final environmental impact statement

volume II - affected environment • environmental consequences

LAKE MEAD

NATIONAL RECREATION AREA / ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME II - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

LAKE MEAD NATIONAL RECREATION AREA
Mohave County, Arizona, and Clark County, Nevada



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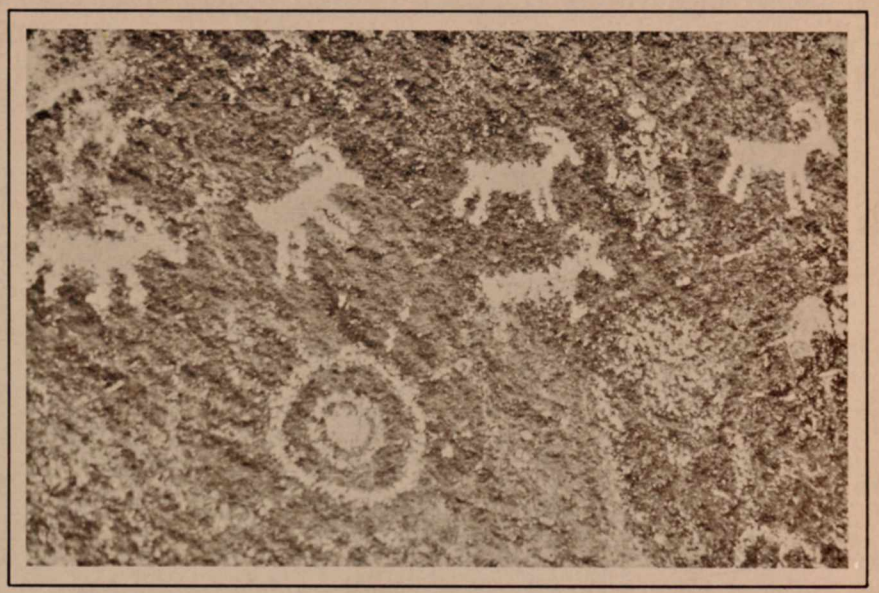
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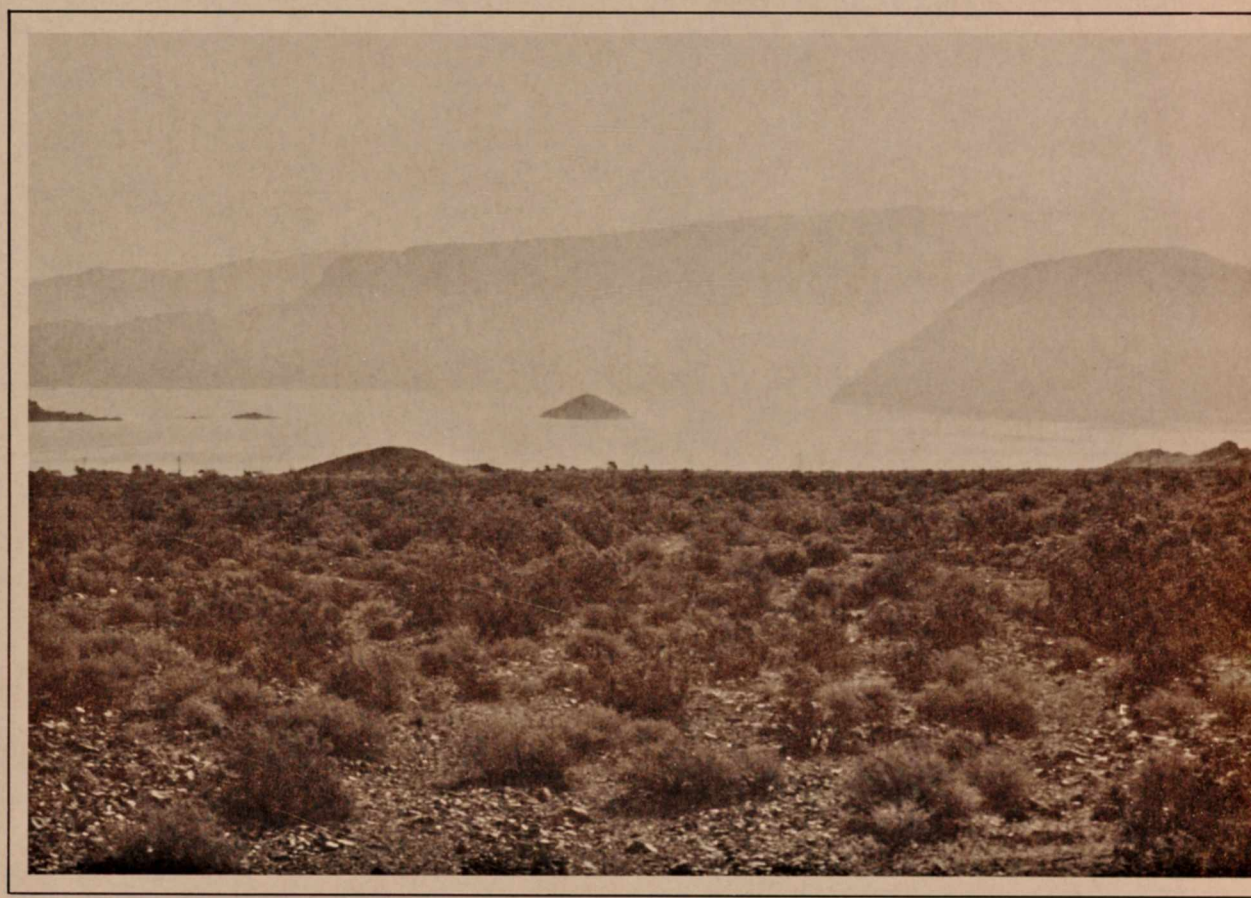
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PREFACE

This document is divided into two volumes. Volume I describes the general management plan and alternatives. The issues addressed include increasing visitation, congestion and user conflicts, flood mitigation, management zoning, lands suitable for wilderness, illegal use of vehicles off approved roads, resources management, boating carrying capacity, information/interpretation, land protection, trailer and cabin site policy, road problems, Las Vegas Wetlands Park proposal, and NPS and concession development proposals. Volume II describes the affected environment and the environmental consequences of implementing the alternatives and proposed action. A discussion of consultation and coordination, the appendixes, bibliography, and list of document preparers are also included.







AFFECTED ENVIRONMENT

GEOGRAPHIC PLANNING ZONE DESCRIPTIONS

Lake Mead National Recreation Area is so large and complex that it has been divided into several geographic planning zones for ease of discussion. A brief description of each zone follows. The zones are mapped in the "Summary" section in volume I.

Katherine Zone

The Katherine Landing development is the only developed access point within the Katherine zone. This development is a large and highly popular resort area for southern California and Arizona boaters and waterskiers during the summer months; the area also serves local residents year-round as a day use swimming and boat launching area. It is the major houseboat rental center for Lake Mohave. The majority of visitor use for the zone is in the coves immediately surrounding the developed area. Most of these coves are accessible by boat only, and other coves in the zone are accessible only by four-wheel-drive vehicle or by boat and are less used. The flood hazard is severe throughout the main development and in Telephone Cove, and it is considered the third most hazardous developed area in the recreation area for potential flooding.

Cottonwood Zone

A major portion of this zone is Cottonwood Basin, which is the only large basin on Lake Mohave. Access to this area is primarily through Cottonwood Cove, a popular resort during the summer months for water-skiers and boaters. During the fall, winter, and spring the area primarily serves fishermen from nearby communities in Arizona and Nevada. A great variety of watercraft (ski boats, hot boats, fishing boats, and houseboats) uses the marina and day facilities. This area has the second greatest flood hazard of any developed area, with most development being vulnerable.

Willow Beach Zone

The major attraction in this zone is the cold waters of northern Lake Mohave which provide excellent trout fishing. The only developed access point in this zone is a small concession operation that functions primarily as a fishing resort. Overnight accommodations for visitors are currently limited to a motel and short-term trailer sites; the campground has been closed because of flash-flood hazards. This area has the most severe flood hazard of any developed area in the recreation area.

Boulder Basin Zone

The majority of visitors to this zone are day users; overnight accommodations are limited to one small motel at Boulder Beach and four

campgrounds. Most year-round day use is from the Las Vegas metropolitan area, less than 25 miles away. Southern Californians make up a large percentage of the users during summer months, and many of the people attracted to Las Vegas from all parts of the country contribute to day use activities. The main activities are waterskiing, boating, swimming, and fishing. The following developed areas in this zone provide and service day use activities.

Boulder Beach is the largest and most heavily visited development in the recreation area; most of the area is susceptible to shallow sheet flooding across the broad alluvial fan.

Las Vegas Wash is the closest area to Las Vegas and therefore attracts a large number of day use visitors; a severe flood hazard exists only for the boat storage area and launch ramp.

Callville Bay has the largest marina to service boatowners from Las Vegas; it is one of the few developed areas without flood hazard.

Some of the most popular coves within this zone are accessible by boat only. Boats leaving any of the marinas within the zone can reach these coves. Some coves are also accessible by unimproved dirt roads.

Echo Bay Zone

This underutilized access point to the Overton Arm provides a full range of services and facilities for day and overnight use; most visitors are fishermen and houseboaters from Las Vegas and southern California. Despite the well maintained modern facilities, the area has not been heavily used because of its distance from southern California and Las Vegas. However, in response to crowding at developed areas in Boulder Basin, more visitors are seeking less crowded conditions at more distant areas. This trend can be expected to continue as congestion mounts to the south and as the harbor and land-based facilities at Echo Bay are discovered by more people. The area is not threatened by flood hazard.

Stewarts Point provides an additional lake access opportunity within the Echo Bay zone. The access road leads to vacation cabins that dot the bluffs and an unimproved launch ramp.

In addition to the attractive lake areas available within the Echo Bay zone, several features apart from the lake and accessible by the Northshore Road enhance the zone's possibilities for visitor use. Rogers Spring and Bluepoint Spring provide a unique diversion for visitors traveling the highway north or south. Warm water bubbles up from these underground hot springs, creating inviting oases, complete with large trees. Redstone picnic area features large and dramatic appearing sandstone rock outcroppings. Opportunities for exploration and discovery are abundant throughout the geologically varied area.

Overton Beach Zone

A small, uncrowded, developed area provides primary access to the zone. The overnight accommodations are limited to primitive camping areas. Small, nearby communities contribute to visitation and use, but the majority of visitors are from major cities to the north and south. Fall and winter brings retired couples who are escaping cold weather and spring brings local Nevadans for skiing, boating, and fishing. The undeveloped camping area is the only part of the area in a flood-hazard zone.

Virgin/Temple Zone

This zone has great potential for growth and is currently underused. Temple Bar serves as the last concession area (or fuel stop) for boaters traveling east on Lake Mead toward the Grand Canyon. Fishing is the most popular activity; overnight accommodations include a motel, short-term trailer sites, and a 153-site campground. Temple Bar is remote compared to other developments and provides convenient access to less congested portions of the lake. It has the fourth greatest flood hazard risk of any developed area, with most development being vulnerable.

Gregg Basin/Grand Wash Zone

This zone is an undeveloped scenic area of the lake; access is limited to one paved launch ramp at South Cove and one unpaved launch ramp at Pearce Ferry, two improved roads, and several unimproved dirt roads.

Visitors must come prepared because the closest services are at Temple Bar about 15-20 miles away by water. The area is isolated and visitation is low, originating from a variety of locations. Use is primarily overnight beach camping; major activities are boating, skiing, and fishing. Pearce Ferry is a takeout point for river runners in the Grand Canyon and a gateway for trips into the canyon. A flash-flood hazard exists at Pearce Ferry and in many of the undeveloped coves in the zone.

Shivwits Plateau Zone

This area is the most isolated and least visited in the recreation area. It is grazed and visitors are generally limited to hunters, yet it affords some of the most spectacular views of the canyon rim country. Access is over a county dirt road. The road within the recreation area is rough, slow, and suitable for four-wheel-drive vehicles only. Due to a higher elevation (6,400 feet), the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests. Therefore, it also contains a wider variety of wildlife, including the only concentration of mule deer to be found in the recreation area. Big game hunting is a favorite recreational pursuit and probably accounts for the majority of visitation to this area (2,000 visitors per year). Additional recreational

activities include nature study, camping with a vehicle, exploring with four-wheel-drive vehicles, and hiking the superlative rim country. Kelly Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon; there is no flood hazard in use areas.

ENVIRONMENTAL CONSTRAINTS

Environmental constraints restrict development and use of certain areas within the recreation area. These constraints include climate, unstable soils, vegetation/wildlife, floodplains, and cultural resources.

The climate of the park is typical of the arid desert. Temperature extremes are common (32° to 110°F or 0° to 35°C), and temperatures can vary greatly within a single day. Precipitation averages 3 to 5 inches annually. Snow falls in the highest elevations of the park on the Shivwits Plateau. Late summer and early fall thunderstorms create flash floods in both developed and undeveloped visitor use areas.

Soils within the recreation area are generally shallow, friable, wind-deposited, or alluvial materials that are very susceptible to wind and water erosion. Erosive forces cause significant, sometimes dramatic, and long-lasting changes in physiography. Evaporation rates are much greater than precipitation and this creates extremely low soil moisture conditions throughout the year, which severely restricts plant growth. Modification by use or development causes loss of soils; this soil damage is slow to heal because of sparse plant growth. Unstable gypsum soils occur in several areas along the Overton Beach access road and in the Detrital Bay area.

Vegetation in general does not present any constraints except that once it is disturbed, the recovery period is usually long. The exotic species, tamarisk, which invades wet areas, often becomes so thick that it limits usable beach space and drys up wildlife water sources. There are several species of plants (see significant natural features under natural environment in "Affected Environment" section) that are significant because, for example, they reach their northern most limits within the park. There are no plant species, however, that are officially listed as threatened or endangered by the U.S. Fish and Wildlife Service. Several species are being considered for listing, many of which are already listed by the states of Arizona and Nevada or are species of local concern. It is NPS policy to treat such plants as if they were officially listed.

The bonytail chub, Gila elegans, and the bald eagle, Haliaeetus leucocephalus, Peregrine falcon, Falco pregrinus, are the only three animal species found in the recreation area which are officially listed as threatened or endangered by the U.S. Fish and Wildlife Service. As with plants, there are several animal species that would potentially be listed or are listed by the two states, such as the gila monster and desert tortoise. Again, they would be treated by the National Park Service as if they were officially listed. Desert bighorn inhabit many areas within the recreation area and their habitat requirements are quite crucial. Some herds, for example, the River Mountain herd, are among the most productive in the region.

Because of the requirements of Executive Order 11988, "Floodplain Management" 3 CFR 121 (Supp. 1977), Executive Order 11990, "Protection of Wetlands" 3 CFR 121 (Supp. 1977), and the final NPS procedures for implementing these orders, certain restrictions must be placed on use in

the recreation area. Mapping of the 100-year and the probable maximum floodplains was performed by the U.S. Army Corps of Engineers, U.S. Geological Survey, National Park Service, and private consulting firms for all developed areas, several existing and proposed improved access points, and many popular undeveloped visitor use areas. Once the plan is implemented, all the existing or proposed developments that now occur in hazardous flash-flood areas would be designed to protect the structures and provide for human safety.

Fluctuating reservoir levels are also major constraints. Originally the National Park Service, after consulting with the Bureau of Reclamation, considered the maximum reservoir level to be 1,221 feet above sea level for Lake Mead. However, because of abnormally high snowpack in the Rocky Mountains in 1983, the reservoir level reached 1,226 feet. Damage to facilities occurred in the 1,221-foot to 1,226-foot zone. Accordingly, the National Park Service now considers maximum high water to be 1,230 feet above sea level. Any facilities that could be damaged by water would not be allowed below that elevation. Daily fluctuations on Lake Mohave are more than those on Lake Mead; however, the annual fluctuations on Lake Mohave are much less. No facilities would be built below the 650-foot contour, which is considered to be the high waterline for Lake Mohave.

Archeological and historic resources of significance have been nominated for inclusion to the National Register of Historic Places. Adverse effects on these significant archeological and historic resources would be mitigated or avoided.

NATURAL ENVIRONMENT

CLIMATE

The variety of topographical features and elevation differences within the Lake Mead region create numerous microclimates. The lower elevations along the Colorado River and the broad valleys between mountain ranges have an arid climate typical of the Mohave Desert. Precipitation is low, averaging only 3 to 5 inches per year. Humidity is also low and averages about 28 percent. Winters are mild, with daily temperatures in January ranging between 32°F and 55°F on many days. In summer an average July maximum temperature reaches nearly 105°F. Evaporation rates are extremely high and exceed 80 inches per year at the surface of Lake Mead.

Most of the precipitation occurs during the winter months and during July through September. There is a period every late summer when warm, moist, tropical air dominates weather conditions in this area, creating higher than average humidity and scattered thundershowers that cause flash-flooding with rapid runoff and severe erosion. Washes that have been dry for the rest of the year can flow without warning. At Lake Mead the greatest hazard to life and property occurs where developed areas were built in flash-flood washes before the danger was fully understood. Virtually every wash in the recreation area can be the path of a flash flood from time to time. Precipitation during the winter is usually from regional storms of low intensity and longer duration. Less than 2 inches of snow per year falls at lower elevations, and it only remains on the ground for a day or two.

Elevation has a marked effect on climatic conditions. Precipitation increases and temperature decreases toward the higher elevations of the area, and the climate becomes more semiarid and steppe-like. Above elevations of about 5,000 feet, the temperature averages approximately 10°F cooler than the lowlands. Summer temperatures on the Shivwits Plateau have average highs in the 90s and lows in the 60s. Winter temperatures may drop as low as -10°F. Snow may fall at any time between October and April, with total yearly amounts averaging between 18 and 33 inches above elevations of 5,000 feet.

Clear weather is the hallmark of the Lake Mead region. There are few overcast, rainy days during the year. The area along the lower Colorado River, south of Willow Beach, is one of four places on earth having more than 4,000 hours of sunshine each year.

GEOLOGY

Lake Mead National Recreation Area contains approximately 2,350 square miles of biologically and geologically diversified land and water environments. The Grand Wash Cliffs mark the boundary between the Colorado Plateau Province of the eastern portion of the recreation area and the Basin and Range Province of the central and western portions of the recreation area.

The Basin and Range Province is characterized by generally north-south trending mountain ranges separated by broad, shallow valleys. Many of these intervening valleys have no exterior drainage and form enclosed basins. The mountains are dissected by deep ravines that open into broad alluvial fans. Commonly, adjoining fans coalesce and form a continuous alluvial apron along the base of the mountains. These slopes extend outward into the valleys where they merge with the valley floor, or extend across the valley and join opposing slopes that form an alluvial divide. The valley floors are usually nearly level and often contain one or more playas, or dry lakes, where silt, clay, evaporites, and weakly cemented gravels have been deposited. In the tilted, fault-block mountains, the age of strata ranges from Precambrian to Tertiary, while the sediments in the intervening structural basins are all younger than the Mesozoic and consist chiefly of late Tertiary and Quaternary deposits.

The portion of the Colorado Plateau Province within the recreation area lies east of the Grand Wash Cliffs and north of the Grand Canyon of the Colorado River. It encompasses the southern portion of the Shivwits Plateau, the extreme southwestern portion of the Uinkaret Plateau, and a small portion of the inner-canyon platform known as the Esplanade.

Most of the upland plateau is a gently rolling but dissected tableland. A number of lava-capped buttes rise above the general landscape, culminating in 7 million-year-old Mount Dellenbaugh, which at an elevation of 6,990 feet is the highest point in the recreation area. The southern edge of the plateau drops away precipitously toward the Colorado River.

The sedimentary rock column includes strata ranging in age from Lower Cambrian to Middle Triassic and overlies a basement complex of Precambrian granite and schist. The sedimentary formations are nearly horizontal and generally have a dip of less than 5° to the east and northeast.

Most of the faults in this section of the recreation area are high-angle and dip-slip, with some having a scissors movement. Structurally and topographically, this portion of the Colorado Plateau contrasts sharply with the deep structural basins, block-faulted ranges, and tilted blocks of strata that are characteristic of the Basin and Range Province to the west.

This portion of the Colorado Plateau provides a classic example of landscape development in nearly horizontal sedimentary rocks with different resistance to erosion under semiarid conditions. In general the landscape is composed of five classes of features: steep to vertical-walled canyons developed in resistant strata; beveled surfaces of the inner canyon of the Colorado River where the massive crystalline rocks of the Precambrian and lower Paleozoic carbonate strata have a more uniform resistance to erosion; stripped surfaces that are developed on a particularly resistant stratum overlain by less resistant strata, typified by the Kaibab uplands and the Esplanade; scarps, either erosional or tectonic, such as the Hurricane and Grand Wash Cliffs; and surfaces of aggradation, most notably represented by lava flows, talus, and colluvial slopes. The three broad soil associations represented in Lake Mead National Recreation Area are as follows.

Lithosols are thin, stony surface soils derived from rocky parent materials which characterize the slopes and crests of parallel desert ranges. These soils support scant growths of desert shrubs. Areas include desert ranges, such as Eldorado, Newberry, Black, River, Muddy, and Virgin mountains; the crests, rocky slopes, and upper part of some associated alluvial slopes; and steep-walled canyons.

Red desert soils are pinkish, reddish, and brownish-gray soils, which are commonly only slightly leached, rich in lime and mineral plant nutrients. They are derived from alluvial outwash from a great variety of rocks in the mountain ranges (metamorphic, granitic, volcanic, sedimentary). Red desert soils include stony to gritty alluvium of fan deposits and finer basin interior deposits. These soils support creosotebush, leguminous trees, cacti, etc. Areas include desert basins, Detrital Wash, Eldorado Valley, and others.

Catron soils are dark brownish-gray to black calcareous soils with moderately high organic content. They are derived from calcareous shales, sandstones, and hard limestone bedrock. Catron soils support a pinyon/juniper grassland association of plants. Areas include the Colorado Plateau section of the recreation area in regions interrupted by outcropping ledges, abrupt cliffs, and deep stream-carved canyons.

MINERALS

The principal source of the following summary of known mineral occurrences and their significance is O'Brien (1982). His report (contracted by the National Park Service, see appendix G) is a compilation of the existing minerals information at the time of writing and is supplemented by mineral occurrence information from U.S. Geological Survey, Nevada Bureau of Mines, U.S. Bureau of Mines, Arizona Bureau of Mines, and a 1985 report from Morrison-Knudsen prepared under contract to the National Park Service. The mineral resource information presented below reflects all these sources and is expressed in section 3031 of the Bureau of Land Management's manual concerning mineral potential reports.

The mineral resources of Lake Mead region are found in widely scattered areas throughout the recreation area. Although there has been a long history of mineral exploration in the area, dating from the early 1860s, mineral production has been minimal. The only recorded production within the last 25 years of leasing at Lake Mead is 60 pounds of tungsten concentrate. For ease of discussion, the mineral resources have been subdivided into metallics, nonmetallics, and energy resources.

Metallic Minerals: Gold in lode deposits has been found in several locations along the west side of Lake Mohave, in the Newberry Mountains and Eldorado Mountains in Nevada, and near Davis Dam in Arizona. Mine production ceased in these areas in 1941. New bulk mining processes for precious metals may make these old mining areas inside and outside the national recreation area (NRA) valuable

for gold production. The Capitol Camp patented mining claim is currently being explored for a gold surface mine. A high potential exists for finding gold deposits within and outside the national recreation area.

Low-grade manganese ores are found in lenticular pockets in the Muddy Creek formation within the NRA. The Three Kids Mine, which was the biggest manganese producer in the state, operated from 1917 to 1961. Lowe (1985) lists four principal manganese deposits within or adjacent to the NRA. A high mineral potential exists for manganese deposits being found within and outside the NRA.

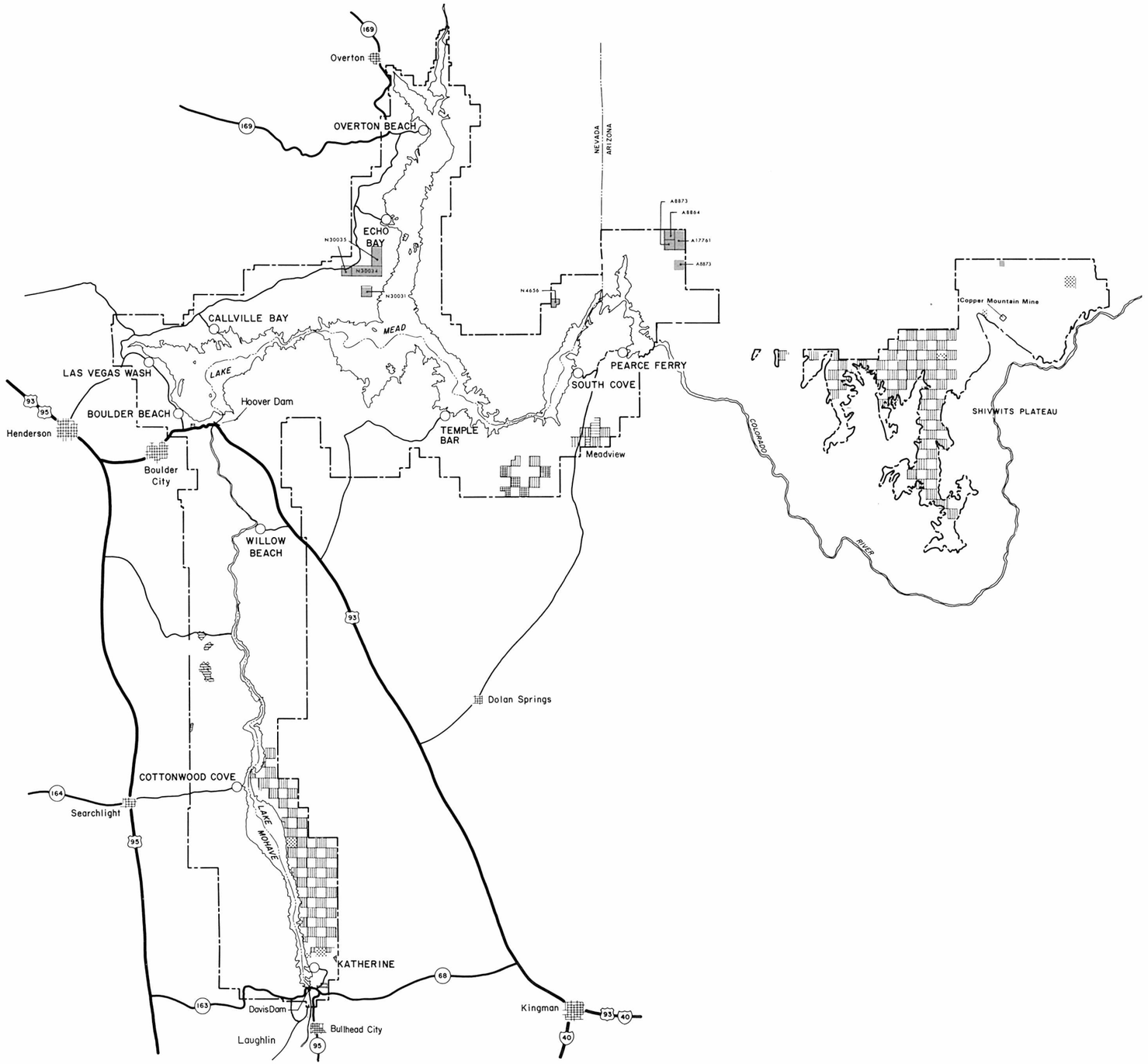
Base metals such as lead, zinc, and copper have been mined at several locations, mostly outside the NRA. These minerals have been produced as by-products of gold and silver mining. Lowe (1985) shows several lead, zinc, and copper occurrences in and adjacent to the NRA, but none are listed as principal deposits. A medium potential exists for lead, zinc, or copper mineral deposits being found within the NRA.

A small deposit of tungsten occurs near Iceberg Canyon within the recreation area. The deposit has been under lease for over 20 years and has produced 60 pounds of concentrate during that time.

Nonmetallic Minerals: Silica is mined outside the recreation area near Overton, Nevada, but there are no reported deposits within the recreation area. Large deposits of salt were mined near St. Thomas Wash and Overton Beach before completion of Hoover Dam but have since been inundated by the waters of Lake Mead. There are subsurface deposits of salt under Detrital and Hualapai valleys outside the recreation area in Arizona, but the need for massive amounts of water to extract the mineral may limit the possibility of using these deposits.

Energy Minerals: Oil and gas leasing has occurred within and adjacent to the recreation area since its establishment and for many years before. However no recent wells have been drilled within the recreation area and no producing fields occur in the region. Recent interest in oil and gas in the area is the result of speculation on the southern trend of the overthrust belt, a productive region in northwest Utah, southwest Wyoming, and northwest Colorado which may also extend into the recreation area. In recent years, several deep wells have been drilled west of the Overton Arm, adjacent to the park boundary, but they have failed to find any promising shows of oil or gas or to confirm the existence of the overthrust belt through stratigraphic testing. Since the last of these holes were drilled in 1980, 64 leases within the recreation area have been withdrawn by their owners. Oil and gas resources have a low potential for occurrence in the recreation area.

Uranium occurs in breccia pipes throughout the Grand Canyon region and extending into the recreation area. Some of these geologic features have been explored for their copper, silver, and gold content.



MINERAL LEASES

BLM Lease #	Acres	Type	Lessee	Date Effective	Annual Rental
NEVADA (4 Leases)					
N4656	400	Mineral	Gentry	4/1/71	$ 100
N30031	640	O&G	IMC Expl.	12/1/82	$ 640
N30034	1,920			9/1/82	$1,920
N30035	1,920				$1,920
ARIZONA (4 Leases)					
A8864	639	O&G	Wahl—Yee	3/1/80	$ 639
A8873	1,280			8/1/80	$1,280
A17761	1,279	O&G	Kenderdine	6/1/82	$1,280

8,078 TOTAL ACRES UNDER LEASE IN NRA — TOTAL **$ 7,779**

4,880 acres leased in Nevada
3,198 acres leased in Arizona

OTHER MINERAL INTERESTS

	ACRES
Copper Mountain Mine (UNPATENTED CLAIMS)	83
PATENTED CLAIMS	941.65
NON FEDERAL SUBSURFACE MINERAL RIGHTS	55,000
STATE LANDS	2,654

TOTAL 58,678.65

N

5 0 5 10 15 MILES
5 0 5 10 15 20 KILOMETERS

OUTSTANDING MINERAL RIGHTS

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA-NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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> Interest in uranium exploration centers around the Parashant-Whitmore Canyon area on the Shivwits Plateau where several applications for prospecting permits have been filed in the last few years. Energy Fuels Corporation (oral communication, Sept. 19, 1984) alone found over 3,000-4,000 circular structures which, when field examined, yielded 68 breccia pipe-like structures. Twenty-six of these had ore grade uranium; one is within the NRA. Three operating uranium mines are on the Shivwits, outside the NRA, in similar breccia pipe structures. Some breccia pipes have been drilled and yield little uranium of value. Two of these unsuccessful exploration drill holes are within the NRA. Nonetheless, there is a high potential for finding uranium deposits within and outside the NRA.

O'Brien (1982) found no mineral occurrences of sufficient quality and quantity to affect the nation's supply of any given commodity. There is, however, high to medium potential for finding deposits of several mineral commodities inside and outside the NRA. The probability of future mineral commodity shortages (demand) for which the medium or high potential commodities becoming so important as to override the benefits of protecting wilderness and park values is remote.

WILDERNESS SUITABILITY

The Wilderness Act of 1964 directed the secretary of the interior to review all roadless areas within units of the national park system and to make recommendations as to the suitability or nonsuitability of each area to the president and the Congress. The act defined wilderness as

> an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean . . . an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which: (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The act further stated:

> Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for

the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area.

Based on the above criteria, the National Park Service initiated a wilderness review of all the lands within Lake Mead National Recreation Area. This initial review was completed by the National Park Service in 1974, when 409,000 acres were proposed for wilderness. In the president's transmittal to Congress, the recommendation was made to defer action on the Lake Mead proposal, pending a study of western power needs by the Bureau of Reclamation. When this study was completed, the National Park Service initiated a new wilderness review using the information provided by the Bureau of Reclamation. This review was completed in 1979 when 418,000 acres were proposed for wilderness and an additional 262,000 acres were proposed as potential wilderness additions (to be designated wilderness when nonqualifying conditions no longer existed). Revisions to this proposal and the Draft Environmental Statement were being prepared based on public comment when the GMP was initiated. At that time, the National Park Service decided to delay completion of the Wilderness Plan so it would not preclude options for any other authorized uses that might surface during preparation of the GMP.

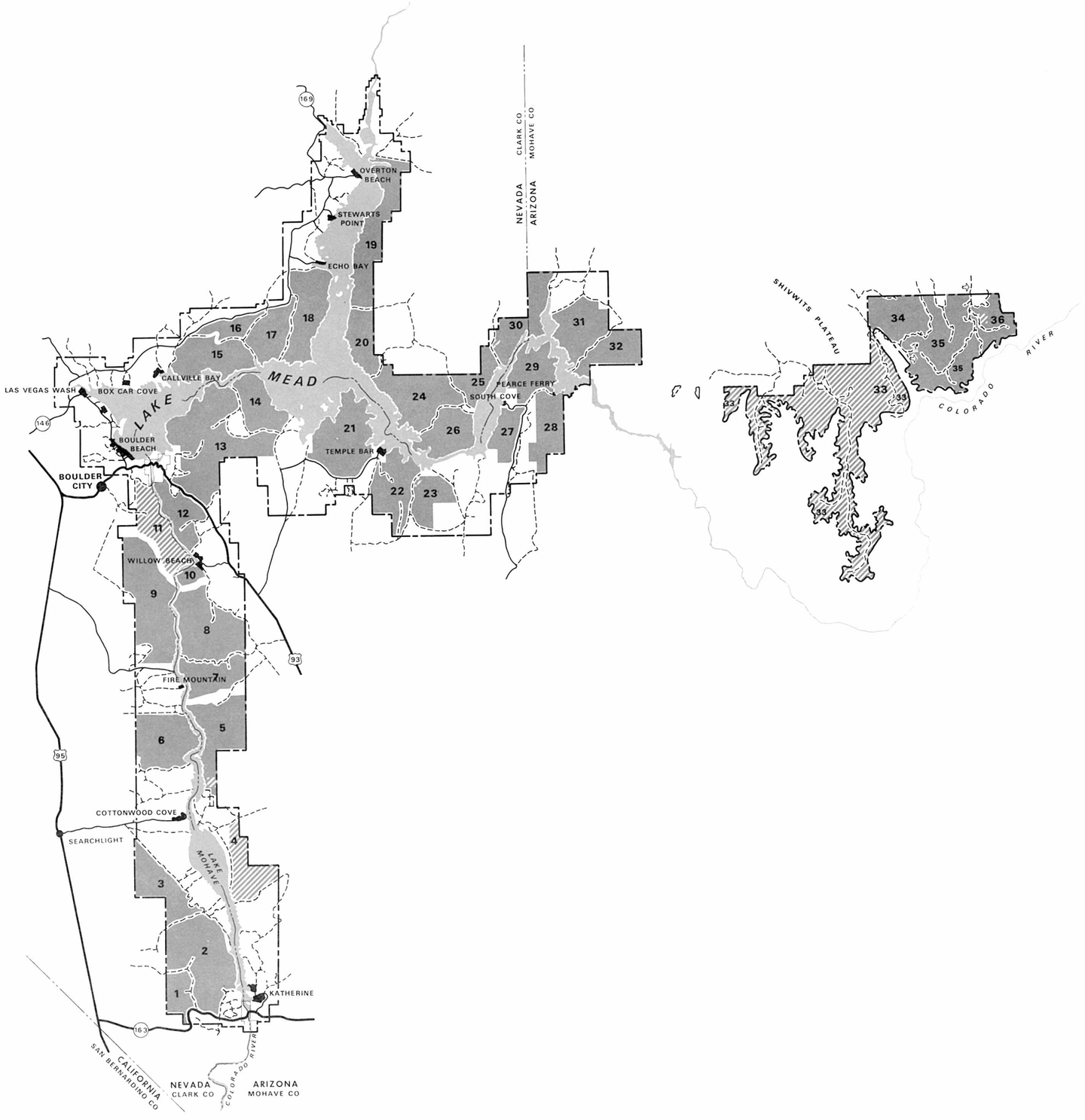
Nothing is proposed for wilderness designation in the GMP. The map included in this section indicates those lands which meet (558,675 acres) or potentially meet (115,700 acres) the criteria of the Wilderness Act of 1964. Following completion of the GMP, a wilderness plan will be prepared. Lands proposed for wilderness designation in that plan will be taken from the lands indicated on this map; other NRA lands will not be affected.

Concerns of conservation organizations over this issue resulted in a lawsuit by the Sierra Club in 1983 (Sierra Club v. Dickenson, civil no. 83-1657 (D.C., Arizona)). The effect of this lawsuit has been to stop mineral leasing within the NRA. The National Park Service anticipates that once the GMP and the MMP have been approved, the mineral leasing program will be reactivated. Thus, all lands possessing wilderness values will be protected until the general management plan has been approved. Once it is approved, mineral leasing will be permitted only in the resource utilization subzone.

The following units are keyed by number to the Wilderness Criteria map. These units which meet or potentially meet the criteria of the Wilderness Act include most of the lands in the recreation area with primitive characteristics. Boundary lines of the units follow topographic features, access roads, the recreation area boundary line, section lines, and a line marking a 300-foot horizontal setback from the high waterlines of Lakes Mohave and Mead.

Units 1 and 2 - Newberry Mountains, Christmas Tree Pass

These units consist of 40,605 acres. They are bordered on the north by the Empire Wash access road, on the east by a 300-foot



WILDERNESS Lands meeting the Wilderness Act Criteria)

POTENTIAL WILDERNESS (Lands potentially meeting the Wilderness Act Criteria)

	WILDERNESS	POTENTIAL WILDERNESS
1	7,650	0
2	32,955	0
3	15,870	0
4	0	15,295
5	17,970	640
6	17,635	0
7	15,145	0
8	25,605	0
9	29,665	0
10	2,045	0
11	0	14,645
12	13,030	0
13	40,835	0
14	13,875	0
15	17,115	0
16	6,680	0
17	14,545	0
18	18,820	0
19	24,040	0
20	10,610	0
21	25,580	0
22	16,665	0
23	9,885	80
24	22,095	0
25	8,545	0
26	14,620	0
27	7,720	0
28	14,020	0
29	13,895	0
30	15,143	460
31	16,480	0
32	12,100	0
33	0	83,980
34	14,905	0
35	32,215	0
36	10,710	600
TOTAL	558,675	1115,700

N

5 0 5 10 15 MILES
5 0 5 10 15 20 KILOMETERS

WILDERNESS SUITABILITY

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA · NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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setback on Lake Mohave, and on the west and south by the boundary of the recreation area and Highway 71. The area centers on the Newberry Mountains, which rise to an elevation of 5,600 feet and offer a cool refuge from the heat of the surrounding desert lowlands. Davis Dam, the Mohave Power Plant, Katherine Landing, and Bullhead City are developments visible from the southern and eastern portions of this unit.

Unit 3 - Nellis Wash

This 15,870-acre unit includes portions of the isolated Newberry Mountains along the western side of the recreation area. Fingerlike drainages and alluvial fans extend eastward from the mountains toward Lake Mohave. Some mining has occurred within the unit. However, it is not obtrusive and no active mining occurs within the unit. A powerline corridor and access road form a boundary to the north and east. The Empire Wash access road bounds the unit on the south, and the recreation area boundary forms its western edge.

Unit 4 - Cottonwood Valley

Cottonwood Valley potentially meets the criteria of the Wilderness Act because of outstanding mineral reservations. However, this outwash trending to the west provides solitude and isolation in a primitive setting north of a major development at Katherine Landing. This 15,295-acre unit is bounded on the north, south, and west by existing access roads and on the east by the recreation area boundary. The terrain slopes gently westward toward Lake Mohave. This unit is adjacent to the Black Mountain North Wilderness study area (WSA) (2-009) managed by the Bureau of Land Management (BLM).

Unit 5 - Black Mountains

The Black Mountains, capped by 2,000-foot Mount Davis, provide a scenic background to users of Lake Mohave. Approximately 17,970 acres are included within this unit. Scattered washes and side canyons transect the Black Mountains from east to west as they wend their way to the Colorado River. The Four Corners-Eldorado Transmission Line forms the north boundary. The west boundary is 300 feet from the high waterline of Lake Mohave, the south boundary follows a series of roads of the Cottonwood Valley system, and the east boundary is the recreation area boundary line. This unit is adjacent to the Mount Davis (2-021) and mockingbird (2-008) WSAs managed by BLM.

Unit 6 - Opal Mountain

Within this unit is a portion of the Eldorado Mountains, gently rolling hills, and outwashes extending to Lake Mohave. Rugged mountains, secluded valleys, and flat alluvial fans provide opportunities for seclusion and isolation in a setting of scenic splendor. The unit is bounded on the north by the Aztec powerline

road, on the east by a 300-foot setback from Lake Mohave, on the south by the Opal Mountain Road, and on the west by the recreation area boundary. Approximately 17,635 acres are included within this unit.

Units 7, 8, 10, 11, and 12 - Fire Mountain and Black Canyon

These units contain some of the most spectacular and rugged terrain within the NRA. They consist of steep barren rocky crags, which begin at an elevation of 645 feet and terminate at an elevation of approximately 2,200 feet. These units consist of 70,470 acres and combine to form the "Black Canyon" of Lake Mohave, which is noted for its hot springs and cool Colorado River. This area is a noted spot for visitors to see sharp and abrupt canyon walls and a myriad of geology. Unit 11 only potentially meets the criteria of the act because the Bureau of Reclamation has identified this area as a potential location for reclamation facilities ranging from modification of Hoover Dam to new transmission line corridors. Each of these potential facilities could require a considerably larger area for construction activities than the principal construction, owing to required site for access roads, transmission and utility lines, and borrow pits. Unit 7 is adjacent to the Van Deeman WSA (2-007) managed by BLM.

Unit 9 - Eldorado Mountains

Contained within this 29,665-acre unit are the picturesque and rugged Eldorado Mountains. The unit is a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. State Highway 60 forms the southern boundary; the Colorado River/Lake Mohave 300-foot setback constitutes the east boundary, the northeast side is bounded by the Mead-Liberty Transmission Line, and the recreation area boundary forms the west unit boundary.

Unit 13 - Kingman Wash

Approximately 40,835 acres are included within this unit. It is bordered on the north by the 300-foot horizontal setback from the high waterline of Lake Mead; on the west by Kingman Wash access road; on the south by U.S. 93; and on the east by access roads. An area used for intensive recreation and an area which may be needed as a powerline corridor are identified as nonwilderness along the east boundary. The undulating Black Mountains typify the topography of the region. Access to the unit is provided on all sides by existing road corridors. This unit is adjacent to the Mount Wilson WSA (2-001A) managed by BLM.

Unit 14 - Bonelli Landing

This unit comprises 13,875 acres of mainly alluvial fans and separates the hilly mountainous area of unit 13 from the gypsum

beds of unit 21. This unit contains some historic mining diggings and some archeological remains in the form of petroglyphs. Access to this unit is primarily by the road to Bonelli Landing and to Temple Bar.

Units 15, 16, and 17 - Pinto Valley

These three units comprise approximately 38,340 acres of rugged hills and highly scenic valleys. These units contain Guardian Peak, which is one of the highest peaks within the area and is used as a navigational aid. The northern side of Boulder Canyon is formed by these units, which is where steep cliffs or barren rock enter the cool blue waters of Lake Mead in a dramatic fashion. Pinto Valley is formed within these units and exemplifies a much photographed topography because of the red sandstone at outcroppings which merge with the green desert vegetation and the grays, browns, and yellows of the desert floor.

Unit 18 - Cathedral Wash

This 18,820-acre unit is bounded on the north, by the Echo Wash access road; on the east and south, by the 300-foot setback from the high waterline of Lake Mead; and on the west, by Nevada State Highway 167 and the Boathouse Cove access road. Mountainous terrain representing the northeast extremities of the Black Mountains dominates the area and contrasts directly with the flat surface of Lake Mead.

Unit 19 - Overton

Most of this 24,040-acre unit consists of flat to "badland-like" lands sloping westward from mountainous terrain to a road corridor east of the recreation area boundary. The unit forms the scenic background for lake users and for shoreline users on the west side of Overton Arm. These flat outwashes lack the spectacular contrasts found within other units. This unit has a typical desert landscape. It has retained its primitive condition and affords an opportunity for seclusion and an unconfined type of recreation. On the north, the unit is bordered by the Narrows South access road; on the east, by the recreation area boundary; on the south, by the Catclaw access road; and on the west, by the 300-foot setback from Lake Mead.

