenance facilities near the dam; develop new district office/maintenance facilities.
- Replace the old restroom facilities at the Overlook with new facilities. (1X1, flush)
- Establish an interpretive area to inform the public about the lake, dam, fishing and the Newlands Project.
- Establish a marina concession and facilities at the North Shore Marina.
  - Provide a phased development plan that would include but not be limited to boat moorings, fuel dock, convenience store, food service, boat rentals, fishing/camping supplies and restrooms/showers.
  - Acquire adjacent private property near the existing marina.
- Establish a concessionaire operated RV campground concession
at Drum Point with full utility hook-ups and boat moorings.

- Establish a primitive "boat-in" campground along the Narrows.
  - Provide five (+ or -) primitive sites at Rattlesnake Point.
  - Provide campsites fire rings/grills and trash receptacles.
  - Restroom facilities (chemical or composting toilets with a maintenance program).
- Provide a new restroom/shower at Beach #2, contingent on the availability of water.
- Pave the Churchill Beach road from Beach #5 to Horseman's Point (Beach 10#).

Silver Springs Area

- Replace staff residences #1 and #2 at Silver Springs.
- Build a new restroom facility with showers for primitive (free form) camping along Silver Springs Beach #4.
- Improve gravel road to Silver Springs Beach #10.
- Provide an interpretive kiosk at Fisherman's Point with Silver Springs Area information about the reservoir, fishing and natural systems.

PHASE 3:

General

- Provide a phased equestrian trail system along the undeveloped east side of the reservoir and provide two trailheads.
- Purchase private property within critical viewsheds as individual parcels become available and funds permit.

Churchill Area

- (Option) Establish a State Parks campground at Drum Point if a concessionaire run campground is not built.
  - Provide a 25 (+ or -) campsites loop.
  - Build restrooms/shower facilities.
  - No utility hook-ups but provide a water spigot for every 4 sites.
  - Each site would have fire rings/grills and tables.
  - Provide handicap access.
- (Option) Establish a new boating oriented campground at Horseman's Point (beach #10). This would occur if the development of a concessionaire operated RV campground at Drum Point is accomplished.
  - Construct a new restroom facility to service the campground.
  - Provide water spigots every four sites.
2. ACQUISITION SCHEDULE

The land to be acquired at Lahontan State Recreation Area should be acquired on a two tier system of priority. The highest priority for acquisition should be private inholdings. These inholdings are important to consolidate the park's boundary and prevent the intrusion of incompatible land uses within the park.

The second highest priority for acquisition are lands that are within critical viewsheds of the lake. The purpose for acquiring these lands is to protect the natural scenic values that surround the reservoir from potentially incompatible residential, commercial or industrial land uses.

D. SIGN PLAN

1. ON-SITE

Signs on-site should orient, educate, and direct. There will be a total of three main entrances onto park property: two entrances in the Churchill Area and another entrance in the Silver Springs Area. The Churchill Area entrances include one for access to the Churchill Beaches and the second at North Shore Marina.

Internal signage within the park needs to be improved and should include; facility signage, information, trip mileage, and historical/interpretive
information. A small kiosk structure will be located at the foot of each equestrian trailhead. The kiosk will post information, park rules and regulations.

Interpretive signage will be displayed at two new locations within the park: the first at the Dam Overlook and the second at Fisherman’s Point in Silver Springs. These two new interpretive areas should represent different themes presented on photo-metal signs or other means. The Overlook location should stress historic trails, history of the Newlands Project and data about the reservoir and dam. The Fisherman’s Point location should stress lake fishing, natural habitats, resource protection, user ethics and the environment.

Park signage also should include warning signs for deep sand and closed roads. With development of each proposed recreational facility a complete signage program should be designed and implemented when these new facilities are opened to the public.

The plan also recommends a signage plan be completed for the lake to give boaters better directional and location information. This signage plan would ultimately be the responsibility of Nevada Division of Wildlife but NDSP will offer support and coordination to accomplish it.

In accordance with the State Parks Sign Policy (Number 15), all non-standard signs will be replaced with standard signs as they are retired from service. In the event a non-standard sign is necessary, this non-standard sign will be modeled after standard signs in color, size, shape, wording, symbols and abbreviations as much as possible. Elements of the sign plan also will be used to provide conformity to all traffic signs with the park. (Policy Manual, 1987)

2. OFF-SITE

Signs located off-site will direct visitors to the park and specific use areas. This plan recommends off-site signs be replaced to reflect the location of new facilities proposed by this plan. The size of the signs and the information contained on them should be coordinated with NDOW and be of adequate size so they may be read at a highway speed of 55 mile per hour.

3. SPECIAL AREAS

Certain areas of the park are to be protected from extensive recreational and facility development. The main area of concern is the Carson River
corridor. This area should have a limited number of access points and all others should be closed to prevent degradation to the existing environment. Hiking and/or equestrian access as opposed to vehicle access should be promoted. Interpretive plaques and brochures should point out the uniqueness and fragile nature of the area.

4. SIGN MANUAL

The signs proposed in this plan follow the direction provided in the sign manual. All signage should be of a coordinated design and presented with clear concise verbiage.
REFERENCES

Written:

Lahontan Reservoir General Recreation Development Plan, SE&A Inc., 1974

Lahontan Water Quality Project, Desert Research Institute, 1983


Bureau of Land Management Cultural Resource Series 5, Pendleton, McLane & Thomas, 1982

Intermountain Antiquities Computer System (IMACS) Site Survey, Hamilton Site, Hattori, 1991

Management Agreement Among the U.S. Government, Truckee-Carson Irrigation District and Nevada State Parks for the Development, Administration, Operation and Maintenance of Recreation at Lahontan Reservoir Newlands Project, Nevada, 1976

Preliminary Plan for Recreation Development at Lake Lahontan, National Park Service, 1965


Carson-Walker Resource Conservation & Development Project, U.S. Department of Agriculture (Soil Conservation Service), 1975

Soil Survey, Fallon-Fernley Area, Nevada, USDA Soil Conservation Service, 1975


Statewide Comprehensive Outdoor Recreation Plan, Department of Conservation and Natural Resources, 1987

Nevada Statistical Abstract, Office of Community Services, 1988

Churchill County Planning Commission, Title 17 Zoning Regulations, 1989

Lyon County, Brief Summary of Lyon County Zoning, 1990
Nevada's Weather and Climate, Houghton, Sakamoto, Gifford, 1975

Cultural Resource Series #5, Carson City District, West Central Nevada, 1982

Lahontan SRA, Water Supply Investigation, Water resources Consulting Engineers, 1974

Water Resources - Reconnaissance Series, Report 59, Nevada Department of Conservation and Natural Resources, Division of Water Resources, Glancy/Katzer, 1975

Reconnaissance Bathymetric Map and General Hydrology of Lahontan Reservoir, Nevada, T.L. Katzer, 1972

The Lahontan Reservoir Water Quality Project, Volume 1, Desert Research Institute, French/Copper/Vigg/Haggard, preliminary - no date given

Total Mercury in Sediment, Water and Fishes in the Carson River Drainage, West-Central Nevada, Cooper/Thomas/Reed, December 1985

Eolian Sand Transport in Western Nevada, Eissmann, 1990

Nevada Bureau of Air Quality Trend Report, Nevada Division of Environmental Quality, 1988

Nevada Place Names, Carlson, 1974

Nevada Historical Sites, Mordy & McCaughey, 1965

The Pony Express in Nevada, Bureau of Land Management, 1990


Turn This River Into Gold: The History of The Newlands Project, Reno Nevada Historical Society, 1977


Final Environment Impact Statement for the Newlands Project Proposed Operating Criteria and Procedures (OCAP), URS Corporation, December 1987
Amended Environmental Assessment for Interim Operating Criteria and Procedures for the Newlands Project Water, Mid-Pacific Region, Bureau of Reclamation, April 1987