Unit 21 - White Hills, Unit 22 - Temple Bar, and Unit 23 Gregg's Hideout

These units are located within the White Hills. They are characterized by isolation, seclusion, scenic views, and historic significance. This rolling hill country includes some evidence of earlier historic mining activities and trails associated with these efforts. The early methods of mining did not scar the area excessively, and many scars have healed to the point of not being noticeable. However, areas further to the west do not meet the Wilderness Act criteria because they have been severely scarred by

modern exploration techniques and road construction. Unit boundaries consist of access roads, setbacks from Lake Mead, development areas, and recreation area property lines. Access to the area is possible from existing roads, hiking from developed areas such as Temple Bar, or by boat from Lake Mead. These three units contain approximately 52,130 acres.

Unit 20 and Units 24 through 32

These units are known as Twin Springs, Scanlon Wash, Hiller Mountains, Hell's Kitchen, Indian Hills, Cockscomb, Grand Wash Cliffs, Iceberg Ridge, South Cove, and Pearce Ferry. The units contain rugged mountain ranges which provide a scenic background for the Virgin Basin section of Lake Mead. Gently sloping outwash fans extend from the mountain fronts to plunge abruptly into the reservoir.

The units are bounded by a network of roads that provide access to developed areas or the lakeshore, by recreation area boundaries, and the lakeshore setback. The interior portions of these units are readily accessible from adjacent roads. Unit 20 contains 10,610 acres and units 24 through 32 contain approximately 125,078 acres. Unit 28 is adjacent to the Grapevine Wash WSA (2-014) managed by BLM.

Unit 33 - Shivwits Plateau

Approximately 83,980 acres are included within this unit. A diversity of activities occur in this remote section of Lake Mead, ranging from hunting to grazing. Due to a higher altitude, the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests. Therefore, it also contains a wider variety of wildlife, including the highest number of mule deer to be found in the recreation area. Big game hunting is a favorite recreational pursuit and probably accounts for the majority of visitation to this area. The cooler, wetter climate also provides for some of the better grasslands that sustain larger numbers of cattle per unit of area than other sections of the recreation area. Additional recreational activities include nature study, dry camping with a vehicle, rockhounding, exploring with four-wheel-drive vehicles, and hiking the superlative rim country. Kelly Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon.

Because there are 66,350 acres of land within this unit which are subject to mineral reservations, the unit only potentially meets the criteria of the Wilderness Act.

Unit boundaries follow rims, internal access roads, and recreation area boundaries.

Several of the units may appear to be narrow and splintered by access roads. However, when considered along with the adjacent

proposed wilderness in Grand Canyon, it is apparent that these would form a significant contiguous wilderness unit.

Unit 34 - Andrus Point, Unit 35 - Whitmore Point, and Unit 36 - Lava

These three proposed wilderness units consist of approximately 58,430 acres in the northeast sector of the recreation area. Contained within these units are Parashant, Andrus, and Whitmore canyons; all are precipitous side canyons of significant grandeur that drain into the Grand Canyon. The entire area is undeveloped land retaining its primeval character with the imprint of man's work substantially unnoticeable. It provides an opportunity for solitude or a primitive and unconfined type of recreation in a scenic setting of steep escarpments, colorful red walls, and deep canyons.

Geologic formations and processes in evidence here may provide information on the origin of the Grand Canyon, which is of interest to the scientific and educational communities. Also of interest to these communities are the archeological sites of several Indian cultures, including the Virgin Anasazi and more recently the Paiutes. Unit 36 is adjacent to the designated Mount Leyan Wilderness Area (Arizona Wilderness Act of 1984).

Grazing has occurred in this region for over 100 years, and the Lake Mead establishing act identifies grazing as an acceptable use. Roads and tanks or water pockets found to be needed for current grazing operations and requiring road access are excluded from the wilderness proposal. All roads in this area and on the Shivwits Plateau serve dual roles in providing access for recreation and for grazing support purposes.

Unit boundaries consist of road systems, recreation area boundaries, and plateau rims. Adjacent primitive areas of Grand Canyon National Park provide for a contiguous unit of primitive lands extending westward from the Pine Mountains across the Sanup and Shivwits plateaus to the Grand Wash Cliffs.

ECOLOGICAL COMMUNITIES

The ecological communities of Lake Mead can be most conveniently divided, like geology, into the Basin and Range Province and Colorado Plateau Province. The best way to describe wildlife in the park is to relate it to habitats represented by vegetational communities. There are five primary vegetation complexes in the two provinces with numerous subcommunities. The following describes all communities represented in Lake Mead, with emphasis on those communities that would be directly affected by the proposed action.

Desert Shrub Complex

In the Basin and Range Province of the recreation area the desert shrub complex is the most prevelant. Within the complex two distinct communities exist--the creosotebush and blackbrush communities. Because most proposals in the draft plan focus on the lake at existing or proposed developed areas and improved access points, the most affected community would be the creosotebush community. It generally exists around both lakes between 500 and 3,500 feet elevation. However, in many cases access to the lakes would necessitate going through the blackbrush community, which ranges between 3,000 and 4,000 feet elevation, and following washes that comprise the transzonal desert riparian community.

Table 18: Area of Ecological Communities

	Acreage	Percentage
Basin and Range Province		
Creosote Community	1,040,000	70.2
Blackbrush Community	35,000	2.4
Pinyon/Juniper Community	2,800	0.2
	1,077,800	72.8
Colorado Plateau Province		
Pinyon/Juniper Community	107,000	7.2
Sagebrush Community	59,000	4.0
Blackbrush Community	30,000	2.0
Creosote Community	12,000	0.8
Oak Woodland Community	1,200	0.1
	209,200	14.1
Aquatic Areas		
Reservoir Community	186,000	12.50
Stream/Riparian Community	2,000	0.10
Springs Community	100	0.01
	188,100	12.61
Developed Area		
Disturbed Communities	7,300	0.50
Total	1,482,400	100.00

The creosotebush community is found in the western and central portions of the recreation area. The most extensive stands are found northeast of Lake Mead in the Twin Springs and Scanlon Wash areas. It is locally well developed on lower bajadas, alluvial fans, and playas. It may be found occasionally at higher elevations on arid, south-facing slopes. Near the Colorado River, the topography occupied by this community is especially rocky and rugged. Soils typically develop on gray alluvium and generally have high salt-alkali contents that often form caliche hardpans. This community has extreme fluctuations of daily and seasonal temperatures and precipitation. Vegetation cover is sparse in this community and dominated by creosotebush and bursage. Other species common to this community are Mormon tea, brittlebush, range ratany, and indigo bush. Following

the period of above-average precipitation, profusions of annual wildflowers can be observed.

Diurnal lizards and nocturnal snakes are relatively common reptiles in this community. The Gila monster reaches its northernmost range in this area, but like the chuckwalla and the desert tortoise, it is not abundant. Densities of bird species are low. Gambel's quail, raven, desert sparrow, horned lark, roadrunner, and the cactus and rock wrens occur in this community. Five species of bats are common to abundant as are seven species of small rodents. The blacktail jackrabbit and the desert cottontail sometimes become locally abundant. Carnivores such as the coyote, kit fox, badger, and bobcat are relatively common, depending on the supply of smaller animals. The feral burro, wild horse, and domestic livestock graze within this community, and the desert bighorn is rarely found in rugged terrain of this community.

The blackbrush community is similar but of greater density than the creosotebush community. Although small in total area, it is widely scattered throughout the recreation area. This community is predominate in Grand Wash and is secondary in areas adjacent to the Colorado River from Callville Bay to Davis Dam. Small isolated stands are occasionally found at higher elevations. The soils of this community are generally more porous, have lower salt content, are more permeable, and have slightly higher organic contents than the soils of the creosotebush community.

Plants frequently associated with this community include blackbrush, Joshua tree, Mormon tea, rabbitbrush, matchweed, and flat-topped buckwheat. While the herbaceous composition is generally the same as the creosotebush community, perennial grasses such as Indian rice grass and needle grass are more abundant.

Reptiles are well represented in the blackbrush community, but there are not as many as in the creosotebush community. Sage sparrow, ladder-backed woodpecker, raven, and cactus and rock wrens are the more abundant resident birds. Most mammals that are residents of the creosotebush community also inhabit this community. Desert bighorn graze in the upper elevations. Other grazing animals include nonnative burros, horses, and domestic cattle. Competition exists among these animals for forage and water. Desert bighorn and burros frequently compete for scarce water sources, but with the reservoirs available this competition is reduced. Grazing impacts on rare, threatened, or endangered plants has not been adequately studied to know the level of effect.

The desert riparian community comprises vegetation in local desert washes, which is not dramatically different in growth-form from that of the surrounding desert shrub communities. Plants are comparable but usually occur in greater density in the desert riparian community. As a result, it is commonly recognized as a transzonal rather than distinct community. Like its Sonoran counterpart, it is scattered like fingers through the landscape. Roadsides are quite similar to these washes because of concentrated water runoff from the pavement surface. Soils are usually silty to sandy but become quite rocky at the higher

elevations. As would be expected, increased subsurface water may be available, allowing greater densities of plants. Mesquite, catclaw acacia, desert willow, cheeseweed, and non-native tamarisk give this community a slightly more developed appearance. On portions of the Colorado River upstream from Lake Mead, ocotillo can be found along the edges of this community. This transzonal complex also extends into major laterals such as Whitmore and Andrus canyons.

Animal species are also similar to those of the surrounding communities; the major difference is that they occur more frequently. Desert wood rats are frequently found in this environment because it offers more abundant food and cover sources than do the adjoining communities. These factors undoubtedly account for the greater density of desert birdlife found here. Feral burros and domestic cattle also use this ecosystem.

Woodland Vegetation Complex

This complex in the Basin and Range portion of the recreation area is represented by only the pinyon/juniper community. The Newberry Mountains area near the southwest corner is the only area exhibiting this higher growth-form and more complex interrelationship of plant and animal life. Nothing has been proposed which would directly affect this area.

Generally surrounded by the blackbrush community, this area receives a greater amount of annual precipitation that supports the more developed community. The dominant species of plants in this community are the California juniper and the pinyon or single-leaf pine. Herbaceous plants are well represented.

Reptiles are not as well represented here as in the communities at lower elevations. Bird species include rock wren, red-tailed hawk, common bushtit, western bluebird, and Gambel's quail. Mammals are well represented, and the area is a major locality for upland game hunting. Several signs and positive sightings of desert bighorn have recently been made nearby. Common carnivores include bobcat, coyote, and gray fox. Domestic livestock and feral burros have frequented and continue to use this community. Except for occasional trespass, domestic livestock and feral burros do not use this community in the Newberry Mountains.

Aquatic Community Complex

This complex contains four distinct communities in the recreation area--desert spring, lake, stream, and stream riparian communities. Evidence concerning the desert spring community indicates that a larger number of desert springs flowed historically. A major concentration of active springs occurs on each side of the Colorado River between Hoover Dam and Willow Beach where no new proposals have been made. However, proposals have been made at Rogers and Bluepoint springs north of Echo Bay.

Many springs are thermal, and water temperatures vary slightly on an annual basis. Various aquatic plant species can be expected, and the peripheries of springs may have a number of sedges, rushes, cattails, salt grass, and salt-tolerant shrubs. Cottonwoods, mesquite, desert willow, palms, and tamarisk may also be found in these mesic soils. Formerly active springs or water catchments provided greater water availability, indicated by the presence of cottonwoods, mesquite, scrub oak, and wild grape.

Although use of local springs as watering sites by resident and migrant birds may not be as great as during preimpoundment days, the springs continue to provide considerable shelter for the park's bird populations.

The lake community contains several variables that influence vegetation and distributions of game fish. This community would only be affected by proposals to use fill to reclaim land from the lakes and in construction of new launch ramps.

Lake Mohave, with its cold upstream water temperatures, has long been known for its excellent trout fishing. Rainbow trout are planted by the U.S. Fish and Wildlife Service directly into Lake Mohave from the Willow Beach Hatchery. The state of Nevada has previously planted kokanee salmon on an experimental basis with little success. Late each spring, the transition zone between colder uplake and warmer downlake waters provides an extremely vivid rust-to-near-orange display of algae in the Chalk Cliff to Monkey Cove area. A noticeable change in game fish composition is associated with this six-mile transition zone. Below the transition zone one can expect fewer trout and an increasing number of largemouth bass. However, this fact is less noticeable today because of increased downlake stocking of rainbow trout and other salmonids. Although it has not been determined how striped bass entered Lake Mohave, it has been confirmed that they are now established in the Lake. This introduction may affect the trout fishing in the future.

Use of the lake community by birds such as western and eared grebes, gulls, egrets, herons, several species of shorebirds, bald and golden eagles, white pelicans, and ospreys is significant. Although not all use the lake community for the basic necessities of food, shelter, or escape cover, most are closely associated to the lake, stream riparian, and stream communities.

The stream community is limited to the waters of the Colorado River (upstream from Lake Mead), Muddy and Virgin rivers, and to the clear or relatively nonsilted lower reaches of Las Vegas Wash and the Colorado River below Hoover and Davis dams. Nothing has been proposed which would affect these areas.

Several variables, including turbidity, depths, widths, velocity, and temperature, influence vegetation within this community. Numerous endemic nongame and nonnative fishes currently inhabit the community. Carp, striped bass, and channel catfish predominate in the waters of the

Colorado River. The introduced striped bass and rainbow trout provide a major sport fishing resource in river waters below Davis Dam. Beaver, and soft-shelled turtle are reportedly found in the Virgin and Muddy rivers and below Davis Dam in the Colorado River.

The stream riparian community is found along Las Vegas Wash and the Muddy, Virgin, and Colorado rivers. Narrow mesic canyons of the Newberry Mountains containing intermittent flows also support riparian vegetation. In addition, limited and scattered shoreline environments of Lakes Mead and Mohave display similar characteristics when lake elevation fluctuations are minimized. For the most part, this is not a natural situation, but rather is manipulated by man as lake levels fluctuate and exotics invade disturbed areas. Proposals that might affect this community are limited to shoreline areas.

Fremont poplar, willow, desert willow, cattail, mesquite, and the nonnative tamarisk might exist. Sedges, rush, monkey flower, and grasses can also be found within this community. Amphibians are represented by the spade-foot toad, the red spotted toad, the introduced bullfrog, and by the tiger salamander introduced in larval form as fishing bait. Beavers, desert bighorns, feral burros, domestic cattle, and coyotes are particularly noticeable in this community.

Colorado Plateau

Although this province contains communities representative of the three vegetational complexes, noted in the Basin and Range Province, they are discussed separately for two reasons. First, because of the differences in elevation and climate from the Basin and Range Province, the composition and density of similar communities can be dramatically different. Second, there is little proposed which will have an effect on the Shivwits Plateau so a detailed description is not necessary. Five distinct communities and one transzonal community are in the area.

The most abundant community on the Shivwits Plateau, the pinyon/juniper association, extends from Snap Point east to Andrus Canyon. Although the Utah juniper and pinyon pine are the dominant plants, ponderosa pine and big sagebrush stands are scattered throughout this community along major drainages. Therefore, portions of this association might vary considerably, with the typical woodland merging into a forest association of ponderosa pine or an extremely sparse stand of juniper with a dense understory of big sagebrush. Plants frequently found in this community are Gambel oak, gooseberry, squawbush, snowberry, and fleabane.

The sagebrush community consists mainly of sagebrush and rabbitbrush and dominates large portions of the Shivwits Plateau. Other plants frequently associated with these indicators are matchweed, rubberweed, cliffrose, Apache plume, and on limestone outcrops, agave.

The pinyon/juniper and sagebrush communities comprise the major areas used for cattle grazing. Mule deer, wild turkey, coyote, badger, wood rat, gopher, deer mouse, cottontail, and blacktail jackrabbit, Gambel's quail, common flicker, raven, scrub jay, Oregon junco, white breasted

nuthatch, rattlesnakes, and several lizards are some of the resident and transient wildlife.

Although more extensive areas of the oak woodland community are adjacent to the recreation area (Mt. Trumbull and Oak Grove Hill), some isolated stands occur in areas of limited exposure on Mt. Dellenbaugh. Southerly exposures support a sparse stand of Gambel oak with an impenetrable understory of manzanita, while northern exposures are more diverse and support Gambel oak, the New Mexico locust, pinyon and ponderosa pine, Utah juniper, barberry, and chokecherry.

The blackbrush and the creosotebush communities are dominant at lower elevations in the Colorado Plateau province of the park. These communities are similar in structure to those described previously for the Basin and Range portion.

The sheer cliffs that separate the Shivwits and Sanup plateaus comprise the transzonal community in the area. Vegetation and wildlife are generally rare in this community, with the exception of several species of bats and small rodents that utilize the many caves in the cliffs. Desert bighorn are known to be transient throughout the community while they range between plateaus.

Developed/Improved Access Areas

There are dramatic differences between these man-made areas and the natural vegetational communities that surround them. All existing and proposed developed areas occur in the creosotebush community close to the lakes. The vegetation in these areas is a sampling of non-native and native species. Intermingled with islands of natural vegetation typical of the creosotebush community are manicured lawns, oleanders, fan palms, flower gardens, and other non-native species. Natural drainages and runoff patterns have been altered by flood-control structures, roads, parking areas, and buildings causing changes in soil moisture content and subsequently species composition. Wildlife species typical of the surrounding community occasionally enter or pass through developed areas, but this is a rare occurrence because of the noise and activity associated with the areas.

It is relatively safe to assume that virtually everything within the confines of developed areas has been previously disturbed.

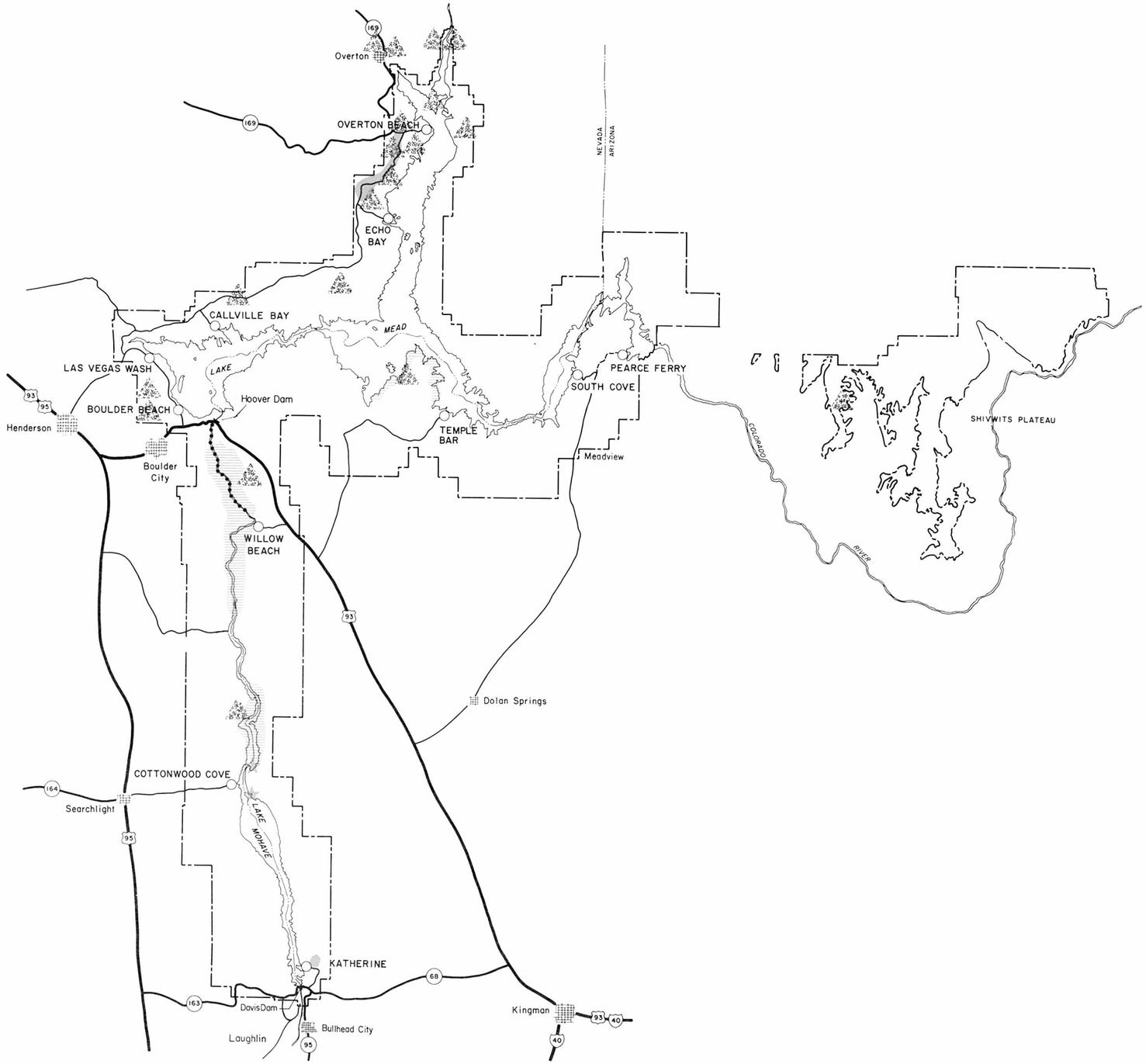
Although not as dramatic, many existing and proposed improved access points have been altered by man. Points not located at the mouths of washes but near the shoreline are also within the creosotebush community. Because of the flood hazard, new access points have not been proposed in washes but access may be through the wash or nearby development. All affected washes comprise the desert riparian, transzonal community. Some isolated stream riparian communities may also be nearby. No improved access point has been proposed which has not historically been used by visitors for camping. The disturbance is not as drastic as in developed areas, but roads, trails, and popular campsites have altered the natural vegetation and wildlife habitats.

THREATENED, ENDANGERED, OR CANDIDATE SPECIES

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, a list of threatened, endangered, or candidate plants and wildife and critical habitat that are present or may be present in the recreation area was requested from the U.S. Fish and Wildlife Service (USFWS) on February 24, 1983. Their reply, dated April 8, 1983 (see appendix B), is the most up-to-date information available at this time. There are no threatened, endangered, or candidate species of plants or their critical habitat in Lake Mead NRA. The endangered bonytail chub, Gila elegans; and falcon, Facco peregrines; bald eagle, Haliaeetus leucocephalus are the only federally listed animal species that are known to occur within the recreation area (see Threatened, Endangered, or Candidate Species map and table 19).

Although not officially listed, there are a number of species that do or could occur in the recreation area that are listed as candidate species. Some of these species are listed as threatened, endangered, or species of concern by the states of Arizona and Nevada. Refer to table 18 for the status and legal classification of all these threatened, endangered, or other rare species. Of these 24 species, 20 are known to occur in the recreation area. Of the 20, six are rare migratory transients in the recreation area with wide distributions outside the area. Thus, only 14 are of concern.

Those 14 species' ranges (peregrine excepted) in the recreation area are shown on the Threatened, Endangered, or Candidate Species map. They will be protected by the National Park Service and will be constraints on planning within the recreation area.



PEREGRINE FALCON - one successful breeding pair, (not shown)

DESERT TORTOISE - infrequent occurrence throughout NRA, except Shivwits plateau (not shown)

••••••• RAZORBACK SUCKER

WINTERING BALD EAGLE HABITAT

KNOWN GILA MONSTER HABITAT

★ BONYTAIL CHUB RECOVERY COVE

PLANT SPECIES (Eriogonum viscidulum, Arctomecon californica, Penstemon bicolor ssp. roseus, Astragalus geyeri var. Triquetrus, Cryptantha insolita, Opuntia basilaris var. treleasei, and Rosa stellata)

N

5 0 5 15 MILES

5 0 5 10 15 20 KILOMETERS

THREATENED, ENDANGERED, OR CANDIDATE SPECIES

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA-NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

602|20,055
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Table 19: Status of Threatened, Endangered, or Candidate Species

		Status				Legal Classification		
		R	E	V	D	USFWS	NV	AZ
Mammals								
Spotted bat	Euderma maculatum	--	--	--	0	C	T	
Fishes								
Razorback sucker	Xyrauchen texanus	1	1	1	1	C		T
Bonytail chub	Gila elegans	3	3	3	1	E	E	E
Birds								
Bald eagle	Haliaeetus leucocephalus	1	2	1	1	E	E	E
Peregrine falcon	Falco peregrinus	3	1	1	1	E	E	T
White-faced ibis	Plegadis chihi	0	--	--	1	C	--	--
Swainson's hawk	Buteo swainsoni	0	--	--	1	C	--	--
Ferruginous hawk	Buteo regalis	0	--	--	1	C	--	--
Western snowy plover	Charadrius alexandrinus nivosus	0	--	--	1	C	--	--
Mountain plover	Charadrius montanus	--	--	--	0	C	--	--
Long-billed curlew	Numeius americanus	0	--	--	1	C	--	--
Western yellow-billed cuckoo	Coccyzus americanus occidentalis	0	--	--	1	C	--	--
Reptiles								
Desert tortoise	Scaptochelys agassizii	1	1	1	1	C	T	T
Gila monster	Heloderma suspectum	1	1	1	1	C	T	
Plants								
Sticky buckwheat	Eriogonum viscidulum	3	3	1	2	C	E	
Bear paw poppy	Arctomecon californica	1	1	1	2	C	E	
Bicolored penstemon	Penstemon bicolor ssp. roseus	2	3	1	2	C	C	--
milk-vetch	Astragalus geyeri var. triquetrus	3	3	2	2	C	--	--
catseye	Cryptantha insolita	3	3	3	2	C	--	--
Bakersfield beavertail cactus	Opuntia basilaris var. treleasei	3	3	2	2	C	--	--
rose	Rosa stellata	1	1	1	1	C	--	--
evening primrose	Camissonia exilis	--	--	--	--	C	--	--
Thompson's wild buckwheat	Eriogonum thompsonae	--	--	--	--	C	--	--
rock daisy	Perityle megalocephala var. intricata	--	--	--	--	C	--	--

Status

R-Rarity
- 0 Uncommon or rare transient throughout the recreation area
- 1 Uncommon, of limited distribution, but distributed widely enough within the recreation area that potential for extirpation is currently low
- 2 Rare, occurrence confined to several populations or one extended population within the recreation area
- 3 Occurs in very few highly restricted populations

E-Endangerment
- 1 Not endangered within the NRA
- 2 Population within NRA endangered or threatened in part of range
- 3 Population within NRA endangered or threatened on all or the greater part of its range

V-Vigor
- 1 Stable or increasing
- 2 Declining
- 3 Approaching extirpation

D-Distribution
- 0 No confirmed records of occurrence in the recreation area
- 1 Widely distributed outside Lake Mead National Recreation Area but of limited abundance
- 2 Regional endemic (restricted to counties surrounding Lake Mead in Nevada and/or Arizona)

Legal Classification (All animals are protected within the recreation area)
- E - Endangered (or equivalent state designation)
- T - Threatened (or equivalent state designation)
- C - Candidate Species
- USFWS - U.S. Fish & Wildlife Service
- NV - Nevada
- AZ - Arizona

FLOODPLAINS AND WETLANDS

National wetlands inventory maps are not available for the area. However, wetland environments are rare within the recreation area, and none exist along the lakeshores because of the wide variation in water levels. Wetland areas include Rogers and Bluepoint springs, the stream riparian environment in Las Vegas Wash, and the mudflats of the Virgin and Muddy rivers at the north end of the Overton Arm.

Many of the popular visitor use areas at the recreation area both developed and undeveloped, are subject to flash flooding. NPS guidelines define flash flood as one in which the flood waters rise so rapidly that there is insufficient time for warning and evacuation of persons threatened by the flood. NPS guidelines classify such flash-flood areas as high hazard areas and require that specific management actions be taken to reduce the flood hazard. Thus, when studies reveal that existing structures or facilities are subject to flash flooding, as they are in the recreation area, a plan of action must be prepared.

This plan defines the probable maximum floodplain (PMF) and 100-year floodplain. The 100-year flood is the flood that has a 1 percent chance of occurring in any given year. Floods of this magnitude occur frequently enough to pose a serious threat to all facilities and people. The PMF is the largest flood that can ever be expected to occur in an area; however, these floods are rare, and their statistical probability of occurring is uncertain. They have occurred on occasion; for example, in 1974 at Eldorado Canyon on Lake Mohave a flood occurred that was 7.6 times larger than the calculated 100-year flood and two-thirds of the calculated PMF (USDI, GS 1949).

Methodology for Estimating Flood Flows and Designing Mitigation Measures

The National Park Service produced a series of "Flood Hazard Studies" (USDI, NPS 1982c) that analyzed 100-year and probable maximum floodplains and presented alternative designs for structural flood mitigation measures. The major developed areas analyzed in these studies included Katherine Landing, Cottonwood Cove, Willow Beach, Boulder Beach, Las Vegas Wash, Overton Beach, and Temple Bar. Because the design of these facilities is so critical for protecting life and property, the National Park Service wanted to test their efficiency. Flood Loss Reduction Associates was hired to provide an independent evaluation (1983) of the National Park Service structural mitigation proposals for Temple Bar, Cottonwood Cove, and Katherine Landing. Their analysis did not reveal any major flaws, but it did recommend several minor changes that would improve the designs. These recommendations have been incorporated into the structural mitigation plans that are presented in the development concept plans.

The calculations for flash-flood flow take into consideration the rate of precipitation, size of drainage, time of flood concentration, length of drainage, change in elevation within the drainage, duration of precipitation, and amount of runoff after absorption in the soil.

Precipitation for the 100-year thunderstorm was determined using the procedures in NOAA Atlas 2, Volume XI, prepared by the National Oceanic and Atmospheric Administration. Precipitation for the probable maximum thunderstorm was determined using the procedures as prescribed in Design of Small Dams, Second Edition, prepared by the Bureau of Reclamation. Runoff was determined by the procedures described in Design of Small Dams. Flood extents were determined using Manning's formula with "n" values of 0.045. Cross sections showing flood flows at strategic locations within each drainage were calculated. This information was then converted to topographic maps. The 100-year and PMF extents are shown on the Development Concept Plan maps for all areas that have flash-flood hazards--Katherine, Cottonwood, Willow Beach, Las Vegas Wash, Overton Beach, and Temple Bar.

Table 20 describes the level of floodplain information available for each developed area.

Table 20: Status of Floodplain Information

	Floodplain Mapped			Agency			
Developed Area	100	500	PMF	NPS	USGS	CORPS	Pvt.
Katherine Landing	X	X	X	X	X		
Cottonwood Cove	X	X	X	X	X		X
Willow Beach	X	X	X	X	X		X
Boulder Beach*	X			X			
Las Vegas Wash	X	X	X	X		X	
Callville Bay	No hazard						
Echo Bay	No hazard						
Overton Beach	X		X	X			
Temple Bar	X	X	X	X		X	
South Cove	X		X			X	
Pearce Ferry	X		X			X	

*Cross sections only

The Corps of Engineers has also mapped the 100-year, 500-year, and PMF floodplain for the following undeveloped, but popular, visitor use areas: Gypsum Wash, Government Wash, Boxcar Cove, Kingman Wash, Detrital Bay, Gregg's Hideout, Hualapai Wash, and Aztec Wash.

Because the National Park Service did not have extensive experience with nonstructural flood mitigation measures (warning systems, emergency preparedness, and facility relocation), Flood Loss Reduction Associates was hired to do a preliminary evaluation (1982) of nonstructural flood loss reduction measures. Their study recommendations have been included in the development concept plan proposals. They are also proceeding with a

study to refine the proposed nonstructural flood mitigation measures--design of needed warning systems, emergency preparedness measures, evacuation plans, and flood information/education plans.

Floodplain Conditions

Flood hazard is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor use facilities are out of the floodplain. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain.

The floodplain for Boulder Beach is on a broad alluvial fan. Flood flows across such fans often change course during flood events and are otherwise unpredictable. Their flows can concentrate, but generally tend to spread out in sheet flows that are not as dangerous to human safety as flash-flood flows concentrated in canyons. Currently earth dikes above the area's developments concentrate flows in drainage channels that run between facilities. These earth dikes are not designed to withstand a major flood event, and their failure could result in substantial sheet flows reaching developments. Because of the uncertain structural integrity of the earth dikes and the changing nature of the flood flows at Boulder Beach, a map of the floodplain would be misleading and inaccurate; and therefore, was not produced. To portray the situation accurately, all facilities and property should be considered to be in jeopardy of damage from locally concentrated flows or sheet flows (a foot or two deep, but usually shallower), but they would not be destroyed. People are not likely to be killed by sheet flows (some danger remains especially for children, elderly, or the disabled), but locally concentrated flows tend to be deeper and could threaten life. The flood-hazard zone that shows on the DCP graphic for Boulder Beach is a drainage channel that has had numerous flood flows concentrated in it in the past. Otherwise the entire area is susceptible to low sheet flows or unpredictable, locally concentrated flows.

At the existing improved access points, South Cove and Pearce Ferry improvements are out of the flash floodplain or have been signed to warn visitors of the hazard. At the proposed improved access points there is either no flood hazard or no space to locate improvements out of the floodplain. Location of floodplains is shown on the maps for the individual development concept plans.

Table 21 lists developments in the 100-year and PMF. Structures in the floodplain might be damaged or destroyed if a flood occurred. Structures listed in the 100-year floodplain are also in the PMF. However, to avoid repetition, only structures that are in the PMF but not the 100-year floodplain are listed in the PMF column.

Table 21: Development in the 100-Year and Probable Maximum Flood (PMF)

	Existing Conditions	
	100-year	PMF
Katherine Landing		
Access		
No. & So. Telephone Coves primitive use area and access	1.9 mi., gravel	
Circulation roads to NPS housing	1,950 feet, gravel	
Parking		
East of motel		700-car, gravel
West of motel		500-car, paved
Launch ramp/ready lane		8 lanes, 150 feet x 200 feet, paved
NPS maintenance		Two 800 sq. ft. bldgs. 1.5 acres unpaved storage 800' fence
NPS and concession housing		1 permanent single family
Trailer Village		33 short-term sites to be relocated
Motel		52 units
Dry boat storage	210 spaces	
Icehouse		Small bldg.
Comfort station	Small bldg.	
Cottonwood Cove		
Access roads*		5 miles, paved
Circulation		2.6 miles, paved
Parking	290 paved 148 gravel	200 paved 90 gravel

	Existing Conditions	
	100-year	PMF
Ranger station	1,800 sq. ft. bldg.	
NPS maintenance	3,000 sq. ft. bldg. pave 25,000 sq. ft. add 600' fence	
NPS housing	Three 1,200 sq. ft. houses, 700-800 sq. ft. trailers, 1,070' paved road	
Picnic area	4 tables 1 large ramada	
Campgrounds (2)*		149 sites
Trailer village*		206 long-term sites; 75 short-term sites
Motel		24 units
Restaurant*		35 seats
Store*		1,200 sq. ft.
Dry boat storage	350 spaces	
Concession maintenance	4,400 sq. ft. bldg. 35,600 sq. ft. paved storage	
Concession housing*		6 trailers 300' gravel road
Gas station*		2 pumps
Comfort station*		Small bldg.
Fish-cleaning station	Small bldg.	

*The 100-year flood was contained in existing earth dikes and channels (see DCP maps) in the Cottonwood area. However, the study indicates that the dike above the employee housing area would probably be breached or overtopped by the 100-year flood and could be in a hazardous location depending on the location of the dike overtopping or breeching. Larger floods may endanger the campgrounds and NPS housing area. The 850-foot section of the dike that parallels the trailer village on the north may only control the 50-year flood. Breeching or overtopping of this section of the dike would allow floodwaters to enter the trailer village and perhaps the store, restaurant, motel, associated parking area, gas station, and comfort station.

	Existing Conditions	
	100-year	PMF
Willow Beach		
Access roads		
Main access 2 of 4 miles in floodplain	2 mi, 2 lane paved	
Trailer village access	1/2 mi, gravel	
Parking	164 paved spaces	
Launch ramp	8 lanes	
Ranger station	1,000 sq. ft.	
NPS maintenance	1,500 sq. ft. bldg. 7,200 sq. ft. paved area 250' fence	
NPS housing (closed)	Four 1,200 sq. ft. houses	
Trailer village	57 long-term sites 18 short-term sites	
Motel	24 units	
Restaurant	100 seats 4,900 sq. ft.	
Store	Part of restaurant	
Dry boat storage	120 spaces	
Concession housing (trailer village)	Ten 1,200 sq. ft. trailers	
Water well buildings	Three 10' x 10' bldgs.	
Canoe/raft takeout	Graded area	
Sewage lagoons		One 1 acre; one .5 acre

	Existing Conditions	
	100-year	PMF
Boulder Beach**		
Las Vegas Wash		
Launch ramp		5 lanes
Overton Beach		
Swim beach	1 acre	
Campground		100 primitive sites
Temple Bar		
Parking		95 spaces paved
Launch ramp		4 lanes
NPS maintenance		2,000 sq. ft. bldg. 22,000 sq. ft. paved area 850' fence
NPS housing		1,500 sq. ft., single family
Campground***		153 sites
Trailer village***		122 sites
Motel***		22 units
Restaurant		76 seats
Store		1,500 sq. ft.
Concession housing		14 trailers
Gas station		2 pumps
Icehouse		Small bldg.
Comfort Station		400 sq. ft.

** Refer to the preceding discussion in this section on the floodplain at Boulder Beach. All facilities are assumed to be in the probable maximum floodplain.

***Although the mapped 100-year floodplain (see DCP graphic) shows flood flows contained by existing earth dikes and channels, those structures are not likely to hold up during such a flood event. Their failure would especially jeopardize the campground, trailer village, and motel.

If a PMF level flood occurred at the recreation area, people would most likely be adversely affected. Table 22 shows an estimate of the numbers of people that would be in the PMF on an average summer weekend day.

Table 22: People in Probable Maximum Floodplain

Developed Area	Existing Conditions Day	Night
Katherine	1,095	1,120
Cottonwood	1,735	1,590
Willow Beach	490	360
Las Vegas Wash	40	0
Overton Beach	315	550
Temple Bar	1,170	1,250
Total	4,845	4,870

The totals from table 22 represent 5 percent of the total visitation of approximately 96,000 that Lake Mead would have on an average summer weekend day.

In the event of flooding at the recreation area, structures would be damaged or lost. Table 23 provides estimates of the costs of repairing the damage caused by the 100-year and PMF. The costs do not include items such as utilities, furnishings, equipment, vehicles, debris removal, or search and rescue. Expenses of victims, such as those for medical help, funeral expenses, and lost wages caused by death or injury are not included.

Table 23: Estimated Costs of Facility Replacement from 100-Year and Probable Maximum Flood

Developed Area	100-Year	Probable Maximum Flood
Katherine	$ 533,860	$ 3,148,420
Cottonwood	2,049,960	9,535,320
Willow Beach	3,990,600	4,095,600
Las Vegas Wash	0	31,250
Overton Beach	4,280	0
Temple Bar	0	3,644,370
Total	$ 6,578,700	$20,454,960

WATER RESOURCES

The springs in the recreation area vary widely in water quality and in flow characteristics. Many are intermittent, seasonal, and contain high concentrations of dissolved salts. Groundwater exists in several water-bearing aquifers, primarily ancient streams and river gravels capped by basaltic lava.

The major rivers supplying water to the recreation area are the Colorado, Virgin, and Muddy rivers. Flows from the major source, the Colorado

River, are controlled upstream by the Glen Canyon Dam, which intercepts 80-85 percent of the sediment which formerly entered Lake Mead. Most of the streams in the recreation area are intermittent or ephemeral and are subject to seasonal flash flooding primarily in the late summer and early fall months. Las Vegas Wash generally flows year-round because it is the outflow for treated municipal and industrial wastewater from Las Vegas.

Lakes Mead and Mohave are the primary water resources in the region. Lake Mead has a 247-square-mile (157,900-acre) water surface capacity, while Lake Mohave has a 45-square-mile (28,800-acre) capacity. Except for the extremely cold water below Hoover Dam, the lakes are ideal for swimming during the summer and fall months. Boating and water-skiing are other primary uses during the same period. Fishing in both lakes is a primary activity throughout the year.

All developed areas have water and sewage systems. Potable water is obtained from a Basic Management Incorporated (BMI) waterline at Las Vegas Wash; from wells about 150 feet deep at Cottonwood Cove, Willow Beach, and Temple Bar; and directly from the lakes at the remaining areas. It is then filtered, chemically treated, and stored for use in NPS and concession facilities. Wastewater is disposed of by evaporation from lined sewage lagoons at all areas, except Callville Bay where lagoons are unlined. Most of the developed areas have relatively new systems capable of handling much greater demand. Only the systems at Callville Bay and Willow Beach developed areas need to be expanded. All systems comply with state and local health standards and are monitored regularly. Although potable water is not provided at undeveloped access points around the lakes, heavily used areas generally have pit or chemical toilets.

Water quality standards of the state of Arizona specify that Lake Mead and Lake Mohave are to be protected for aquatic life (as a cold water fishery) and wildlife, full body contact recreation, agricultural irrigation, agricultural livestock watering, and as a domestic water source. These standards include allowable limits for various water quality parameters for each of these protected uses.

The state of Nevada water quality standards do not specify protected uses for the Colorado River but do identify numerical (and narrative) standards that must be met at various locations within Lake Mead NRA. These locations include Las Vegas Wash, 0.5 mile downstream of Willow Beach, and 0.5 mile downstream of Davis Dam.

Based on available water quality data and the protected uses of water within Lake Mead NRA, water quality in Lake Mead and Lake Mohave is generally in compliance with established water quality standards throughout the year. However, isolated instances do occur where bacteriological pollution threatens the use of water in the NRA for full body contact recreation. This type of water use includes swimming, water-skiing, and other similar activities during which water may be ingested accidentally and certain sensitive body organs (e.g., eyes and nose) may be exposed to water. Although water quality standards have been established for full body contact recreation for various physical water quality characteristics (e.g., temperature and turbidity) and trace

substances (e.g., arsenic, cadmium, and mercury), the critical water quality parameter for full body contact recreation in Lake Mead NRA is the level of fecal coliforms. The allowable maximum limits for fecal coliforms (in units/100ml) for full body contact recreation in the Arizona and Nevada water quality standards are 200 as a geometric mean (5 sample minimum), 400 in 10 percent of samples for a 30-day period; and 800 in a single sample.

Elevated counts of fecal coliforms generally occur during heavy use days (such as Labor Day), when lake levels are low, and at undeveloped coves accessible only by water where use is low to moderate and no sanitary facilities are available. In the latter case, localized incidents of high fecal coliforms occur when water levels rise and such areas are inundated. It should also be pointed out that bacteriological pollution is rare in open areas (such as Boulder Beach) where wind and wave action provide adequate mixing; however, in areas where beaches are located in harbors or confined areas, incidents of elevated coliform counts are common by late summer. For example, fecal coliform levels have reached 1,200 at Cottonwood Cove, 1,100 at Temple Bar, and up to 24,000 in Las Vegas Bay (discussed in more detail below). It should be noted that water quality at designated swimming beaches in Lake Mead NRA is regularly monitored in accordance with applicable state and local health codes to identify unsafe water quality conditions.

The overall water quality at the lakes was the subject of the Arizona Clean Lakes Classification Study (1982) recently conducted by the state. The purpose of the study was to determine the water quality characteristics of all lakes in the state and prioritize them according to those lakes requiring quality restoration work. In the overall ranking of 56 lakes, Lakes Mead and Mohave ranked 48 and 47 respectively, i.e., they require little restoration work. In specific catagories such as Secchi disk visibility, chlorophyl a, phosphates, dissolved oxygen, and nitrogen/nitrates, both lakes ranked consistently high. This speaks well of water quality in the lakes especially when the amount of visitor use is considered. Lakes Mead and Mohave ranked first and third respectively for overall recreation visitor days.

The Las Vegas Wash and Bay area has been a water quality problem on Lake Mead for a number of years. This is principally caused by the use of the wash as an outflow for treated municipal and industrial wastewater from the metropolitan Las Vegas area. In cooperation with Clark County, the state of Nevada, University of Nevada at Las Vegas, and the Environmental Protection Agency, the problem has been regularly monitored and studied since the early 1970s to assess the impacts on the lake and to work with pollution sources to find mitigating measures. The situation is especially critical because this area of the lake receives heavy visitor use. In the 1977 monitoring program report produced by UNLV and submitted to the Clark County Sanitation District, it was established that this is a localized incident that does not influence water quality on the rest of the lake or in Lake Mohave, primarily due to the dilution that occurs in the Boulder Basin. The problem has improved significantly. The Clark County Sanitation District has recently completed a new tertiary sewage treatment plant that is now operational. Industrial waste

evaporation ponds in Henderson, Nevada, which have been monitored as a possible pollution source, are currently being lined to prevent the percolation of contaminants into the groundwater table.