Correspondence: NDSP to Alliance Properties, December 11, 1987

Final Lahontan Herd Management Area Plan, Bureau of Land Management, 1991

Interviews:
Bob Francke, District III Ranger, Nevada State Parks, 1990
Melva Parkhill, Bureau of Reclamation/Carson City, 1990
Joann Hufnagle, Bureau of Land Management/Carson City, Real Estate Specialist, 1990
Wanda Bremer, Churchill County Planning, 1990
Shanda B. Turner, Lyon County, 1990
Willis Hyde, Water Master, Truckee Carson Irrigation District (TCID), 1991
Dorothy Miller & Jim Ashby, Western Climate Center (DRI), 1991
SUMMARY OF PUBLIC COMMENTS

The following comments were obtained during the four workshops held on June 24th/25th, 1991 and August 26th and 27th, 1991. Written comments were also received during the initial comment and alternative phases of the plan. A total of 500 individual announcements were sent out to the public concerning the first two public workshops and 250 alternative brochures were sent prior to the last two workshops. The mailing list was generated using season permits and existing correspondence. In addition, seven newspapers were contacted and requested to run information concerning times and locations of the meetings.

Workshop 1 - 2

Comments from Fallon Workshop on June 24, 1991:

This workshop was poorly attended with only one individual in attendance. The presentation was given and the following comments were collected.

- Improve navigation within the lake with nautical markers.
- Continue an active program of removing obstacles whenever the reservoir is at its lowest stages.
- Provide signage which will identify various coves, points, etc. to make identification easier for boaters.
- Establish a low water launching ramp which will allow launching during dry years. This ramp does not need to be paved but some type of graded ramp which could be easily repaired after several seasons of inundation would be adequate.
- Removal of the dirt bank which is located in front of the boat ramp at the Cove Marina. [Bob Francke indicated this would not be feasible due the volume of soil and rock which would need to be moved.]

Comments from Silver Springs Workshop on June 25, 1991:

The Silver Springs Workshop was well attended including 23 individuals from the surrounding community. The session was very informative for staff and all in attendance had strong opinions on the direction of the park. The following comments were collected after the presentation.

- Remove stumps which are visible during low water years to improve navigation during dry years. It was also important that the habitat that these stumps provide to fish must be replaced or enhanced after the removal of these habitat structures.
- Public sentiment supported the acquisition of water rights (Question 5) or any other means of providing optimum water levels for longer periods.
- A problem presently exists concerning day use within the park. It was suggested that no more organized day use be developed with the park. The reasons given were two-fold: the existing day use area is not being used to its potential and day use that does occur is unorganized and not found in the picnic area. It was noted
that a large percentage of day users were associated with existing campers and their associated campsites.

- Several in attendance stressed the thing they most liked about the park was the freedom it affords for unstructured activities and camping.
- No one in attendance felt there was any need to expand the organized campground. The overwhelming support was for unstructured camping (free form) that is presently seen on all beaches.
- In an effort to cater to this free form camping it was suggested that the location of restroom/shower structure near SS Beach 4 would provide these campers with convenient facilities while retaining a free form camping area.
- The location of a public telephone on SS Beach 7 to provide increased safety was mentioned, however, the telephone company will not locate a phone in this location due to past vandalism.
- The public also supported the stepping up of patrols with the park. Those in attendance did realize the difficulties of increasing patrols but would like to see an increase if funds were made available and additional staff were assigned.
- The public was highly supportive of establishing some type of concessionaire in the North Shore Marina area. The concessionaire could just provide minimum services such as gas and a few retail items.
- Expansion of the existing trailer dump station at Silver Springs was suggested. This could be accomplished by expanding the existing one or with the addition of a similar facility at another location.

Written comments received in conjunction with the first two workshops held on the 24th and 25th of June, 1991:

A total of 10 comment forms were received before and after the meetings.

- Clear willow seedings from beach areas that are becoming overrun. [1]
- Clear trees out of Beach 11 channel (new trees are growing). [1]
- Clear all dead stumps from lake during low water periods. [2]
- Better enforcement of curfews (noise after hours). [3]
- Upgrading picnic facilities with a small play area for children [1]
- Pave the remain portion of the road between Highway 50 and the Carson Bridge at Churchill Beach Complex. [1]
- Maintain a consistent summer water level. [1]
- Widen the existing boat ramps. [1]
- A comment was received that accused state parks of lying and not listening to the public during the last master plan process. No more development. [1]
- Park personnel are very friendly and helpful. [1]
- The park and its facilities looked clean and well kept. [1]
- Confine jet skiers to specific beaches. [1]
- Set up a season pass lane for efficiently exiting the park. [1]
- Provide a slide and diving platform for day use visitors. [1]
- Provide showers at Beach 11 (Churchill ?). [1]
- Establish a gasoline, propane, convenience, marina complex near Beach 5 or 7 (Churchill ?). [1]
- Establish another boat dock at SS Beach 7. [1]
- Provide additional black top camping pads. [1]
- Provide electric light hook-ups in certain areas. [1]
- Provide additional ranger patrols to maintain a more family like atmosphere. [1]

Workshop 3 - 4

Comments from Silver Springs Workshop on August 26th, 1991:

The attendance at the 3rd workshop was also good with approximately a dozen people in attendance, including two representatives from the Bureau of Reclamation. Attitudes toward jet skiers, the natural environment and staffing concerns were major topics.

- Improve the water quality and fishery at Lahontan Reservoir.
- Do not do anything to impact or disturb the wetlands of the three ranches which are being considered for acquisition.
- If jet skiers were to be controlled or limited, the preferred beaches at Silver Springs would be Beaches # 2-4.
- Jet skiers should not be restricted or controlled in any manner.
- The day use area at Silver Springs should be redesigned to increase its usage.
- Another option for the control of jet skiers would be the establishment of a beach which would not be accessed by jet skiers.
- Bring back the discount for second vehicles.
- Don’t establish any buoy systems on the lake.
- Maximize "free form" camping by providing tables, trash cans, barrels for fires and not restricting camping activities.
- Developed campgrounds should be "above" beaches out of the beach zone.
- Spend money on improving the existing facilities instead of building new ones.
- Increase the present staffing levels.

Comments from Fallon Workshop on August 27th, 1991:

The meeting included a total attendance of nine persons, however only one was representative of the public. NDOW had four representatives at the meeting and discussion included limitations to jet skier and buoy plans.

- Realign dangerous curves on the Silver Springs road.
- Nevada Dept. of Wildlife plans to move ahead with a buoy plan for the reservoir and increase the use of navigational markers.
- Remove the hump in front of the North Shore Marina.
- "Work with", coordinate and support NDOW's buoy plan for the reservoir.
- Investigate the water transfer rights for the ranches upstream of the reservoir.
It is NDOW's understanding that water rights will be purchased by NDSP along with the three ranches. (No NDOW funds are allocated for the purchase of these water rights.)

- Hunting should be encouraged within the park for waterfowl and upland birds. High powered rifles are a concern and discharges should not be allowed within the park. Big game (deer) hunting should not be banned but the methods for taking game should be limited to shotguns and bow.
- The park should coordinate with Wildlife Commission to get compatible hunting regulations.
- Permanent mooring buoys will be required to have a yellow flashing lights on outside corners of each group of buoys. (as required by federal and state law)
- The best campsite location for Churchill Beach is Beach #10 and Drum Point. Site selection will be dependant on the possibility of attracting a RV concessionaire for Drum Point.
- Acquire additional property at the corner of the North Shore Marina.
- Of the three ranch properties the Amerongen Ranch has the most ecologically valuable flora and fauna habitat. This flood plain is unique not only locally but holds statewide significance as an undisturbed river flood plain.
- NDOW agrees that setting aside certain beaches as "Jet Ski Free Zones" would be appropriate and practical. This could be accomplished with NDOW's buoy plan.
- NDOW's buoy plan will probably include a 5 MPH speed zone from Silver Springs Beach #3 - 9. This would allow open jet skiing at the even beaches.
- All state boat ramps should include a beacon light to help with night time navigation.
- All state developed boat ramps should include a fish cleaning station with water and grinders.
- A proposed marina concession should include; boat slips, bait shop, fishing licenses and food services. A bar should not be a part of this development.
- In addition to passive interpretive facilities the park should also develop active interpretive tours/classes (i.e. fishing, environment, wildlife, etc.).