Another water quality problem common throughout the lower Colorado River is the increasing salinity levels. Present levels of salinity have been attributed to a number of sources, with about half coming from natural sources, irrigated agriculture contributing about 37 percent, reservoir evaporation causing 12 percent, out-of-basin exports responsible for 3 percent, and municipal and industrial uses causing 1 percent. Salinity increases result from two processes: salt loading and salt concentration. Salt loading increases the quantity of salt in a given amount of water, and salt concentration decreases the amount of diluting water for a given quantity of salt. Salt loading is seen in the discharge of mineral salts from natural and man-made sources to the river system. Salt concentration occurs through the consumptive use of water in the basin and in the diversion from the basin of water with a low salt concentration. High levels of salinity have adverse economic effects on agricultural, municipal, and industrial water users in the United States and Mexico. A basinwide federal/state program for salinity control is underway.

AIR QUALITY

The air quality of the Lake Mead region is generally good, especially in the Colorado Plateau portion of the recreation area. However, air quality degradation is increasingly evident throughout the lower elevations of the Basin and Range Province. Air pollutants drain into the basin of the Colorado River from all directions and are of particular concern during periods of atmospheric inversion.

The major existing source of air pollutants within the recreation area is the coal-fired Fort Mohave steam generating plant of Southern California Edison Company, about 2 miles from the extreme southern park boundary in Clark County, Nevada. Pollution generated in the Las Vegas Basin west of the recreation area drains into the Boulder Basin along Las Vegas Wash. The automobile is the major generator of this pollution; however, the Henderson Industrial Park, 7 miles to the west of the recreation area, provides a local source of industrial pollution from chemicals, metal processing, and cement production. Other regional sources of pollution include the coal-fired power plant at Moapa, Nevada, about 15 miles northwest of the Overton Arm of Lake Mead; gypsum and some mineral processing plants north of the Boulder Basin; and dust from areas where the desert environment has been disturbed. Under appropriate atmospheric conditions, photochemical oxidants from the Los Angeles Basin are a major source of air pollutants. Since monitoring began in 1968, there has been a decline in air quality.

Background air quality data are not available for the recreation area; therefore, the impact of pollution on the ambient air quality cannot be quantified. However, a 1973 emissions inventory for Clark County, Nevada, carried out by the Air Pollution Control Division of the District Board of Health of Clark County, indicates that motor vehicles are the

major contributors to air pollution in the county by accounting for 97 percent of the carbon monoxide, 81 percent of the hydrocarbons, and 52 percent of the nitrogen oxide emissions. Power plants discharge 89 percent of the sulfur dioxides and 22 percent of the total particulates. Mobile sources account for approximately 245,000 tons of pollutants in the air per year, power plants 83,000 tons, and industrial processes 56,000 tons.

The National Park Service is currently monitoring the visibility at Lake Mead through the use of a teleradiometer and camera. This data will be used to establish baseline air quality information.

VISUAL QUALITY

Visitors at Lake Mead NRA find spectacular scenic vistas from the park roads, lake surface, and hiking routes. Because the desert vegetation tends to be low and sparse, the views are uninhibited for miles. Striking backdrops for all recreational activities include deep canyons, dry washes, sheer cliffs, distant mountain ranges, the lakes, colorful soils and rock formations, mosaics of different vegetation, and changing cloud formations. A panorama of such intriguing features depends on clean dry air and is one of the most important resources in the recreation area.

Preserving the high visual qualities of the area is integral to preserving the high quality of the recreation experience. This is one reason why the National Park Service is so concerned about surface ground disturbance from mineral, oil, and gas leasing; illegal ORV use; and uncontrolled expansion of developed areas.

SIGNIFICANT NATURAL FEATURES

Throughout the recreation area there are many natural features that are important enough to require special attention when considering any planning proposals. These include resources in the outstanding natural features and protected natural area subzones (see "Management Zoning" section); rare, threatened, or endangered species habitat; and areas important for visitor use and appreciation. Uniqueness, critical habitat protection, and aesthetic or recreational value are the criteria for outstanding natural features. Examples of outstanding resources are warm springs, unique geologic formations and plant communities, scenic vistas, desert bighorn lambing grounds, and coves that are popular for their sandy beaches or scenic beauty. These features are identified on the Outstanding Natural Features map and were considered environmental constraints when evaluating development proposals.

Lake Mead affords special protection to some areas or features by including them in special natural area subzones. Starting south on Lake Mohave and moving north, these areas as numbered on the graphic include the following:

1. Mouth of Grapevine Canyon - northernmost occurrence of smoke trees (Dalea spinosa) in Nevada and only stand in the recreation area

2. Newberry Mountains - scenic geologic formations in the Christmas Tree Pass and Spirit Mountain areas

3. Cholla Forest - a fascinating dense stand of teddy bear cholla cactus straddling the boundary north of the Cottonwood Cove access road

4. Palo Verde (Cercidium sp.) Forest - northernmost natural occurrence of palo verde trees in the United States and only stand in the recreation area

5. Fire Mountain Area - scenic geologic formations of volcanic origin permeated by very colorful Andesitic flows

6. Black Canyon of the Colorado River - significant geologic and scenic values, with numerous hot and warm water springs and winter habitat for bald eagles

7. Fortification Hill/Paint Pots - colorful and scenic geologic examples of volcanic activity and erosion

8. River Mountains - desert bighorn lambing grounds and habitat (most productive herd in Nevada)

9. Redstone - impressive and scenic geologic formations of Aztec Sandstone

10. Boulder Canyon - spectacular geologic and significant scenic values

11. Pinto Valley - impressive and scenic geologic mix of smooth Aztec sandstone and jagged granite outcrops demonstrating the mountain building geologic process of tilting

12. Rogers and Bluepoint Springs - interesting warm water springs

13. Stewarts Point Area - exposed or close to the surface salt deposits and habitat for rare bearpaw poppy

14. Overton Wildlife Management Area - protected aquatic habitat area managed by the state of Nevada

15. Gypsum Beds - fascinating crystaline gypsum formations and wintering bald eagle habitat

16. Iceberg Canyon - scenic geologic formation demonstrating tilting and unique distribution of the locally limited ocotillo plant

Wintering bald eagle sightings within the recreation area have increased in the last few years. Although isolated sightings have been made in areas, such as Swallow Bay and the Overton Wildlife Management Area, the heaviest concentrations seem to be along the Black Canyon between Eldorado Canyon and Hoover Dam and along the gypsum bed shoreline between Temple Bar and Bonelli Bay. Because this endangered species is

only known to winter but not nest in the recreation area, the chances of conflict with heavy summer visitor use are minimal. Migrant and/or breeding peregrine falcon also appear safe due to their seasonal use of this recreation area and isolation from human disturbances. However, facilities that would encourage increased winter visitor activity should be discouraged. The gila monster is listed as a species of concern by the states of Nevada and Arizona and currently under review for an official listing by U.S. Fish and Wildlife Service, but more data needed. The species has a habitat that generally includes the entire Mojave Desert, a large part of the recreation area. Sightings have been made in many areas, but the majority occur in the Katherine area and along the Northshore Road between the Echo Bay and Overton Beach access roads. Also listed as a species of concern by both states and under review by the U.S. Fish and Wildlife Service is the desert tortoise. The habitat for the tortoise encompasses most of the recreation area, and sightings do not seem to be concentrated in any one area. The bonytail chub is known in the wild in Lake Mohave, one of the only places for this species in the United States. The Arizona Game and Fish Department and the Colorado River Fishes Recovery Team intend to use two coves across the lake from Cottonwood Cove to introduce fingerlings into their natural habitat.

Although there are no federally listed plant species that occur in the recreation area, six species are presently under review for listing by the U.S. Fish and Wildlife Service. These species and their locations within the recreation area are noted in appendix B.

Bighorn sheep are significant because of their value as a game species and as a species that many visitors enjoy viewing. Important bighorn sheep habitats and lambing grounds are identified on the Significant Natural Features map. Population levels of this native species are currently increasing within the NRA.

Nearly 300 identifiable, named coves are on Lake Mead and about 200 on Lake Mohave. Some of these coves are not well suited for any activities while others may be suitable for only one or two activities. Of the 500 coves, only 12 are considered excellent for houseboating, beach camping, and waterskiing, three of the primary activities at Lake Mead. These coves were identified during the 1979 Carrying Capacity Study for both lakes by a team that visited every cove and rated the physical characteristics contributing to the coves' desirability. The activities and characteristics of the coves are as follows:

Houseboating	Waterskiing	Camping
Soft ground-sandy beach	Steep dropoffs	Shade
Steep dropoffs	Sandy beach	Sandy beach
Sheltered cove	Sheltered	Visual screening
Lack of hazards	Sufficient size	Sheltered
	Lack of hazards	Flat area

The following coves are most desirable for the above recreational use:

Lake Mead	Lake Mohave
Road Runner	Davis
Sandy	Chili Pepper
Calico Bay	Cottontail
Bluepoint Bay	Owl Point
Faltons Reef	
Kline Hole	
Glory Hole	
North Bay	

The few coves that have such high desirability ratings have been included as outstanding natural features. The planning process must consider the competition for, traditional use, and accessibility of these resources when making proposals. In some cases it may be advantageous to enhance the coves and in others it may be best to avoid them entirely.

Consideration of significant natural features must go beyond protecting the integrity of the feature itself. The spectacular views these features provide from points around the recreation area must also be considered. For example, the Newberry Mountains have been protected by zoning and their unique geology and scenic value recognized. However, to place a facility or a road scar outside the zone but in the foreground of the view as seen from the heavily visited Katherine developed area would detract from the overall scenic value of the mountains. Likewise, to make development around the Black Canyon visible from U.S. 93 on the Arizona side of Hoover Dam would compromise the scenic integrity of the canyon. Therefore, these and the following outstanding views as shown on the Significant Natural Features map are also constraints to be considered during the planning process.

Newberry Mountains viewed from Katherine area

Black Canyon viewed from U.S. 93

View corridor from Colorado River through Black Canyon

Fortification Hill/Paint Pots viewed from Boulder Beach area

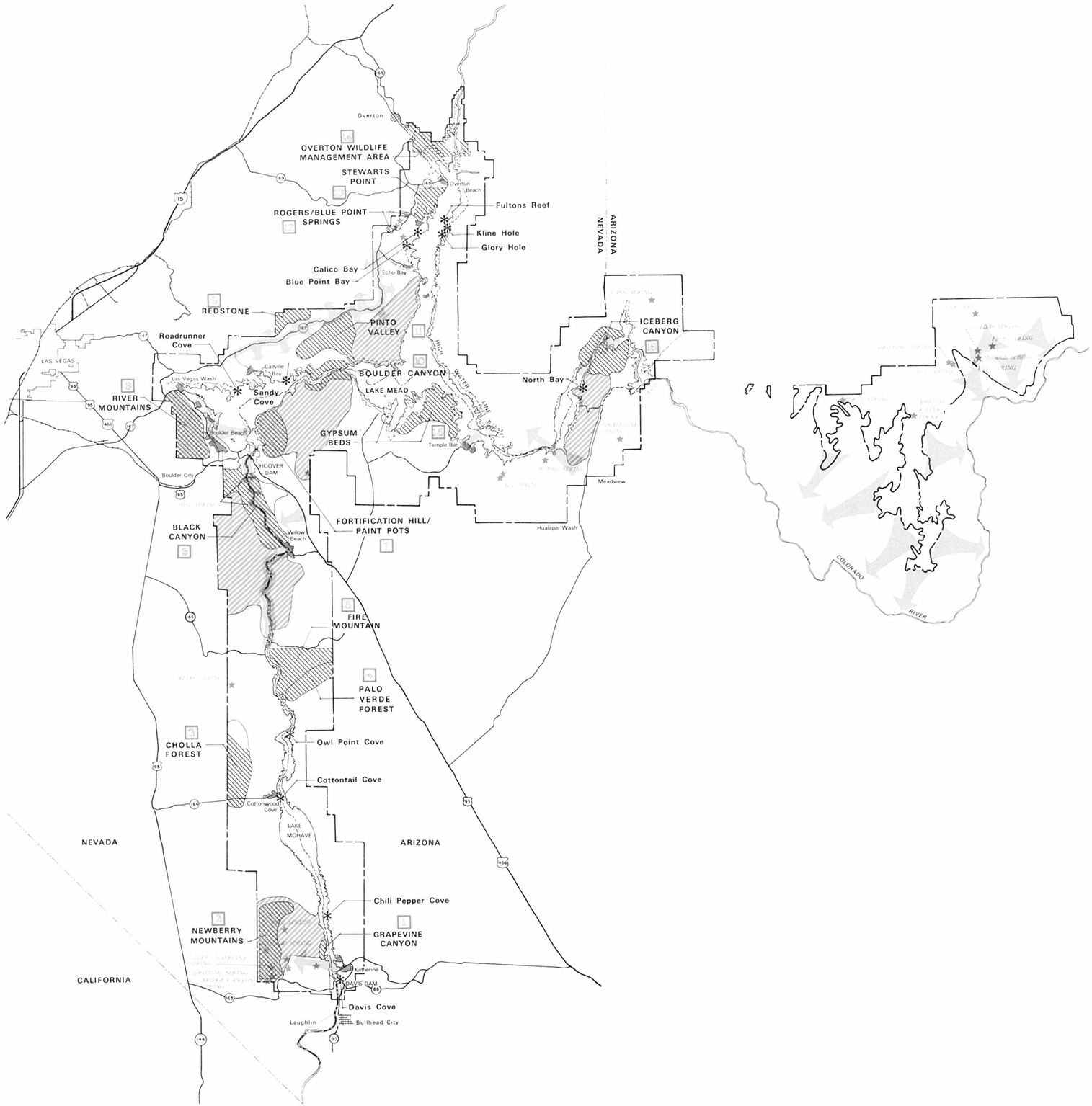
View corridor from Northshore Road between Callville and Echo Bay access roads

The Temple viewed from Temple Bar area

View corridor from water through Iceberg Canyon

Temple and Virgin Basin viewed from Pearce Ferry Road near Meadview

Grand Canyon viewed from rim of Shivwits Plateau



SIGNIFICANT NATURAL FEATURES

BIGHORN SHEEP HABITAT

* OUTSTANDING COVE

SPRINGS

VIEW

NUMBERS KEYED TO TEXT

N

5 0 5 10 15 MILES

0 5 10 15 20 KILOMETERS

SIGNIFICANT NATURAL FEATURES

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA · NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

602|20,038F
MAR 86|DSC

CULTURAL ENVIRONMENT

ARCHEOLOGICAL RESOURCES

The Lake Mead area has been the subject of extensive archeological, anthropological, and ethnographical studies. Early 20th century research was primarily conducted by private institutions, while work from the 1930s to the 1960s was primarily government-funded and related to the creation of Lakes Mead and Mohave. More recent work has been carried out in conjunction with management of cultural resources at Lake Mead NRA.

Many of the archeological resources now lie beneath the waters of Lakes Mead and Mohave. Still, over 800 archeological sites have been identified above the waterline, and researchers estimate that a complete survey of the recreation area would produce some 2,000 sites. To avoid the loss of archeological resources because of visitor use and development, research priorities in recent years have concentrated on the developed areas near the lakeshores. The backcountry and wilderness areas have been less extensively surveyed.

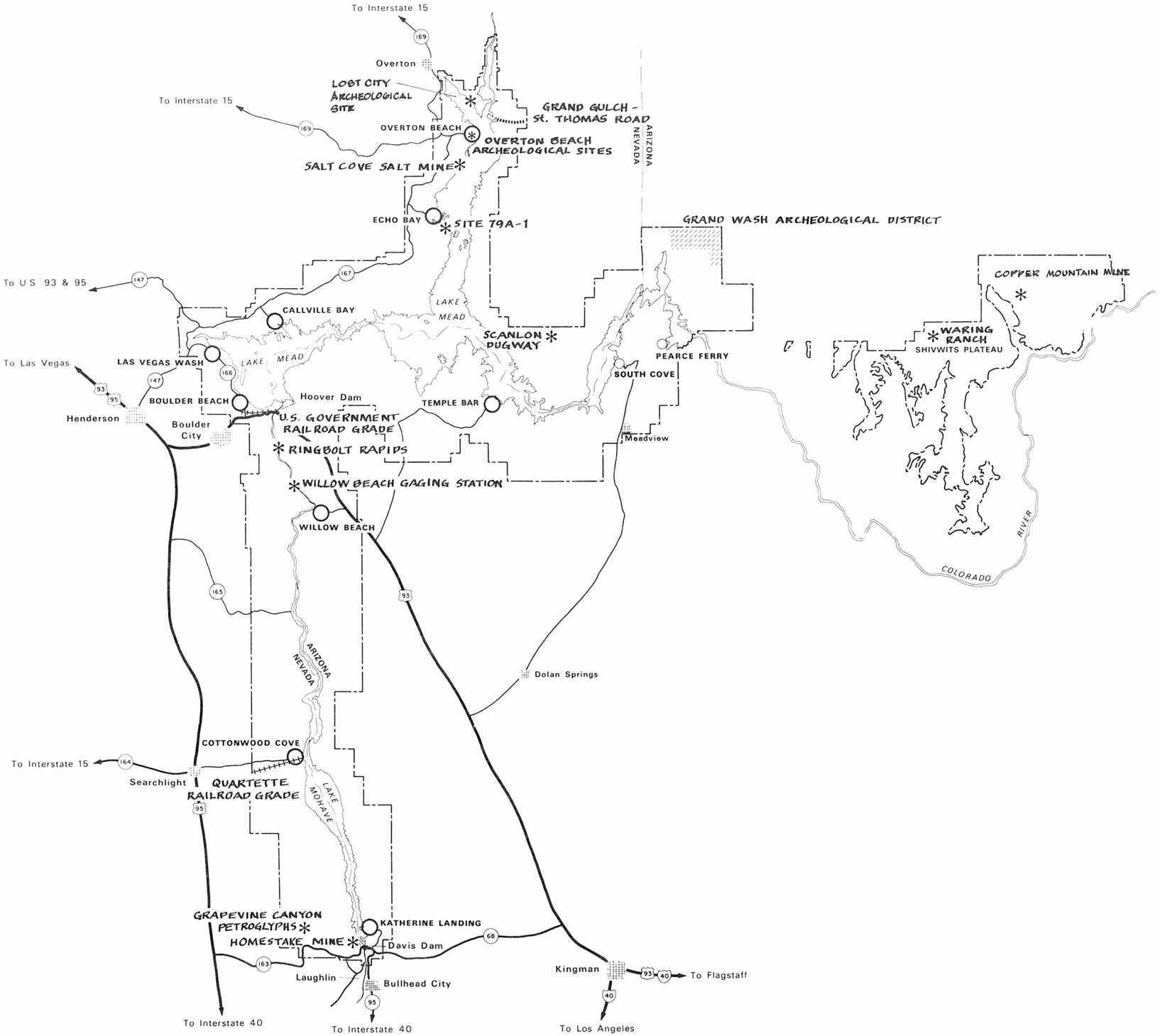
Three archeological complexes currently listed on the National Register of Historic Places are the Grand Wash archeological district, the Overton Beach archeological district, the Lost City archeological sites, and the Grapevine Canyon petroglyphs. In addition the Salt Cove Saltmine is in the process of being nominated to the National Register.

HISTORIC RESOURCES

Many of the historic sites of the Lake Mead area, such as early river crossings and ferries, townsites, and mines, are now submerged beneath the waters of Lakes Mead and Mohave. Two historic sites within the recreation area are currently on the National Register of Historic Places. Three additional properties have been determined eligible for listing on the National Register. On the basis of recent research, three historic sites are now in the process of being nominated to the National Register. The status of all eight of these historic sites is as follows:

Homestake Mine (on National Register)
Grand Wash-St. Thomas Road (nominated)
Scanlon Dugway (nominated)
Waring Ranch (Howe Valley Ranch, on National Register)
Ringbolt Rapids (nominated)
Quartette Mining Company Railroad Grade (eligible)
U.S. Government Railroad Grade (eligible)
Willow Beach Gaging Station (eligible)

Lake Mead has 38 structures included on its List of Classified Structures; 23 are associated with the National Register sites listed above. The remaining 15 structures are associated with the Golden Mile Mine, Golden Gate Mine, Joker Mine, Pearce Ferry Seismograph Station, Pine Valley Cabin, Tassi Ranch, Bonelli Landing Road, Pearce Ferry Road, and the Six Companies Railroad Grade. All of these latter sites were evaluated by NPS historians in 1982 and were not considered to possess National Register significance.



* CULTURAL RESOURCE SITES
○ MAJOR DEVELOPED AREA
○ EXISTING IMPROVED ACCESS POINT

N

5 0 5 10 15 20 MILES
5 0 5 10 15 20 25 30 KILOMETERS

CULTURAL RESOURCES

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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SOCIOECONOMIC ENVIRONMENT

REGIONAL LANDOWNERSHIP

Lake Mead NRA's immediate socioeconomic environment consists of a region composed of Clark County, Nevada (5,039,360 acres), and Mohave County, Arizona (8,458,880 acres). Landownership patterns in the two counties and in the composite region are shown on diagrams at the end of this section.

As elsewhere in both Nevada and Arizona, a very large proportion of the land in Lake Mead's region is owned and administered by the federal government (78%), with BLM being the largest administrator in both counties. Some 10 percent of the lands in Clark County and 11 percent in Mohave County are administered by the National Park Service. Nineteen percent of the composite region is in private, state, or local government ownership, ranging from 8 percent in Clark County to 25 percent in Mohave County.

REGIONAL LAND USE AND SOCIOECONOMICS

As a composite, the region of Clark and Mohave counties has a population density of 24.6 persons per square mile. However, the two counties differ markedly in population density because of the influence of the Las Vegas urban area, which brings Clark County's figure to 58.8 persons per square mile, compared to Mohave County at 4.2 persons per square mile. Some 85 percent of the two-county population lives in Las Vegas.

Although a full spectrum of land uses takes place in the region, the predominance of federally owned land has led to primary public uses of recreation, power generation, and leased lands for mineral extraction and grazing. On private lands adjacent to recreational lands, increasing development of residential retirement and second homes is occurring, along with privately developed commercial facilities serving the recreational public.

The regional population has shown dramatic increases of an average of 12 percent annually from 1960 to 1980, with a total increase of 240 percent over the 20-year period. This growth is principally related to migrations into the Las Vegas urban area, which accounted for almost half the region's increase. However, substantial growth was also recorded within the rural and small town areas immediately surrounding Lake Mead.

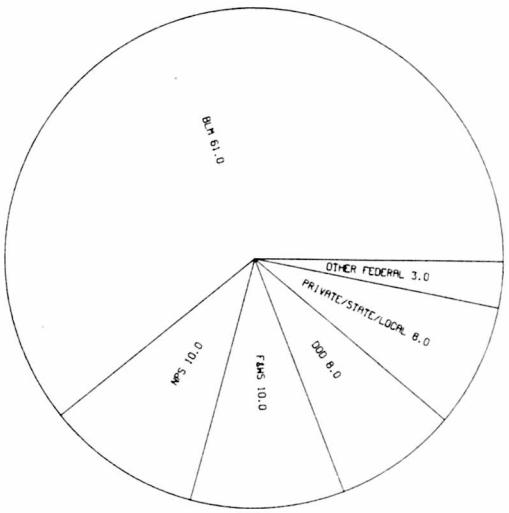
Per capita income in 1980 was $6,673 in Mohave County and $8,453 in Clark County, compared to $7,313 nationally. Regional unemployment has been running slightly lower than the national average. For 1980 the national unemployment average was 6.6 percent, while unemployment in Clark County was 3.1 percent and Mohave County was 5.4 percent.

The economy of Las Vegas is dominated by the gambling and entertainment industries, which attract over 12 million visitors annually. Elsewhere in Lake Mead's region, local economies depend heavily on

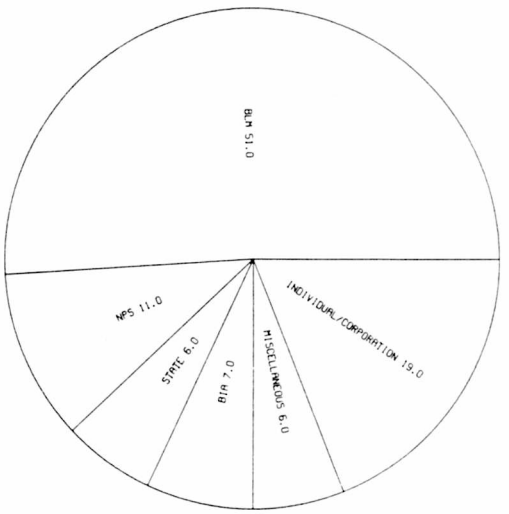
tourism and recreation-oriented activities, with Lakes Mead and Mohave being the principal recreational destination. Mining and minerals extraction and grazing are locally significant economic contributors, as are federal employment and power generation and export.

Laughlin, Nevada, across the Colorado River from Bullhead City, Arizona, is a rapidly expanding gambling and entertainment center. In 1980 its population was 92, but its population is anticipated to reach 25,000 by 1990 (personal communication with Laughlin Chamber of Commerce).

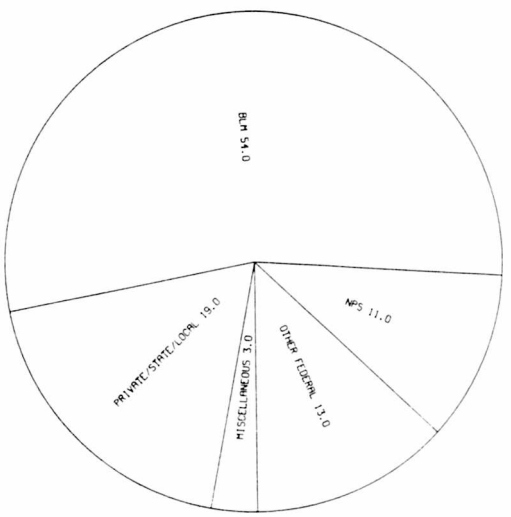
Clark County
Landownership



Mohave County
Landownership



Region
Landownership



VISITOR USE ANALYSIS

Lake Mead NRA reports the number of recreational and nonrecreational visitors on a monthly basis. Use is measured in terms of visits, defined as the entry of a visitor into the park. Nonrecreational use is figured as commuters, inholders, tradesmen, and employees of any federal (not National Park Service), state, or local agency or business in the park as measured by traffic counters. Recreational visitors are counted at 22 to 29 different traffic counter locations at the recreation area, primarily at entrances to developed areas and primitive access points.

A visitor use study was conducted in 1978 and 1979 by the National Park Service. The surveys were conducted through a nonstatistical random sample, with the goal being the most responses possible. The questionnaires were handed out at developed areas and the Alan Bible Visitor Center; respondents were requested to return the completed survey by mail. The sample population was comprised of approximately 6,470 visitors, yielding a total of 1,585 respondents.

REGIONAL RECREATION PATTERNS

The two-county region contains one national recreation area, a portion of a national park, one national forest, and two state parks. These units vary from arid canyonlands to forested mountains, and recreational opportunities range from hiking and boating to snow-skiing. Camping is available on federal lands and at many private campgrounds.

The principal scenic and recreational attractions are the lower portions of the Colorado River in Grand Canyon National Park, Lake Mead National Recreation Area, and Red Rock Canyon recreation lands managed by Bureau of Land Management. The recreation area reported 6,128,254 recreational visits in 1983. The majority of these visitors considered Lake Mead to be their destination, with no other stops on their way to or from the area.

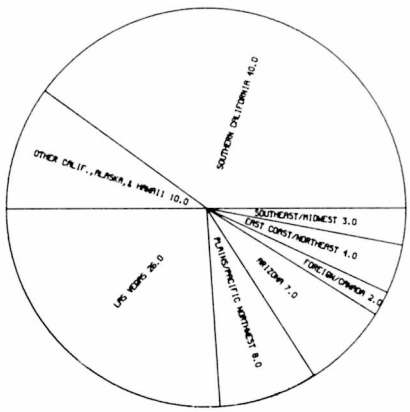
The typical visitor to the recreation area comes as a member of a family group and spends one night, resulting in one to seven days at the area within a year's time.

RECREATION AREA USE PATTERNS

Visitor Residence

As shown in the following pie chart, over one-third of the visitors surveyed in 1978 and 1979 were from southern California and one-fourth were from Las Vegas.

Residence
1978-1979 Visitors



Visitor Activities

The region's climate facilitates year-round recreation at Lake Mead. Beach use and water sports are greatly limited during the winter, but the best lake fishing occurs at this time, and the increase in the number of fishermen tends to offset the decrease in the number of other kinds of recreationists. Hot summertime temperatures tend to discourage backcountry use west of the Grand Wash Cliffs, and most of the summer recreation in this part of the recreation area occurs on or near the lakes. The cooler climate of the Colorado Plateau, east of the cliffs, tends to favor use of the backcountry in this area during the summer, but physical isolation and poor roads have limited such use.

Park visitors participate in the following activities in the proportions shown below:

97%	relax	64%	water ski
93%	view scenery	33%	rock hunt
89%	swim	19%	attend evening programs
80%	camp	11%	sail
77%	picnic	10%	four-wheel
76%	motor boat	8%	dirt bike
76%	hike/walk	8%	scuba dive
73%	photograph scenery	6%	backpack
70%	fish	3%	hunt

A majority of visitors have indicated a desire to see new areas developed in the recreation area, although there was no concensus on location(s).

Visitation Patterns

The peak use days of the year usually occur during Memorial Day weekend. In 1983, there were about 253,791 visitors (33% increase over

1982) during the three-day period. Labor Day weekend and the Fourth of July weekend fluctuate on being the second highest peak public use periods; in 1983, the three-day period for the Fourth of July had 162,928 visitors (36% increase over 1982), while the four-day Labor Day weekend had 121,887 visitors. The majority of these visitors are in the Lakeshore Road (Boulder Beach and Las Vegas Wash) and Katherine Landing areas. The Lakeshore Road area tends to attract day users, while Katherine Landing attracts more overnight visitors.

Through 1983, April/May and July/August are the peak use periods as shown on the Monthly Visitation graph. About 50 percent of the total year's visitation occurs from April through August, with 75 percent occurring from March through October. Visitation at the developed areas has been relatively uniform over the last five years (see Visitation by Developed Area graph). Likewise, overnight stays at concession lodging have not changed significantly over the last five years (see Concession Lodging graph). From 1979 to 1982 there was a +0.3 percent growth per year in overnight stays at concession lodging. This static trend is expected to continue in the near future or occupancy could increase if any number of factors change. Specific events can alter this trend. In 1983 use of concession lodging decreased, but it is attributed to the recession and extreme high water levels on Lake Mead. It is noteworthy that while use of overnight facilities decreased in 1983 compared to 1982, total visitation increased. People came to see the lake flowing over the Hoover Dam spillways, but because of the recession they did not stay overnight as often as in 1982. The trend from 1979 to 1982 for all other overnight stays (NPS and concession campgrounds, trailer villages, and RV sites) in developed areas was a +2 percent increase. Again 1983 was left out because of the specific events that decreased the use of facilities.

Occupancy rate information would be very useful for determining facility use trends, but such data are not available for Lake Mead.

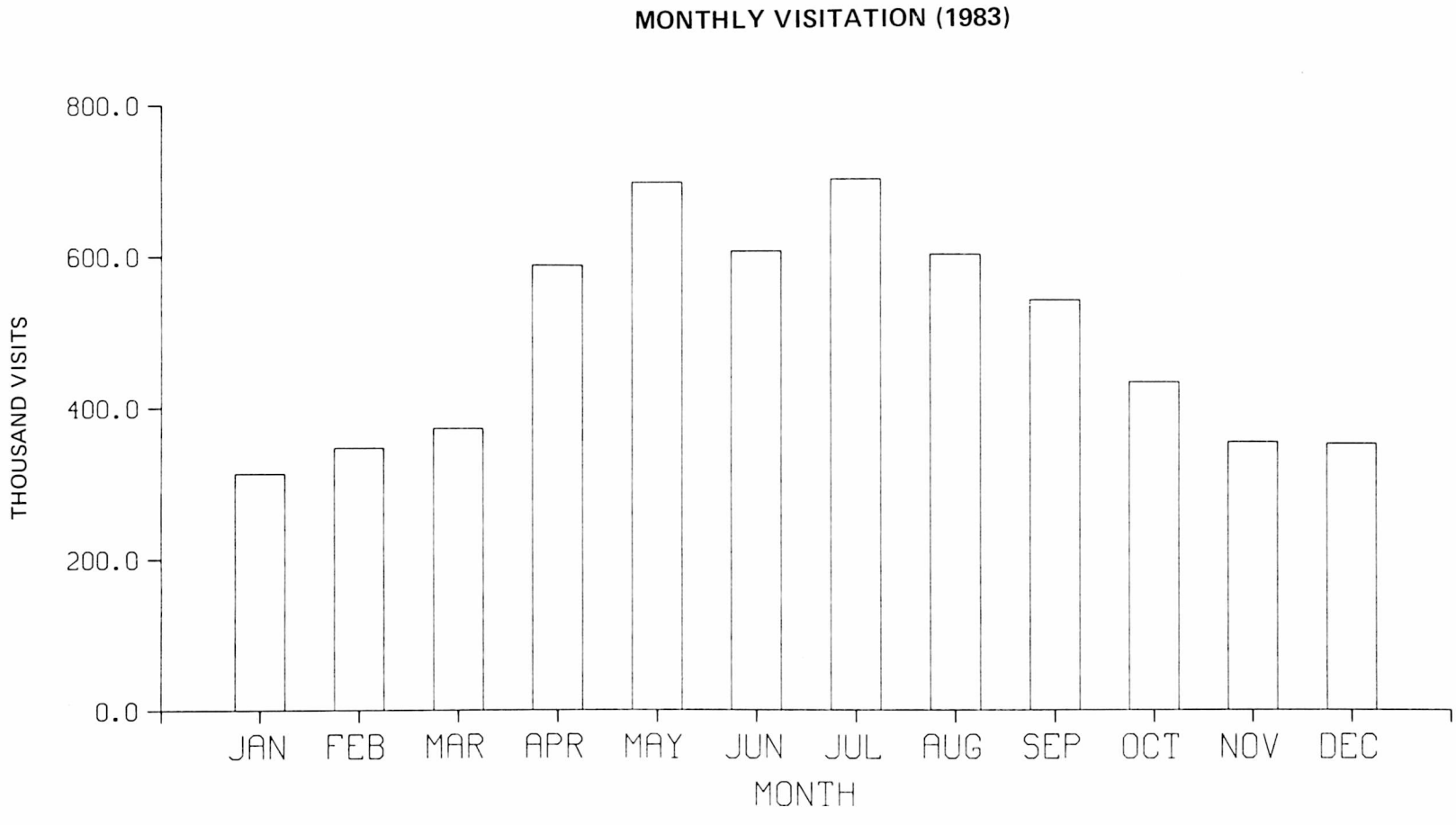
Facility use is dependent on the economy, quality of the facilities and associated services, price, and quantity of available facilities. Nearly static use, as observed for overnight stays at concession lodging, can result from one or more factors, and it is not known which ones are currently responsible. Since the use of the less expensive overnight options (campgrounds, trailer villages, and RV sites) increased during the same time frame, lodging costs and the state of the economy may be the cause for the near static use of concession lodging.

Discussing trends with only a few years worth of data may be misleading. A more realistic evaluation of visitation trends at Lake Mead can only be made by looking at visitation over the long term, which is not possible at this time for overnight stays because of the inconsistency of existing data. The overall visitation trend gives a clearer picture of the potential use of facilities, depending on the types of factors discussed previously.

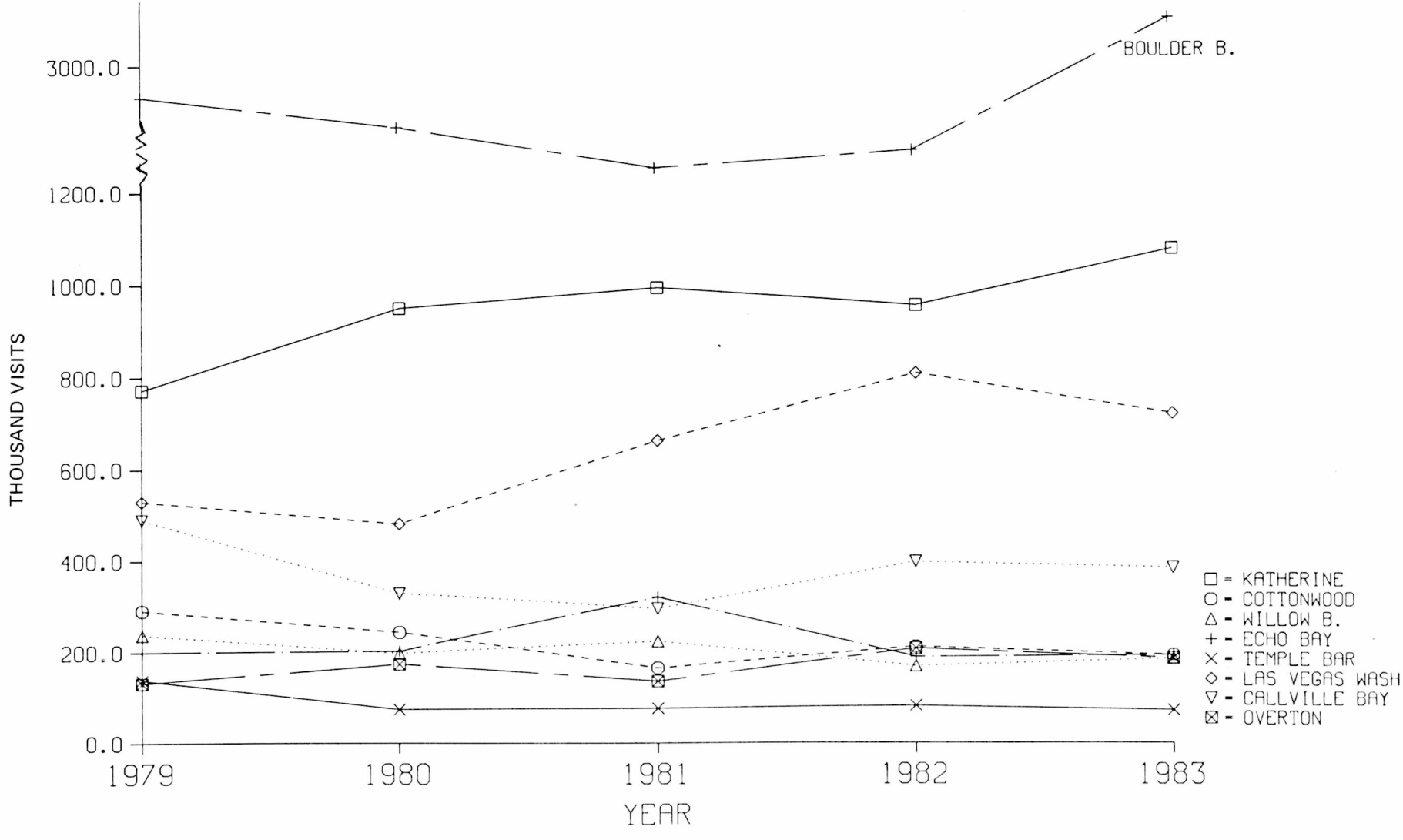
Since the mid 1940s, visitation to Lake Mead has increased fairly steadily (see Visitor Use Levels graphs). The growth rate from 1962 through 1983 averaged 156,343 more visits each year. Growth during the last decade has not been unduly affected by gasoline shortages in 1974 and 1979.

Because a large portion of the visitors are from Las Vegas and other close areas, they will tend to continue visiting Lake Mead NRA in times of gasoline shortages.

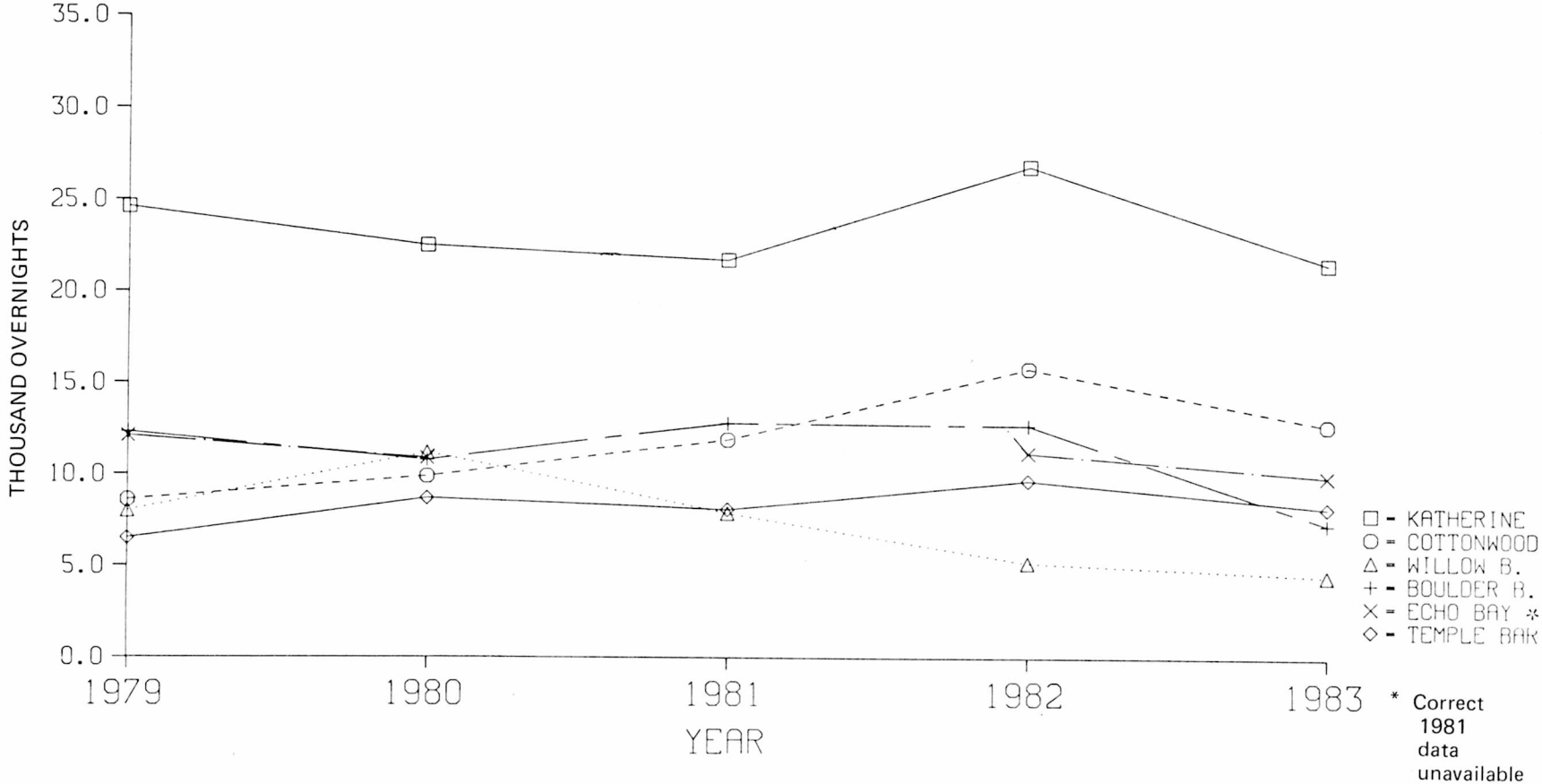
Future trends in visitation to Lake Mead National Recreation Area can be projected by observing the trends in the past two decades (see Projected Growth graph), especially as the major urban areas it serves are continually growing. The line labeled "continued growth" is a projection based on visitation from 1937, while the line labeled "back to 1962" reflects growth potential, considering only the more recent years when growth in the region expanded.