Written comments received in conjunction with the last two workshops held on the 26th and 27th of August, 1991:

A total of 11 public comment forms were received before and after the last two workshops.
- Water quality and fishery management should be a priority for State Parks. Seek more federal and state money for the resource. [2]
- "Alternative 3#. This looks good." [1]
- Support for alternatives 1,2, & 3 but need additional water and security. (complaint about unleashed dogs) [1]
- Keep the open "free form" type of camping within the park. Noisy careless boaters and jet skiers should be targeted not all sport enthusiasts. Problems still exist with party noise at 1-3am which keeps people awake. Provide a pair of all night park rangers on weekends. Spend money on staff not new campgrounds. [1]
Alternative #3 is the most desirable. Provide fish cleaning stations at all developed boat ramps. Manage the wetlands area for hunting since that is the predominate visitation in the winter. Is there an immediate need to replace the restroom at the Overlook? [1]

Alternative #3 is supported although it would greatly increase visitation. Supported the vegetation management plan and natural resource protection. [1]

Support for alternative #2. Keep jet skiers away from popular fishing areas. [2]

Churchill area: pave roads to all beaches and provide water, electricity, and restroom/showers to all beaches ("after all this is the 90's"). Provide a fuel dock, grocery store, cafe and boat rentals. "Churchill area should be as nice as Silver Springs area". Provide RV park at Churchill beach, paving is a must. [2]

Support Alternative #2 as being the most practical. Add campground north of existing Silver Springs campground at beach #7. [1]

In favor of maintaining the Carson River. Also thinks tree stumps should be removed. RV Campground with utilities needed with decent fees. [1]

Support for Alternative #2. #1 is too austere and #3 too elaborate. In favor of confinement of jet and water skiers to specific areas. [1]

[summary:Alternative #1 = 1 Alternative #2 = 4 Alternative #3 = 4]

PROPOSE PLAN

Written comments received in conjunction with the Proposed Plan.

- Improve beach area by removing stumps and seedling willows. [1]
- What will be the future restriction against jet skiers? [2]
- If you can accomplish all that you propose the recreation area will be extremely enjoyable. [1]
- Pray for rain! [1]
- Hold meetings in Reno since that is where most of your users are from. [1]
- Fencing near the Carson River will be necessary to keep cattle from destroying the area. [Staff]
- Expand capacity or size of dump station at Silver Springs. [Staff]
- Fish cleaning stations at all developed boat ramps would be underutilized. [Staff]
- Picnic tables in primitive area has been tried before with poor results. [Staff]
- Group use structure should be located next to parking lot. [Staff]
- Support activities which would maintain or improve wildlife habitats. [Staff]
ALTERNATIVE 1:

GENERAL

- Improve on the use of navigational & nautical markers within the reservoir.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights.
- Eliminate all old restrooms which do not meet health or building codes.
- Acquire private inholdings and property within critical viewsheds.
- Protect and preserve the natural Carson River corridor and floodplain area above the reservoir.
- Improve and increase the amount of park signage.

CHURCHILL AREA

- Revamp Churchill Beach water system.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Replace old restroom facilities at the Overlook.

SILVER SPRINGS AREA

- Establish a separate lane at the Silver Springs fee booth for visitors who have season passes.
- Expand the existing trailer dump station at Silver Springs.
- Expand the existing boat ramp to four lanes serviced by three docks.
ALTERNATIVE 2:

GENERAL
- Improve on the use of navigational & nautical markers within the reservoir and around boat ramps.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights.
- Eliminate all old restrooms which do not meet health or building codes.
- Acquire private inholdings and land within critical viewsheds.
- Protect and preserve the natural Carson River corridor and flood plain above the reservoir.
- Improve wetlands and lake habitats.
- Improve and increase the amount of park signage.
- Confine jet skiers to specific, more remote beaches.
- Provide equestrian parking area and trails.