MONTHLY VISITATION (1983)
800.0
600.0
400.0
200.0
0.0
THOUSAND VISITS
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
MONTH

LAKE MEAD NRA VISITATION BY DEVELOPED AREA (1979 - 1983)

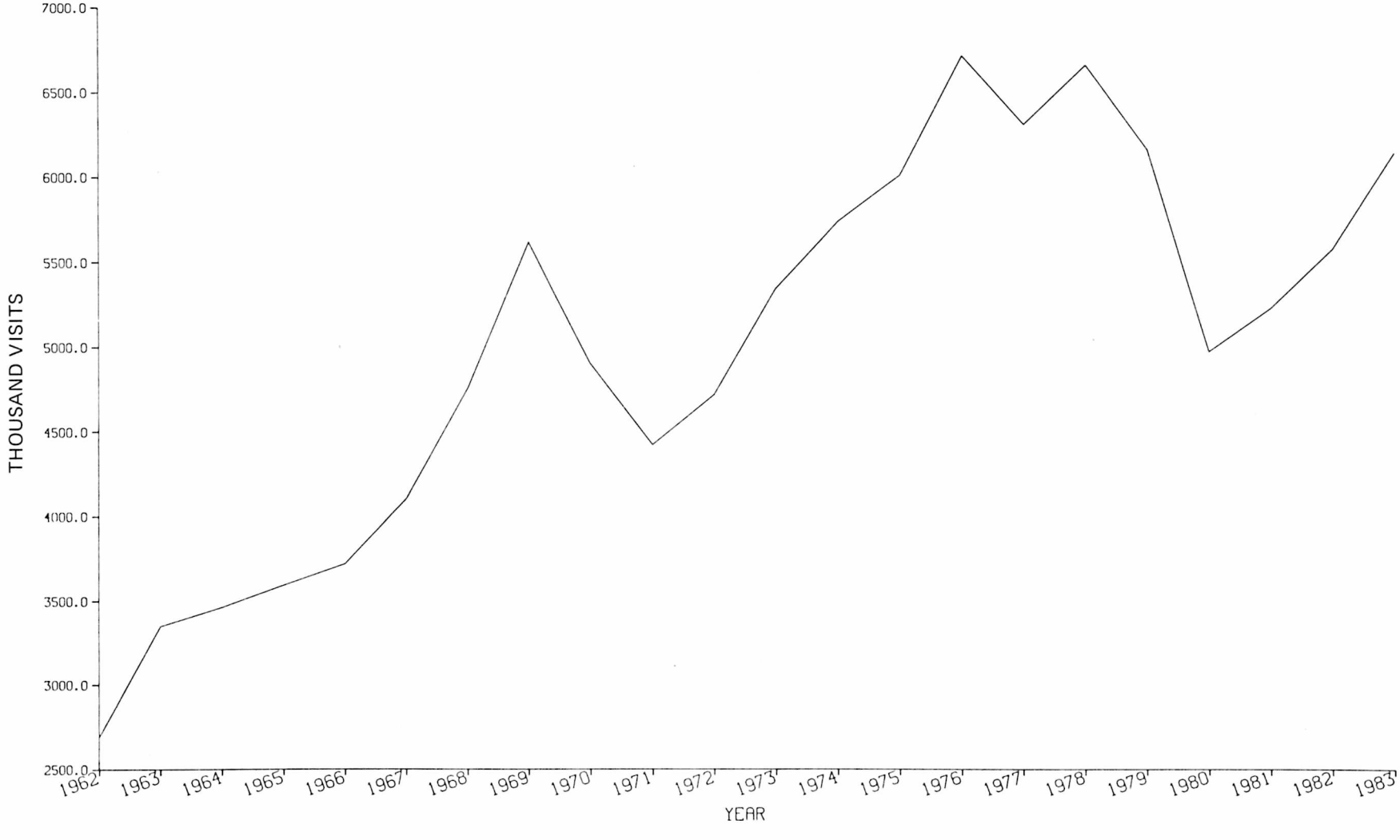


LAKE MEAD NRA CONCESSIONER LODGING (1979 - 1983)



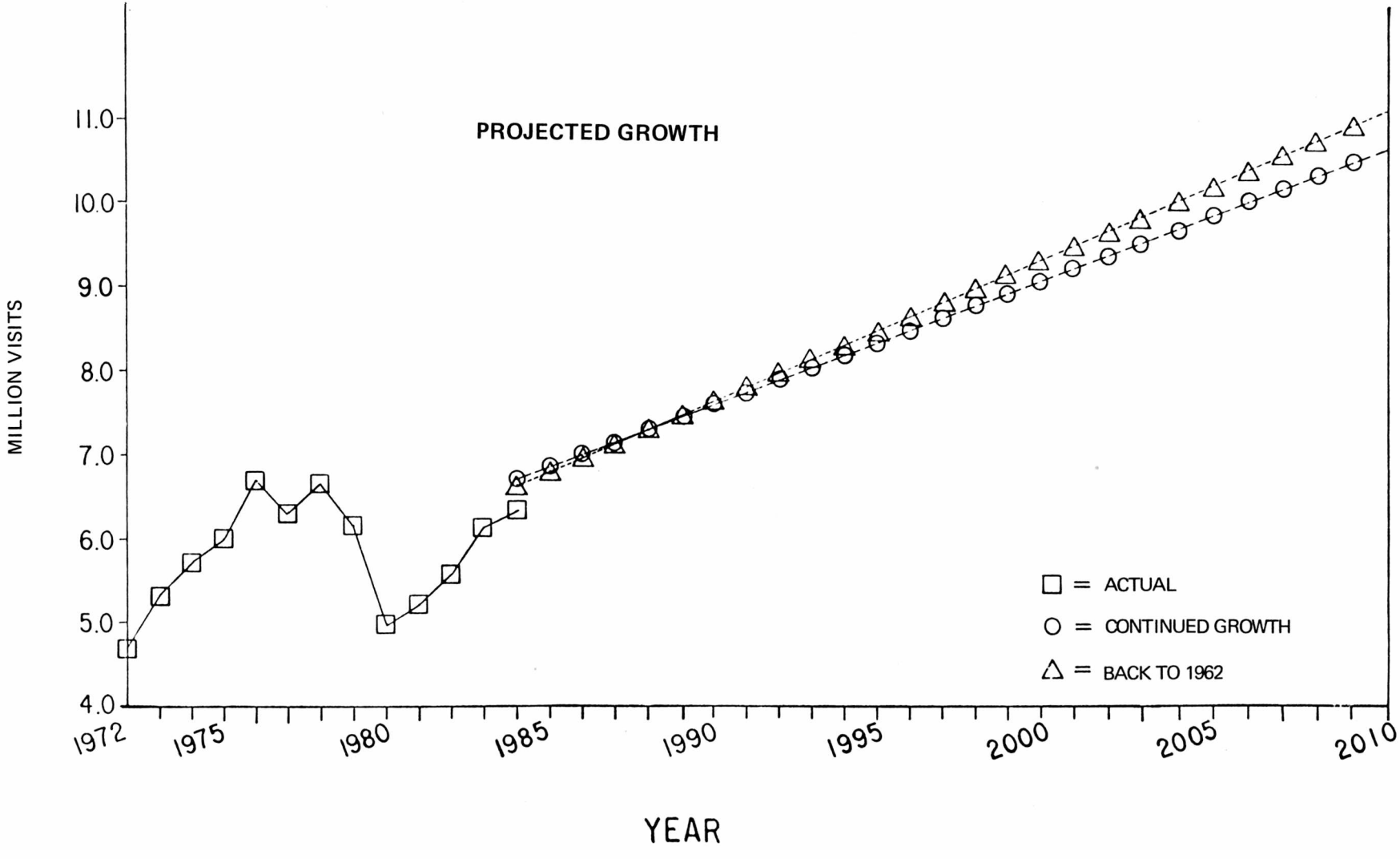
* Correct 1981 data unavailable

LAKE MEAD VISITOR USE LEVELS (1962 - 1983)



LAKE MEAD VISITOR USE LEVELS (1937 - 1961)




PROJECTED GROWTH
MILLION VISITS
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
1972
1975
1980
1985
1990
1995
2000
2005
2010
YEAR
□ = ACTUAL
○ = CONTINUED GROWTH
△ = BACK TO 1962

FACILITY ANALYSIS

A full description of existing facilities can be found in the "Alternative Development Concept Actions" section under the no-action alternative column of the Actions charts. Following is a discussion of roads and utilities, which are more clearly explained in the Actions charts. However, an understanding of access and utilities are basic to all development proposals.

ROADS

The major paved and dirt roads that are primarily used by visitors are part of this facility analysis.

Nevada 163 and Arizona 68 is the major paved road in the southern portion of the recreation area, which connects U.S. 95 with U.S. 93. It is a two-lane road that has considerable use because it is one of the limited number of road crossings of the Colorado River. This road is maintained by the states. The other major road through the recreation area is U.S. 93, a major two-lane highway connecting Phoenix to Las Vegas. This state-maintained road has one pullout, overlooking Willow Beach and the Colorado River.

Other paved roads around Lake Mohave include the access roads to Katherine Landing (3 miles), Willow Beach (4 miles), Cottonwood Cove--NV 164 (5 miles), and NV 165, which terminate at a Colorado River overlook/turnaround above Eldorado Canyon. These roads within the NRA boundary are maintained by the National Park Service.

The area around Lake Mohave has two major dirt roads that are maintained by the National Park Service after entry into the recreation area's boundary. They are Christmas Tree Pass Road (9 miles) and Cottonwood Cove East Road (4 miles). The Christmas Tree Pass Road has two turnouts for interpretation and an area designated for camping.

Within the Boulder Basin area are three major paved roads. U.S. 93 bisects the lower portion of this district and crosses Hoover Dam. This highway is maintained by the state and is a major southwest connecting route. Lakeshore Road, which is maintained by the National Park Service, runs from a junction with U.S. 93, traverses 14 miles, and then terminates at Henderson, Nevada. Northshore Road begins at a junction with Lakeshore Road and terminates north of the recreation area's boundary in the town of Overton. This 64-mile-long road is maintained by the National Park Service within the boundary. Lake Mead Boulevard (6 miles), the access road to Callville (4 miles), and the access road to Hemenway launch ramp (1.5 miles) all begin or terminate on one of the previously mentioned roads that the Park Service maintains and services.

In other parts of the recreation area access is provided to Temple Bar, of which the Park Service maintains 14 miles; and to South Cove launch ramp, of which the Park Service maintains 13 miles. This road begins at

a junction with U.S. 93 and goes through the town of Dolan Springs to the NRA boundary.

Three major dirt roads are maintained: Temple Bar to Gregg's Hideout Road (34 miles); Gregg's Hideout access road (8 miles); and Pearce Ferry access road (3 miles).

UTILITIES

The following discussion describes the utility systems that are currently provided at developed areas throughout the recreation area.

Katherine Landing

This area has a 500,000-gallon water storage tank and a treatment system that distributes water to the developed area. Water is taken out of Lake Mohave and pumped to the treatment facility. The sewage system consists of three lagoons that treat the sewage. The power and telephone systems are provided by Citizen's Utility Company of Kingman, Arizona.

Cottonwood Cove

California Pacific Power supplies electricity to Cottonwood Cove, and Centel of Nevada supplies telephone services. Cottonwood Cove has a three-cell sewage treatment facility and two wells that pump into a 325,000-gallon storage tank and treatment facility.

Willow Beach

Two wells currently supply a 200,000-gallon water storage tank and treatment facility. Power and telephone are supplied by Citizen's Utility Company. Two lagoon cells provide necessary sewage treatment. When the flood mitigation is completed, water and sewage systems will need to be rebuilt.

Boulder Beach Area

Within the Boulder Beach area all power is supplied by Nevada Power, and all telephone services are provided by Centel of Nevada. Sewage is treated by four lagoons. The water is pumped from Lake Mead into a treatment plant and distributed from a 2,455,000-gallon storage system.

Las Vegas Wash

Water for this area is taken from a private pipeline, treated, and then distributed from a 100,000-gallon storage tank. All sewage is treated through a three-cell lagoon system. Power is provided by Nevada Power, and telephone service is supplied by Centel Telephone Company.

Callville Bay

Telephone service for this area is provided by Centel Telephone. Nevada Power provides electricity, but it is inadequate. The water system at Callville Bay consists of an intake on Lake Mead, with a 100,000-gallon storage tank, treatment and distribution system. Two cells treat the sewage generated at Callville Bay. This system must be redone to handle any future needs that may be generated.

Echo Bay

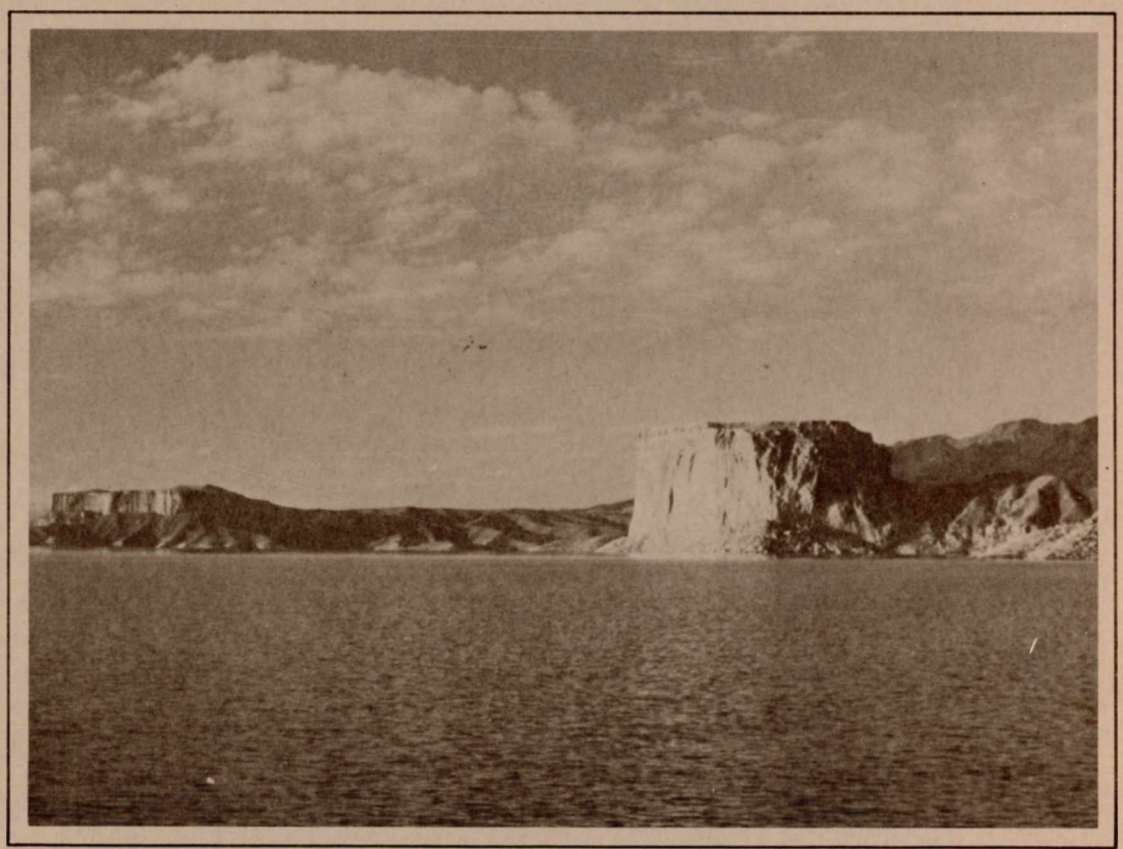
Overton Power District and Moapa Valley Telephone, both of Nevada, supply utilities to this area. The water system consists of a lake intake system and a 601,000-gallon storage system. There is a four-cell sewage system at Echo Bay.

Overton Beach

The Overton Power District and Moapa Valley Telephone supply utilities. Sewage is treated in a new four-cell treatment facility, and the water system consists of a lake water intake with a 165,000-gallon storage tank and treatment plant.

Temple Bar

Citizen's Utility Company of Kingman, Arizona, supplies power and telephone service to Temple Bar. Water treatment consists of two wells that supply a 600,000-gallon storage tank and treatment system. Sewage is treated in a new four-cell system.



ENVIRONMENTAL CONSEQUENCES

INTRODUCTION AND DERIVATION OF IMPACT TOPICS

A summary of environmental impacts is presented in the "Summary" section at the beginning of this document. Impacts of the proposed action and alternatives are addressed. As described in the "Management Strategy" section, many development proposals are the maximum allowable, rather than the optimum based on current or projected demand. The following environmental consequences evaluate the worst-case situation. The actual level of development would most likely be less than the maximums, so that the resultant impacts would be less severe than those described. All impacts take into account the trend of increasing visitation described under recreation area use patterns in the "Visitor Use Analysis" section, and the impacts would be greater or lesser depending on how actual visitation varied from the predicted trend.

The impacts that mineral leasing might have on other natural and cultural resources under the alternatives have not been assessed in detail because of the highly speculative nature of mineral resources within the recreation area. Specific impacts are outlined for the development of mineral commodities that can realistically be expected to be mined within the next decade. Impacts associated with the development of other mineral commodities are discussed in less detail because of the improbability of development. Following completion of the GMP, the minerals management plan (MMP) and the accompanying evironmental compliance document will present typical mineral development scenarios and a cumulative impact analysis of those scenarios. Then as lease or permit applications are received, the environmental assessment (EA) required to process the application can be tiered to the cumulative impact analysis contained in the environmental document accompanying the MMP. This eliminates duplication of environmental analyses and allows the EA to concentrate on site-specific impacts and mitigation.

To focus on the most significant impact topics, the issues, alternatives, and impacts were evaluated throughout the GMP planning process. The issues and alternatives are presented in the previous section, and the scoping process and its results are described in the "Consultation or Coordination" section. A few impact topics, like threatened or endangered species, were raised by the public in the scoping process. However, all impact topics were evaluated by the GMP planning team and narrowed to specific topics that include only those of significant environmental concern. An explanation of how each impact topic was generated follows.

Broad Impact Subjects	Impact Topics
Floodplains	
Lake Mead's flash-flood zones are associated with altered dry washes in existing developed areas that	Public Safety in Floodplains Property in Floodplains

lack natural values which regulations intended to protect--no recharge of water tables, no diverse riparian environment, no wetland or riparian species, etc. There are some developments in flash-flood zones where people and property are jeopardized.

Floodplain capacity would not be affected by changes in development or even structural flood mitigation measures. The location of the flood flow could be altered, but the capacity would not change. Thus, floodplain capacity is not a significant issue.

Water Quality

Wind-induced wave action overrides all other sources of siltation. Construction activities involving earth movement will not add measurably to siltation. The dry wash bottoms and alluvial slopes are either 1) dry and soil movement cannot affect the lake's water quality, or 2) flooded very briefly during a flashflood which carries a full sediment load to the lake whether construction activity is in the flood path or not. Construction of marinas is done from the marina or barges and siltation from anchor placement is not measurable compared to wind-induced wave action. Salt and heavy metal concentrations are Colorado River Basin problems and do not stem from any GMP issues. Microbial contamination of lake water from human waste in areas of concentrated visitor use poses a problem.

Reservoir Water Quality

Wetlands

U.S. Fish and Wildlife Service lists no wetlands in Lake Mead. However, desert spring communities are critical wetland habitat in small isolated areas. They are not as critical for free-roaming animals as they once were, because those animals can also get water from

Desert Spring Ecological Communities

the reservoirs. Only two springs are located where they might be affected by GMP development proposals. Others might be affected by mineral leasing. The riparian habitat along the Virgin River and Las Vegas Wash would not be affected by any GMP proposals

Soils

There is no parkwide information on soils, but what is known indicates no soils of inherent value--no farmland or productive soils, no rare soils. Most soils are unconsolidated alluvial material lacking soil profiles. Some soils with high shrink-swell properties could affect the development proposals. Because significant soils cannot be identified due to lack of data, a general analysis of impacts on soils will be presented.

Soils

Significant Natural Features

Unique, rare, scientifically important, or scenic natural features--see "Affected Environment" section for full listing. Many of these features are critical for their scenic or visual resource values. None affected except from potential mineral development.

Significant Natural Features

Vegetation

Most vegetation types are regionally common or are already disturbed by man. Accordingly, threatened or endangered species and desert spring communities (already considered) are the critical issues.

Development proposals are all in previously disturbed areas of the creosote bush community, which dominates almost three quarters of the recreation area. Mineral leasing could affect vegetative communities that are more significant. Thus, the impacts from mineral leasing on

Threatened or Endangered Species
Vegetation

vegetation in general will also be thoroughly considered to ensure protection to unknown threatened, endangered, or candidate plants.

Wildlife

Most species are regionally common. Bighorn sheep are important for viewing, hunting, and restocking of depleted herds in other areas; threatened or endangered species are important because of their rarity and legally protected status.

Threatened, Endangered, or Candidate Species
Bighorn Sheep

Visitor Use

Much of the plan is directed at managing visitor use. The major areas for potential impacts are cabin sites, trailer villages, and visitor crowding/congestion. Traffic levels, circulation, and congestion are serious concerns addressed under visitor crowding/congestion.

Impact on off-road vehicle use is not addressed because all use of vehicles off approved roads is illegal, and the current system of approved roads that can be used by off-road vehicles is not changed by any alternative.

Visitor Crowding/Congestion
Vacation Cabin Site Residents
Trailer Village Residents

Concession Services

The level of services offered by concession operations directly affects visitor use and is therefore an important component of the Lake Mead environment.

Level of Concession Services

Mineral Leasing

There is potential for major impacts on mineral leasing and development from zoning alternatives. The GMP addresses management of future mineral leasing. None of the alternatives affect existing mineral interests whether they arise from a valid mining claim, existing lease,

Mineral Leasing Opportunity

or nonfederal mineral ownership. Based on what is known about mineral resources within the NRA, uranium appears to be the most probable mineral to be developed within the immediate future. Sporadic exploration for oil and gas may continue in the future; however, major field development is not expected and impacts would be minimal from the sporadic exploration activity. Exploration for other hard-rock minerals might occur in scattered locations, and some minor production might occur in older existing mines, but based on past trends no major new mines would be expected.	
Wilderness Values	
Lands meeting the criteria of the Wilderness Act have been identified. There is potential for major impacts on these lands from zoning alternatives.	Lands Possessing Wilderness Values
Air Quality	
Air quality problems are in a regional airshed which contains major population centers and power plants. Dust from dirt roads is not significant locally by comparison to regional problems. Although visitation is projected to increase, no proposals under any alternative could significantly alter existing air quality.	Not Considered Further
Cultural Resources	
As described in the "Affected Environment" section, all significant cultural resources have been identified. However, none of these would be affected by any development proposals. To ensure protection of any unknown cultural resources, preconstruction or premineral leasing surveys would be conducted for all land that could be	Not Considered Further

affected by specific construction or leasing proposals.

Land Protection Issues

The GMP summarizes decisions already made in the Land Protection Plan and does not propose any new actions. The LPP had its own assessment. See the "Land Protection" section for a full description of the issues and management direction on:

- boundary revisions
- state and private lands
- Santa Fe Pacific mineral rights
- Arizona indemnity selection program
- Hualapai Indian Reservation lands
- Bureau of Reclamation withdrawal lands
- easements and utility corridors
- special activities on nonfederal lands

Not Considered Further

Resources Management Issues

The GMP summarizes decisions already made in the Resource Management Plan and does not propose any new actions, except for mining/minerals management and actions related to illegal use of vehicles off approved roads. The RMP had its own assessment. See the "Natural and Cultural Resources Management" section for a full description of the issues and management direction on:

Not Considered Further

natural resources management

- fishing, hunting, and trapping management
- tamarisk control
- non-native plant and wildlife species control
- air and water quality monitoring
- fire management
- threatened or endangered species management
- grazing management

	cultural resources management cultural resource surveys archeological site management historic site management contemporary native American concerns collections management	
Public Safety on Highways		
	A leading accident-prone road within the national park system and several others with high accident rates are in the recreation area. These issues and associated road maintenance problems are being addressed by a separate planning process done in conjunction with the Federal Highway Administration. The GMP summarizes decisions made in this separate process.	Not Considered Further

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

A summary of the following impacts is presented in the "Summary" section at the beginning of volume I.

IMPACT ON PUBLIC SAFETY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. The 100-year flood has a 1 percent chance of occurring in any year. The probable maximum flood is the greatest flood that could ever be expected. Probable maximum floods do occur, but the frequency is uncertain; the likelihood in any year is less than 1/10 of 1 percent. Flood hazard is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor use facilities are out of the floodplain. At Boulder Beach all development is on a broad alluvial fan, with protection provided by earth dikes. Flooding at Boulder Beach can concentrate unpredictably in localized flows but more often takes the form of sheet flows up to 2 feet in depth. Therefore flooding at Boulder Beach is not considered to present as great a danger to human life or property as the concentrated flows in canyons at other areas in the NRA, and no potential victims or damage to structures are shown for Boulder Beach under the impact sections relating to floodplains. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. See discussion of floodplains and wetlands in the "Affected Environment" section of this document for a more detailed explanation of floodplain conditions. The development concept plan graphics for each developed area show the extent of the 100-year and probable maximum floods.

The proposed action would mitigate the impact of floodwaters to the 100-year level with structural measures, mitigate the effects of floods larger than the 100-year flood with warning systems and evacuation plans, and rely on relocation of facilities for some areas. Removal of structures that would be used by people or relocation of the structures out of the floodplain provides the best protection. Structural measures offer the next best method. Warning systems provide less protection than either of the former two methods. The "Alternative Development Concept Actions" section of this document has full details on proposals. The discussion on floodplains and wetlands in the "Affected Environment" section describes flood probabilities.

The proposed action would involve implementation of nonstructural (not requiring major construction) flood mitigation measures in all developed areas having flood hazard. These measures are as follows:

> Provide education and information about the potential flood hazard and what to do in case of such an emergency.
>
> Install flood warning systems that provide early identification of an impending flood; analyze the magnitude, severity, and potential impact of an impending flood; disseminate appropriate warnings to parties likely to be affected by an impending flood.

Prepare evacuation plans. Evacuation planning for developed areas at Lake Mead NRA is influenced by two factors. First, flooding can occur very rapidly, so people must respond rapidly to a warning to save their lives. Second, some of the developments are located such that safe refuge is either some distance away or difficult to reach because of steep slopes.

All three of these nonstructural measures are collectively referred to as the warning system package in the discussions that follow. Two developed areas, Willow Beach and Cottonwood Cove, already have warning system packages in operation.

The following is a summary of the most important structural measures that would be implemented under the proposed action. A complete discussion of flood mitigation actions for the proposed action can be found in the "Alternative Development Concept Actions" section.

Katherine Landing

one earth/concrete/gabion-lined diversion canal 1,550 feet long
concrete-lined channel 2,437 feet long
650-foot concrete-lined diversion dike ,

Cottonwood Cove

three concrete/gabion-lined diversion dikes totaling 1,700 feet in length
two concrete-lined channels totaling 5,911 feet in length

Willow Beach

550 feet of riprap dike
626 feet of concrete wall

Boulder Beach

armoring of existing earth dikes with gabions

Temple Bar

four armored diversion dikes 2,595 feet long
two concrete channels with a combined length of 3,955 feet

Facilities that would be relocated out of the floodplain include:

Katherine - NPS maintenance
Cottonwood Cove - NPS housing and maintenance area and swim beach

Willow Beach- NPS housing and maintenance, ranger station, campground, trailer village, concession housing and maintenance
Las Vegas Wash - dry boat storage, concession maintenance
Overton Beach - campground

Structural measures for protecting people and development are less effective than relocating the people and development out of the floodplain because the former rely on man-made attempts to change the shape of the natural floodplain into a configuration that is more convenient to man, and they must be adequately designed, constructed, and maintained to be effective. Sometimes structural measures provide the basis for a false sense of security to people in the floodplain, and people fail to evacuate the floodplain in case of potential flooding.

Warning systems provide the least protection of the three measures discussed. To be effective, warning systems must receive and interpret incoming data correctly and give the warning signal, the Park Service personnel must receive the warning signal and put the evacuation plan into effect. Occupants of the floodplain must then cooperate in getting to higher ground. There are no statistics available on the likelihood of a warning system failure. Some people might not receive the warning, and others might refuse to follow evacuation instructions. Thus, the possibility of injury or loss of life exists for the people in the greater than 100-year floodplain at the time of such a flood event.

Under the proposed action, structural measures would protect up to the level of the 100-year floodplain. Any flood greater than the 100-year flood would be mitigated by warning systems only.

Under the proposed action, on an average summer weekend, an estimated 160 people would be in the 100-year floodplain at any one time in the daytime and none would be there at night. For the possible maximum flood, the numbers would be approximately 4,155 for day and 3,860 for night. Of the 96,000 people expected to be in the recreation area on a summer weekend day, 0.2 percent would be expected to be in the 100-year floodplain and about 4 percent would be in the PMF. For the 100-year flood, these figures are 13 percent of the figures for a daytime flood and 0 percent of the number of potential victims for a nighttime flood. For the probable maximum flood, these figures are over 90 percent of the figures for existing conditions. The figures presented in the preceding narrative and in tables 24 and 25 are based on the number of people that would be expected to be in the floodplain at any one time on an average summer weekend day. The potential hazard to people in the probable maximum floodplain would be mitigated under the proposed action by warning systems, evacuation plans, and emergency procedures.

After all the mitigation measures were taken for the 100-year flood, there would be very few people in the floodplain. The hazard for them, as well

Table 24: Estimated number of people in the 100-year floodplains of Lake Mead NRA at any one time on an average summer weekend who would only be protected by warning systems and evacuation plans

	No-Action Alternative (Same as existing conditions)		Alternative A		Alternative B		Proposed Action	
	Day	Night	Day	Night	Day	Night	Day	Night
Katherine Landing	605	800	5	0	5	0	10	0
Cottonwood Cove	100*	30*	0	0	25	0	0	0
Willow Beach	465	395	50	0	90	0	70	0
Las Vegas Wash	40	0	40	0	40	0	40	0
Overton Beach	40	0	40	0	40	0	40	0
Temple Bar	0*	0*	0	0	0	0	0	0
NRA Grand Total	1,250*	1,225*	135	0	200	0	160	0
Percentage of Existing Conditions	100%	100%	11%	0%	16%	0%	13%	0%

*The 100-year floodplain was mapped at Cottonwood Cove and Temple Bar based on the assumption that existing earth dikes and channels would withstand the 100-year flood. However, those structures are not likely to withstand such a flood, and the number of people in the floodplain for those areas and the grand total are unrealistically low. No attempt was made to estimate numbers of people in the floodplain because of dike and channel failures, because the sites of the potential failures and the extent of resulting inundation are too unpredictable.

Table 25: Estimated number of people in the probable maximum floodplains of Lake Mead NRA at any one time on an average summer weekend who would only be protected by warning systems and evacuation plans

	No-Action Alternative (Same as existing conditions)		Alternative A		Alternative B		Proposed Action	
	Day	Night	Day	Night	Day	Night	Day	Night
Katherine Landing	1,095	1,120	5	0	5	0	570	520
Cottonwood Cove	1,735	1,590	0	0	280	0	1,830	1,825
Willow Beach	490	360	50	0	50	0	100	0
Las Vegas Wash	40	0	40	0	40	0	40	0
Overton Beach	315	550	40	0	40	0	40	0
Temple Bar	1,170	1,250	0	0	0	0	1,575	1,515
NRA Grand Total	4,845	4,870	135	0	415	0	4,155	3,860
Percentage of Existing Conditions	100%	100%	3%	0%	8%	0%	86%	79%

as people in the probable maximum flood, would be mitigated with warning systems and other methods. However, there would be little difference between the proposed action and existing conditions with regard to the number of people in the PMF. Examining each developed area explains this situation.

Under the proposed action, at the Katherine area approximately 630 people (daytime) would be protected from the probable maximum flood by prohibiting use of the North and South Telephone coves primitive use areas and access and from other minor changes. An additional 105 people would be at risk from a daytime probable maximum flood compared to existing conditions at the expanded motel. The net result at Katherine is about 525 fewer people in the PMF.

At Cottonwood Cove approximately 40 fewer people would be in the probable maximum floodplain in the daytime compared to the no-action alternative because of the relocation of NPS maintenance, NPS housing, the picnic area, and concession housing out of the floodplain. About 140 additional people would be in the probable maximum floodplain in the daytime compared to existing conditions because of expansion of the motel, restaurant, store, parking, dry boat storage, and concession maintenance. Here there would be about 100 more people in the probable maximum floodplain.

At Willow Beach approximately 200 fewer people would be in the probable maximum floodplain in case of a daytime flood because of relocation of NPS maintenance, the trailer village, and concession housing. About 170 people would be protected from a daytime flood by diverting floodwaters with structures. About 10 additional people might be in the probable maximum floodplain on an average summer weekend day at any given time because they would be using the new trailer dump station/gas station. Overall about 380 fewer people would be in the probable maximum floodplain.

At Boulder Beach aproximately 353 additional people would be in the zone of sheet flooding due to expansion of the campground, trailer village, motel, and store. Installation of a warning system would be the only protection afforded these people in the probable maximum floodplain. However, sheet flows of 1 to 2 feet in depth are not expected to be life threatening to many visitors.

There would be no change in the numbers of potential victims of the probable maximum flood at Las Vegas Wash.

At Overton Beach relocation of the campground would remove approximately 275 people from the probable maximum floodplain. This action would also be taken under the no-action alternative. The swim beach would remain, leaving some people in the floodplain. Accordingly, there is no difference between the no-action alternative and the proposed action.

Flood safety at Temple Bar would be improved over existing conditions by protecting two daytime residents from the probable maximum flood through diversion of floodwaters. An estimated 370 additional people would be at

risk from a daytime probable maximum flood because of expansion of the parking, motel, restaurant, and store. The net change here would be about 370 more people being in the floodplain under the proposed action.

The number of people in the 100-year floodplain would be greatly reduced under the proposed action compared to existing conditions (160 compared to 1,250). There would be a net decrease in the number of people in the probable maximum floodplain because the number of people protected through site closures or relocation of structures would more than offset the increased number of people in the probable maximum floodplain because of expansion of facilities. The decrease in the number of people in the probable maximum floodplain would be about 365. However, this is a small 8 percent reduction, and about 4,155 people would still be estimated to be in the probable maximum floodplain in developed areas during a summer day. The potential hazard to them would be reduced by the warning system, evacuation plan, and emergency preparedness efforts.

Conclusion: A flood of the 100-year magnitude would not pose a significant hazard to people, but over 4,000 people are in probable maximum floodplains. The degree of hazard would depend on how well the warning systems and evacuation plans worked. During such a large flood event it is likely that injuries or fatalities would result even if the nonstructural mitigation package operated properly. There would be a 14 percent reduction during the day and a 21 percent reduction at night of people in the probable maximum floodplain compared to existing conditions.

IMPACT ON PROPERTY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. Flood hazard is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor facilities are out of the floodplain. At Boulder Beach, all development is on a broad alluvial fan, with protection provided by earth dikes. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. A more thorough discussion of floodplains can be found in the "Affected Environment" section of this document. The development concept plan graphics for each developed area show the extent of the 100-year and probable maximum floods.

Table 26 shows existing and proposed development in the floodplain for the proposed action and each alternative. The proposed action would mitigate the impact of floodwater to the 100-year level with structures, mitigate the effects of floods larger than the 100-year flood with warning systems and evacuation plans, and rely on relocation for some areas. Warning systems and evacuation plans would not provide any protection for property in the floodplains. Consequently, some property in the flood hazard zone would remain susceptible to flood damage and could be damaged or destroyed in the event of a flood. The cost of replacing structures left unprotected in the 100-year floodplain would be $327,970;

for replacing those in the probable maximum floodplain approximately $20.1 million. These costs do not include utilities, furnishings, equipment, vehicles, flood control devices, debris removal, search and rescue, or expenses of victims. The cost to replace facilities damaged by the 100-year flood would be approximately 5 percent of the cost of replacing structures in the 100-year floodplain under existing conditions.

Conclusion: A flood of the 100-year magnitude would not pose a significant hazard to structures but one of the PMF size would. During a 100-year flood, damage to structures would probably be $327,970 or only 5 percent of what it would be under no action. A PMF would probably cause significant damage to structures because very little would be done under this alternative to protect structures. It is estimated that damage to structures under the proposed action from the PMF would be $20,094,340, or 98 percent of that expected under existing conditions.

Table 26: Existing and proposed development in Lake Mead NRA floodplains that are left unprotected by structural flood mitigation measures and are vulnerable to flood damage or destruction.

Structure	No-Action Alternative 100-year	No-Action Alternative PMF	Alternative A 100-year	Alternative A PMF	Alternative B 100-year	Alternative B PMF	Proposed Action 100-year	Proposed Action PMF
Katherine Landing								
Access N&S Telephone Cove primitive use area & access	1.9-mi gravel							
Circulation roads to NPS housing	1,950-ft gravel				1,950-ft gravel			
Parking east of motel		700-car gravel						700-car paved
west of motel		500-car paved						500-car paved
Launch ramp/ ready lane		8 lanes/150 x 200' paved						8 lanes/200 x 200' paved
NPS maintenance		2 800-sf bldgs 1.5-ac unpaved storage 800' fence						
NPS & concession housing		1 permanent single-family						1 permanent single-family
Trailer village		33 short-term sites						33 short-term sites
Motel		52 units						104 units* add pool*
Dry boat storage	210 spaces		420 spaces	210 spaces			420 spaces	
Ice house		small building						small building
Comfort station	small building							small building
Cottonwood Cove**								
Access roads		5-mi paved				5-mi paved		5-mi paved
Circulation		2.6-mi paved				2.6-mi paved		2.6-mi paved
Parking	290 paved 148 gravel	200 paved 90 gravel			290 paved 148 gravel	200 paved 90 paved		490 paved* 238 gravel*
Ranger station	1,800-sf building							1800 sf building comfort station
NPS maintenance	3,000-sf building, pave 25,000 sf, add 600' fence							
NPS housing	Three 1200-sf houses; seven 800-sf trailers 1,070-ft paved road							

Structure	No-Action Alternative 100-year	No-Action Alternative PMF	Alternative A 100-year	Alternative A PMF	Alternative B 100-year	Alternative B PMF	Proposed Action 100-year	Proposed Action PMF
Picnic area	4 tables 1 large ramada				4 tables 1 large ramada			
Campground #4 & 17 DCP map		149 sites						149 sites
Trailer village		206 long-term sites; 75 short-term sites						206 long-term 75 short-term
Motel		24 units						48 units*
Restaurant		35 seats						70 seats*
Store		1,200 sf						2400 sf*
Dry boat storage	350 spaces							470 spaces*
Concession maintenance	4,400-sf building 35,600-sf paved storage							6,900-sf building* 35,600-sf paved storage
Concession housing		6 trailers 300' gravel road						
Gas station		2 pumps						2 pumps
Comfort station		small building						small building
Fish-cleaning station	small building							small building
Willow Beach								
Access roads main access	2-mi, 2-lane paved		2-mi, 2-lane paved		2-mi, 2-lane paved			2-mi, 2-lane paved
trailer village access	1/2-mi gravel		1/2-mi gravel				1/2-mi gravel	
Parking	164 space paved				164 spaces paved			
Launch ramp	8 lanes				8 lanes		8 lanes	
Ranger station	1,000 sf						1,000 sf (storage only)	
NPS maintenance	1,500-sf building 7,200-sf paved area 250' fence							
NPS housing (closed)	four 1,200-sf houses							
Trailer village	57 long-term 18 short-term							
Motel	24 units							
Restaurant	100 seats 4,900 sf							

Structure	No-Action Alternative 100-year	PMF	Alternative A 100-year	PMF	Alternative B 100-year	PMF	Proposed Action 100-year	PMF
Store	part of restaurant							
Dry boat storage	120 spaces		120 spaces		120 spaces		120 spaces	
Concession housing trailer village	ten 1,200-sf trailers							
Water well buildings	three 10'x10' buildings							
Canoe/raft takeout	graded area		graded area		graded area		graded area	
Trailer dump station/ gas station/storage							1 pump	
Sewage lagoons		one 1-ac one 0.5-ac		one one				one 1-ac one 0.5-ac
Boulder Beach								
Although data are available and cross sections have been developed for Boulder maximum floodplains are available. The following structures are in low, flat are the PMF. Boulder Beach is on a broad alluvial fan and the flood hazard is from localized concentrations. This hazard is low compared to all other areas with fl					, no maps of 100-year and probable erefore, all development is shown in ow sheet flows or unpredictable zard.			
Campground		338 sites (Hemenway)						338 sites (10 group, two 500-sf comfort stations)
Trailer village		293 sites						368 sites*
Motel		44 units						88 units*
Store		5,500 sf						8,250 sf*
Las Vegas Wash								
Launch ramp		5 lanes				5 lanes		5 lanes
Overton Beach								
Swim beach	1 ac		1 ac		1 ac		1 ac	
Campground		100 primitive sites						
Temple Bar***								
Parking		95 spaces paved				95 spaces paved		365 spaces paved*
Launch ramp		4 lanes				4 lanes		8 lanes*
Ranger station								1,000-sf bldg*
NPS maintenance		2,000-sf bldg 22,000-sf paved area 850' fence						2,000-sf bldg 22,000-sf paved area 850' fence
NPS housing	1,500-sf, single family							1,500-sf, single-family

Structure	No-Action Alternative 100-year	No-Action Alternative PMF	Alternative A 100-year	Alternative A PMF	Alternative B 100-year	Alternative B PMF	Proposed Action 100-year	Proposed Action PMF
Campground		153 sites						153 sites
Trailer village		122 sites						122 sites
Motel		22 units						90 units* 1,200-sf pool*
Restaurant		76 seats						228 seats*
Store		1,500 sf						3,500 sf*
Concession housing		14 trailers						14 trailers
Gas station		2 pumps						2 pumps
Ice house		small building						small building
Comfort station		400 sf						400 sf

Note: Structures listed in the 100-year floodplain are also in the probable maximum floodplain; however, to avoid repetition, only structures that are in the PMF but not the 100-year floodplain are listed in the PMF column.

* Indicates development that is within the probable maximum floodplain and is being expanded. These new or expanded facilities would be vulnerable to floods larger than the 100-year up to the PMF.

** For existing conditions (no-action alternative), the 100-year floodplain was mapped based on the assumption that existing earth dikes and channels would withstand such a flood. However, USDI Open File report 80-1216 "Potential flood and debris hazards at Cottonwood Cove, Lake Mead National Recreation Area, Clark County, Nevada," prepared in cooperation with the National Park Service, indicates that the dike above the employee housing area would be breached or overtopped by the 100-year flood, and the housing could be in a hazardous location depending on the location of the dike overtopping or breeching. Larger floods might endanger the campground and mobile home area. The 850-foot section of the dike that parallels the trailer village on the north might only control the 50-year flood. Breeching or overtopping of this section of the dike would allow flood waters to enter the trailer village and perhaps the store, restaurant, motel, associated parking area, gas station, and comfort station.

***For existing conditions (no-action alternative) the 100-year floodplain was mapped based on the assumption that existing earth dikes and channels would withstand such a flood. However, those existing structures are not likely to withstand a 100-year flood, and most of the facilities listed in the PMF would be susceptible to flood damage from a 100-year flood.

Table 27: Replacement costs of existing and proposed development in Lake Mead NRA floodplains that are left unprotected by structural flood mitigation measures and are vulnerable to flood damage or destruction

	No-Action Alternative		Alternative A		Alternative B		Proposed Action	
	100-Year	PMF	100-Year	PMF	100-Year	PMF	100-Year	PMF
Katherine Landing	$ 533,860	$ 3,148,420	$ 50,000		$ 25,000		$ 83,860	$ 3,116,860
Cottonwood Cove	2,049,960	9,535,320	-0-		470,330	$4,012,300	-0-	9,412,080
Willow Beach	3,990,600	4,095,600	965,830	$1,070,830	1,129,030		239,830	1,194,830
Las Vegas Wash	-0-	31,250	-0-	31,250	-0-	31,250	-0-	31,250
Overton Beach	4,280		4,280		4,280		4,280	
Temple Bar	-0-	3,644,370	-0-	-0-	-0-	148,500	-0-	6,339,320
Grand Total	$6,578,700	$20,454,960	$1,020,110	$1,102,080	$1,628,080	$4,192,050	$327,970	$20,094,340

IMPACT ON RESERVOIR WATER QUALITY

Based on available water quality data and the projected uses of water within Lake Mead NRA, water quality in Lakes Mead and Mohave is generally in compliance with established water quality standards throughout the year. However, isolated instances do occur where bacteriological pollution threatens the use of water in the NRA for full body contact recreation. The pollution results from improper disposal of human waste from visitors in the shoreline zone around the lakes. Concentrations of visitors at swim beaches and popular coves increases the probability of pollution. The health risk results from water use like swimming, water skiing, and other similar activities during which water may be ingested accidently, and certain sensitive body organs (e.g., eyes and nose) might be exposed to water.

The allowable maximum limits for fecal coliforms (measure of bacteriological pollution in units/100 ml) for full body contact recreation in the Arizona and Nevada water quality standards are 200 as a geometric mean (5-sample minimum); 400 in 10 percent of samples for a 30-day period; and 800 in a single sample.

Elevated counts of fecal coliforms generally occur during heavy use days (such as Labor Day), when lake levels are low, and at undeveloped coves accessible only by water where use is low to moderate and no sanitary facilities are available. In the latter case, localized incidents of high fecal coliforms occur when water levels rise and such areas are inundated. It should be pointed out that bacteriological pollution is rare in open areas (such as Boulder Beach) where wind and wave action provide adequate mixing; however, in areas where beaches are located in harbors or confined areas, incidents of elevated coliform counts are common by late summer. For example, fecal coliform levels have reached 1,200 at Cottonwood Cove, 1,100 at Temple Bar, and up to 24,000 in Las Vegas Bay (pollution from Las Vegas is discharged from Las Vegas Wash into Lake Mead).

Water quality at designated swimming beaches in Lake Mead NRA is regularly monitored in accordance with applicable state and local health codes to identify unsafe water quality conditions. When unsafe conditions are noted, that particular area is more closely monitored and may be closed to public use. The Las Vegas Wash swim beach has been closed since 1976, and several heavily used shoreline areas like Boulder Beach and the Katherine swim beaches have had conditions on several occasions that nearly dictated their closure.

Up to now, no recorded cases of serious infectious diseases have been contracted from contact with water from either lake. The existing conditions just described would, however, be expected to get worse over the life of the plan as visitation increased. During that time visitation would be expected to increase about 1.38 times the current levels. Although pollution levels would likely increase with visitation, the mathematical correlation between visitor use and associated pollution cannot be determined with existing data, so the levels of pollution cannot

be projected. As pollution levels increased, risk of shoreline users contracting diseases from contaminated water would increase, but the degree of increase can also not be determined.

The proposed action includes several items which would minimize or reduce the impact of increased visitation on water quality and the related public health. These actions include the following:

> Change shoreline visitation patterns by opening new improved access points, relocating problem swim beaches, and redesigning existing developed areas. These actions are designed to resolve existing crowding and congestion problems and to otherwise improve the visitor experience. By reducing concentrations of visitors, the impact on water quality and the resultant public health hazard would be reduced.
>
> Implement improved, regularly scheduled water quality monitoring programs, particularly during high visitation periods at heavily visited coves and developments. The water quality monitoring program should make the risk of contaminated water to shoreline users insignificant by continuing to assess the risk and determining when remedial actions are necessary. Temporary swim beach closures or closures of popular coves might become necessary if levels of bacteriological pollution were to exceed state standards.
>
> Improve existing sanitation and trash removal programs. Additional restroom facilities would be placed in existing heavily used coves and designated swim beaches, and existing facilities would be improved. Restroom facilities would be placed at all new improved access points and at areas indicated as problems from the water quality monitoring program.

The existing situation at Katherine Landing and Cottonwood Cove would be improved because swim beaches would be relocated. The water quality would be improved and the resulting health hazard reduced, because the new swim beach locations would be more exposed to the main body of lake water and increased wave action. That situation results in greater mixing of the water with accompanying dilution of pollution. Thus, even with increased use, the new swim beaches would be less likely to pose public health hazards.

The new designated swim beaches at Temple Bar and Cottonwood Cove would concentrate visitors at improved shoreline locations. Both locations would be exposed to the main body of the lakes and, as described previously, would not tend to pose public health hazards. To ensure that the public health risk is insignificant, both areas would be included in the water quality monitoring program.

Conclusion: Although visitation is expected to increase, the proposed action includes several mitigating measures which would minimize the effect of such visitation on water quality and related public health in the

recreation area; the hazard would be reduced compared to existing conditions at Katherine Landing and Cottonwood Cove by relocating the swim beaches.

IMPACT ON DESERT SPRING ECOLOGICAL COMMUNITIES

Rogers and Bluepoint springs are easily accessible and heavily used warm water springs. They contain native and exotic fish, provide habitat for waterfowl and shorebirds during their migrations, contain aquatic and emergent vegetation, and provide a rare moist habitat and water source for small mammals, reptiles, amphibians, and nesting birds. While such desert spring ecological communities are rare and important habitats, they are not as critical as they once were because the reservoirs provide some comparable shoreline habitat. Spring communities amount to less than 100 acres or less than .01 percent of the recreation area. Rogers and Bluepoint springs amount to less than 10 acres. Paths have formed around both springs from visitor use.

The proposed action at Rogers Spring calls for expansion and paving of an existing gravel parking area, addition of five covered picnic tables, addition of a small composting toilet, and rehabilitation of an existing interpretive wayside. At Bluepoint Spring one covered picnic shelter with three picnic tables would be added. Desert spring ecological communities would not be affected by mineral leasing because none of them would be in areas subject to leasing.

The proposed developments at these two springs would not directly affect any of the spring community habitat. All development would be in desert shrub or previously disturbed and developed areas. The only impacts to the spring communities would result from increased use by visitors. If visitation to these springs increased 38 percent, as projected for the recreation area over the life of the plan, footpath use around the springs would be expected to increase by at least that much. Emergent vegetation and other moist terrestrial vegetation would be destroyed, and the spring water could be polluted by improperly disposed trash and human waste. The degree of these impacts cannot be determined. The spring communities would be monitored by the recreation area's resource management staff, and if increases in impacts from visitor use were noted, corrective measures would be taken, including boardwalks or fences to constrain visitor movement and information to educate visitors about these sensitive habitats. Such mitigating measures have been very successful with sensitive habitats elsewhere in the national park system.

Conclusion: The proposed action would not directly affect Rogers or Bluepoint springs, but indirect impacts from increasing visitor use could result in trampled vegetation or polluted waters.

IMPACT ON SOILS

Soils in the recreation area are extremely variable. Climate, vegetation, parent material, elevation, slope, and aspect affect the development of

these soils, which are characterized by a wide range of physical and chemical properties. Texture, permeability, depth, stoniness, organic content, alkalinity, and other properties are highly diverse and change quickly within short distances.

Off-road vehicles rut soils with their tires, pulverize and disperse surface soil and compact the subsurface soil, demolish chemically bonded surface crusts and protective layers of desert pavement, and crush and destroy plants including fungus, algae, and lichens that bind the soil together. Once the desert lithosols in the recreation area have been broken by offroad vehicles crossing them, they are exceptionally vulnerable to wind, water, and mechanical erosion.

Visitors are permitted to drive land vehicles only on approved roadways in the recreation area under existing regulations. However, law enforcement, information services, and physical barriers have not been successful in curbing the illegal activity of driving off designated roads. Staffing is inadequate to provide the necessary personnel for air, water, and land detection patrols and to apprehend violators of the offroad vehicle regulations. They often escape punishment by claiming there was no way for them to have known of the regulations.

Under the proposed action more adequate maps and information services would be provided; regulatory signs would be posted at all entrances to the recreation area, including backcountry off-road access points that do not connect to the approved road system. In the Northshore Area between Las Vegas Wash and Callville Bay developments, where the most damage has occurred, existing gravel roads would be improved and new spur roads would be added to provide better access roads to the reservoirs. Improved information services would include off-site talks to off-road vehicle organizations, identification of federal lands where off-road vehicle use is not restricted, and distribution of appropriate information through off-road vehicle distributors near the recreation area. This latter action might be done in cooperation with other federal land management agencies in Utah, Arizona, Nevada, and California. Under the proposed action, the land between the Northshore Road and the lake would be zoned as a scientific research area to study the effectiveness of various rehabilitation methods. These methods would probably include sweeping out ruts, scattering gravel to replace displaced desert pavement, and seeding with native plants to reestablish a diverse and self-reproducing vegetative cover. Off-road driving for management or enforcement purposes and for access permits would be restricted.

Once off-road vehicle use was eliminated, the soils and plant cover would restore themselves at an extremely slow rate; invading weed species would generally replace native species, greatly simplifying a once complex soil-building plant and animal community.

A motorcycle driven so as to have the smallest impact on the desert soils would affect 1 acre of land for ever 20 miles it traveled. A four-wheel-drive vehicle driven in a similar manner would affect 1 acre of land for every 6 miles it traveled. About 350 acres of the recreation area

have been damaged severely enough to need some form of rehabilitation, and an additional 30 to 40 acres are being scarred each year. A description of these soils is shown on the Resource Damage map.

The information services, maps, and signing described under the proposed action would ensure that cooperative visitors with offroad vehicles would not inadvertently damage soils in the recreation area.

Similarly, visitors reaching the reservoirs on approved roads would be less tempted to break new ground for a more private setting if approved roads already extended along the lakeshore. The Northshore Area Road improvements would reduce off-road use by providing access to highly desired areas along the lake and by providing a route for detection and enforcement personnel. The soil damage created by off-road vehicle drivers who are less inclined to be cooperative would not be curbed by the proposed action because it does not call for additional enforcement personnel and equipment to maintain a strong detection and enforcement function. Thus, the proposed action would reduce the rate at which soils are being destroyed, but it would not be expected to bring it to a halt.

The rehabilitation research efforts of the proposed action would eliminate visual scars and greatly reduce the rate of wind, rill, and gully erosion on about 100 acres of the recreation area and restore a semblance of desert pavement and native plant cover. Rehabilitation, however, cannot really reclaim severely damaged areas in the sense of restoring the original ecosystem that took many years to form. Successful methods of restoration arising from research would be applied to all areas in the recreation area that have been damaged by off-road vehicle use and by any other activities that similarly mark the land.

Facilities in developed areas have destroyed or severely damaged the natural soils on about 800 of the recreation area's 1.5 million acres (about .0005 percent of the area). The proposed roadways and visitor facilities would add about 503 acres to the total area of lands devoted to these purposes. Although rehabilitation and landscaping would mute the scars from construction and prevent the loss of soil through erosion, the natural productivity of these soils would be lost.

The construction of facilities under the proposed action would compact adjacent soils and create impermeable surfaces which would increase local runoff and erosion in the short expanse between the activity or structure and the lake. Because most facilities are immediately adjacent to major natural washes that feed immediately into the reservoirs, this erosion would be minor and very limited in area. Roadway construction, however, blocks and channelizes runoff as well as increases it. Slopes downhill from the roadway are deprived of overland flow, and downhill gullies and washes are depleted or augmented by the location of road culverts. Upslope gullies and slopes would flood and pond if the water was not sent under the roadway by culverts, increasing sediment deposition. The patchy soil moisture regime thus created would express itself in stands of vegetation that were more or less robust than average. The more robust communities would probably balance the less robust in

the amount of sediment eroded by rainsplash and carried in overland flow.

The proposed roadways would require approximately 1,450,000 cubic yards of material to be removed in cuts. The only major cuts would be along a 3-mile section of the Lakeshore Road where cuts of 30 to 40 feet would have to be made. Such cuts often reveal geologic features in the bedrock that are otherwise masked by soils and overburden. With adjacent pulloff areas, some of these cuts can serve both educational and interpretive purposes. Roadways and flood prevention fill at developed areas would require approximately 1,700,000 cubic yards of material--about 250,000 cubic yards more than that removed in cuts. Some suitable material could be obtained where excavation deepened washes at their mouths in the developed areas as protection against flash flooding. For the most part, however, the additional fill would be brought into the recreation area from established borrow pits or rock waste sites.

The proposed action restricts mineral leasing to the resource utilization subzone, as shown on the Proposed Action Management Zoning map, which is consistent with NPS management zoning policies as defined in the "Planning Process Guideline." This represents an 87 percent reduction in area currently available to leasing consideration, from the current 1,162,550 acres to 148,970 acres. Where leases exist on lands outside the proposed resource utilization subzone, the National Park Service would not renew these leases once the full term of the lease expired, unless that lease was held by production (see the Outstanding Mineral Rights map.) Where other outstanding mineral rights (i.e., mining claims or private mineral rights) exist in areas other than the resource utilization subzone, the National Park Service would manage the surface according to the surrounding land classification, and any proposed development of those mineral rights would continue to be evaluated individually to determine appropriate protection options. Only the resource utilization subzone would be available for mineral leasing consideration, while existing leases would be gradually phased out on the remainder of the recreation area as their terms expired. Following finalization of the GMP, the excepted areas regulations for Lake Mead (43 CFR 3100 and 3500) would be revised to reflect these changes. All pending prospecting permits and lease applications that occur in areas other than the resource utilization subzone would be rejected once the regulations were revised. Pending applications inside the resource utilization subzone would not be processed until the minerals management plan was completed.

Under the proposed action, up to 20,000 acres could be subjected to mineral development on 8,238 acres of existing leases and 11,640 acres of pending permits (if approved). The most likely mineral activity would be exploration for hard-rock minerals on 560 acres of existing mineral leases and 11,640 acres of pending prospecting permits. Exploration activities normally involve collection of rock samples, magnetic surveys, geochemical analysis, and core drilling. Each drill site requires about ¼ acre, and five to 25 holes may be drilled to locate and determine characteristics of an ore body. Acreage necessary for development of an ore deposit would depend on location and size of the deposit and mining method. Seismic

exploration on the 7,678 acres of existing oil and gas leases could also potentially occur under the proposed action. Acreage disturbed by these activities would depend on whether existing roads were available in the lease block, but in most cases impacts would be minimal. Over half the acreage under application would be in Gregg Basin/Grand Wash and the Virgin/Temple zones of the NRA; the remaining applications would fall in the Willow Beach and Cottonwood zones. Most of the 21,000 acres under application that fall in zones not open to mineral leasing are in the Shivwits Plateau zone.

Exploration activities associated with prospecting permits and oil and gas leases could result in damage to soils through excavation, erosion, and compaction with additional damage expected from associated excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods would be reduced in these disturbed soils by erosion and accelerated weathering, and compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil has been demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. The reclamation potential of the disturbed areas would be reduced unless proper care was taken to mitigate soil damage. Because of the diversity of soils in the recreation area, site-specific soils data would be acquired, and detailed impact assessment and reclamation planning completed before mining approval.

Mineral leasing would not be expected to significantly affect soils in any area of the park under the proposal. Some damage or loss could be expected from sporadic exploration activities; however, the amount of acreage affected would likely be less than 300 acres over the next 10 years if the present mineral development trends continued in the area.

Conclusion: Under the proposed action the rate of damage and erosion from off-road vehicles would be moderately diminished, and about 350 acres of damaged soils would be rehabilitated. Developments would destroy or severely damage about 500 acres of lithosols and red desert soils and cause minor disruptions in drainage patterns, which would temporarily increase erosion potential. Damage to recreation area soils resulting from mineral leasing activities would not be significant over the next decade, assuming mineral development activity followed historical trends.

IMPACT ON SIGNIFICANT NATURAL FEATURES

Significant natural features include unique geological areas, outstanding scenic vistas, outstanding coves, and areas in the environmental protection subzone or outstanding natural feature subzone. Under the proposed action, none of these areas would be available for mineral leasing, so no impacts from pending permits would be expected.

IMPACT ON THREATENED, ENDANGERED, OR CANDIDATE SPECIES

The endangered bonytail chub, Gila elegans, Peregrine falcon, Falco peregrinus, and bald eagle, Haliaeetus leucocephalus, are the only three federally listed animal species that are known to occur. There are no threatened or endangered plant species, candidate species, or critical habitats in the NRA. There are several federal candidate species that do, or could, inhabit or visit the recreation area. Some of these species are also listed by the states of Arizona and Nevada as threatened or endangered species, or species of concern. Table 19 identifies the status and legal classification of all threatened, endangered, and candidate species.

The proposed action restricts mineral leasing to the resource utilization subzone as shown on the Proposed Action/Management Zoning map, which is consistent with NPS management zoning policies as defined in the "Planning Process Guideline." This represents an 87 percent reduction in the area currently available to leasing consideration, from 1,162,550 acres to 148,970 acres. Where leases exist on lands outside the proposed resource utilization subzone, the National Park Service would not renew these leases once the full term of the lease expired, unless that lease was held by production (see the Outstanding Mineral Rights map). Where other outstanding mineral rights (i.e., mining claims or private mineral rights) exist in areas other than the resource utilization subzone, the National Park Service would manage the surface according to the surrounding land classification, and any proposed development of those mineral rights would continue to be evaluated individually to determine appropriate protection options. Only the resource utilization subzone would be available for mineral leasing consideration, while existing leases would be gradually phased out on the remainder of the recreation area as their terms expire. Following finalization of the GMP, the excepted areas regulations for Lake Mead (43 CFR 3100 and 3500) would be revised to reflect these changes. All pending prospecting permits and lease applications that occur in areas other than the resource utilization subzone will be rejected once the regulations were revised. Pending applications inside the resource utilization subzone would not be processed until the mineral management plan was completed.

Under the proposed action, up to 20,000 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 11,650 acres of pending permits (if approved). The most likely mineral activity would be exploration for hardrock minerals on 560 acres of existing mineral leases and 11,640 acres of pending prospecting permits. Exploration activities normally involve collection of rock samples, magnetic surveys, geochemical analysis, and core drilling. Each drill site requires about ¼ acre, and five to 25 holes may be drilled to locate and determine characteristics of an ore body. Acreage necessary for development of an ore deposit would depend on location and size of the deposit and mining method. Seismic exploration on the 7,678 acres of existing oil and gas leases could also potentially occur under the proposed action. Acreage disturbed by these activities would depend on whether existing roads were available in the lease block, but in most cases impacts would be

minimal. Over half the acreage under application would be in Gregg Basin/Grand Wash and Virgin/Temple zones of the NRA; the remaining applications would fall in the Willow Beach and Cottonwood zones. Most of the 21,000 acres under application that fall in zones not open to mineral leasing are in the Shivwits Plateau zone.

The proposed action would place 1,050,030 acres or 70 percent of the NRA, in the natural zone. Known habitat or potential habitat for rare, threatened, or endangered plant and animal species would be further protected by placement in the environmental protection or outstanding natural feature subzone of the natural zone. Areas open to mineral leasing would be the 148,970 acres in the resource utilization subzone and the existing leases and pending prospecting permits described below.

About 20,000 acres have the highest potential for mineral development--8,238 acres of existing leases and 11,640 acres of pending prospecting permits (if approved). None of these leases and pending permits are in areas where they could potentially affect any threatened or endangered wildlife species. Two existing leases and one pending prospecting permit are located within 5 miles of known locations of candidate threatened or endangered plant species. Additional surveys on these leases or permits could reveal additional populations of these plants. Potential threats to these plants include physical destruction of populations or habitat and illegal collection. When specific mineral development proposals were received in these areas, surveys would be conducted and protective stipulations applied to the plan of operation. However, it is not certain that all threats would be avoided.

Proposed developments that could affect rare, threatened, or endangered plant and wildlife candidate species include the Fire Mountain developed area and access points in the Cottonwood East vicinity and at Detrital Bay. None of the developments would be in areas identified as habitat, but they would all be close to identified habitat areas. Visitor movement around these areas could cause conflicts. Any effects on threatened or endangered species would be due to the increased visitation disturbing these species in habitat areas near these new developments. Peregrine falcons would not be affected.

Areas used by the endangered bald eagle and peregrine falcon are high cliffs, well above the water. These areas are remote and are lightly used by eagles only during the winter (the season of lowest visitor use); they are not used for nesting. The cliffs are not satisfactory for rockclimbing, and direct disturbance on the cliffs would not occur even if more people were present. Boating use along shoreline areas could affect their feeding activities. Although boating use would likely increase because of the new Fire Mountain developed area and Detrital Bay access point, it would remain very low during winter months and would not likely affect the eagles.

Visitation is now very light in the Cottonwood East vicinity, where the proposed access point improvements could affect the endangered bonytail chub recovery cove. The Colorado River Fishes Recovery Team would be

consulted before locating the access point, to preclude impacts on the bonytail chub. Closing the cove or nearby areas to visitor use would be another mitigating measure applied when needed.

The effects of new developments on threatened or endangered species would be further evaluated and mitigation developed in consultation with the Fish and Wildlife Service during the period before construction (about 10 years). Monitoring methods would be developed and refined during these consultations. All species would be closely monitored as visitation increased. Management recommendations based on this monitoring would be designed to allow the areas to be developed with minimal effects on these species. If impacts on threatened or endangered species could not be mitigated, the new areas would not be developed.

Conclusion: Impacts on threatened or endangered species resulting from the proposed action would not occur. To assure that this assessment is correct, studies will be initiated to evaluate visitors' impacts on the species of concern and recommend any mitigation. If impacts on threatened or endangered species could not be mitigated, the new areas would not be developed.

IMPACT ON VEGETATION

Approximately 71 percent of the NRA is dominated by the creosotebush community. This community type is widespread throughout the desert southwest and is the representative low elevation vegetation type of the Mohave desert. Vegetation typical of higher elevations includes blackbrush, sagebrush, and pinyon/juniper. These vegetation types are common throughout the Basin and Range and Colorado Plateau provinces.

Precipitation rates in low elevation communities are generally less than 5 inches annually, while higher elevations receive 5 to 15 inches. Because of these low precipitation rates, revegetation of disturbed sites to pristine conditions may be as much as 50 to 75 years.

The proposed action restricts mineral leasing to the resource utilization subzone, as shown on the Proposed Action/Management Zoning map, which is consistent with NPS management zoning policies as defined in NPS-2 "Planning Process Guideline." This represents an 87 percent reduction in the area currently available to leasing consideration, from the current 1,162,550 acres to 148,970 acres. Where current leases exist on lands outside the proposed resource utilization subzone, the Park Service would not renew these leases once the full term of the lease expired, unless that lease was held by production (see the Outstanding Mineral Rights map). Where other outstanding mineral rights (i.e., mining claims or private mineral rights) exist in areas other than the resource utilization subzone, the Park Service would manage the surface according to the surrounding land classification, and any proposed development of those minerals would continue to be evaluated individually to determine appropriate protection options. About 148,970 acres would be available for mineral leasing consideration, while existing leases would be gradually

phased out on the remainder of the recreation area as their terms expire. Following finalization of the GMP, the excepted areas regulations (43 CFR 3100 and 3500) would be revised to reflect these changes. All pending prospecting permits and lease applications that occur in areas other than the resource utilization subzone would be rejected once the regulations were revised. Pending applications inside the resource utilization subzone would not be processed until the mineral management plan was completed.

Under the proposed action up to 20,000 acres could be subject to mineral development on 8,238 acres of existing leases and 11,640 acres of pending permits (if approved). The most likely mineral activity would be exploration for hard-rock minerals on 560 acres of existing mineral leases and 11,640 acres of pending prospecting permits. Exploration activities normally involve collection of rock samples, magnetic surveys, geochemical analysis, and core drilling. Each drill site requires about ¼ acre, and five to 25 holes might be drilled to locate and determine characteristics of an ore body. Acreage necessary for development of an ore deposit would depend on location and size of the deposit and mining method. Seismic exploration on the 7,678 acres of existing oil and gas leases could also potentially occur under the proposed action. Acreage disturbed by these activities would depend on whether existing roads were available in the lease block, but in most cases impacts would be minimal. Over half the acreage under application would be in the Gregg Basin/Grand Wash and Virgin/Temple zones of the NRA; the remaining applications would fall in the Willow Beach and Cottonwood zones. Most of the 21,000 acres under application that fall in zones not open to mineral leasing are in the Shivwits Plateau zone.

Impacts to vegetation under the proposed action would be greatest if an ore deposit was discovered and production of a mine initiated. Over a hundred acres of vegetation could potentially be destroyed through development of mine surface facilities, access roads, and tailings piles. However, given the history of Lake Mead leasing, this level of development is unlikely. Exploration activities on mineral and oil and gas leases would disturb only a small amount of native vegetation.

Conclusion: Only minor impacts to vegetation under this alternative would likely occur.

IMPACT ON BIGHORN SHEEP

Under the proposed action, no bighorn sheep habitat would be available for mineral leasing; therefore, no impacts from pending permits would be expected. However, existing oil and gas leases in the Pinto Valley, totaling 4,480 acres, are in an area of bighorn sheep habitat. If current owners of these leases pursued exploration activities in this area, impacts to bighorn sheep could be expected. Seismic exploration could cause more stress on the herd due to increased human presence and noise from blasting and vehicle travel. Continued stress in bighorn populations elsewhere has led to population die-offs because of increased susceptibility to disease organisms. Careful alignment of seismic lines, placement of remote recorders by hiking into sites, and timing of operations would reduce this threat.

A quarterly population and distribution survey would be conducted on mineral leases and adjacent lands to mitigate impacts to bighorn sheep populations, if the leases have active mineral operations taking place on them. A program to collect and record data needed for this type of survey is being developed by the Cooperative National Park Resources Studies Unit, University of Nevada at Las Vegas. This program will gather baseline population data and annual herd movements for all bighorn sheep populations near mineral leases, so that any changes from the normal patterns can be easily identified.

All mineral related operations that would occur within known lambing areas would contain a stipulation preventing operations from taking place during the lambing period (normally late in December to early April). If significant detrimental impacts to a bighorn population from exploration or mining operations were found, a temporary shutdown of operation would be made until corrective actions could be made to prevent further detriment to the herd.

Conclusion: Under the proposed action, no bighorn sheep habitat would be available for mineral leasing; therefore, no impacts from pending permits would be expected. Existing oil and gas leases in the Pinto Valley totaling 4,480 acres are, however, located in an area of bighorn sheep habitat. Seismic exploration would have the potential to cause adverse impacts on the herd. Based on implementation of proposed mitigating measures and the assumption that activity would remain sporadic as in the past, impacts to the sheep population should not be significant enough to affect overall population health.

IMPACT ON VISITOR CROWDING/CONGESTION

Existing conditions at the developed areas are extremely crowded and congested on weekends during the summer. Holiday weekends are the worst. Memorial Day weekend has had visitation of 254,000. Annual visitation is around 6.5 million and expected to increase to around 9 million by the year 2000. Currently it is not unusual for visitors at several of the larger developed areas to wait up to an hour to launch their boats and twice that long on a holiday weekend. Several of the popular campgrounds and motels are full during the summer. At several developed areas, confusing circulation systems frustrate first-time visitors who are trying to find their way around. Illegal parking along road shoulders is a common problem that results when existing parking areas become full.

The proposed action would accommodate increasing visitor use and solve existing crowding/congestion problems by expanding and improving existing developed areas, improving existing access points to the lakeshores, and providing new developed areas. (For a full discussion of these actions, refer to the "Alternative Development Concept Actions" section.) These actions would include many proposals intended to accommodate increasing visitation or to solve crowding/congestion. To understand the magnitude of these proposals, the increases in parking, overnight accommodations, and launch ramps are used as examples. The

proposed action would include an increase of 7,470 parking spaces (19,660 spaces exist), or a 38 percent increase. There are 1,755 overnight accommodation units (a unit is either one campsite, one motel room, or one RV site). The proposed action would increase the number of units by 1,180 or an increase of 67 percent. There would be 73 launch ramp lanes, and the proposed action would add 22, an increase of 30 percent.

Over the life of the plan visitation is expected to increase by about 68 percent, and most visitor facility proposals call for increases from 35 to 85 percent above existing levels. This parity between expected use and capacity of proposed facilities indicates that crowding/congestion would not get any worse than it is now. However, it should be less than current levels because of other proposals that cannot be quantified. For example, circulation improvements would facilitate vehicle and pedestrian movements in several developed areas.

Conclusion: The proposed facility improvements and expansions would reduce current crowding/congestion compared to existing levels, while accommodating increasing numbers of visitors.

IMPACT ON VACATION CABIN SITE RESIDENTS

Lake Mead has three lakefront areas in which sites may be leased for privately owned vacation cabins. These areas are Katherine, which has 39 cabin sites, Stewarts Point, which has 60 cabin sites, and Temple Bar, which has 36 cabin sites. Cabin site occupancy is for personal, not commercial, use. Department of the Interior regulations (43 CFR 21) prohibit granting new leases for cabin site occupancy within Lake Mead. Under the proposed action, cabin site occupancy would continue at existing levels at the three developed areas. Extensions of leases up to five years would continue to be granted until the need for public use of the cabin site areas dictated termination. The determination of public need would be made two years in advance of the common expiration date. As part of the GMP planning effort, a determination of public need for the cabin site areas was made. The cabin sites were found to be compatible with public use, and there was no projected public need for these sites.

Conclusion: The proposed action would have no effect on cabin site residents.

IMPACT ON TRAILER VILLAGE RESIDENTS

NPS trailer village policy allows for short- (30-day occupancy or less) and long-term sites, and currently most of the developed areas around the lakes have concessioner-operated trailer villages for long- and short-term visitors. Under the proposed action, to meet an existing demand for RV sites, some concessioner trailer villages might be expanded or converted to provide for more short-term sites. The number of long-term, short-term, and RV sites that are available at each area and the changes under the proposed action are as follows:

Area	Existing Number of Sites Long/Short/RV	Proposed Action
Katherine Landing	104/39/0	Add 40 RV sites
Cottonwood Cove	223/75/0	Retain existing
Fire Mountain	0/0/0	Add 50 RV sites
Willow Beach	60/18/0	Relocate 50 long-/18 short-term sites Add 50 RV sites
Boulder Beach	215/75/0	Add 75 short-term sites
Las Vegas Wash	0/ 0/0	Add 80 RV sites
Callville Bay	94/6/0	Add 29 RV sites
Boxcar Cove	0/ 0/0	Add 50 RV sites
Echo Bay	69/58/0	Add 42 RV sites
Overton Beach	19/13/0	Relocate/convert to 15 long-term, 30 RV sites
Temple Bar	103/13/0	Remove 10 long-and 7 short-term sites
Totals	887/297/0	

The proposals to add RV sites at most of the developed areas would have no effect on existing trailer village residents. The effects of converting long-term sites to short-term sites would be mitigated by converting them as current residents vacated the sites. Trailer village residents would be most affected in the following areas: Willow Beach, where 50 of the 60 long-term and all 18 short-term residents would be relocated out of the flood-hazard zone to a safer area; Overton Beach, where 15 long-term and 13 short-term residents would be relocated, and 4 long-term sites would be removed; and Temple Bar, where 10 long-term and 7 short-term residents would be removed to provide for a high-water parking area.

The social impact resulting from these trailer village relocations would be felt most by the four long-term residents at Overton Beach and 10 long-term residents at Temple Bar. These people would have to relocate to other areas within the recreation area or to communities outside the area. This would be a traumatic event to many of these occupants, who have spent as many as 30 years in their trailers. Throughout the years, many have invested their time, energy, and creativity in landscaping and home improvements that they hoped to enjoy for the rest of their lives. There could be some economic impact to some of the occupants because the government is not required to relocate renters and lessees. The number of long-term sites adversely affected at these areas is 14 out of 887 for the entire NRA, or 2 percent of the total long-term sites. Only seven of the 297 short-term sites, or 2 percent, would be affected. These impacts would be mostly mitigated, because the National Park Service would first rely on normal attrition before any action would be taken to force residents from their trailer spaces.

Conclusion: The proposed action would have little or no effect on existing trailer village residents at most developed areas. Trailer village

residents affected by the proposal would be those at Willow Beach, where long-term and short-term occupants would be relocated to a safer area, and those at Overton Beach and Temple Bar.

IMPACT ON LEVEL OF CONCESSION SERVICES

The following table summarizes the level of services to be provided by the concessioner under the proposed action.

Conclusion: Comparing the proposed concession services to existing conditions, there would be an increase in the level of services in eight out of the nine categories. These increases would range from 34 percent in rental boats to 161 percent in the number of motel units. In one of the nine categories--long-term trailer villages--the number of spaces would decrease by 2 percent.

Table 28: Impact on Level of Concession Services, Proposed Action

	Trailer Village Long-Term/ Short-term Sites	Motel Units	Restaurant Seats	Store Square Feet	Marina Slips/Moorings	Rental Boats Houseboats/ Other	Dry Boat Storage Spaces	Gas Station # Pumps	Gas Dock # Boat Capacity
Katherine Zone									
Katherine Landing	104/79	104	234	7,200	805/0	75/41	420	2	14
Lower Mohave East	0	0	0	2,000	0	0	0	0	4
Cottonwood Zone									
Cottonwood Cove	223/75	48	70	2,400	535/0	25/31	465	2	8
Fire Mountain	0/50	25	50	3,000	200/0	0/0	120	0	0
Willow Beach Zone									
Willow Beach	60/68	48	100	1,000	270/16	0/40	120	1	
Boulder Basin Zone									
Boulder Beach	215/150	88	314	8,250	875/0	0/78	275	0	
Las Vegas Wash	0/80	0	54	3,300	630/3	0/70	200	0	4
Callville Bay	94/30	30	60	1,000	1,045/0	15/33	166	2	
Boxcar Cove	0/50	35	50	3,000	0/0	0	120	0	
Echo Bay Zone									
Echo Bay	69/100	104	120	11,000	530/0	90/25	200	4	
Overton Beach Zone									
Overton Beach	15/30	0	0	1,800	0/140	0/12	65	2	3
Virgin/Temple Zone									
Temple Bar	93/6	88	228	3,500	980/0	45/15	300	2	
Totals: Proposed Action	873/718	570	1,280	47,450	5,870/159	250/345	2,451	15	33
Existing Conditions	887/297	218	834	25,600	3,317/99	170/258	1,328	11	24
Net change	-14/+421	+352	+446	+21,850	+2,553/+60	+80/+87	+1,123	+4	+9
Percent change	-2/+42	+1604	+53	+85	+77/+61	+47/+34	+85	+36	+38

IMPACT ON MINERAL LEASING OPPORTUNITY

The proposed action restricts mineral leasing to the resource utilization subzone, as shown on the Proposed Action/Management Zoning map, which is consistent with NPS management zoning policies as defined in the "Planning Process Guideline." This represents an 87 percent reduction in area currently available to leasing considertion, from the current 1,162,550 acres to 148,970 acres. Where current leases exist on lands outside the proposed resource utilization subzone, the Park Service would not renew these leases once the full term of the lease expired, unless that lease was held by ongoing production (see Outstanding Mineral Rights map). Where other outstanding mineral rights (i.e., mining claims or private mineral rights) exist in areas other than the resource utilization subzone, the Park Service would manage the surface according to the surrounding land classification, and any proposed development of those mineral rights would continue to be evaluated individually to determine appropriate protection options. About 148,970 acres would be available for mineral leasing consideration, while existing leases would gradually be phased out on the remainder of the recreation area as their terms expire. Following finalization of the GMP, the excepted areas regulations for Lake Mead (43 CFR 3100 and 3500) would be revised to reflect these changes. All pending prospecting permits and lease applications that occur in areas other than the resource utilization subzone would be rejected once the regulations were revised. Pending applications inside the resource utilization subzone would not be processed until the minerals management plan was completed.

Under the proposed action, up to 20,000 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 11,640 acres of pending permits (if approved). The most likely mineral activity would be exploration for hard-rock minerals on 560 acres of existing mineral leases and 11,640 acres of pending prospecting permits. Exploration activities normally involve collection of rock samples, magnetic surveys, geochemical analysis, and core drilling. Each drill site requires about ¼ acre, and five to 25 holes may be drilled to locate and determine characteristics of an ore body. Acreage necessary for development of an ore deposit would depend on location and size of the deposit and mining method. Seismic exploration on the 7,678 acres of existing oil and gas leases could also potentially occur under the proposed action. Acreage disturbed by these activities would depend on whether existing roads were available in the lease block, but in most cases impacts would be minimal. Over half the acreage under application would be in Gregg Basin/Grand Wash and Virgin/Temple zones of the NRA; the remaining applications would fall in the Willow Beach and Cottonwood zones. Most of the 21,000 acres under application that fall in zones not open to mineral leasing are in the Shivwits Plateau zone.

The most immediate impact of removing the remaining 1,333,505 acres of the park from mineral leasing consideration would be on applicants who have applied for 17,590 acres of uranium prospecting permits in the Shivwits Plateau zone. Under this alternative these applications would be rejected. The areas having the highest potential for mineral resources within the Shivwits Plateau zone are in mineralized breccia pipes of which

approximately 10 are known to exist in the area. Breccia pipes are often not mineralized, but substantial production of uranium, copper, and other metals has been produced from breccia pipes in the Arizona strip country, including Hack Canyon, Kanab Creek, and Pigeon mines northeast of the NRA. The proposed action would leave two of the known pipes open to development: the Copper Mountain pipe (currently under claim) and the "mule pipe" (currently under lease). The remaining eight pipes would be removed from further mineral leasing consideration. However, two of these eight pipes might be located within Grand Canyon National Park and therefore are currently not available for mineral leasing. Another pipe, the "Parashant pipe" was drilled by the Cotter Corporation in 1968, and although anomalous radioactivity was present, no commercial grade uranium was found (USDI 1977). The other five pipes have not been drilled. The only known resources are currently in the Copper Mountain pipe, which would still be available for development.

Energy Fuels Corporation (September 19, 1984) stated there were over 26 breccia pipe-like structures with ore grade uranium found within the area. Of these, none are in the park. Therefore, the proposed restrictions on mineral leasing will affect less than 4 percent of the high potential uranium exploration targets.

There is a high potential that gold and silver mineral deposits may be located within the NRA. There are also hundreds of known gold and silver deposits outside the NRA available to the public. Therefore, exclusion of gold and silver mining within the NRA will not greatly reduce the number of high potential exploration targets for gold and silver in the local or national economy. Lowe (1985) identified 51 principal gold deposits within the state of Nevada, only one of which was within or adjacent to the national recreation area.

Another impact of the proposed action would be on noncompetitive oil and gas lessees, who have historically represented the majority of mineral leasing activity at the recreation area. However, in the last 20 years, since establishment of the NRA, no oil and gas wells have ever been drilled on the oil and gas leases that have been issued to date, and no oil and gas deposits have been identified within the recreation area. Therefore, removal of most of the NRA from leasing would have a minimal impact on the petroleum industry. A few individuals and corporations would be prevented from acquiring leases in the NRA, and the treasury would lose several thousand dollars annually in lease rental fees. However, because 148,870 acres would still be open to leasing in the NRA, and since the same geologic structures may be reached from outside the NRA, this impact is expected to be minimal.

During the period 1955-1983, applications for over 700 federal leases were reviewed by the NRA. Although less than 200 acres have been disturbed to date, an undetermined portion of this acreage was disturbed prior to recreation area establishment, this widely scattered disturbance has resulted in production of only 60 pounds of tungsten, and the stockpiling of approximately 10 tons of tungsten ore awaiting shipment for processing since 1972. Over 200 leases have been issued in the recreation area since the beginning of 1972 for the following commodities:

Gold	Pumice
Silver	Fluorspar
Copper	Titanium
Tungsten	Turquoise
Sodium	Uranium
Perlite	Thorium
Oil and Gas	

Mineral leasing in Lake Mead National Recreation Area has not yielded commercial production of any other fossil fuel, nonmetallic or metallic minerals. A contracted analysis of known mineral occurence by the National Park Service in 1982 concluded that increasing the area excepted from mineral leasing under the proposed action would have no measurable impact on present or future mineral production (O'Brien 1982, see appendix G).

Conclusion: It is not anticipated that a reduction of 87 percent of the area currently available for mineral leasing consideration would significantly affect current or future mineral and fossil fuel production opportunities locally or nationally.

IMPACT ON WILDERNESS LANDS

Management zoning under the proposed action would place 148,970 acres in the resource utilization subzone of the special use zone. These lands would be open to mineral leasing. Although no lands are proposed for wilderness designation, the Wilderness Suitability map in the "Affected Environment" section indicates those lands that meet or potentially meet the criteria of the Wilderness Act of 1964. The following units are keyed by number to that map and include most of the lands in the recreation area that possess primitive characteristics. Boundary lines of the units follow topographic features, access roads, the recreation area boundary line, section lines, and a line marking a 300-foot horizontal setback from the high waterlines of Lakes Mohave and Mead.

Units 1 and 2 (total, 40,605 acres) center on the Newberry Mountains, which rise to an elevation of 5,600 feet and offer a cool refuge from the heat of the surrounding desert lowlands. Davis Dam, the Mohave power plant, Katherine Landing, and Bullhead City are developments visible from the southern and eastern portions of this unit. The resource utilization subzone would include 3,755 acres within these units on the lower alluvial slopes adjacent to the Nellis Wash unit.

Unit 3, Nellis Wash, includes portions of the isolated Newberry Mountains along the western side of the recreation area. Finger-like drainages and alluvial fans extend eastward from the mountains toward Lake Mohave. Some mining has previously occurred within the unit. All of the 15,870 acres within this unit would be placed in the resource utilization subzone under the proposed action.

Unit 4, Cottonwood Valley, potentially meets the criteria of the Wilderness Act in spite of outstanding mineral reservations. This 15,295-acre gently sloping wash provides solitude in a primitive setting just to the north of a major development at Katherine Landing. The resource utilization subzone would include 4,950 acres within this unit at the southern end closest to Katherine Landing.

Unit 5, the Black Mountains capped by 2,000-foot Mount Davis, provides a background for Lake Mohave. Approximately 17,970 acres are included within this unit. Scattered washes and side canyons transect the Black Mountains from east to west as they wend their way to the Colorado River. The resource utilization subzone would include 10,580 acres within this unit in the eastern portion and adjacent to the NRA boundary.

Unit 6, Opal Mountain (17,635 acres), contains a portion of the Eldorado Mountains, gently rolling hills, and outwashes extending to Lake Mohave. Rugged mountains, secluded valleys, and gently sloping alluvial fans provide opportunities for seclusion in a setting of scenic splendor. The resource utilization subzone would include the 8,125 acres of gently sloping alluvial fans behind Opal Mountain and far from the lake.

Units 7, 8, 10, 11, and 12, Fire Mountain and Black Canyon, contain some of the most spectacular and rugged terrain within the recreation area. They consist of steep, barren rocky crags, which begin at an elevation of 645 feet and rise to approximately 2,200 feet. These units consist of 70,470 acres and combine to form the "Black Canyon" of Lake Mohave, which is noted for its hot springs and cool Colorado River. This area is a popular spot for visitors to see sharp and abrupt canyon walls and a myriad of geologic features. Unit 11 only potentially meets the criteria of the Wilderness Act because the Bureau of Reclamation has identified this area as a potential location for reclamation facilities ranging from Hoover Dam modifications to new transmission line corridors. The resource utilization subzone would include 11,850 acres within these units that are adjacent to the NRA boundary and are not visible from the lake or major access roads.

Unit 9, Eldorado Mountain, contains approximately 29,665 acres of this picturesque and rugged mountain range. The unit is a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. The resource utilization subzone would include the 4,270 acres immediately north of an active mining area.

Unit 13, Kingman Wash, contains approximately 40,835 acres. The undulating Black Mountains typify the topography of the region. Access to the unit is provided on all sides by existing road corridors. The resource utilization subzone would include the 1,845 acres within the unit adjacent to highway 93.

Unit 14, Bonelli Landing, comprises 13,875 acres of mainly alluvial fans and separates the hilly mountainous area of unit 13 from the gypsum beds of unit 21. This unit contains historic mining diggings and some archeological remains in the form of petroglyphs. Access to this unit is by the road to Bonelli Landing and Temple Bar. None of these lands would be open to mineral leasing.

Units 15, 16, and 17, Pinto Valley, comprise approximately 38,340 acres of rugged hills and highly scenic valleys. These units contain Guardian Peak, which is one of the highest peaks in the area and is used as a navigational aid. The northern side of Boulder Canyon is formed by these units, where steep cliffs or barren rock extend into the cool blue waters of Lake Mead in a dramatic fashion. Pinto Valley is a much-photographed topography, with red sandstone outcroppings that merge with the green desert vegetation and the grays, browns, and yellows of the desert floor. None of these lands would be open to mineral leasing.

Unit 18, Cathedral Wash, contains 18,820 acres. Mountainous terrain representing the northeast extremities of the Black Mountains dominates the area and contrasts with the flat surface of Lake Mead. None of these lands would be open to mineral leasing.

Unit 19, Overton (24,040 acres), consists of flat to "badland-like" lands sloping westward from mountainous terrain to a road corridor east of the recreation area boundary. The unit forms the scenic background for lake users and for shoreline users on the west side of Overton Arm. These flat outwashes lack the spectacular constrasts found in other units and portray a typical desert landscape. This unit has retained its primitive characteristics and affords an opportunity for seclusion and an unconfined type of recreation. None of these lands would be open to mineral leasing.