CHURCHILL AREA
- Revamp Churchill Beach water system.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Replace old restroom facilities at the Overlook with new facilities.
- Establish a primitive "boat-in" campground along the Narrows
  > 5 primitive sites at Rattlesnake Point.
  > Provide campsite fire rings and trash receptacles.
  > Restroom facilities (chemical toilets with a maintenance program).
- Establish a group use structure at Beach #1 within the Churchill Beach Complex.
Establish a concessionaire marina and facilities at the Cove.
- Provide a phased development plan which would include but not limited to boat moorings, fuel dock, grocery store, restaurant and boat rentals.
- Establish an RV campground at Drum Point with full utility hook-ups.

**SILVER SPRINGS AREA**
- Establish a separate lane at the Silver Springs fee booth for visitors who have season passes.
- Expand the existing trailer dump station at Silver Springs.
- Build a new restroom/shower facility for primitive (free form) camping along Silver Springs Beach #4.
- Pave park road to Silver Springs Beach #4.
- Convert two existing restrooms at existing campground (3x3) to shower/restroom combos (2x2).
- Expand Silver Springs boat ramp to four lanes serviced by three docks.

**ALTERNATIVE 3:**

**GENERAL**
- Improve on the use of navigational & nautical markers within the reservoir and around boat ramps.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights.
- Eliminate all old restrooms which do not meet health or building codes.
- Acquire private inholdings and land within critical viewsheds.
- Protect and preserve the natural Carson River corridor and flood plain above the reservoir.
- Improve wetlands/lake habitats and manage for hunting.
- Improve and increase the amount of park signage.
- Confine jet skiers to specific, more remote beaches.
- Provide equestrian parking area and trails.
- Develop a vegetation management plan.

**CHURCHILL AREA**

- Revamp Churchill Beach water system.
- Replace staff residence (#3) near dam.
- Remodel or replace existing park office/maintenance facilities at the dam.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Replace old restroom facilities at the Overlook with new facilities.
- Establish an interpretive area to inform the public about the lake, dam, fishing and the Newland's Project.
- Build a fish station for visitors at the Overlook.
- Pave the road from U.S. Highway 50 to the Carson River Bridge within the Churchill Beach Complex.
- Establish a primitive "boat-in" campground along the Narrows.
  - 5 primitive sites at Rattlesnake Point.
  - Provide campsite fire rings and trash receptacles.
  - Restroom facilities (chemical toilets with a maintenance program).
- Establish a new boating oriented campground at Horseman's Point (beach #10).
  - Construct a new restroom/shower facility to service the campground.
  - Provide water only no electricity to 25 campsites.
  - Each site would have fire rings and trash receptacles.
  - Numbered boat mooring buoys corresponding to 10 lakeside campsites.
  - Handicap access provided.
  - Pave road from beach #5 to new campground.
  - Provide telephone service to Horseman's Point.
- Establish a group use structure at Beach #1 within the Churchill Beach Complex.
- Provide a new restroom/shower at Beach #2.
- Establish a concessionaire marina and facilities at the Cove.
  - Provide a phased development plan which would include but not limited to boat moorings, fuel dock, grocery store, restaurant and boat rentals.
  - Establish an RV campground at Drum Point with full utility hook-ups.

**SILVER SPRINGS AREA**

- Establish a separate lane at the Silver Springs fee booth for visitors who have season passes.
- Expand the existing trailer dump station at Silver Springs.
- Build a new restroom/shower facility for primitive (free form) camping along Silver Springs Beach #4.
- Pave park road to Silver Springs Beach #4.
- Build a group use structure in the Silver Springs day use area.
  - Provide an interpretive kiosk at Fisherman's Point.
- Convert two existing restrooms at existing campground (3X3) to shower/restroom combos (2X2).
- Build a new 25 campsite loop north of the existing loop in Silver Springs.
  - Existing restrooms/showers in place.
  - Provide electric and water hook-ups.
  - Each site would have fire rings and trash receptacles.
  - Provide handicap access.
  - Provide telephone service to the campground.
- Expand Silver Springs boat ramp to four lanes serviced by three docks.
- Replace staff residences #1 and #2 at Silver Springs.
PROPOSED PLAN