Unit 21--White Hills, unit 22--Temple Bar, and unit 23--Gregg's Hideout, all in the White Hills offer isolation, scenic views, and historic attractions. This rolling hill country includes some evidence of earlier mining activities and trails. These activities did not scar the area excessively, and many scars have healed to the point of not being noticeable. Access to the area is possible by car on existing roads, by hiking from developed areas such as Temple Bar, or by boat from Lake Mead. These three units contain approximately 52,130 acres. The resource utilization subzone would include 10,720 acres in units 22 and 23. These areas are remote from the lake and already show some evidence of earlier historic mining activities and trails.

Units 20 and 24-32 are known as Twin Springs, Scanlon Wash, Hiller Mountains, Hell's Kitchen, Indian Hills, Cockscomb, Grand Wash Cliffs, Iceberg Ridge, South Cove, and Pearce Ferry. The units (total 135,688 acres) contain rugged mountain ranges that provide a scenic background for the Virgin Basin, Virgin Canyon, Gregg Basin, Iceberg Canyon, and Pearce Ferry sections of Lake Mead. Gently sloping outwash fans extend from the mountains to plunge abruptly into the reservoir. The resource utilization subzone would include 9,320 acres within these units--4,200 acres in unit 24 and 5,120 acres in unit 30--all hidden from view of the lake.

Unit 33, Shivwits Plateau, contains approximately 83,980 acres. Diverse activities occur in this remote section of Lake Mead, ranging from hunting to grazing. Due to a higher altitude, the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests and a wider variety of wildlife than can be found in the rest of the recreation

Table 29: Summary of the Effects of the Proposed Action on Lake Mead NRA Lands Meeting or Potentially Meeting Wilderness Act Criteria

	Acres Meeting the Criteria		Acres Affected by Proposed Action	
	Wilderness	Potential Wilderness	Wilderness	Potential Wilderness
1	7,650			
2	32,955		3,755	0
3	15,870		15,870	0
4	0	15,295	0	4,950
5	17,970	640	10,580	
6	17,635	0	8,125	
7	15,145		1,710	0
8	25,605		10,240	0
9	29,665		4,270	0
10	2,045			0
11	0	14,645		
12	13,030	0		
13	40,835		1,845	0
14	13,875			
15	17,115			
16	6,680			
17	14,545			
18	18,820			
19	24,040			
20	10,610			
21	25,580			
22	16,665		6,145	0
23	9,885	80	4,575	0
24	22,095		4,200	0
25	8,545			
26	14,620			
27	7,720			
28	14,020			
29	13,895			
30	15,143	460	5,120	0
31	16,480			
32	12,100			
33	0	83,980		
34	14,905	0		
35	32,215	0		
36	10,710	600		
Totals	558,675	115,700	76,435	4,950
Percentage	100	100	14	4

area. Kelly Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon. Because most of the land within this unit is subject to nonfederal mineral rights, the unit only potentially meets the criteria of the Wilderness Act. This unit, like several others, appears to be narrow and splintered by access roads. However, when considered along with the adjacent proposed wilderness in Grand Canyon, it is apparent that these would form a significant contiguous wilderness unit. None of these lands would be open to mineral leasing.

Unit 34--Andrus Point, unit 35--Whitmore Point, and unit 36--Lava consist of approximately 58,430 acres in the northeast sector of the recreation area. Contained within these units are Parashant, Andrus, and Whitmore canyons; all are precipitous and scenic side canyons that drain into the Grand Canyon. The entire area is undeveloped land retaining its primeval character, and it provides an opportunity for solitude or a primitive and unconfined type of recreation in a scenic setting of steep escarpments, colorful red walls, and deep canyons. Geologic formations and processes in evidence here might provide information on the origin of the Grand Canyon. Archeological sites of several Indian cultures, including the Virgin Anasazi and more recently the Paiutes, are also found here. Adjacent primitive areas of Grand Canyon National Park provide for a contiguous unit of primitive lands extending westward from the Pine Mountains across the Sanup and Shivwits plateaus to the Grand Wash Cliffs. None of these lands would be open to mineral leasing. See table 28 for a summary of wilderness acres affected.

Conclusion: Leaving 148,970 acres open to mineral leasing consideration within the NRA would affect 76,435 acres, or 14 percent of those lands that meet the criteria of the Wilderness Act, and 4,950 acres, or 4 percent of those lands that potentially meet the criteria. These are lands which primarily meet the roadless requirements of the Wilderness Act and do not possess outstanding natural beauty or other significant resource values. Mining activities as a result of mineral leasing in these areas could unnaturally scar the landscape and alter the wilderness character of these lands, making wilderness values on at least part of these lands lost to any future possible designation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

If a flood caused the death of one or more individuals, such a loss would be irreversible and irretrievable. Likewise, flooding has the potential to cause injuries that would result in irreversible and irretrievable damage to the person as well as to a person's capability to participate in some activities.

Destruction of up to 500 acres of lithosols and red desert soils from development of NPS and concessioner structures, and damage and erosion of soils from offroad vehicles, would be irretrievable losses of these soils.

Irretrievable damage to soils might result from mineral exploration activities. Exploration activities associated with prospecting permits and oil and gas leases could result in damage to soils through excavation, erosion, and compaction, with additional damage expected from associated

excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods of time would be reduced in these disturbed soils by exposure of the soils to erosion and accelerated weathering while soil compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil have been demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. All factors could reduce the reclamation potential of the disturbed area unless proper care was taken to mitigate soil damage. Under the proposed action, soil damage caused by exploration and development over the next 10 years would be expected to be fewer than 300 acres provided that present mineral development trends in the area continued.

Irreversible and irretrievable loss of vegetation could result from implementation of the proposed action. In the unlikely event that an ore deposit was discovered and a mine began to produce, over a hundred acres of vegetation could be destroyed through development of mine surface facilities, access roads, and tailings piles. Whether vegetation could be reestablished would depend on the success of mitigation designed to maintain the productivity of the soil. Reclamation of mined areas to pristine conditions would take a minimum of 50 to 75 years.

Exploration or mining activities as a result of mineral leasing could irretrievably scar the landscape and alter the wilderness character of lands that meet the criteria for wilderness.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY OF THE ENVIRONMENT

Under the proposed action money would be expended to place development in areas that are known to be prone to flooding. Facilities would be protected by structural measures to the level of the 100-year flood. No protection from the probable maximum flood would be provided to structures. Warning systems and evacuation plans would be developed to protect human life in the event of a 100-year or probable maximum flood. The premise underlying the proposed action is that the chance of the a probable maximum flood occurring is so slight that the expenditure to protect structures against this flood is not justified. Over the long term, there is a chance that structures and human lives might be lost as the result of a probable maximum flood.

Removal of the Shivwits Plateau from any further mineral leasing consideration would favor long-term provision of recreational benefits over short term economic and energy supply gains. Among the benefits provided by Lake Mead National Recreation Area are public recreation, and preservation of scenic, historic, and other important features. Opportunities for primitive, secluded, backcountry experiences on the Shivwits Plateau or in the esplanade and canyon country of the Whitmore-Parashant Canyon area would not be compromised. The long-term gains obtained from preserving the recreational values of the park far outweigh the uncertain, relatively short-term gains from mineral development.

Approximately 500 acres of soil and vegetation would be lost to provide additional recreation benefits for six million to nine million people per year who visit Lake Mead National Recreation Area.

In the event that mining did occur in the recreation area with concomitant destruction of soil and vegetation, public recreational opportunities would be lost in favor of development of the mineral resources. Other industries would benefit from the development of the mineral resources. Over the long term--no less than 50 to 75 years--productive soils and vegetation might be restored in mined areas through reclamation.

ADVERSE IMPACTS THAT COULD NOT BE AVOIDED

In the event of a probable maximum flood occurring under the proposed action, the survival of people within the probable maximum floodplain would depend on the adequacy of the warning system and the evacuation plans, and on the actions taken by themselves and other people in attempting to evacuate the area. National Park Service and concessioner structures probably would be lost. Personal property of visitors such as vehicles probably would be lost.

There is a possibility that increased visitor numbers (about 1.35 times current levels) would increase the level of currently experienced adverse impacts on water quality. Actions such as moving swim beaches at several developed areas might prevent these potential adverse effects from materializing. Should water quality deteriorate below the level required by state standards, some swim beaches and coves might have to be closed to use.

Indirect impacts such as pollution of springs and trampling of vegetation could be aggravated by increased visitor use at Rogers and Bluepoint springs. Under all alternatives, visitation to these special communities is expected to increase by about 38 percent. The difference is that under the no-action alternative and alternative A, there would be no addition of visitor facilities, while under the proposed action and alternative B, additional facilities would be provided and monitoring would be done. The monitoring and subsequent management action under the proposed action is expected to stop adverse impacts as soon as they occurred.

Destruction of up to 500 acres of lithosols and red desert soils from development of NPS and concessioner structures, and damage and erosion of soils from off-road vehicles would be an unavoidable adverse impact on soils. There would be unavoidable adverse impacts on soils structure and productivity from mineral exploration activities. Exploration activities associated with prospecting permits and oil and gas leases could result in damage to soils through excavation, erosion, and compaction, with additional damage expected from associated excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods of time would be reduced in these disturbed soils by exposure of the soils to erosion and accelerated weathering, while soil compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil have been

demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. All factors could reduce the reclamation potential of the disturbed area unless proper care is taken to mitigate soil damage. Under the proposed action, soil damage caused by exploration and development over the next 10 years is expected to be fewer than 300 acres, provided that present mineral development trends in the area continued.

Trailer village residents at Willow Beach where 50 long-term residents would be relocated to a safer area approximately a half mile away would experience the inconvenience associated with moving. Removal of four long-term sites at Overton Beach and 10 long-term sites at Temple Bar would adversely affect a total of 14 (2 percent) of the 887 long-term sites in the recreation area. To mitigate the effect on these long-term residents, they would first be reduced by attrition. However, some long-term residents would have to relocate to another developed area or outside the recreation area. Only seven out of the NRA total of 297 or 2 percent of short-term sites would be removed.

The national recreation area has 558,675 acres of land that meet the criteria for wilderness and 115,700 acres that potentially meet these criteria. Under the proposed action 76,435 acres that meet the criteria for wilderness (14 percent of the NRA's total that meet the criteria) would be open to mineral leasing; 4,950 acres (4 percent of the NRA's total acres that potentially meet the criteria) would be affected. Exploration or mining activities as a result of mineral leasing could scar the landscape and alter the wilderness character of these lands, making wilderness values on at least part of these lands lost to any future possible designation. These are lands that primarily met the roadless requirements of the Wilderness Act criteria and do not contain other significant resource values.

ENVIRONMENTAL IMPACTS OF THE NO-ACTION ALTERNATIVE

A summary of the following impacts is presented in the "Summary" section at the beginning of this document.

IMPACT ON PUBLIC SAFETY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. The 100-year flood has a 1 percent chance of occurring in any year. The probable maximum flood is the greatest flood that could ever be expected. Probable maximum floods do occur, but the frequency is uncertain; and the likelihood in any year is less than 1/10 of 1 percent. Flooding is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor use facilities are out of the floodplain. At Boulder Beach all development is on a broad alluvial fan, with protection provided by earth dikes. Also, since flooding at Boulder Beach takes the form of sheet flows up to 2 feet in depth, it is not considered to present as great a danger to human life or property as the concentrated flows in canyons at other areas of the NRA; therefore, no potential victims or damage to structures are shown for Boulder Beach in the impact sections relating to floodplains. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. See the discussion of floodplains and wetlands in the "Affected Environment" section of this document for a more detailed explanation of floodplains. The development concept plan graphics for each developed area show the extent of the 100-year and probable maximum floods.

The number of people in the probable maximum floodplains of the developed areas of the recreation area on an average summer weekend has been estimated at 4,845 during the day and 4,870 at night. A breakdown by developed area is shown in table 25. This number of people in the probable maximum floodplain represents approximately 5 percent of the people in the recreation area on a summer weekend day (96,000). About 1,250 people during the day and 1,225 at night are in the 100-year floodplain on an average summer weekend (see table 24). These numbers are about 1 percent of the people in the recreation area.

Flood mitigation in the no-action alternative would rely mainly on the nonstructural methods of the warning system package discussed in the proposed action and minor maintenance actions, such as regrading of dikes and channels. A few facilities would be removed or relocated from the floodplain.

The specific flood mitigation actions that would occur at each developed area are described below.

> Katherine. The short-term trailers (#17 Katherine Marina Area DCP graphic in volume I) would be removed from the north Katherine Wash area, and the area would be regraded. The existing diversion canal east of the main access road would be regraded to divert flood

flow into Telephone Cove. The warning system package would be installed.

Cottonwood Cove. Existing drainage canals and the warning system package would be maintained.

Willow Beach. The existing warning system package would be maintained; facilities now closed would remain closed.

Boulder Beach. Existing diversion dikes and channels would be maintained and the warning system package would be installed.

Las Vegas Wash. The launch ramp and parking would be protected through nonstructural measures. Dry boat storage and concession maintenance would be relocated. A warning system package would be developed for the launch ramp in the floodplain.

Overton Beach. The campground would be relocated out of the flood-hazard zone.

Temple Bar. The existing diversion dikes and channels would be maintained and the warning system package would be installed.

Removal of facilities from the floodplain would provide the best protection from floods. The warning system would be the second most effective method of reducing the number of flood victims, assuming that it operated correctly and provided a signal in advance of the flood, that people received the signal and respond appropriately, and that the evacuation plan was effective.

While diversion structures would normally be more effective than warning systems, the existing earth dikes and channels are so unsound that they would provide essentially no protection. People would see the diversion dikes and channels and feel a false sense of security because flood protection measures appeared to be in place. At Cottonwood Cove and Temple Bar the 100-year floodplain was mapped assuming that the existing earth dikes and channels would withstand such a flood. The structures would not likely do that, and their failure would jeopardize large numbers of people in campgrounds, trailer villages, etc., at Cottonwood and Temple Bar. Thus, the estimate of the number of people who would be in the floodplain in those areas is unrealistically low.

At the Katherine Landing developed area the potential number of people in the probable maximum floodplain would be reduced by about 65 during the day and 100 at night by removing the short-term trailer village sites. The safety of the remaining 1,030 people in the probable maximum floodplain would depend on the warning system.

There would be no change at Cottonwood Cove, since a warning system is already in place. Therefore, there would be no impact on visitor safety in floodplains.

There would similarly be no change at Willow Beach. However, the warning system that is already in place is less effective than warning

systems at other areas. It only gives notice of an impending flood approximately 20 minutes before the flood strikes. Flood conditions develop relatively rapidly at Willow Beach because water concentrates very quickly in its steep canyons. Floods are difficult to flee at Willow Beach because steep canyons make escape to higher ground difficult. Road access to the area is severed during most floods because the access road follows a narrow canyon bottom.

Installation of warning systems at Las Vegas Wash and Temple Bar would improve the safety of about 1,210 people in the probable maximum floodplain. Due to the shallow sheet-flow-type flooding at Boulder Beach there is little hazard to people in the floodplain, and it has been excluded from the tables. However, a warning system would be installed to even further reduce the hazard for the 1,260 people in the probable maximum floodplain.

At Overton Beach the campground would be relocated out of the floodplain, eliminating the hazard for about 275 people during the day and 350 people at night.

Conclusion: Compared to existing conditions, the no-action alternative would provide additional protection to approximately 2,620 occupants of the probable maximum floodplain and 685 occupants of the 100-year floodplain through installation of warning systems. The degree of hazard would depend on how well the warning systems and evacuation plans worked. During a large flood event it is likely that injuries or fatalities would result.

IMPACT ON PROPERTY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. Flooding is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor use facilities are out of the floodplain. At Boulder Beach, all development is on a broad alluvial fan, with protection provided by earth dikes. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. A more thorough discussion of floodplains may be found in the "Affected Environment" section of this document. The development concept plan graphics for each developed area show the extent of the 100-year and probable maximum floods.

Table 21 shows development in the floodplain under each alternative, including no action. The no-action alternative would keep existing structures in their present locations. Protection of these structures would be enhanced somewhat by regrading dikes and channels, but warning systems added to protect human occupants would not provide any protection to property in the floodplain. Consequently, this property would remain susceptible to flood damage. The cost of replacing structures left unprotected in the 100-year floodplain would be approximately $6.6 million; and for replacing those in the probable maximum floodplain, approximately $20.4 million. These costs would not cover utilities, furnishings, equipment, vehicles, flood-control devices, debris removal, search and rescue, or expenses of victims.

Conclusion: Under the no-action alternative, the 100-year or probable maximum flood would damage or destroy a large number of structures.

IMPACT ON RESERVOIR WATER QUALITY

Based on available data, water quality in Lakes Mead and Mohave is generally in compliance with established standards throughout the year. However, in isolated instances bacteriological pollution threatens the use of water for full body contact recreation. The pollution results from improperly disposed human waste from visitors using the shoreline zone around the lakes. Concentrations of visitors at swim beaches or popular coves increases the probability of pollution. The health risk occurs during activities like swimming and waterskiing, when water may be ingested accidently and certain sensitive body organs (e.g., eyes and nose) might be exposed to water.

The allowable maximum limits for fecal coliforms (measure of bacteriological pollution in units/100ml) for full body contact recreation in the Arizona and Nevada water quality standards are 200 as a geometric mean (5 sample minimum), 400 in 10 percent of samples for a 30-day period, and 800 in a single sample.

Elevated counts of fecal coliforms generally occur during heavy use days (such as Labor Day), when lake levels are low, and at undeveloped coves accessible only by water where use is low to moderate and no sanitary facilities are available. In the latter case, localized incidents of high fecal coliforms occur when water levels rise and such areas are inundated. Bacteriological pollution is rare in open areas (such as Boulder Beach) where wind and wave action provide adequate mixing; however, in areas where beaches are located in harbors or confined areas, incidents of elevated coliform counts are common by late summer. For example, fecal coliform levels have reached 1,200 at Cottonwood Cove, 1,100 at Temple Bar, and up to 24,000 in Las Vegas Bay (pollution from Las Vegas discharged from Las Vegas Wash into Lake Mead).

Water quality at designated swimming beaches in Lake Mead NRA is regularly monitored in accordance with applicable state and local health codes to identify unsafe water quality conditions. When potentially unsafe conditions are noted, the particular area is more closely monitored and may be closed to public use. The Las Vegas Wash swimming beach has been closed since 1976, and several heavily used shoreline areas, like the swimming beach at Katherine Landing, has had conditions on several occasions that nearly dictated its closure.

The no-action alternative does not propose any actions that would change shoreline visitation patterns and thereby alter water quality. The existing conditions just described would be expected to get worse over the life of the plan as visitation increased. Over the life of this plan visitation would be expected to increase to about 1.38 times the current levels. The mathematical correlation between visitor use and associated pollution cannot be determined with existing data, so the levels of pollution cannot be projected. Temporary swim beach closures or closures of popular coves might become necessary if levels of bacteriological pollution were to exceed state standards.

There would be an increased risk of shoreline users contracting diseases from contaminated water, but the degree of increase cannot be determined. The water quality monitoring program should make this risk insignificant by continuing to assess the risk and determining when remedial actions are necessary. Up to now there have not been any recorded cases of serious infectious diseases being contracted from contact with Lake Mead's water. The monitoring program is explained in the shoreline pollution section of the proposed action.

Conclusion: Even with expected increases in visitation, the no-action alternative would not pose significant health hazards from water pollution.

IMPACT ON DESERT SPRING ECOLOGICAL COMMUNITIES

The Significant Natural Features map identifies 33 springs and seeps within the NRA. Rogers and Bluepoint springs are unique warm water springs. They contain native and non-native fish, provide suitable habitat for waterfowl and shorebirds during their migrations, contain aquatic and emergent vegetation, and provide a rare moist habitat and water source for small mammals, reptiles, amphibians, and nesting birds. While such desert spring ecological communities are rare and important habitats, they are not as critical as they once were because the reservoirs provide some comparable shoreline habitat. Spring communities amount to less than 100 acres or less than .01 percent of the recreation area. Rogers and Bluepoint springs amount to less than 10 acres. The existing picnic areas at Rogers and Bluepoint springs would remain under the no-action alternative. Rogers Spring has a 0.4-mile gravel access road, unpaved parking for about 10 vehicles, two picnic shelters with tables, and pit toilets. Bluepoint Spring has a small parking area and two picnic tables. Paths have formed around both springs from visitor use.

Impacts on the spring communities surrounding Rogers and Bluepoint springs would result from increased use by visitors. If visitation to these springs increased 38 percent, as projected for the recreation area over the life of the plan under existing conditions, the foot paths around the springs would be expected to increase by at least that much. Emergent vegetation and other moist terrestrial vegetation would be destroyed, and the spring water could be polluted by improperly disposed trash and human waste. The degree of these impacts cannot be determined, but impacts on the moist terrestrial vegetation habitat could result in damage or destruction to a fourth or more of rare habitat around these two springs.

Under this alternative, five springs could potentially be affected by uranium mining if the current prospecting applications were approved and mining occurred. The no-action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little

activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area land, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area, 5,840 acres are in the Gold Butte area, and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Most of the springs in the area originate in the lower portion of the Supai formation and could be connected with nearby breccia pipes which extend upward from the Redwall limestone, through the Supai formation, into the Toroweap formation. The potential for adverse impacts on these springs from mine development would be greatest where the springs are perennial in nature. It is believed that breccia pipes are capable of transmitting groundwater from the upper perched aquifers (such as the Supai springs) to the undefined aquifers in the Redwall formation. Although there may be natural movement of water through the pipes, mine development could increase this exchange between formations, leading to two potential impacts on local groundwater resources. First, the partial dewatering of a given pipe from mine development could result in reduction or complete loss of flow from seeps and springs that support sensitive ecosystems. Second, contamination of groundwater sources in the Redwall limestone could result from post-operational mine water, leachate from ore stockpiles, accidental spills, and discharges from fuel tanks. The mining of the high-grade ore in the breccia pipes would mobilize the ionic and metallic elements in the low-grade deposits that would not be removed during mining, thereby creating a potential for groundwater contamination when natural aquifer conditions were reestablished upon mine closure. Although arid to semiarid conditions exist throughout the Shivwits Plateau, the potential for leachate production from the ore stockpiles still exists. Impacts on Cedar Spring could be especially serious because it is less than ¼ mile from the known Lone Mountain breccia pipe, an important link in the groundwater transmission system. The proximity of the other four springs to breccia pipes is not known. Although the 1966 excepted areas exclude all lands within ¼ mile of any spring or seep from mineral leasing, these resources might still be affected by mining activities because of potential hydraulic connections between the springs and seeps and breccia pipes.

Conclusion: The no-action alternative would not directly affect Rogers and Bluepoint springs, but impacts from increasing visitor use could result in trampled vegetation or polluted waters. These impacts could easily damage or destroy a fourth or more of the moist vegetation habitat around these springs. The no-action alternative could have adverse impacts on at least five of the 33 springs that support sensitive desert ecological communities, should uranium mining occur. A complete hydrologic assessment would have to be conducted before a new proposal was approved.

IMPACT ON SOILS

Soils of the recreation area are extremely variable. Climate, vegetation, parent material, elevation, slope, and aspect affect the development of these soils, which are characterized by a wide range of physical and chemical properties. Texture, permeability, depth, stoniness, organic content, alkalinity, and other properties are highly diverse and change quickly within short distances.

Under the no-action alternative, soil damage resulting from off-road vehicle use would continue. The passive offroad vehicle control elements of the proposed action would be implemented, but lakeside roadways would not be constructed at the ends of approved roads. No new additional access point roads would be added along the reservoirs. Also, there would be no new major developments on the lake to relieve pressure on currently overcrowded areas. The area heavily damaged by offroad vehicles in the Boulder Basin zone would be used for rehabilitation research, but no program would be developed for application of successful methods elsewhere in the recreation area. The roadways and facilities of the proposed action and alternatives A and B would not be built.

Because the no-action alternative would not provide additional outlets for off-road vehicle use and additional access to the lake, off-road vehicle drivers would be expected to continue damaging soils along the reservoirs in attempts to reach less crowded areas. Off-road vehicle driving would damage slightly less than the 30 to 40 acres per year that are currently damaged. Damaged soils in the recreation area would double to about 700 acres in a decade, and these soils would remain damaged unless restoration activities were implemented and law enforcement activities accelerated.

The no-action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little activity is expected. If the no-action alternative was selected, approximately 32,600 acres, or less than 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area; 5,840 acres are in the Gold Butte area; and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Impacts on soils from mineral leasing under the no-action alternative would be expected to be greatest in the Shivwits Plateau area, where nearly 17,000 acres of land could come under lease for uranium exploration if pending prospecting permit applications were approved. Development of the two to three breccia pipes in the Shivwits area could result in damage to 100 to 150 acres of soils through excavation, erosion,

and compaction, with additional damage expected from associated excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods of time would be reduced in these disturbed soils by erosion and accelerated weathering, while soil compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil have been demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. The reclamation potential of the disturbed areas would be reduced unless proper care was taken to mitigate soil damage. Site-specific soils data would be necessary for detailed impact assessment and reclamation planning before mining approval.

Mineral leasing would not be expected to significantly affect soil in remaining areas of the park. Some damage could be expected from sporadic exploration activities; however, the amount of acreage affected would likely be less than 300 acres over the next 10 years if the present mineral development trends continued in the area.

Conclusion: Under this alternative, off-road vehicle driving would damage from 750 to 1,000 acres of soils over the life of the plan. There would be no new destruction or damage to soils from construction and no increases in soil erosion from runoff from impervious surfaces. Further, no fill material would have to be imported into the recreation area, and existing soil surfaces would not be covered. Mineral leasing activities could result in damage to soils on approximately 150 acres on the Shivwits Plateau. Effects in other areas would not be expected to be significant.

IMPACT ON SIGNIFICANT NATURAL FEATURES

Significant natural features include unique geological areas, outstanding scenic vistas, outstanding coves, and areas zoned as environmental protection areas or outstanding natural and physical features. Only scenic vistas would be impacted by the activity occurring under this alternative. Outstanding scenic vistas are important because they contribute to the overall visual quality of the NRA. Preservation of the high visual quality found in the NRA has been identified as integral to preserving a high-quality recreational experience. In the Shivwits area, Whitmore and Kelly points provide the only overlooks of the lower Grand Canyon region. From Whitmore Point the views include several intervening levels, each a platform or terrace of irregular width that rise one above the other in precipitous steps hundreds of feet in height. The facades of the cliffs separating the terrace levels are majestic walls or murals that form dramatic visual features.

The only potential source of impacts on scenic vistas would be from operations on federal mineral leases. The no-action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources

within the recreation area, little activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area; 5,840 acres are in the Gold Butte area; and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. Since leasing is primarily speculative within the NRA, it is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Uranium development in the Shivwits Plateau area would be the most likely mineral activity to take place within the near future. In the Parashant and Whitmore Canyon areas, uranium development would lead to significant degradation of the scenic vistas from Whitmore Point because most of the activity would take place in the immediate foreground of the views from the point.

Sporadic oil, gas, and mineral exploration in other parts of the NRA would not likely cause significant impact to the scenic vistas because of stringent lease application review procedures designed to protect visual quality.

Conclusion: Uranium development on the Shivwits Plateau could significantly degrade scenic vistas from Whitmore Point.

IMPACT ON THREATENED, ENDANGERED, OR CANDIDATE SPECIES

The endangered bonytail chub, Gila elegans, and the threatened bald eagle, Haliaeetus leucocephalus, and peregrine falcon, Falco peregrinus are the only federally listed animal species that are known to occur within Lake Mead NRA. There are no threatened or endangered plant species or critical habitats in the recreation area.

There are several federal candidate plants and wildlife that do, or could, inhabit or visit the recreation area. Some of these species are also listed by the states of Arizona and Nevada as comparable species of concern. Table 19 identifies the status and legal classification of all threatened, endangered, or candidate species.

The major source of impacts at this time on threatened or endangered species would be from operations on federal mineral leases. The no-action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the

Shivwits Plateau area; 5,840 acres are in the Gold Butte area; the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Sensitive plant or animal species could occur in any of the 78 percent of the NRA remaining open to mineral leasing consideration under this alternative. Specific locations of each species would be determined during the review process for lease applications. Mineral development proposals under the no-action alternative would most likely involve the Shivwits Plateau portion of the NRA. Prospecting permit applications currently on file for uranium total nearly 18,000 acres. In addition, seismic exploration for oil and gas resources could occur throughout the NRA, but it would be most likely in three locations where existing leases are concentrated: the Grand Wash Cliffs, an area south of Temple Bar, and the west side of the Overton Arm south to Pinto Valley.

The impacts of mineral leasing on threatened or endangered species would include direct elimination of individuals or populations through mechanical means, destruction of habitat (or potential habitat), and indirect impacts on reproduction and foraging caused by noise and human presence. Also, harassment or illegal shooting of animals might result from the increased accessibility associated with new road construction or improvement of existing roads.

If threatened or endangered species were known to occur, or were suspected to occur, on lands encompassed by a lease or permit application, appropriate stipulations would be applied to protect these species. If the area was of critical concern to the species, the application might be denied. For officially listed species, a biological opinion would be obtained from the U.S. Fish and Wildlife Service. A "will effect" or "may effect" determination might result in denial of a lease application. If the lease was approved, adequate stipulations would be required to protect the species.

Because the Shivwits Plateau area has only one plant species that is a candidate for federal protection and no known threatened or endangered wildlife, impacts on threatened or endangered species in that area would not be significant. Several candidate threatened or endangered plants are found on the west side of the Overton Arm, and known gila monster habitat occurs in the vicinity of Rogers and Bluepoint springs; however, impacts on these species from oil and gas seismic exploration would not be significant.

Conclusion: This alternative would have the greatest potential for impact on threatened and endangered or candidate plant and wildlife species because 78 percent of the NRA would be open to consideration of mineral leasing. However, these effects would be evaluated in case-by-case environmental assessments of each lease application, and specific mitigating measures would be recommended. Existing leases and pending permits do not occur in areas that pose a significant threat to threatened or endangered species.

IMPACT ON VEGETATION

Approximately 71 percent of the NRA is dominated by the creosotebush community. This community type is widespread throughout the desert southwest and is the representative low elevation vegetation type in the Mohave and Sonoran deserts. Vegetation typical of higher elevations, such as in the Shivwits portion of the NRA, includes blackbrush, sagebrush, and pinyon/juniper. These vegetation types are common coexisting throughout the Basin and Range Province.

Precipitation rates in low elevation communities are generally less than 5 inches annually, while higher elevations receive 5 to 15 inches. Because of these low precipitation rates, revegetation rates on disturbed sites may be as much as 50 to 75 years.

Impacts to vegetation could occur from mineral leasing under the no-action alternative. This alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area; 5,840 acres are in the Gold Butte area; and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Impacts would be expected to be greatest in the Shivwits Plateau area where nearly 18,000 acres of land could come under lease for uranium exploration if pending prospecting permit applications were approved. In addition, sporadic exploration activities associated with oil and gas leases might occur throughout the NRA. Current interest is in three areas; the Grand Wash Cliffs, south of Temple Bar, and the west side of the Overton Arm south to Pinto Valley.

The primary impact to vegetation resulting from activities proposed on leases or prospecting permits would be direct removal of plants. Blading of areas for location of access roads, drill pads, or mine facilities would result in local destruction of vegetation on approximately 50-100 acres for each surface mine, and less than 5 acres for each oil and gas seismic exploration line. Other impacts would occur due to covering of vegetation with spoil materials, diversion of drainage channels, or potential unauthorized offroad use.

Whenever native vegetation was removed from a site through physical means, the disturbed site would sparsely revegetate with a variety of invader species, including several non-native plants such as puncture

vine (Tribulus terrestis) and Russian thistle (Salsola sp.) Propagation of these exotic invaders on large disturbed sites in remote areas would provide a large seed source for introduction of undesirable species into the surrounding native communities. The invading species would also be better adapted to disturbed sites and would out-compete native plants unless an active reclamation program utilizing native species was employed on each disturbed area.

Reclamation of disturbed areas with native species in arid environments would be extremely difficult, particularly in lower elevations. It is unlikely that disturbed areas could be restored to natural conditions in less than 50 to 75 years. Therefore, the loss of vegetation and its indirect effects on wildlife habitat, soil stability, surface erosion, and visual effects would be prolonged for the period of reclamation establishment.

Conclusion: Because the history of mineral leasing in Lake Mead has been primarily speculative and has resulted in almost no surface disturbance in 20 years, the likelihood of future mineral activity is remote. If oil and gas seismic exploration were to proceed, the amount of vegetation lost throughout the NRA would not be significant. If a uranium mine were developed in the Shivwits Plateau area, the effect may be locally significant because of the destruction of vegetation in a largely pristine area.

IMPACT ON BIGHORN SHEEP

Bighorn sheep inhabit many areas within the recreation area and their habitat requirements are quite crucial. Some herds, for example in the River Mountains, are among the most productive in the region. Bighorn are significant because of their value as game species, for visitor viewing enjoyment, and as a source of animals used to restock depleted bighorn ranges outside the recreation area.

The no-action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area; 5,840 acres are in the Gold Butte area; and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the new leased land would be significantly disturbed by mineral development.

Any oil, gas, and mineral exploration activity in Pinto Valley could cause some impact on identified bighorn sheep habitat. Seismic exploration

could cause increased stress on the herd due to increased human presence and noise from blasting and vehicle travel. Continued stresses on bighorn elsewhere has led to population die-offs because of increased susceptibility to disease organisms. Careful alignment of seismic lines, placement of remote recorders by hiking into sites, and timing of operations should reduce this threat.

To mitigate impacts on bighorn sheep if mineral leases have active operations taking place on them, a quarterly population and distribution survey would be conducted on those leases and adjacent lands inhabited by the bighorn. A program to collect and record the data needed for this type of survey is being developed by the Cooperative National Park Resources Studies Unit, University of Nevada, Las Vegas. This program will gather baseline population data and annual herd movements for all bighorn populations near mineral leases, so that any changes from the normal patterns can be easily identified.

All operations that would occur within known lambing areas would contain a stipulation preventing operations from taking place during the lambing period (normally late December to early April). If significant detrimental impacts to a bighorn population from exploration or mining operations were found, a temporary shutdown of operation would be made until corrective actions could be made to prevent further detriment to the herd.

Conclusion: The no-action alternative has the greatest potential to affect bighorn sheep populations of any of the alternatives because 78 percent of the NRA will remain open to mineral leasing. If, however, exploration activities remained sporadic, as in the past, impacts to the bighorn sheep should not be significant enough to affect overall population health.

IMPACT ON VISITOR CROWDING/CONGESTION

Existing conditions at the developed areas are extremely crowded and congested on weekends during the summer. Holiday weekends during this period are the worst. Memorial Day weekend has had visitation of 254,000. Annual visitation is around 6.5 million and expected to increase to around 9 million by the year 2000. Currently it is not unusual for visitors at several of the larger developed areas to wait up to an hour to launch their boats and twice that long on a holiday weekend. Several of the popular campgrounds and motels are full during the summer. At several developed areas confusing circulation systems frustrate first-time visitors from easily finding their way around. Illegal parking along road shoulders is a common problem that results when existing parking areas fill.

The no-action alternative does not propose any solutions to crowding/congestion problems. (For a full discussion of the no-action alternative proposals, refer to the "Alternative Development Concept Actions" section.) Over the life of the plan visitation is expected to increase by about 68 percent. Because this alternative does not propose

any actions to solve crowding/congestion problems, the problems also expected to increase by 68 percent. Crowding/congestion would most likely be significantly worse than that figure because of the way circulation, parking, and overnight accommodation problems compound themselves. The visitors' aggravation and frustration would increase greatly as it took longer to launch boats and became more difficult or impossible to find legally authorized parking spaces and overnight accommodations. Visitation would probably not increase as much as projected because visitors would have such bad experiences that they wouldn't come back as often and would tell friends to stay away.

Conclusion: Because none of the visitor use problems would be solved, crowding/congestion would increase significantly above existing levels. Crowding/congestion would diminish visitor experiences so much that visitation would probably not increase as much as projected.

IMPACT ON VACATION CABIN SITE RESIDENTS

Lake Mead NRA has three lakefront areas in which sites may be leased for privately owned vacation cabins. These areas are at Katherine, which has 39 cabin sites, Stewarts Point, which has 60 cabin sites, and Temple Bar, which has 36 cabin sites. Cabin site occupancy is for personal, not commercial, use. Department of the Interior regulations (43 CFR 21) prohibit granting new leases for cabin site occupancy within Lake Mead. Under no action, existing conditions would continue. Extensions of leases up to five years would continue to be granted until the need for public use of the cabin site areas dictated termination. The determination of public need would be made two years in advance of the common expiration date.

Conclusion: Since the no-action alternative would mean a continuation of existing conditions, it would have no effect on the cabin site residents.

IMPACT ON TRAILER VILLAGE RESIDENTS

Under the no-action alternative there would be no changes from existing conditions. The following list presents the existing number of long-term, short-term, and RV sites at developed areas.

Area	Existing Number of Sites Number of Sites (Long/Short/RV)
Katherine Landing	104/34/0
Cottonwood Cove	223/75/0
Fire Mountain	0/0/0
Willow Beach	60/18/0
Boulder Beach	215/75/0
Las Vegas Wash	0/0/0
Callville Bay	94/6/0
Boxcar Cove	0/0/0

Echo Bay	69/58/0
Overton Beach	19/13/0
Temple Bar	103/13/0
Totals	883/297/0

Conclusion: The no-action alternative would not affect trailer village residents.

IMPACT ON LEVEL OF CONCESSION SERVICES

Table 30 summarizes the existing level of services provided by the concessioner.

Conclusion: The level of concession services would not change under this alternative.

IMPACT ON MINERAL LEASING OPPORTUNITY

The no action alternative would allow the continued consideration of mineral leasing in all management zones of the recreation area, outside those lands excepted by current regulation. Thus, 78 percent of the recreation area, or 1,162,550 acres, would be open to leasing consideration. Mineral development activity would be expected to continue according to past historical trends and would not be expected to change. Due to few known mineral resources within the recreation area, little activity would be expected. If the no-action alternative was selected, approximately 32,600 acres, or 2 percent of the recreation area, could potentially come under lease within the first year if pending prospecting permits and leases were approved. Over half the acreage under application is in the Shivwits Plateau area, 5,840 acres are in the Gold Butte area, and the remaining 10,000 acres are scattered around the recreation area in smaller parcels. It is difficult to estimate how much of the leased land would be significantly disturbed by mineral development.

Excepted areas identified in 43 CFR are areas of the NRA where mineral leasing would not be considered. In these areas, lease or permit applications received are automatically denied. Approximately 1,162,550 acres (or 78 percent) of Lake Mead NRA are outside these excepted areas and are thus open to consideration of lease and prospecting permit applications. Stringent lease review procedures in these areas require evaluation of each lease application by the NRA for its potential impact on other resource values. In some instances, leases or permits might be denied in areas outside the established excepted areas. In other cases, leases or permits might be approved with protective stipulations to reduce or mitigate potential impacts. Stipulations might include no surface occupancy for all or part of the lease or permit acreage, or operations might be restricted to a particular season to protect wildlife migrations, reproduction areas, or wintering grounds.

Under the no-action alternative, the acreage open to leasing consideration would remain the same, and lease review procedures would be unchanged.

Conclusion: There would be no impact on mineral leasing opportunity under this alternative.

Table 30: Impact on Level of Concession Services, No-Action Alternative

	Trailer Village Long-Term/ Short-term Sites	Motel Units	Restaurant Seats	Store Square Feet	Marina Slips/Moorings	Rental Boats # Houseboats/ # Other	Dry Boat Storage Spaces	Gas Station # Pumps	Gas Dock # Boat Capacity
Katherine Zone									
Katherine Landing	104/33	52	117	3,600	764/0	75/41	210	2	14
Lower Mohave East	--	--	--	--	--	--	--	--	--
Cottonwood Zone									
Cottonwood Cove	223/75	24	35	1,200	237/0	10/31	350	2	4
Fire Mountain	--	--	--	--	--	--	--	--	--
Willow Beach Zone									
Willow Beach	60/18	24	100	1,000	182/16	0/40	120	1	
Boulder Basin Zone									
Boulder Beach	215/75	44	314	5,500	400/0	0/39	100	0	
Las Vegas Wash	0/0	0	36	3,300	595/3	0/35	100	0	3
Callville Bay	94/6	0	36	500	300/0	15/33	111	0	
Boxcar Cove	--	--	--	--	--	--	--	--	--
Echo Bay Zone									
Echo Bay	69/58	52	120	9,000	314/0	70/18	97	4	
Overton Beach Zone									
Overton Beach	19/13	0	0	0	0/50	0/6	40	0	3
Virgin/Temple Zone									
Temple Bar	103/13	22	76	1,500	64/0	0/15	200	2	
Totals--No-Action Alternative	883/297	218	834	25,600	2,856/69	170/258	1,328	11	24

IMPACT ON WILDERNESS LANDS

Under the no-action alternative, the recreation area would be managed according to the Management Zoning map for this alternative (based on the existing Land Management and Use map from the revised 1981 "Statement for Management") and the 1966 Excepted Areas map and regulations that define areas where mineral leasing would be considered on a case-by-case basis and where it is closed to (excepted from) leasing. There is virtually no relationship between these two schemes--the Excepted Areas map was never updated to reflect the more recent Land Management and Use map; the excepted areas are based on precise definitions and reflect general management intent. Accordingly, mineral leasing can be considered on a case-by-case basis in portions of most of the zones and subzones. The only areas of the NRA where leasing is categorically excluded (excepted) are those areas shown on the 1966 Excepted Areas map (NRA-LM 2291-A). These areas are

> all lands within 200 feet of the centerline of any public road, or within 200 feet of any public utility including, but not limited to, electric transmission lines, pipelines, and railroads
>
> all lands within the smallest legal subdivision of the public land surveys containing a spring or water hole, or within ¼ mile thereof on surveyed public land
>
> all land within 300 feet of Lake Mead, Lake Mohave, or the Colorado River, measured horizontally from the shoreline at maximum water surface elevation, and all lands within the area of supervision of the Bureau of Reclamation around Hoover and Davis dams
>
> all lands within any developed and/or concentrated public use area or other area of outstanding recreational significance as designated by the superintendent

Lease applications are considered within all other lands of the NRA, subject to a determination of effect upon surrounding park resources. Applications are reviewed through the NEPA process, which identifies significant resources. Those resources are then either excluded from the lease or stipulations are applied to mitigate the impact to them. Currently 1,162,550 acres of the NRA are open to consideration for mineral leasing.

Some adverse effect could occur to the visitor experience if existing leases were developed and pending permit applications in areas open to mineral leasing under this alternative were issued. However since it is unlikely that existing leases would result in any major new mining or oil and gas operation, the impact to the visitor experience from sporadic exploration activity on these leases is expected to be minimal.

Although none of the NRA lands have been officially designated as wilderness, the Wilderness Suitability map in the "Affected Environment" section indicates those lands that meet or potentially meet the criteria of the Wilderness Act of 1964. The following units are keyed by number to that map and include most of the lands in the recreation area that possess

primitive characteristics. Boundary lines of the units follow topographic features, access roads, the recreation area boundary line, section lines, and a line marking a 300-foot horizontal setback from the high waterlines of Lakes Mohave and Mead.

Units 1 and 2 center on the Newberry Mountains, which rise to an elevation of 5,600 feet and offer a cool refuge from the heat of the surrounding desert lowlands. Davis Dam, the Mohave power plant, Katherine Landing, and Bullhead City are developments visible from the southern and eastern portions of this unit. Of the 40,605 acres contained in these units, 22,940 acres in unit 2 are open to consideration for mineral leasing.

Unit 3, Nellis Wash, 15,870 acres, includes portions of the isolated Newberry Mountains along the western side of the recreation area. Fingerlike drainages and alluvial fans extend eastward from the mountains toward Lake Mohave. Some mining has occurred previously within the unit. All lands within this unit are open to consideration for mineral leasing.

Unit 4, Cottonwood Valley, potentially meets the criteria of the Wilderness Act because of outstanding mineral reservations. However, this gently sloping outwash provides solitude and isolation in a primitive setting north of a major development at Katherine Landing. All of the 15,295 acres within this unit are open to consideration for mineral leasing.

Unit 5, the Black Mountains, capped by 2,000-foot Mount Davis, provides a scenic background to Lake Mohave. Scattered washes and side canyons transect the Black Mountains from east to west as they wend their way to the Colorado River. Of the 18,610 acres contained in this unit, 16,205 acres are open to consideration for mineral leasing.

Unit 6, Opal Mountain, contains a portion of the Eldorado Mountains, gently rolling hills, and outwashes extending to Lake Mohave. Rugged mountains, secluded valleys, and flat alluvial fans provide opportunities for seclusion in a setting of scenic splendor. Of the 17,635 acres contained in this unit, 16,180 acres are open to consideration for mineral leasing.

Units 7, 8, 10, 11, and 12, Fire Mountain and Black Canyon, contain some of the most spectacular and rugged terrain within the recreation area. They consist of steep barren rocky crags, which begin at an elevation of 645 feet and terminate at an elevation of approximately 2,200 feet. These units combine to form the "Black Canyon" of Lake Mohave, which is noted for its hot springs and cool Colorado River. This area is a popular spot for visitors to see sharp and abrupt canyon walls and a myriad of geology. Unit 11 only potentially meets the criteria of the act because the Bureau of Reclamation has identified this area as a potential location for reclamation facilities ranging from Hoover Dam modifications to new transmission line corridors. Of the 70,470 acres within these units, 54,245 are open to consideration for mineral leasing.

Unit 9, Eldorado Mountains, contains approximately 29,665 acres of this picturesque and rugged mountain range. The unit is a maze of peaks

and side canyons with vertical cliffs extending to the edge of the Colorado River. All lands in this unit are open to consideration for mineral leasing.

Unit 13, Kingman Wash, contains approximately 40,835 acres. The undulating Black Mountains typify the topography of the region. Access to the unit is provided on all sides by existing road corridors. All lands are open to consideration for mineral leasing.

Unit 14, Bonelli Landing, comprises 13,875 acres of mainly alluvial fans and separates the hilly mountainous area of unit 13 from the gypsum beds of unit 21. This unit contains historic mining diggings and some archeological remains in the form of petroglyphs. Access to this unit is primarily by the roads to Bonelli Landing and Temple Bar. All lands are open to consideration for mineral leasing.

Units 15, 16, and 17, Pinto Valley, comprise approximately 38,340 acres of rugged hills and highly scenic valleys. These units contain Guardian Peak, which is one of the highest peaks in the area, and is used as a navigational aid. The northern side of Boulder Canyon is formed by these units, where steep cliffs or barren rock extend into the cool blue waters of Lake Mead in a dramatic fashion. Pinto Valley is a much-photographed topography, with the red sandstone outcroppings that merge with the green desert vegetation and the grays, browns, and yellows of the desert floor. A total of 22,730 acres in these units are open to consideration for mineral leasing.

Unit 18, Cathedral Wash, contains 18,820 acres. Mountainous terrain representing the northeast extremities of the Black Mountains dominates the area and contrasts with the flat surface of Lake Mead. All lands are open to consideration for mineral leasing.

Unit 19, Overton, 24,040 acres, consists of flat to "badland-like" lands lsoping westward from mountainous terrain to a road corridor east of the recreation area boundary. The unit forms the scenic background for lake users and for shoreline users on the west side of Overton Arm. These flat outwashes lack the spectacular contrasts found in other units and portray a typical desert landscape. This unit has retained its primitive characteristics and affords an opportunity for seclusion and an unconfined type of recreation. All lands are open to consideration for mineral leasing.

Unit 21--White Hills, unit 22--Temple Bar, and unit 23--Gregg's Hideout, all in the White Hills, offer isolation, scenic views, and historic attractions. This rolling hill country includes some evidence of earlier mining activities and trails. These activities did not scar the area excessively, and many scars have healed to the point of not being noticeable. Access to the area is possible by car on existing roads, by hiking from developed areas such as Temple Bar, or by boat from Lake Mead. These three units contain a total of approximately 52,130 acres, all of which are open to consideration for mineral leasing.

Units 20 and 24 to 32 are known as Twin Springs, Scanlon Wash, Hiller Mountains, Hell's Kitchen, Indian Hills, Cockscomb, Grand Wash Cliffs,

Iceberg Ridge, South Cove, and Pearce Ferry. The units contain rugged mountain ranges that provide a scenic background for the Virgin Basin, Virgin Canyon, Gregg Basin, Iceberg Canyon, and Pearce Ferry sections of Lake Mead NRA. Gently sloping outwash fans extend from the mountains to plunge abruptly into the reservoir. Of the 135,688 acres within these units, 116,450 acres are open to consideration for mineral leasing.

Unit 33, Shivwits Plateau, contains approximately 83,980 acres. Diverse activities occur in this remote section of the recreation area, ranging from hunting to grazing. Due to a higher altitude, the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests and a wider variety of wildlife than can be found in the rest of the recreation area. Kelly Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon. Because most of the land within this unit is subject to mineral reservations, the unit only potentially meets the criteria of the Wilderness Act. Much of this unit is splintered by access roads. When considered with the adjacent proposed wilderness in Grand Canyon National Park, it is apparent that these splintered segments would form a significant contiguous wilderness unit. All lands in this unit are open to consideration for mineral leasing.

Should this alternative be selected, the remote undeveloped nature of the Shivwits Plateau could be dramatically altered by potential uranium mining. Because of its unique juxtaposition with Grand Canyon National Park, this area of the NRA provides a scenic, remote and primitive landscape which blends well with the lower portion of the Grand Canyon. Activities such as river float trips, scenic overflights and backcountry use actually focus on the Grand Canyon "nature" of this country, crossing between the national park and national recreation area lands without recognition of the "difference." Inherent to the visitor experience on the Shivwits Plateau is its remoteness and undeveloped nature where unconfined recreational activities can take place.

Mine facilities and operations would create a man-made disturbance out-of-character with the remote, primitive, existing nature of the area. The presence of mining equipment, improved roads, structures, spoil and ore stockpiles would be a sharp, and in some cases irreversible, contrast to the present landscape. Should mining actually take place, significant impact to the visitor experience is expected to occur not only to visitors of the NRA, but also to many of the visitors of the lower Grand Canyon country within Grand Canyon National Park.

Unit 34--Andrus Point, unit 35--Whitmore Point, and unit 36--Lava consist of approximately 58,430 acres in the northeast sector of the recreation area. Contained within these units are Parashant, Andrus, and Whitmore canyons; all are precipitous side canyons of significant grandeur that drain into the Grand Canyon. The entire area is undeveloped land retaining its primeval character, and it provides an opportunity for solitude or a primitive and unconfined type of recreation in a scenic setting of steep escarpments, colorful red walls, and deep canyons. Geologic formations and processes in evidence here may provide information on the origin of the Grand Canyon. Archeological sites of several Indian cultures, including the Virgin Anasazi and more recently

the Paiutes, are also found here. Adjacent primitive areas of Grand Canyon National Park provide for a contiguous unit of primitive lands extending westward from the Pine Mountains across the Sanup and Shivwits plateaus to the Grand Wash Cliffs. All of the lands within these three units are open to consideration for mineral leasing.

See table 31 for summary of wilderness acres affected.

Conclusion: The 1,245,275 acres of the NRA that are open to consideration for mineral leasing could affect 495,390 acres, or 89 percent, of those lands that meet the criteria of the Wilderness Act and 106,380 acres, or 91 percent, of those lands which potentially meet the criteria. Mining activities as a result of mineral leasing in these areas could unnaturally scar the landscape and alter the wilderness character of these lands, making wilderness values on at least part of these lands lost to any future possible designation.

Table 31: Summary of the Effects of the No-Action Alternative on Lake Mead NRA Lands Meeting or Potentially Meeting Act Criteria

	Acres Meeting the Criteria		Acres Affected by this Alternative	
	Wilderness	Potential Wilderness	Wilderness	Potential Wilderness
1	7,650	0	0	0
2	32,955	0	22,940	0
3	15,870	0	15,870	0
4	0	15,295	0	15,295
5	17,970	640	15,565	640
6	17,635	0	16,180	0
7	15,145	0	15,145	0
8	25,605	0	25,605	0
9	29,665	0	29,665	0
10	2,045	0	1,000	0
11	0	14,645	0	5,325
12	13,030	0	7,170	0
13	40,835		40,835	0
14	13,875		13,875	0
15	17,115		12,085	0
16	6,680		2,865	0
17	14,545		7,780	0
18	18,820		18,820	0
19	24,040		24,040	0
20	10,610		10,610	0
21	25,580		25,580	0
22	16,665		16,665	0
23	9,885	80	9,885	80
24	22,095		22,095	0
25	8,545		8,545	0
26	14,620		14,620	0
27	7,720		0	0
28	14,020		12,900	0
29	13,895		6,965	0
30	15,143	460	11,675	460
31	16,480		16,480	0
32	12,100		12,100	0
33	0	83,980	0	83,980
34	14,905	0	14,905	0
35	32,215	0	32,215	0
36	10,710	600	10,710	600
Totals	558,675	115,700	495,390	106,380
Percentage	100	100	89	91

ENVIRONMENTAL IMPACTS OF ALTERNATIVE A

A summary of the following impacts is presented in the "Summary" section at the beginning of this document.

IMPACT ON PUBLIC SAFETY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. The 100-year flood has a 1 percent chance of occurring in any year. The probable maximum flood is the greatest flood that could ever be expected. Probable maximum floods do occur, but the frequency is uncertain; the likelihood in any year is less than 1/10 of 1 percent. Flooding is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor use facilities are out of the floodplain. At Boulder Beach all development is on a broad alluvial fan, with protection provided by earth dikes. Also, because flooding at Boulder Beach takes the form of sheet flows up to 2 feet in depth, it is not considered to present as great a danger to human life or property as the concentrated flows in canyons at other areas of the NRA; therefore, no potential victims or damage to structures will be shown for Boulder Beach in the impact sections relating to floodplains. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. See the discussion of floodplains and wetlands in the "Affected Environment" section of this document for a more detailed explanation. The development concept plan graphics for each developed area show the extents of the 100-year and probable maximum floods.

Alternative A would mitigate the flood hazard up to the level of the probable maximum flood by building major structures like dams or channels and by relocating some developments. Removal of structures from the floodplain provides the best protection from floods. Structural measures offer the next best method. Warning systems provide less protection than either of the preceding methods.

The following is a summary of the flood mitigation proposals for each zone of the recreation area. All areas with flood hazard would have warning systems installed even if they were structurally protected.

Katherine Landing. The development would be protected to the level of the probable maximum flood through structural measures such as diversion canals and diversion dikes.

Cottonwood Cove. NPS housing and maintenance areas would be relocated out of the probable maximum floodplain. Other development in the area would be protected to the level of the probable maximum flood through structural measures such as dikes and channels.

Willow Beach. The launch ramp, restaurant, store, campground (at ¼ to ½ its original capacity), ranger station, NPS housing, NPS maintenance facilities, trailer village, concession housing, and concession maintenance facilities would be relocated out of the

probable maximum floodplain. The motel and a portion of the parking area would be protected from the probable maximum flood with a 6-foot-high wall. A riprap dike would protect the sewage lagoons from the 100-year flood.

Boulder Beach. The earth dikes in the Boulder Beach area would be regraded and reinforced with gabions to protect the area to the probable maximum flood level.

Las Vegas Wash. The launch ramp, concession dry boat storage, and concession maintenance area would be relocated out of the probable maximum floodplain. No structural measures or warning system would be used at Las Vegas Wash.

Overton Beach. The campground would be relocated out of the floodplain.

Temple Bar. Diversion dikes and channels would be added to accommodate the probable maximum flood.

A complete discussion of actions that would be taken to protect each development zone from the hazardous effects of a probable maximum flood is found in the "Alternative Development Concept Actions" section under alternative A.

An estimated 135 people would be in the probable maximum floodplain during the day and none would be there at night. This represents approximately 0.1 percent of the people expected to be in the recreation area on a summer weekend day (96,000) and is 97 percent fewer people during the day and 100 percent fewer people at night than would be expected under existing conditions.

Compared with existing conditions, approximately 1,045 additional people would be protected from the probable maximum flood at Katherine Landing by structural measures. The dry boat storage would receive no protection from the probable maximum flood, but fewer than five people would be expected there at any one time.

Relocation of NPS housing and NPS maintenance facilities out of the floodplain at Cottonwood Cove would protect approximately 15 daytime occupants. The additional 1,720 projected summer weekend daytime occupants of the probable maximum floodplain at this location would be protected from the probable maximum flood by structural measures.

At Willow Beach, relocation of the launch ramp, restaurant, store, campground (at ¼ to ½ its original capacity), ranger station, NPS housing, NPS maintenance facilities, trailer village, concession housing, and concession maintenance facilities out of the probable maximum floodplain would mean that approximately 376 fewer people would be expected to be in the probable maximum floodplain on an average summer weekend day than under existing conditions. Protection of the motel and a portion of the parking area from the probable maximum flood with a 6-foot-high wall would provide additional safety to 70 expected occupants

of the probable maximum floodplain. Approximately 50 people would be expected to be in the probable maximum floodplain after the above measures were in place because the only protection for the access roads, dry boat storage, and canoe/raft takeout would be the existing warning system.

The expansion of the campground and trailer village at Boulder Beach would mean that an additional 112 people would be at risk in the probable maximum floodplain as compared with existing conditions. The expected 1,371 people (which includes the additional 112 people) in the probable maximum floodplain would be protected by structural measures and a warning system.

The campground at Overton Beach would be relocated, leaving only the swim beach in the floodplain. This situation would leave about 40 people in the floodplain during the day; the hazard would be mitigated by a warning system.

All probable maximum floodplain occupants would be protected by dikes and channels at Temple Bar.

Conclusion: This alternative would provide the greatest level of protection of any alternative. After all flood mitigation actions were taken, about 135 people in the daytime would remain in the probable maximum floodplain where the hazard would be mitigated only by warning systems. That is a 97 percent reduction compared to existing conditions. At night no people would be in the areas only protected by warning systems. All other people in the probable maximum floodplain (day or night) would be protected by structures like dikes and channels. About 135 people during the day and none at night would remain in the 100-year floodplain protected only by a warning system. That represents an 89 percent and 100 percent reduction respectively compared to existing conditions.

IMPACT ON PROPERTY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. Flooding is the most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor facilities are out of the floodplain. At Boulder Beach, all development is on a broad alluvial fan, with protection provided by earth dikes. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. A more thorough discussion of floodplains may be found in the "Affected Environment" section which starts on the first page of this volume. The development concept plan graphics for each developed area shows the extent of the 100-year and probable maximum floods.

Table 21 shows development in the floodplain under each alternative including no action. Alternative A would mitigate the flood hazard up to the level of the probable maximum flood by building major structures like

dikes or channels and relocating some developments. However, the property shown in the flood-hazard zone under alternative A would remain susceptible to flood damage or destruction in the event of a flood. The cost of replacing structures left unprotected in the 100-year floodplain would be approximately $1 million; and for replacing those in the probable maximum floodplain, approximately $1.1 million. These costs would not cover utilities, furnishings, equipment, vehicles, flood-control devices, debris removal, search and rescue, or expenses of victims. The cost to replace facilities damaged by the 100-year flood would be approximately 15 percent of the cost of replacing structures in the 100-year floodplain under existing conditions. The cost to replace structures damaged by the probable maximum flood would be about 5 percent of the cost of replacing structures in the same floodplain under existing conditions.

Conclusion: This is the most effective alternative in terms of protecting structures from flood damage.

IMPACT ON RESERVOIR WATER QUALITY

These impacts would be the same as for the proposed action.

IMPACT ON DESERT SPRING ECOLOGICAL COMMUNITIES

These impacts would be the same as for the proposed action.

IMPACT ON SOILS

Soils of the area are extremely variable. Climate, vegetation, parent material, elevation, slope, and aspect affect the development of these soils, which are characterized by a wide range of physical and chemical properties. Texture, permeability, depth, stoniness, organic content, alkalinity, and other properties are highly diverse and change quickly within short distances.

Alternative A would maintain existing areas for visitor use. No new major access points or developments would be constructed along the reservoir shores. The passive off-road vehicle recommendations of the proposed action would be implemented, some lakeside roadways would be eliminated, and accesses to the lakeshore would be reduced. The reduction in lake accesses would encourage offroad drivers to trailbreak their own roads, and the rate of soil damage would increase from its present level of 30 to 40 acres per year. Research on the rehabilitation of off-road vehicle soil damage and implementation of a rehabilitation program would be done as in the proposed action, but this would probably be a losing battle because soils can be damaged at a much faster rate than they can be rehabilitated.

The construction of roadways and expansion of existing facilities under this alternative would destroy or severely damage about 178 acres of

undisturbed soils. Rehabilitation and landscaping would be done around construction sites but natural ecosystems and soil productivity would not be restored. The roadway construction and flood protection measures in this alternative would require about 280,000 cubic yards of material to be removed from cuts and about 500,000 cubic yards of material to be deposited as fill. The deficit of 220,000 cubic yards of fill would have to be imported from existing quarries or obtained from flood-control excavations in the developed areas. This is only 30,000 cubic yards less than the proposed action.

The intent of this alternative is the same as that of the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative A is in the amount of acreage contained in the resource utilization subzone. Under this alternative only 51,550 acres would remain open to mineral leasing consideration to achieve the objective of resource protection and reduced consumptive uses rather than 148,970 acres under the proposed action. This alternative would also reduce the amount of land where current prospecting permit applications have been filed from the 11,640 acres available under the proposed action to 940 acres under alternative A. Existing leases, mining claims, and private mineral rights would be unaffected. Under this alternative, up to 9,200 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 940 acres of pending prospecting permits (if approved), a reduction of 10,800 acres from the proposed action.

Exploration activities associated with prospecting permits and oil and gas leases could result in damage to soils through excavation, erosion, and compaction, with additional damage expected from associated excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods of time would be reduced in these disturbed soils by exposure to erosion and accelerated weathering and soil compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil have been demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. The reclamation potential of the disturbed areas would be reduced unless proper care was taken to mitigate soil damage. Because of the diversity of soils in the recreation area, site-specific soils data would be necessary for detailed impact assessment and reclamation planning before mining approval.

Mining as a result of mineral leasing would not be expected to significantly affect soils in any area of the park. Some damage could be expected from sporadic exploration activities; however, the amount of acreage affected would likely be less than 300 acres over the next 10 years if the present mineral development trends continued in the area.

Conclusion: Under alternative A, the rate of damage and erosion from off-road vehicles would increase and only be partially offset by rehabilitation efforts. Developments would destroy or severely damage about 178 acres of lithosols and red desert soils and cause minor disruptions in drainage patterns, which would temporarily increase erosion

potential. Damage to recreation area soils resulting from mineral leasing would not be significant over the next decade, assuming current mineral development activity followed historical trends.

IMPACT ON SIGNIFICANT NATURAL FEATURES

These impacts would be the same as for the proposed action.

IMPACT ON THREATENED, ENDANGERED, OR CANDIDATE SPECIES

The endangered bonytail chub, Gila elegans, peregrine falcon, Falco peregrinus and the bald eagle, Haliaeetus leucocephalus, are the only federally listed animal species that are known to occur within the NRA. There are no threatened or endangered plant species, or critical habitats in Lake Mead. There are several federal candidate plants and wildlife that do, or could, inhabit or visit the recreation area. Some of these species are also listed by the states of Arizona and Nevada as comparable species of concern. Table 19 identifies the status and legal classification of all these threatened, endangered and candidate species.

The intent of this alternative is the same as that of the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative A is in the amount of acreage contained in the resource utilization subzone. Under this alternative only 51,550 rather than 148,970 acres would remain open to mineral leasing. This alternative would also reduce the amount of land where current prospecting permit applications have been filed from the 11,640 acres available under the proposed action to 940 acres under alternative A. Existing leases, mining claims, and private mineral rights would be unaffected. Under this alternative, up to 9,200 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 940 acres of pending prospecting permits (if approved), a reduction of 10,800 acres from the proposed action.

Under this alternative 1,148,100 acres or 77 percent of the NRA would be placed in the natural zone. Known habitat or potential habitat for candidate threatened, and endangered plant and animal species would be further protected by placement in the environmental protection or outstanding natural feature subzones. Areas open to mineral leasing would be the 51,550 acres in the resource utilization subzone and an additional 9,200 acres of existing leases and pending prospecting permits. No new developments are proposed under this alternative.

About 9,200 acres would have the highest potential for mineral development--8,238 acres of existing leases and 940 acres of pending prospecting permits (if approved). None of the leases and pending permits would be in areas where they could potentially affect any candidate threatened or endangered wildlife. Two existing leases and one pending prospecting permit would be located within 5 miles of known locations of candidate threatened or endangered plants. Additional surveys on these leases or permits could reveal additional populations. Potential threats to these plants would include physical destruction of

populations or habitat and illegal collection. When specific mineral development proposals were received in these areas, surveys would be conducted and protective stipulations applied to the plan of operation, but it would not be certain that all potential effects would be avoided.

Conclusion: Impacts on candidate, threatened, and endangered plants and wildlife resulting from this alternative could occur but are not likely to be significant.

IMPACT ON VEGETATION

Approximately 71 percent of the NRA is dominated by the creosotebush community. This community type is widespread throughout the desert southwest and is the representative low elevation vegetation type in the Mojave Desert. Vegetation typical of higher elevations includes blackbrush, sagebrush, and pinyon/juniper. These vegetation types are common throughout the intermountain region.

Precipitation rates in low elevation communities are generally less than 5 inches annually, while higher elevations receive 5 to 15 inches. Because of these low precipitation rates, revegetation rates on disturbed sites might be as much as 50 to 75 years.

The intent of this alternative is the same as that of the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative A is in the amount of acreage contained in the resource utilization subzone. Under this alternative only 51,550 acres would remain open to mineral leasing consideration in order to achieve the objective of resource protection and reduced consumptive uses. This alternative would also reduce the amount of land where current prospecting permit applications have been filed from the 11,640 acres available under the proposed action to 940 acres under alternative A. Existing leases, mining claims, and private mineral rights would be unaffected. Up to 9,200 acres of the NRA could be subjected to mineral development on 8,238 acres of existing leases and 940 acres of pending prospecting permits (if approved).

Impacts to vegetation under this alternative would be greatest if an ore deposit was discovered and production of a mine initiated. Over a hundred acres of vegetation could potentially be destroyed through development of mine surface facilities, access roads, and mine tailings. However, given the history of Lake Mead NRA mineral leasing, this level of development is unlikely. Exploration activities on mineral and oil and gas leases would disturb only a small amount of native vegetation.

Conclusion: None of the impacts to vegetation under this alternative would be significant.

IMPACT ON BIGHORN SHEEP

Under this alternative, no bighorn sheep habitat would be available for mineral leasing; therefore, no impacts from pending prospecting permits would be expected. However, existing oil and gas leases in the Pinto Valley, totaling 4,480 acres, are located in an area of desert bighorn habitat. If current owners of these leases pursued exploration activities in this area, impacts to bighorn sheep could be expected. Seismic exploration could cause increased stress in the herd due to increased human presence and noise from blasting and vehicle travel. Continued stress in bighorn populations elsewhere has led to population die-offs because of increased susceptibility to disease organisms. Careful alignment of seismic lines, placement of remote recorders by hiking into sites, and timing of operations should reduce this threat.

To mitigate impacts to bighorn sheep populations if mineral leases have active operations taking place on them, a quarterly population and distribution survey would be conducted on those leases and the adjacent lands inhabited by the bighorn. A program to collect and record the data needed for this type of survey is being developed by the Cooperative National Park Resources Studies Unit, University of Nevada, Las Vegas. This program will gather baseline population data and annual herd movements for all sheep populations near mineral leases, so that any changes from the normal patterns can be easily identified.

All operations that would occur within known lambing areas would contain a stipulation preventing operations from taking place during the lambing period (normally late in December to early April). If significant detrimental impacts to a bighorn population were to result from exploration or mining operations, a temporary shutdown of operations would occur until corrective actions could be taken to prevent further detriment.

Conclusion: If exploration activities remained sporadic, as in the past, impacts to the bighorn sheep population should not be significant enough to affect overall population health.

IMPACT ON VISITOR CROWDING/CONGESTION

Existing conditions at the developed areas are extremely crowded and congested on weekends during the summer. Holiday weekends are the worst. Memorial Day weekend has had visitation of 254,000. Annual visitation is around 6.5 million and expected to increase to around 9 million by the year 2000. Currently it is not unusual for visitors at several of the larger developed areas to wait up to an hour to launch their boats, and twice that long on a holiday weekend. Several of the popular campgrounds and motels are full during the summer. At several developed areas confusing circulation systems frustrate first-time visitors from easily finding their way around. Illegal parking along road shoulders is a common problem that results when existing parking areas fill.

Alternative A would accommodate increasing visitor use and solve existing crowding/congestion problems by expanding and improving existing developed areas. (For a full discussion of these actions, refer to the "Alternative Development Concept Actions" section.) These actions would include many proposals intended to accommodate increasing visitation or to solve crowding/congestion. To understand the magnitude of these proposals, the increases in parking, overnight accommodations, and launch ramps are used as examples. Alternative A includes an increase of 5,990 parking spaces (19,660 spaces exist) or an increase of 30 percent. There are 1,755 overnight accommodation units (a unit is one campsite, one motel room, or one RV site). Alternative A would increase them by 1,110 units or an increase of 63 percent. There are 73 launch ramp lanes, and alternative A would add 10, an increase of 14 percent.

Over the life of this plan, visitation is expected to increase by about 68 percent and most visitor facility proposals under alternative A call for increases from 30 to 63 percent beyond existing levels. This parity between expected use and proposed facility levels indicates that crowding/congestion would not get any worse than it is now; however, it should be less than current levels. For example, circulation improvements would facilitate vehicle and pedestrian movements in several developed areas.

Conclusion: The proposed facility improvements and expansion would reduce crowding/congestion by an unknown amount compared to existing levels, while accommodating increasing numbers of visitors.

IMPACT ON VACATION CABIN SITE RESIDENTS

Lake Mead NRA has three lakefront areas in which sites may be leased for privately owned vacation cabins. These areas are near Katherine Landing, which has 39 cabin sites, Stewarts Point, which has 60 cabin sites, and Temple Bar, which has 36 cabin sites. Cabin site occupancy is for personal, not commercial, use. Department of the Interior regulations (43 CFR 21) prohibit granting new leases for cabin site occupancy within the recreation area. Under alternative A, to provide for increased use in existing developed areas, the cabin site areas near Katherine Landing and Temple Bar would be removed and replaced with visitor facilities; the cabin sites at Stewarts Point would be retained.

In the vicinity of Katherine Landing, all 39 cabins would be removed and replaced with public facilities, including a 40-table picnic area, 25-site RV trailer park, 24-unit motel, four-lane boat launching ramp, and 300 parking spaces. At Temple Bar all 36 cabins would be removed and replaced with public facilities, including a picnic area, swim beach, and 80 recreation vehicle sites. The social impact resulting from removal of these 75 cabin sites would be most felt by the residents that would no longer be able to live or vacation close to the lake. These people would have to relocate to other areas within the recreation area or to communities outside the area. This would be a traumatic event to many of these occupants, who have spent as many as 30 years in their cabins. Throughout the years, many have invested their time, energy, and

creativity in landscaping and home improvements that they hoped to enjoy for the rest of their lives. There could be some economic impact to some of the occupants because the government is not required to relocate renters and lessees.

Conclusion: Under alternative A, proposals for removal of the cabin site areas and replacement with public facilities in the vicinity of Katherine Landing and Temple Bar would eliminate 75 vacation cabin sites. Vacation cabin sites at Stewarts Point would not be affected.

IMPACT ON TRAILER VILLAGE RESIDENTS

The general concept for trailer villages under alternative A would be the same as for the proposed action. The number of long-term, short-term, and RV sites available at each developed area and the proposed actions under alternative A are presented below.

Area	Existing Number of Sites (Long/Short/RV)	Alternative A Actions
Katherine Landing	104/34/0	Retain existing sites
Cottonwood Cove	223/75/0	Retain existing sites
Fire Mountain	0/0/0	Same as no action
Willow Beach	60/18/0	Relocate 50 long-term and 18 short-term sites
Boulder Beach	215/75/0	Add 75 short-term sites
Las Vegas Wash	0/0/0	Add 80 RV sites
Callville Bay	94/6/0	Retain existing sites
Boxcar Cove	0/0/0	Same as no action
Echo Bay	69/58/0	Add 42 RV sites
Overton Beach	19/13/0	Relocate/convert to 15 long-term/30 RV sites
Temple Bar	103/13/0	Remove 10 long-term and 7 short-term sites
Total	887/297	

As under the proposed action, adding RV sites at most of the developed areas would have no affect on existing trailer village residents. The effects of converting long-term sites to short-term sites would be mitigated by converting them as current residents vacated the sites. Under alternative A trailer village residents would be most affected in the following areas: Willow Beach, where 50 of the 60 long-term and all 18 short-term residents would be relocated out of the flood-hazard zone to a safer area; Overton Beach, where 15 long-term and 13 short-term residents would be relocated and four long-term sites could be removed; and Temple Bar where 10 long-term and seven short-term residents would be removed to provide for a high-water parking area.

The social impact resulting from these trailer village relocations would be felt most by the four long-term residents at Overton Beach and 10 long-term residents at Temple Bar. These people would have to relocate to other areas within the recreation area or to communities outside the area. This would be a traumatic event to many of these occupants who have spent as many as 30 years in their trailers. Throughout the years, many have invested their time, energy, and creativity in landscaping and home improvements that they hoped to enjoy for the rest of their lives. There could be some economic impact to some of the occupants because the government is not required to relocate renters and lessees. Those impacts would be mostly mitigated, because where long-term trailer residents must be reduced in number, they would be reduced through attrition before any action would be taken to force residents out of their trailer spaces.

Conclusion: Under alternative A, proposals to add RV sites or convert long-term sites to short-term sites would have little or no effect on existing trailer village residents at most developed areas. Trailer village residents affected by the proposal would be those at Willow Beach, where long-term and short-term occupants would be relocated to safer areas, and those at Overton Beach and Temple Bar. At Overton Beach four long-term sites would be removed, and at Temple Bar, 10 long-term sites would be converted to high-water parking. To mitigate the effect on these long-term residents, the Park Service would rely on normal attrition before relocation was attempted. However, some long-term residents would have to relocate to another developed area or outside the recreation area. The number of long-term sites adversely affected at these areas are 14 out of 887 for the entire NRA, or 2 percent of the total long-term sites. Only seven of the 297 short-term sites (or 2 percent) would be affected.

IMPACT ON LEVEL OF CONCESSION SERVICES

Table 32 summarizes the level of services to be provided by the concessioner under alternative A.

Conclusion: There would be an increase in the level of concession services over existing conditions in eight of the nine categories. This increase would range from 21 percent for gas docks to 146 percent for motel units. In one of the nine categories--long-term trailer village spaces--there would be a 2 percent decrease.

IMPACT ON MINERAL LEASING OPPORTUNITY

Under this alternative, 51,550 acres of the NRA would remain open to consideration for mineral leasing (the size of the resource utilization subzone would be 97,420 acres smaller than under the proposed action). Most of the lands removed from leasing consideration would be south of Temple Bar and west of the main body of Lake Mohave. None of these lands have experienced significant mineral development activity, and no significant mineral resources are known to exist.

Table 32: Impact on Level of Concession Services, Alternative A

	Trailer Village Long-Term/ Short-term Sites	Motel Units	Restaurant Seats	Store Square Feet	Marina Slips/Moorings	Rental Boats # Houseboats/ # Other	Dry Boat Storage Spaces	Gas Station # Pumps	Gas Dock # Boat Capacity
Katherine Zone									
Katherine Landing	104/39	104	234	7,200	805/0	75/41	420	2	14
Lower Mohave East	--	--	--	--	--	--	--	--	--
Cottonwood Zone									
Cottonwood Cove	223/75	48	70	2,400	535/0	25/31	465	2	8
Fire Mountain	--	--	--	--	--	--	--	--	--
Willow Beach Zone									
Willow Beach	60/18	24	100	1,000	270/16	0/40	120	1	
Boulder Basin Zone									
Boulder Beach	215/150	88	314	11,000	875/0	0/78	275	0	
Las Vegas Wash	0/80	50	54	3,300	630/3	0/70	200	0	4
Callville Bay	94/6	30	60	1,000	1,045/0	15/33	166	2	
Boxcar Cove	--	--	--	--	--	--	--	--	--
Echo Bay Zone									
Echo Bay	69/100	104	200	9,000	530/0	90/25	200	4	
Overton Beach Zone									
Overton Beach	15/30	0	100	1,000	0/140	0/12	80	2	3
Virgin/Temple Zone									
Temple Bar	93/6	88	226	3,500	980/0	45/15	300	2	
Totals: Alternative A	873/504	536	1,358	39,400	5,670/159	250/345	2,226	15	29
Existing Conditions	887/297	218	834	25,600	3,317/99	170/258	1,328	11	24
Net change	-14/+208	+318	+524	+13,800	+2,353/+60	+80/+87	+898	+4	+5
Percent change	-2/+70	+146	+63	+54	+71/+61	+47/+34	+68	+36	+21

The intent of this alternative is the same as that of the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative A is in the amount of acreage contained in the resource utilization subzone. Under this alternative only 51,550 acres would remain open to mineral leasing consideration to achieve the objective of resource protection and reduced consumptive uses. This alternative would also reduce the amount of land where current prospecting permit applications have been filed from the 11,640 acres available under the proposed action to 940 acres under alternative A. Existing leases, mining claims, and private mineral rights would be unaffected. Up to 9,200 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 940 acres of pending prospecting permits (if approved).

Mineral development could still take place on the 8,238 acres covered by existing leases within the NRA. However, of the 32,600 acres of land already applied for prospecting permits, only 940 acres would remain available for exploration. The remaining 31,640 acres would be withdrawn from further mineral leasing consideration. Most of the pending applications that would be affected by this withdrawal are for gold and silver prospecting in the Gold Butte and Malpais Flattop Mesa areas of the NRA, and for uranium on the Shivwits Plateau.

The primary impacts of this alternative on mineral leasing opportunities would be identical to the impacts described under the proposed action--the Shivwits Plateau zone would remain unavailable for further mineral leasing consideration. For a discussion of these impacts on uranium development, see the proposed action.

Removal of additional lands from the resource utilization subzone under this alternative would affect an additional five applicants who currently await action on prospecting permit applications. The lost opportunity for exploration on these lands would mean that geological knowledge regarding the nature, extent, and formation of any mineralized zones would not be gained. In light of the many high potential precious metal exploration activities outside the NRA, it appears the long-term gains obtained from preserving the recreational and wilderness values of the park far outweigh the uncertain, relatively short-term economic gains from mineral development.

Conclusion: This alternative would not have a significant effect on the opportunity to develop a mineral resource.

IMPACT ON WILDERNESS LANDS

The objective of management zoning under alternative A would be maximum protection of natural resources. The only difference between this alternative and the proposed action is that the resource utilization subzone of the special use zone would be smaller because all areas meeting the Wilderness Act criteria would be excluded from mineral

leasing. All areas possessing wilderness values would be in the natural zone, which emphasizes preservation and protection of natural resources.

Conclusion: Although no lands are proposed for wilderness designation, the Wilderness Suitability map indicates those lands that meet or potentially meet the criteria of the Wilderness Act of 1964. None of these lands would be affected under this alternative.

ENVIRONMENTAL IMPACTS OF ALTERNATIVE B

A summary of the following impacts is presented in the "Summary" section at the beginning of this document.

IMPACT ON PUBLIC SAFETY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. The 100-year flood has a 1 percent chance of ocurring in any year. The probable maximum flood is the greatest flood that could ever be expected. Probable maximum floods do occur, but the frequency is uncertain; the likelihood in any year is less than 1/10 of 1 percent. Flooding is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor facilities are out of the floodplain. At Boulder Beach all development is on a broad alluvial fan, with protection provided by earth dikes. Also, because flooding at Boulder Beach takes the form of sheet flows up to 2 feet in depth, it is not considered to present as great a danger to human life or property as the concentrated flows in canyons at other areas of the NRA; therefore, no potential victims or damage to structures are shown for Boulder Beach in the impact sections relating to floodplains. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. See the discussion of floodplains and wetlands in the "Affected Environment" section for a more detailed explanation. The DCP graphics for each developed area show the extent of the 100-year and probable maximum floods.

Alternative B would mitigate the flood hazard up to the level of the probable maximum flood primarily through nonstructural measures. These include relocation of facilities out of the floodplains and installation of warning systems. Removal of structures from the floodplains would provide the best protection, structural measures would offer the next best method. Warning systems would provide less protection than either of the preceding methods.

The following is a summary of the flood mitigation proposals for each of the major developments in the recreation area under alternative B. All areas with flood hazards would have warning systems installed even if they were structurally protected.

Katherine Landing. The NPS maintenance area and 15 long-term and all 33 short-term trailer sites would be relocated out of the probable maximum floodplain. Use of North and South Telephone Cove as a primitive use area would be prohibited. The remaining development with the exception of the dry boat storage would be protected to the level of the probable maximum flood through structural measures such as diversion canals and diversion dikes.

Cottonwood Cove. The National Park Service would buy out the concessioner, remove the concession facilities, and operate the area as a day use access point to Lake Mohave.

Willow Beach. The National Park Service would buy out the concessioner and operate the area as a day use access point, with most remaining facilities being relocated and operated at reduced capacity. Such facilities include parking, ranger station, NPS housing and maintenance, restaurant/store, and concession housing and maintenance.

Boulder Beach. The existing earth dikes that protect the developments in the Boulder Beach area would be regraded and reinforced with gabions to protect the area to the level of the probable maximum flood.

Las Vegas Wash. The concession dry boat storage and concession maintenance area would be relocated out of the probable maximum floodplain. Although the launch ramp is in the flood hazard zone, this is the only feasible location. In the event of a flood, a warning system at the ramp would advise incoming boaters to leave.

Overton Beach. Camping would be relocated out of the floodplain.

Temple Bar. The height of diversion dikes would be increased and the channels deepened to contain the probable maximum flood.

A complete discussion of actions that would be taken under alternative B to protect the flood-hazard areas from the effects of the probable maximum flood may be found in the "Alternative Development Concept Actions" section.

It was estimated that 410 people would be in all probable maximum floodplains in the daytime and none would be there at night. This represents 0.4 percent of the people expected to be in the area on a summer weekend day (96,000), and is 92 percent fewer people during the day and 100 percent fewer at night than would be expected under existing conditions.

At Katherine approximately 605 people would be protected from the probable maximum flood by relocating NPS maintenance facilities out of the Katherine Landing floodplain and prohibiting the use of North and South Telephone Cove primitive use area. The removal of the 15 long-term and 33 short-term trailer village sites would reduce the number of people in the probable maximum floodplain by 50 during the day and 100 at night. All the remaining developments at Katherine, except the dry boat storage area, would be protected by structural measures. Structural protection is expected to mitigate the hazard for 410 average summer weekend day users of the probable maximum floodplain. The five people expected to be at the dry boat storage area on an average summer weekend day would be protected by the warning system. All people in the probable maximum floodplain at night would be protected by structures.

Buy out and removal of concession facilities at Cottonwood Cove under alternative B would result in a reduction of 1,455 people in the probable maximum floodplain as compared to existing conditions. The remaining projected 280 occupants of the floodplain would receive no protection from a flood except for the warning system and evacuation plan.

At Willow Beach the relocation of the restaurant, store, campground, ranger station, NPS maintenance and concession housing, and concession maintenance out of the probable maximum floodplain, plus the complete removal of the motel and trailer village, would result in approximately 440 fewer people in the probable maximum floodplain on an average summer weekend day. Because no structural measures would be taken at Willow Beach, the remaining 1,476 people in the floodplain would only be protected by the warning system.

At Boulder Beach approximately 112 additional occupants of the campground and trailer village would mean that an additional 112 people would be at risk in the event of a probable maximum flood as compared with existing conditions. All of the expected 1,371 people (includes the 112 added) in the floodplain would be protected by structural measures and a warning system.

At Las Vegas Wash the situation would be the same as existing conditions, with only the launch ramp in the floodplain. About 40 people could be expected in the launch ramp area during the day, and any hazard they would be subject to would be mitigated by a warning system.

Relocation of the wash campground at Overton Beach out of the probable maximum floodplain would provide maximum levels of protection to approximately 275 daytime visitors and 550 nighttime users on an average summer weekend day. The 40 daytime users of the swim beach would receive no protection from a warning system.

All of the expected 1,167 daytime occupants of the probable maximum floodplain at Temple Bar would be protected by structural measures and a warning system.

Conclusion: After all flood mitigation actions were taken for alternative B, about 415 people in the daytime would remain in the probable maximum floodplain, where the hazard would be mitigated only by warning systems. That is a 92 percent reduction compared to existing conditions. At night no people would be in the areas only protected by warning systems. All other people in the probable maximum floodplain would be protected by structures like dikes and channels. For the 100-year flood there would be 200 people during the day and none at night; only a warning system would provide protection. That is an 84 percent and 100 percent reduction compared to existing conditions.

IMPACT ON PROPERTY IN FLOODPLAINS

Many areas in the recreation area are subject to flash flooding. Flooding is most severe at Willow Beach, followed by Cottonwood Cove, Katherine Landing, and Temple Bar. The hazard at Las Vegas Wash and Overton Beach is much less severe because most visitor facilities are out of the floodplain. At Boulder Beach, all development is on a broad alluvial fan, with protection provided by earth dikes. Callville and Echo bays are the only areas where all facilities are out of the flash floodplain. A more thorough discussion of floodplains may be found in the "Affected Environment" section at the beginning of this volume. The DCP graphics

for each developed area show the extent of the 100-year and probable maximum floods.

Table 21 shows development in the floodplain under each alternative. Alternative B would mitigate the flood hazard up to the level of the probable maximum flood through structural measures such as levees and channels and nonstructural measures such as relocation of facilities out of the floodplain and installation of warning systems. However, the property shown in the flood-hazard zone under alternative B would remain susceptible to flood damage after implementation of flood mitigation measures proposed in alternative B. The cost of replacing structures left unprotected in the 100-year floodplain would be approximately $1.6 million; for replacing those in the probable maximum floodplain, approximately $4.2 million. These costs do not include utilities, furnishings, equipment, vehicles, flood-control devices, debris removal, search and rescue, or expenses of victims.

Conclusion: The costs to replace facilities damaged by the 100-year flood would be approximately 2.5 percent of the costs under existing conditions. The cost to replace facilities damaged by the probable maximum flood would be about 20 percent of the costs under existing conditions.

IMPACT ON RESERVOIR WATER QUALITY

Impacts would be the same as for the proposed action.

IMPACT ON DESERT SPRING ECOLOGICAL COMMUNITIES

These impacts would be the same as for the proposed action.

IMPACT ON SOILS

Soils of the area are extremely variable. Climate, vegetation, parent material, elevation, slope, and aspect all affect their development. They are characterized by a wide range of physical and chemical properties. Texture, permeability, depth, stoniness, organic content, alkalinity, and other properties are highly diverse and change quickly within short distances.

Under alternative B existing developments would be retained, major new areas would be developed, and the number of access points to the reservoirs would be increased. The off-road vehicle recommendations under the proposed action would be implemented. Lakeside roadways would not be extended from access points.

Under this alternative, off-road vehicle drivers would have the greatest number of approved roads to gain access to the reservoir, but once there they would not be able to get to more private areas over approved roadways. This would result in a continuation of the present situation because as visitation increased, drivers would blaze new routes to more

secluded areas. Individuals wishing to hold off-road maneuvers in the desert would probably continue to do so, with soil damage continuing at about the same rate as under the no-action alternative. Research on the rehabilitation of off-road vehicle soil damage and implementation of a rehabilitation program would be initiated as in the proposed action.

The intent of this alternative would be the same as the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative B would be in the amount of acreage contained in the resource utilization subzone. Under this alternative, 320,550 acres would remain open to mineral leasing consideration to achieve the primary objective of this alternative (emphasizing resource utilization without compromising NPS recreational management responsibilities). Alternative B would also increase the amount of land where current prospecting permit applications have been filed, from 11,640 acres under the proposed action to 13,900 acres under alternative B. Existing leases, mining claims, and private mineral rights would be unaffected. Under this alternative, up to 22,100 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 13,900 acres of pending permits (if approved).