GENERAL
- Coordinate and support Nevada Division of Wildlife buoy plan and use of navigational & nautical markers within the reservoir and around boat ramps.
- Provide beacon lights at all developed boat ramps.
- Build a fish cleaning station at all developed boat ramps.
- Remove obstacles to navigation (tree stumps, etc.) during periods of low water.
- Acquire additional water rights.
- Improve road alignment at Silver Springs.
- Replace all old restrooms which do not meet health or building codes.
- Protect and preserve the natural Carson River corridor and flood plain above the reservoir.
- Maintain wetland and lake habitats for hunting and fishing.
- Improve current park signage.
- Provide an equestrian trail system along the undeveloped east side of the reservoir and provide two trailheads.
- Develop a vegetation management plan which addresses the maintenance and improvement of native vegetation.
- Place a high priority on the purchase of private inholdings.
- Place a lower priority on the purchase of private property within critical viewsheds.

Appendix 3
CHURCHILL AREA

- Revamp Churchill Beach water system.
- Replace staff residence (#3) near dam.
- Remodel the existing park office/maintenance facilities near the dam.
- Establish a low water boat launching ramp and parking area near the Overlook.
- Replace the old restroom facilities at the Overlook with new facilities. (1X1, flush)
- Establish an interpretive area to inform the public about the lake, dam, fishing and the Newlands Project.
- Pave the road from U.S. Highway 50 to the Carson River Bridge within the Churchill Beach Complex.
- Pave the Churchill Beach road from Beach #5 to Horseman's Point (Beach 10#).
- Establish a primitive "boat-in" campground along the Narrows.
  - 5 primitive sites at Rattlesnake Point.
  - Provide campsite fire rings/grills and trash receptacles.
  - Restroom facilities (chemical toilets with a maintenance program).
- Establish a group use structure at Beach #1 within the Churchill Beach Complex.
- Provide a new restroom/shower at Beach #2, contingent on the availability of water.
- Establish a concessionaire marina and facilities at the Cove.
  - Provide a phased development plan which would include but not limited to boat moorings, fuel dock, convenience store, food service, boat rentals, fishing/camping supplies and restroom/showers.
  - Acquire adjacent private property near the existing marina.
- Establish an RV campground at Drum Point with full utility hook-ups and boat moorings.
- (Option) Establish a State Parks campground at Drum Point if a concessionaire run campground is not built.
  - Provide a 25 campsite loop.
  - Build restrooms/shower facilities.
  - No utility hook ups but provide a water spigot for each 4 sites.
  - Each site would have fire rings/grills and tables.
  - Provide handicap access.
- (Option) Establish a new boating oriented campground at Horseman's Point (beach #10). This would occur if the development of a concessionaire RV campground at Drum Point is accomplished.
  - Construct a new restroom facility to service the campground.
  - Provide water spigots every 4 sites but no electricity.
  - Each site would have fire rings/grills and trash receptacles.
  - Numbered boat mooring buoys corresponding to 10 lakeside campsites including legally required legal buoys.
  - Handicap access provided.
  - Provide telephone service to Horseman's Point.

SILVER SPRINGS AREA

- Expand the existing trailer dump station at Silver Springs.
- Build a new restroom facility for primitive (free form) camping along Silver Springs Beach #4.
- Provide picnic tables for primitive camping beaches.
- Improve gravel road to Silver Springs Beach #4.
- Build a group use structure on the point at the Silver Springs day use area.
  - Redesign day use area access and parking.
- Provide an interpretive kiosk at Fisherman's Point with information about the reservoir, fishing and natural systems.
- Convert two existing restrooms at existing campground (3X3) to shower/restroom combos (2X2X2).
- Build a new 25 campsites loop north of the existing loop in Silver Springs.
  - Existing restrooms/shower in place.
  - No utility hook ups but provide a water spigot for every 4 site.
  - Each site would have fire rings/grills and trash receptacles.
  - Provide handicap access.
  - Provide telephone service to the campground.
  - Re-design circulation patterns around existing campground.
- Expand Silver Springs boat ramp to four lanes serviced by three docks.
- Replace staff residences #1 and #2 at Silver Springs.

(Revised: 10/28/91)