Exploration activities associated with prospecting permits and oil and gas leases could result in damage to soils through excavation, erosion, and compaction with additional damage expected from associated excavation and removal for road construction and similar earthwork. Soil nutrients that have developed over long periods of time would be reduced in these disturbed soils by exposure to erosion and accelerated weathering, while soil compaction and abnormally high soil temperatures could also occur. In addition, removal of vegetation and stockpiling of topsoil have been demonstrated to significantly reduce soil microorganisms, which are essential for nutrient cycling and soil development. The reclamation potential of the disturbed area would be reduced unless proper care was taken to mitigate soil damage. Because of the diversity of soils in the recreation area, site-specific soils data would be necessary for detailed impact assessment and reclamation planning prior to mining approval.

Mineral leasing is not expected to significantly affect soils in any area of the park at the present time. Some damage can be expected from sporadic exploration activities; however, the amount of acreage affected would be expected to be less than 300 acres over the next 10 years if the present mineral development trends continued in the area.

Conclusion: The construction of roadways and facilities under this alternative would destroy or severely damage about 238 acres of lithosols and red desert soils and cause minor disruptions in drainage patterns, which would temporarily increase the potential for erosion. The rate of damage and erosion from off-road vehicles would continue at its present level of 30 to 40 acres per year and would only be marginally offset by restoration efforts. Damage to soils from mineral leasing would not be expected to be significant over the next decade, assuming mineral development activity followed current trends.

IMPACT ON SIGNIFICANT NATURAL FEATURES

These impacts would be the same as for the proposed action.

IMPACT ON THREATENED, ENDANGERED, OR CANDIDATE SPECIES

The endangered bonytail chub, Gila elegans, peregrine falcon, Falco peregrinus; and bald eagle, Haliaeetus leucocephalus, are the only federally listed animal species that are known to occur in the NRA. There are no threatened or endangered plant species, or critical habitat in Lake Mead NRA.

There are several federal candidate plants and wildlife that do, or could, inhabit or visit the recreation area. Some of these species are also listed by the states of Arizona and Nevada as comparable species of concern. Table 19 identifies the status and legal classification of all threatened, endangered, or candidate species.

The intent of this alternative would be the same as the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative B would be in the amount of acreage contained in the resource utilization subzone. Under this alternative 320,550 acres would remain open to mineral leasing consideration to achieve the primary objective of this alternative (emphasizing resource utilization without compromising NPS recreational management responsibilities). Alternative B would also increase the amount of land where current prospecting permit applications have been filed, from 11,640 acres under the proposed action to 13,900 acres. Existing leases, mining claims, and private mineral rights would be unaffected. Under this alternative, up to 22,100 acres of the NRA could be subject to mineral development on 8,238 acres of existing leases and 13,900 acres of pending permits (if approved).

Alternative B would place 878,450 acres or 58 percent of the NRA in the natural zone. Known habitat or potential habitat for threatened, endangered, or candidate plants and wildlife would be further protected by placing these areas in either the environmental protection subzone or the outstanding natural feature subzone of the natural zone. Areas open to mineral leasing would be 320,550 acres or 22 percent of the NRA in the resource utilization subzone.

About 22,100 acres of the NRA have the highest potential for mineral development--8,238 acres of existing leases and 13,900 acres of pending prospecting permits (if approved). None of the leases and pending permits are in areas where they could potentially affect any threatened or endangered wildlife. Two existing leases and one pending prospecting permit are located within 5 miles of known locations of candidate plant species. Additional surveys on these leases or permits could reveal additional populations. Potential threats to these plants include physical destruction of individuals or their habitat and illegal collection. When specific mineral development proposals were received in these areas, surveys would be conducted and protective stipulations applied to the

plan of operation, but it is not certain that all potential impacts would be avoided.

Developments under alternative B that could affect threatened or endangered plants and wildlife species include the Fire Mountain developed area and improved access points in the Cottonwood East vicinity and at Detrital Bay. None of the developments would be in areas identified as habitat for these species, but some would be close to identified habitat areas. Any effects on candidate threatened or endangered species would be due to increased visitation in habitat areas near new developments. Peregrine falcons would not be affected.

Areas used by the endangered bald eagle and peregrine falcon are high cliffs well above water. These areas are remote and lightly used only during winter; they are not generally used for nesting. The cliffs are not satisfactory for rock climbing, and direct disturbance on the cliffs would not occur even with an increase of people. Boating use along shoreline areas could affect feeding activities. Although boating use would likely increase as a result of new development at Fire Mountain and at the Detrital Bay access point, it would still remain very low especially during winter and would likely have minimal effect on these birds.

Visitation is now very light in the Cottonwood East vicinity, where the proposed access point improvements could affect the endangered bonytail chub recovery cove. The endangered species recovery team for the bonytail chub would be consulted before locating the access point so as to preclude impacts on this fish. Closing the cove or nearby areas to visitor use would be another mitigating measure applied if needed.

The effects of new development on candidate threatened or endangered plants and wildlife would be further mitigated during the period before construction (about 10 years). Species, when warranted, would be closely monitored as visitation increased. Management recommendations based on this monitoring would allow the areas to be developed with minimal effects on these species.

Conclusion: Impacts on threatened or endangered species resulting from alternative B would not occur. To assure that this assessment is correct, studies will be initiated to evaluate visitors' impacts on the species of concern.

IMPACT ON VEGETATION

Approximately 71 percent of the NRA is dominated by the creosotebush community. This community type is widespread throughout the desert southwest and is the representative low elevation vegetation type in the Mohave Desert. Vegetation typical of higher elevations includes blackbrush, sagebrush, and pinyon/juniper. These vegetation types are common throughout the intermountain region.

Precipitation rates in low elevation communities are generally less than 5 inches annually, while higher elevations receive 5 to 15 inches. Because

of these low precipitation rates, revegetation rates on disturbed sites may be as long as 50 to 75 years.

The intent of alternative B would be the same as the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative B would be in the amount of acreage contained in the resource utilization subzone. Under alternative B, 320,550 acres would remain open to mineral leasing consideration to achieve the primary objective of this alternative. Alternative B would also increase the amount of land where current prospecting permit applications have been filed from the 11,640 acres available under the proposed action to 13,900 acres under alternative B. Existing leases, mining claims, and private mineral rights would be unaffected.

Under this alternative, up to 22,100 acres of the NRA could be subjected to mineral development on 8,238 acres of existing leases and 13,900 acres of pending prospecting permits (if approved).

Impacts to vegetation under this alternative would be greatest if an ore deposit were discovered and production of a mine initiated. Over a hundred acres of vegetation could potentially be destroyed through development of mine surface facilities, access roads, and mine tailings. However, given the history of Lake Mead NRA mineral leasing, this level of development is unlikely. Exploration activities on mineral and oil and gas leases would disturb only a small amount of native vegetation.

Conclusion: None of the impacts to vegetation under this alternative would be significant.

IMPACT ON BIGHORN SHEEP

These impacts would be the same as for the proposed action.

IMPACT ON VISITOR CROWDING/CONGESTION

Existing conditions at the developed areas are extremely crowded and congested on weekends during the summer. Holiday weekends are the worst. Memorial Day weekend has had visitation of 254,000. Annual visitation is around 6.5 million and expected to increase to around 9 million by the year 2000. Currently it is not unusual for visitors at several of the larger developed areas to wait up to an hour to launch their boats and twice that long on a holiday weekend. Several of the popular campgrounds and motels are full during the summer. At several developed areas confusing circulation systems frustrate first-time visitors from easily finding their way around. Illegal parking along road shoulders is a common problem that results when existing parking areas fill.

Alternative B would accommodate increasing visitor use and solve existing crowding/congestion problems by expanding and improving existing developed areas, improving existing access points to the lakeshore, and

providing new developed areas. (For a full discussion of these actions, refer to the "Alternative Development Concept Actions" section.) These actions include many diverse proposals intended to accommodate increasing visitation or solve crowding/congestion. To understand the magnitude of these proposals, the increases in parking, overnight accommodations, and launch ramps are used as examples. Alternative B includes an increase of 1,880 parking spaces (19,660 spaces exist), or an increase of 10 percent. There are 1,755 overnight accommodation units (a unit is either one campsite, one motel room, or one RV site). Alternative B would increase them by 90 units, or an increase of 5 percent. There are 73 launch ramp lanes, and alternative B would add 16, an increase of 22 percent.

Over the life of the plan, visitation is expected to increase by about 68 percent, and visitor facility proposals under alternative B call for capacities to increase 5 to 40 percent beyond existing levels. This disparity between expected use and proposed facility levels indicates that crowding/congestion could increase beyond existing levels. However, it might not get any worse than existing levels, and it might actually be reduced because of proposals that would reduce crowding/congestion but that cannot be quantified. For example, circulation improvements would facilitate vehicle and pedestrian movements in several developed areas.

Conclusion: The facility improvements and expansions proposed under alternative B would tend to hold crowding/congestion near existing levels or result in increased crowding and congestion, even as visitation increased.

IMPACT ON VACATION CABIN SITE RESIDENTS

Lake Mead NRA has three lakefront areas in which sites may be leased for privately owned vacation cabins. These areas are Katherine Landing, which has 39 cabin sites; Stewarts Point, which has 60 cabin sites, and Temple Bar, which has 36 cabin sites. Cabin site occupancy is for personal, not commercial, use. Department of the Interior regulations (43 CFR 21) prohibit granting new leases for new cabin site occupancy within the recreation area. Implementation would affect eight cabin sites at Katherine Landing. Cabin sites at Temple Bar and Stewarts Point would not be affected. Extensions of leases up to five years would continue to be granted until the need for public use of the cabin site areas dictated termination. The determination of public need would be made two years in advance of the common expiration date.

At Katherine Landing eight cabins would be removed and replaced with public facilities, including a 20-table picnic area, four-lane launch ramp, and 325-vehicle parking area. The launch ramp would allow visitors access to a floating facility in the north end of the Katherine zone. Eight cabin site residents would be removed from their permanent or seasonal homes in this area. The social impact resulting from removal of these eight cabin sites would be most felt by the residents that would no longer be able to live or vacation close to the lake. These people would have to relocate to other areas within the recreation area or to communities outside the area. This would be a traumatic event to many

of these occupants, who have spent as many as 30 years in their cabins. Throughout the years, many have invested their time, energy, and creativity in landscaping and home improvements that they hoped to enjoy for the rest of their lives. Any financial compensation they would receive could not alleviate the loss that many would feel in leaving their vacation homes. There could be some economic impact to some of the occupants because the government is not required to relocate renters and lessees. The number of cabin sites adversely affected is eight out of 135 for the entire NRA or 6 percent of the total number of cabin sites.

Conclusion: Cabin site residents at Katherine Landing, Temple Bar, and Stewarts Point would not be affected by this alternative. Cabin site residents adversely affected by the proposal would be those eight cabin sites at Katherine Landing which would be removed and replaced with public facilities.

IMPACT ON TRAILER VILLAGE RESIDENTS

Most of the developed areas around the lakes have concessioner-operated trailer villages for long- and short-term visitors.

The existing number of long-term, short-term, and RV sites available at each area and the proposed alternative B actions are presented below.

Area	Existing Number of Sites (Long/Short/RV)	Alternative B Actions
Katherine Landing	104/39/0	Relocate 15 long-term and all 33 short-term sites
Cottonwood Cove	223/75/0	Remove all from flood-hazard zone
Fire Mountain	0/0/0	Add 50 RV sites
Willow Beach	60/18/0	Remove all from flood-hazard zone
Boulder Beach	215/75/0	Add 75 short-term sites
Las Vegas Wash	0/0/0	Same as no action
Callville Bay	94/6/0	Same as no action
Boxcar Cove	0/0/0	Same as no action
Echo Bay	69/58/0	Same as no action
Overton Beach	19/13/0	Same as no action
Temple Bar	103/13/0	Same as no action
Totals	887/297/0	

The only trailer village residents who would be affected under this alternative would be those relocated because of flood hazard. They include 15 long-term and 33 short-term residents who would be relocated within the Katherine area; all 223 long-term and 75 short-term residents at Cottonwood Cove; and all 60 long-term and 18 short-term residents at

Willow Beach. The residents at Cottonwood Cove and Willow Beach would be most adversely affected, because they would be relocated out of the developed areas entirely. These residents would be safer from flood hazard (discussed under another impact topic); however, there could be social impacts resulting from relocation because these residents would no longer be able to live or vacation close to the lake. This could be a traumatic event to many of these occupants, who have spent as many as 30 years in their trailers. Throughout the years, many have invested their time, energy, and creativity in landscaping and home improvements that they hoped to enjoy for the rest of their lives. There could be some economic impact to some of the occupants because the government is not required to relocate renters and lessees.

Conclusion: Implementation of this alternative would result in temporary disruption of the lives of some long- and short-term residents at Katherine Landing. Long- and short-term residents at Willow Beach and Cottonwood Cove would be most adversely affected by removal of the trailer villages at these locations. Such removal amounts to a loss of 32 percent of all NRA long-term sites and 31 percent of all NRA short-term sites.

IMPACT ON LEVEL OF CONCESSION SERVICES

Table 33 summarizes the level of services to be provided by the concessioner in alternative B.

Conclusion: The level of concession services compared to existing conditions would decrease in five of the nine categories under this alternative. The decrease would range from 9 percent in gas station pumps to 32 percent in the number of long-term trailer spaces. One category--gas docks--would not change. Increases would range from 4 percent in restaurant seats to 61 percent in the number of moorings.

Table 33: Impact on Level of Concession Services, Alternative B

	Trailer Village Long-Term/ Short-term Sites	Motel Units	Restaurant Seats	Store Square Feet	Marina Slips/Moorings	Rental Boats # Houseboats/ # Other	Dry Boat Storage Spaces	Gas Station # Pumps	Gas Dock # Boat Capacity
Katherine Zone									
Katherine Landing	104/39	52	117	3,600	764/0	75/41	210	2	14
Lower Mohave East	0	0	0	1,000	0	0/0	0	0	4
Cottonwood Zone									
Cottonwood Cove	0	0	0	0	0	0/0	0	0	0
Fire Mountain	0/50	25	50	3,000	200/0	0/0	120	0	0
Willow Beach Zone									
Willow Beach	0	0	100	1,000	182/16	0/40	120	0	
Boulder Basin Zone									
Boulder Beach	215/150	44	314	5,500	875/0	0/39	275	0	
Las Vegas Wash	0	0	54	3,300	595/3	0/35	100	0	3
Callville Bay	94/6	0	36	500	755/0	15/33	111	2	
Boxcar Cove	--	--	--	--	--	--	--	--	--
Echo Bay Zone									
Echo Bay	69/58	52	120	9,000	321/0	70/18	97	4	
Overton Beach Zone									
Overton Beach	19/13	0	0	0	0/140	0/6	40	0	3
Virgin/Temple Zone									
Temple Bar	103/13	22	76	1,500	980/0	45/15	200	2	
Totals: Alternative B	604/329	195	867	28,400	4,672/159	205/227	1,273	10	24
Existing Conditions	887/297	218	834	25,600	3,317/99	170/258	1,328	11	24
Net change	-283/+32	-23	+33	+2,800	+1,355/+60	+35/-31	-55	-1	0
Percent change	-32/+11	-11	+4	+11	+41/+61	+21/-12	-4	-9	0

IMPACT ON MINERAL LEASING OPPORTUNITY

The intent of alternative B would be the same as the proposed action in that mineral leasing would be restricted to the resource utilization subzone. The difference between the proposed action and alternative B would be in the amount of acreage. Under alternative B, 320,550 acres of the NRA would remain open to consideration for mineral leasing (an increase in the size of the resource utilization subzone of 171,580 acres over the proposed action). Most of the lands added to leasing consideration would be north of Lake Mead in the Overton Arm, Gold Butte, and Grand Wash areas and near Lake Mohave in the Malpais Flattop Mesa area south of Willow Beach.

Mineral development could take place on the 8,238 acres covered by existing leases within the NRA. Of the 32,600 acres of pending prospecting permits and leases, approximately 13,900 acres would remain available for exploration. The remaining 18,700 acres would be withdrawn from further mineral leasing consideration. Most of the pending applications that would be affected by this withdrawal are for uranium in the Shivwits Plateau zone of the NRA. Existing mining claims and private mineral rights would be unaffected.

The immediate impacts of this alternative on mineral leasing opportunities would be similar to the impacts described under the proposed action--the Shivwits Plateau zone would remain unavailable for further mineral leasing consideration. None of the 17,590 acres of pending permits would be approved, thus preventing any further uranium exploration on the Shivwits Plateau.

The major difference between this alternative and the proposed action is that approximately 60 percent more land would be available for mineral leasing consideration under alternative B.

The highly speculative nature of the mineral resources within the NRA indicates that the long-term gains obtained from preserving the recreational values of the park far outweigh the uncertain, relatively short-term economic gains from mineral development.

Conclusion: This alternative would not have a significant effect on the opportunity to develop a mineral resource within the NRA.

IMPACT ON WILDERNESS LANDS

Alternative B emphasizes maximum use of the resources of the NRA and a broader range of choices and experiences for visitors.

To allow more resource use and to also preserve scenic vistas, this alternative would protect a 1.5-mile-wide corridor of land back from the shoreline of both lakes. This would be different from the proposed action, which seeks to preserve scenic vistas through protection of entire natural features. Alternative B would have the largest special use zone and resource utilization subzone (320,550 acres) of all the alternatives.

Many areas possessing wilderness values would be in the resource utilization subzone and would be subject to mineral leasing. Areas containing significant natural resource values would be in the natural zone. Many of these areas also possess wilderness values.

Although no lands are proposed for wilderness designation, the Wilderness Suitability map in the "Affected Environment" section indicates those lands that meet or potentially meet the criteria of the Wilderness Act of 1964. The following units are keyed by number to that map and include most of the lands in the recreation area that possess primitive characteristics. Boundary lines of the units follow topographic features, access roads, and recreational area boundary lines, section lines, and a line marking a 300-foot horizontal setback from the high waterlines of Lakes Mohave and Mead.

Units 1 and 2 (total, 40,605 acres) center on the Newberry Mountains, which rise to an elevation of 5,600 feet and offer a cool refuge from the heat of the surrounding desert lowlands. Davis Dam, the Mohave power plant, Katherine Landing, and Bullhead City are developments visible from the southern and eastern portions of this unit. The resource utilization subzone would include 3,755 acres.

Unit 3, Nellis Wash (15,870 acres), includes portions of the isolated Newberry Mountains along the western side of the recreation area. Fingerlike drainages and alluvial fans extend eastward from the mountains toward Lake Mohave. Some mining has occurred previously within the unit. All of the lands within this unit would be placed in the resource utilization subzone.

Unit 4, Cottonwood Valley, potentially meets the criteria of the Wilderness Act in spite of outstanding mineral reservations. This 15,295-acre gently sloping outwash provides solitude in a primitive setting to the north of the major development at Katherine Landing. The resource utilization subzone would include 9,592 acres.

Unit 5, the Black Mountains capped by 2,000-foot Mount Davis, provides a scenic background for Lake Mohave. Approximately 17,970 acres are included in this unit. Scattered washes and side canyons transect the Black Mountains from east to west as they wend their way to the Colorado River. The resource utilization subzone would include 10,925 acres.

Unit 6, Opal Mountain (17,635 acres), contains a portion of the Eldorado Mountains, gently rolling hills, and outwashes extending to Lake Mohave. Rugged mountains, secluded valleys, and flat alluvial fans provide opportunities for seclusion in a setting of scenic splendor. The resource utilization subzone would include 12,735 acres.

Units 7, 8, 10, 11, and 12, Fire Mountain and Black Canyon, contain some of the most spectacular and rugged terrain within the recreation area. They consist of steep, barren rocky crags, which begin at an elevation of 645 feet and terminate at an elevation of approximately 2,200 feet. These units consist of 70,470 acres and combine to form the "Black Canyon" of Lake Mohave, which is noted for its hot springs and cool Colorado River. This area is a popular spot for visitors to see sharp and

abrupt canyon walls and a myriad of geology. Units 11 and 12 only potentially meet the criteria of the Wilderness Act because the Bureau of Reclamation has identified these areas as potential locations for reclamation facilities ranging from Hoover Dam modifications to new transmission line corridors. The resource utilization subzone in these units would include 18,571 acres.

Unit 9, Eldorado Mountains, contains approximately 29,665 acres of this picturesque and rugged mountain range. The unit is a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. The resource utilization subzone would include 8,705 acres.

Unit 13, Kingman Wash, contains approximately 40,835 acres. The undulating Black Mountains typify the topography of the region. Access to the unit is provided on all sides by existing road corridors. The resource utilization subzone would include 9,970 acres.

Unit 14, Bonelli Landing, comprises 13,875 acres of mainly alluvial fans and separates the hilly mountainous area of unit 13 from the gypsum beds of unit 21. This unit contains historic mining diggings and some archeological remains in the form of petroglyphs. Access to this unit is by the road to Bonelli Landing and Temple Bar. The resource utilization subzone would include 1,500 acres.

Units 15, 16, and 17, Pinto Valley, comprise approximately 38,340 acres of rugged hills and highly scenic valleys. These units contain Guardian Peak, which is one of the highest peaks within the area and is used as a navigational aid. The northern side of Boulder Canyon is formed by these units, where steep cliffs or barren rock extend into the cool blue waters of Lake Mead in a dramatic fashion. Pinto Valley is much-photographed because of the red sandstone outcroppings that merge with the green desert vegetation and the grays, browns, and yellows of the desert floor. None of these lands would be open to mineral leasing.

Unit 18, Cathedral Wash, contains 18,820 acres. Mountainous terrain representing the northeast extremities of the Black Mountains dominates the area and contrasts with the flat surface of Lake Mead. None of these lands would be open to mineral leasing.

Unit 19, Overton (24,040 acres), consists of flat to "badland-like" lands sloping westward from mountainous terrain to a road corridor east of the recreation area boundary. The unit forms the scenic background for lake users and for shoreline users on the west side of Overton Arm. These flat outwashes lack the spectacular contrasts found in other units and portray a typical desert landscape. This unit has retained its primitive characteristics and affords an opportunity for seclusion and an unconfined type of recreation. The resource utilization subzone would include 13,650 acres open to mineral leasing.

Unit 21--White Hills, unit 22--Temple Bar, and unit 23--Gregg's Hideout, all in the White Hills, offer isolation, scenic views, and historic attractions. This rolling hill country includes some evidence of earlier

mining activities and trails. These activities did not scar the area excessively, and many scars have healed to the point of not being noticeable. Access to the area is possible by car on existing roads, by hiking from developed areas such as Temple Bar, or by boat from Lake Mead. These three units contain approximately 52,130 acres; the resource utilization subzone would include 32,086 of this total acreage.

Units 20 and 24-32 are known as Twin Springs, Scanlon Wash, Hiller Mountains, Hell's Kitchen, Indian Hills, Cockscomb, Grand Wash Cliffs, Iceberg Ridge, South Cove, and Pearce Ferry. The units (total, 135,688 acres) contain rugged mountain ranges that provide a scenic background for the Virgin Basin section of Lake Mead. Gently sloping outwash fans extend from the mountains to plunge abruptly into the reservoir. The resource utilization subzone would include 71,445 acres.

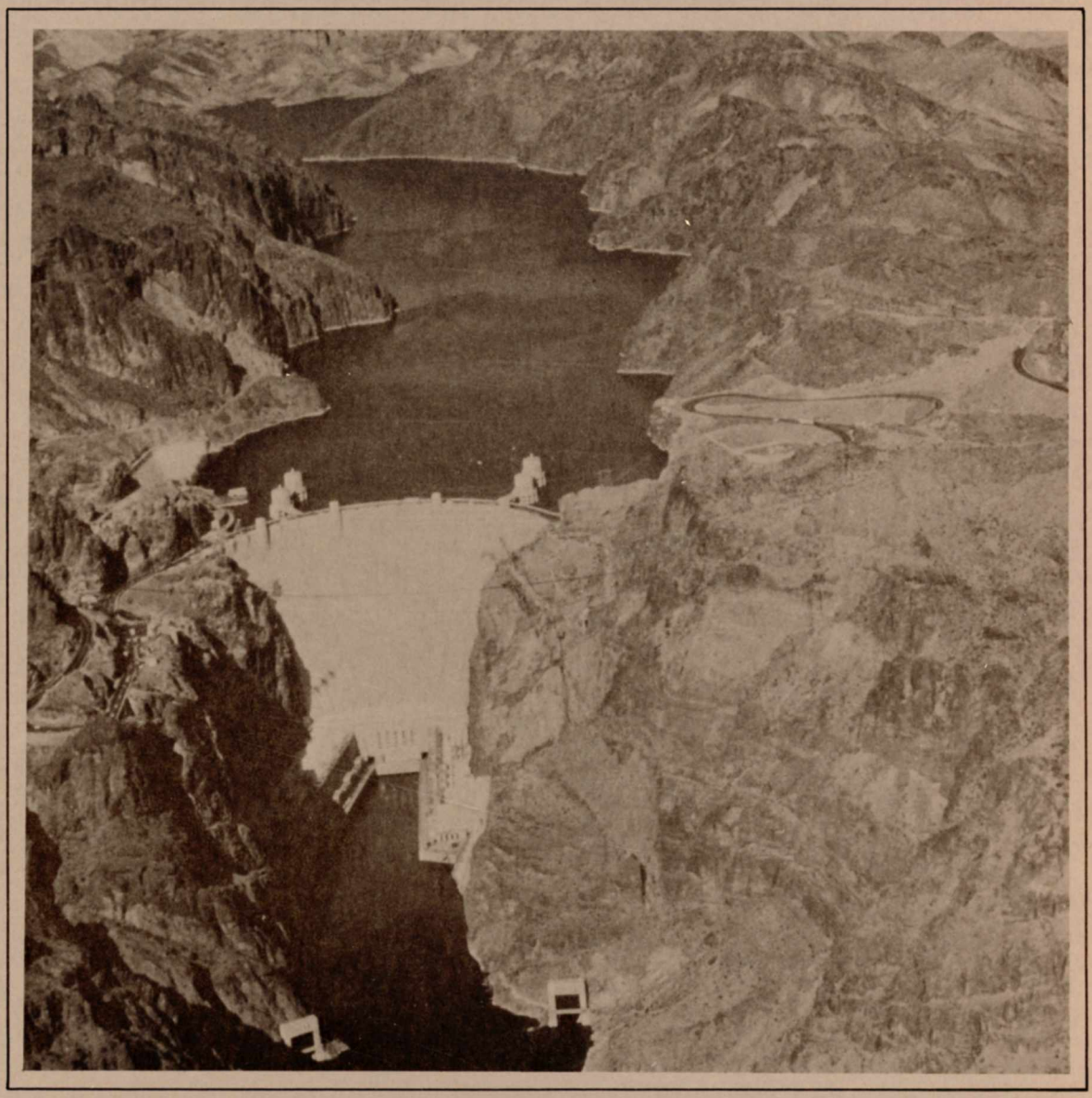
Unit 33, Shivwits Plateau, contains approximately 83,980 acres. Diverse activities occur in this remote section of Lake Mead, ranging from hunting to grazing. Due to a higher altitude, the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests and a wider variety of wildlife than can be found in the rest of the recreation area. Kelly Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon. Because most of the land within this unit is subject to mineral reservation, the unit only potentially meets the criteria of the Wilderness Act. Portions of the unit are narrow and splintered by roads. However, when considered along with the adjacent proposed wilderness in Grand Canyon National Park, it is apparent that these would form a significant contiguous wilderness unit. None of these lands would be open to mineral leasing.

Unit 34--Andrus Point, unit 35--Whitmore Point, and unit 36--Lava consists of approximately 58,430 acres in the northeast sector of the recreation area. Contained within these units are Parashant, Andrus, and Whitmore canyons; all are precipitous side canyons of significant grandeur that drain into the Grand Canyon. The entire area is undeveloped land retaining its primeval character, and it provides an opportunity for solitude or a primitive and unconfined type of recreation in a scenic setting of steep escarpments, colorful red walls, and deep canyons. Archeological sites of several Indian cultures, including the Virgin Anasazi and more recently the Paiutes, are also found here. Adjacent primitive areas of Grand Canyon National Park provide for a contiguous unit of primitive lands extending westward from the Pine Mountains across the Sanup and Shivwits plateaus to the Grand Wash Cliffs. None of these lands would be open to mineral leasing.

Conclusion: Designating 320,550 acres as open to mineral leasing within the NRA would affect 199,312 acres, or 37 percent, of those lands that meet the criteria of the Wilderness Act and 10,132 acres, or 8 percent, of those lands that potentially meet the criteria. Mining activities as a result of mineral leasing in those areas could unnaturally scar the landscape and alter the wilderness character of these lands, making wilderness values on at least part of these lands lost to any future possible designation. These are lands which primarily meet the roadless requirements of the Wilderness Act and are not lands possessing significant resource values.

Table 34: Summary of the Effects of Alternative B
on Lake Mead NRA Lands Meeting or
Potentially Meeting Wilderness Act Criteria

	Acres Meeting the Criteria		Acres Affected by this Alternative	
	Wilderness	Potential Wilderness	Wilderness	Potential Wilderness
1	7,650			
2	32,955		3,755	0
3	15,870		15,870	0
4	0	15,295	0	9,592
5	17,970	640	10,925	0
6	17,635	0	12,735	0
7	15,145		2,255	
8	25,605		16,316	0
9	29,665		8,705	0
10	2,045			
11	0	14,645		
12	0	13,030		
13	40,835		9,970	0
14	13,875		1,500	0
15	17,115			
16	6,680			
17	14,545			
18	18,820			
19	24,040		13,650	0
20	10,610		5,120	0
21	25,580		9,760	0
22	16,665		13,110	0
23	9,885	80	9,216	80
24	22,095		15,770	0
25	8,545		5,120	0
26	14,620		3,960	0
27	7,720			
28	14,020		11,025	0
29	13,895			
30	15,143	460	8,330	460
31	16,480		11,195	0
32	12,100		10,925	0
33	0	83,980		
34	14,905	0		
35	32,215	0		
36	10,710	600		
Totals	558,675	115,700	199,312	10,132
Percentage	100	100	37	8



CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION

SCOPING PROCESS AND ISSUES AND ALTERNATIVES RAISED

Meetings, public workshops, and surveys were an integral part of the scoping process. Their purpose was to identify all issues, alternatives, and impact topics that should be considered in planning and to keep the public informed throughout plan formulation. On April 7, 1982, a notice of intent to do an EIS for the Lake Mead GMP and to begin scoping for that planning process was issued in the Federal Register (vol. 47, no. 67, p. 14962).

Visitor Survey

From Memorial Day to Labor Day in 1978 and Easter week in 1979, questionnaires were distributed to people visiting Lake Mead National Recreation Area. The objectives of the survey were to determine the characteristics of visitors to Lake Mead, what activities visitors were currently engaged in at Lake Mead, and what additional services and facilities were needed at Lake Mead to serve the visitor. Results of this survey are contained in a Denver Service Center report (USDI 1982a).

Spring Newsletter

In the spring of 1982, a newsletter listing those GMP issues identified by the National Park Service was sent to those publics interested in Lake Mead National Recreation Area. From the response, the issues of most concern to the public were as follows:

Wilderness areas should be included in Lake Mead National Recreation Area.

Mining and mineral leasing is acceptable in the recreation area within limits.

Endangered species should be protected.

Visitor contact stations should be supported.

Black Canyon raft trips should be provided.

Areas should be closed when capacity is reached on holiday weekends.

Additional development is needed at Lake Mead NRA.

The tamarisk should be eradicated where it encroaches on beach space.

Planning Team's Analysis

During 1982 the planning team gathered extensive amounts of data. They spent time in the recreation area to familiarize themselves with the area and to identify sensitive resources, problems, planning issues, and alternative solutions. They contacted numerous agencies and individuals during this process. During 1983 and 1984 the analysis continued, while alternatives and their impacts were further specified.

Public Meetings

Four open-house meetings were conducted as part of the scoping process. At Bullhead City, Arizona, 16 people attended; 14 at Las Vegas, Nevada; five at Pasadena, California; and 16 plus a college class of 35 at Santa Ana, California. At each open house, the public was invited to read the graphics on display throughout the room, watch a narrated slide show on Lake Mead NRA planning issues (except Pasadena), and discuss their ideas and concerns with one or more of the National Park Service representatives. Although attendance at the meetings was lower than hoped for, those who came represented a variety of interests and opinions.

The most common issues of discussion at the openhouses were as follows:

Additional land access to the lake is needed for day users and visitors who do not own boats.

More launch ramps are needed around the lake to alleviate the congestion at developed areas.

Trash and sanitation problems at remote coves need to be solved.

Mining and mineral leasing is acceptable in Lake Mead NRA as long as it is not visible and extensive site clean-up requirements are enforced.

No additional, major developments are needed in the NRA.

Some of the additional comments were as follows:

The launch ramp procedure at Katherine Landing is inadequate for the numbers of people who use that facility.

Better land access to Telephone Cove and No Ski Cove is needed for day-use and beach-oriented activities.

Trash was considered a major problem on Lake Mohave.

Some coves need to be zoned for fishing to alleviate the conflicts between fishermen and skiers.

More roads need to be legalized for vehicle access to the lake.

Concern was expressed over any commercial raft trips that might increase use and environmental degradation in the Black Canyon.

Interest was expressed in helping the National Park Service clean up trash around the lake in exchange for a free camping space or other nominal privileges.

A greater National Park Service presence is needed (e.g., more ranger patrols).

Summer Newsletter

In the summer of 1982 a newsletter was sent to those interested in the General Management Plan (GMP) for Lake Mead National Recreation Area. This newsletter summarized the comments from the spring newsletter and public meetings. The newsletter again identified the issues for the plan and modified them in consideration of public comments.

Alternatives Workbook

In December 1982, 309 alternatives workbooks were distributed for the Lake Mead National Recreation Area GMP. An additional 91 workbooks were distributed at a question/answer session. Of the 122 responses, 58 percent were from the mailing, while 42 percent were from those distributed at the recreation area or session.

The return rate for the workbook was 30.5 percent (out of the 400 distributed.)

The parkwide comments were varied, with 31 persons responding to this comment sheet. Approximately half of those making comments selected a preferred parkwide alternative; of these, a majority preferred alternative C (became proposed action).

Of the 48 people who responded to the general development concepts, alternative C was preferred for all developed areas, with the exception of Katherine. This difference at Katherine is a reflection of the cabin site lessees who selected the no-action alternative as their preferred concept.

The following are summaries of reactions to the specific development proposals for each of the nine planning zones:

Katherine Zone, 41 responses

For flood mitigation, access and parking, and launch ramps, a majority of the respondents selected alternative C. However, for the remainder of the development proposals, the no-action alternative was selected. Respondents indicated that Arrowhead and Shoshone coves were preferred for improved access, while Tokyo Bay was selected as the preferred site for a new developed area.

Cottonwood Zone, 29 responses

Alternative C was the preferred alternative for a majority of the respondents for each of the developed proposals. Six-Mile Cove was selected as a location for improved access, with Fire Mountain as the site for new development.

Willow Beach Zone, 30 responses

The no-action alternative was selected by a majority of respondents for: flood mitigation, parking, launch ramp, courtesy dock, swim beach, trailer village, and all concession facilities and services. On the other hand, alternative A was preferred for the picnic area, campground, NPS boat dock and ranger station, and interpretation/ information development proposals. Finally, alternative C was selected for the access, NPS maintenance, and NPS housing proposals. No locations were indicated for either improved access or new development.

Boulder Basin Zone, 28 responses

A majority of the respondents felt that alternative C was appropriate for the launch ramp, courtesy dock, swim beach, ranger station, interpretation/information, NPS boat dock, maintenance and housing, and picnic area proposals. The no-action alternative was preferred for the trailer village, gas station, and gas dock. Alternative A was selected for the remainder of the development proposals, which encompassed concessioner services and facilities, campground, flood mitigation, access, and parking. Improved access was indicated for Boxcar Cove, as well as improvements on Northshore and Lakeshore drives. Few respondents indicated a desired site for new development; of those who did, Boxcar Cove was the favorite.

Echo Bay Zone, 15 responses

Alternative A appeared to be the preference of a majority of the respondents for the development proposals in this zone. However, for cabin sites, trailer village, concession maintenance and housing, and gas station and dock, the no-action alternative appeared to be the preferred alternative. Alternative C was selected for the flood mitigation, launch ramp, and swim beach proposals. Again, few people responded to the improved access issue; of those who did, Stewarts Point was preferred. Rogers Spring was selected for improved interpretive programs. No preferences were indicated for a new developed area in this zone.

Overton Beach Zone, 15 responses

Alternative C was selected for the flood mitigation, access and parking, trailer village, motel, rental boat, gas station, and gas dock proposals. No majority opinions were indicated for improved access or new development areas.

Virgin/Temple Zone, 18 responses

With the exception of flood mitigation, alternative A was preferred for the development proposals. Alternative C was preferred for flood mitigation. Detrital Bay was selected as the site for both improved access and new development.

Gregg Basin/Grand Wash Zone, 17 responses

A majority of respondents felt that the no-action alternative was preferred for this zone. The exceptions were for the access and parking, launch ramp, courtesy dock, swim beach, and picnic area proposals, where alternative C was preferred. Pearce Ferry was selected as an improved access site. Only two people responded to the new developed area issue; they both selected Pearce Ferry.

Shivwits Plateau Area, 10 responses

The no-action alternative was selected by a majority of respondents for all development proposals.

Additional Public Input

In response to public inquiries about the alternatives workbook, an informal question/answer session was held in Las Vegas during January 1983. The primary objectives of this session were: to distribute workbooks to those who had not received them in the mail; to answer questions about the workbooks; and to provide additional information to explain and clarify issues. There were 115 people in attendance.

The following are some of the comments, related to the alternatives workbook, which were made during the course of the meeting:

More road access to the shore for fishing is needed.

The possibilities of concessioner-managed launch ramps and launching fees were raised.

Breakwaters for slips are needed.

Additional roads would be a burden to staffing capabilities.

Need for hobie cat and sailboard launch and use areas.

The number and impacts of houseboats were raised.

Consultation with Agencies During Preparation of the Proposed Plan

On May 3, 1982, a meeting was held for all interested federal, state, and local government agencies; 16 people attended this meeting and included representatives from: Bureau of Land Management, U.S. Fish and Wildlife Service, Bureau of Reclamation, Arizona Department of Game and

Fish, Nevada Department of Wildlife, and Clark County Planning Department.

The agencies were primarily interested in how the planning process would proceed, what the public response was to date, and how and when the National Park Service wanted the agencies involved in the process.

The Arizona Department of Game and Fish was specifically concerned with tamarisk control and wanted to be involved in habitat manipulations related to such controls. They also requested information on federally listed endangered and threatened species for the national recreation area. The BLM expressed interest in the wilderness plan and the results of the visitor survey and carrying capacity studies. Other agencies expressed appreciation for the opportunity to comment at this early stage of the planning process.

Agencies were also contacted for information on numerous occasions. Refer to appendixes B and C for U.S. Fish and Wildlife Service and Arizona and Nevada cultural resource consultations.

ISSUES, ALTERNATIVES, AND IMPACT TOPICS FROM SCOPING

Those Considered

Throughout the scoping process the only full alternatives developed were those suggested by the planning team in the alternatives workbook. They have been modified but are essentially the same as those presented previously in the "Alternatives Including the Proposed Action" section.

The issues addressed in those alternatives are summarized in the "Issues Addressed by the Plan" section at the beginning of this document. Almost all issues raised are addressed. The impact topics considered are described in the beginning of the "Environmental Consequences" section.

Those Not Further Considered

Closing Areas When Capacity is Reached on Holiday Weekends. Closing developed areas to further entry when they become overcrowded is not acceptable to most members of the public. This issue is also sensitive politically and is not a realistic solution today. However, this issue is generally addressed in the "Carrying Capacities" section.

Zoning Some Coves for Fishing. This issue is only addressed indirectly. Areas of concentrated use where use conflicts are the greatest are proposed as flat-wake zones. Directing zoning areas for only fishing would limit too many other legitimate uses.

Air Quality. Problems are in a regional airshed from major population centers and power plants. Even dust from dirt roads is not significant locally by comparison to regional problems. Proposals in any alternative, including projected visitation increases, would not alter existing air quality.

Cultural Resources. As described in the "Affected Environment" section, all known significant cultural resources have been identified. However, none of these will be affected by any alternatives. To ensure protection of currently unknown cultural resources, preconstruction or premineral leasing surveys will be conducted for all land that could be affected by specific construction or leasing proposals.

Land Protection Issues. The General Management Plan will only summarize decisions already made in the Land Protection Plan and will not propose any new actions. The Land Protection Plan had its own assessment. See the "Land Protection" section for a full description of the issues and management direction on boundary revisions, state and private lands, Santa Fe Pacific mineral rights, Arizona indemnity selection program, Hualapai Indian Reservation lands, Bureau of Reclamation withdrawal lands, easements and utility corridors, and special activities on nonfederal land.

Resource Management Issues. The General Management Plan will only summarize decisions already made in the Resources Management Plan and will not propose any new actions except for mining/mineral management and illegal use of vehicles off approved roads. The Resources Management Plan has its own assessment. See the "Resources Management" section for a full description of the issues and management directions on natural resources management--fishing, hunting, and trapping management, tamarisk control, exotic species control, air and water quality monitoring, fire management, threatened or endangered species management, grazing management, and needed research; cultural resources management-- cultural resource surveys, archeological site management, historic site management, contemporary native American concerns, collections management, and needed research.

Road Safety and Maintenance. Most through-highways and many access roads for developed areas within the recreation area are deteriorating and are chronic maintenance problems. Several roads commonly have more than 20 accidents per year and are consistent safety hazards. These problems need attention, but they are being solved in another planning process being done in conjunction with the Federal Highway Administration. Accordingly these issues will only be summarized and not solved in the GMP.

CONSULTATION AND COORDINATION ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

This section includes a brief summary of the comment period and the public meetings following the release of the DEIS in May 1985.

History of Public Comment

The DEIS was released to the public on May 17, 1985, with a comment deadline of July 31, 1985. A Notice of Availability of the DEIS was published in the Federal Register on May 14, 1985.

The public meetings were publicized in the local news media and were scheduled for June 12-24, 1985. A total of seven public meetings were held which were attended by 178 people. An additional three informal meetings were held following the formal public meetings which six people attended.

The purposes of the public meetings were to answer questions, to receive comments on the information and analyses contained in the DEIS, and to record the public preferences for the future of the recreation area. Representatives from the National Park Service briefly presented background information on the GMP and DEIS and the alternatives considered in the DEIS. This was followed by a public comment and question/answer period.

Public Meetings

St. George, Utah - June 12, 1985

9 Public in Attendance

Official Comments

Mesquite City Council would like to see a primitive access and launching area in the Gold Butte, Hell's Kitchen area or across from Overton Beach.

Unofficial Question

How many levels of wilderness are being proposed?

Will wilderness be proposed in final form again after GMP is done?

Is more wilderness proposed now in relation to the 1979 plan?

Are natural fires going to be let burn?

Do you have a resource plan for grazing burros and minerals?

Overton, Nevada - June 13, 1985

44 Public in Attendance

Official Comments

Moapa Valley Town Board (Lois Perkins)

What is going to happen to Overton Beach during the building process?

What facilities will be provided at Overton Beach?

Why can't we stay where we are at in the trailer village?

Is the new store to have piles or underpinning to hold it in place?

Want rangers to remain next to lake for safety purposes.

Should do all the earthwork in new trailer village then do the work in the old trailer village after moving the people to new area.

Protect the trailers during the summer while in storage.

Expensive to move the trailers - some of the people do not have the money to move.

Have an alternate in budget to move the dirt twice.

Garbage containers and restrooms at Stewarts Point.

Put improvements at Stewarts Point away from water intake which is used for water source.

If water comes up and inundates the trailers then they have to move and they will gamble that the water will not come up again - leave them in present place.

Boulder City, Nevada - June 17, 1985

41 Public in Attendance

Official Comments

Forever Living Resorts (Mr. Ham)

> Growth potential (Table One) needs to be changed to reflect at Callville that 180 long-term and 60 short-term sites be added, 90 campsites be added and 5 acres of swim beach, 100 motel units, 50 picnic sites and 1,200 slips be added. At Cottonwood, the plan should reflect 300 long-term sites, 100 short-term sites, 100 campsites, 7 acres of swim beach all should be added.
>
> Proposed action is a good one, but Alternative "A" should be considered strongly.

Shivwits should be in wilderness with no mining occurring.

Must preserve scenes into canyon.

Objects to landing strip and any additional facilities on the Shivwits.

Eliminate mining.

All pending applications for mining outside the lands shown on the plan whould not be granted.

Correlate wilderness in the Wilson Range and Bowl of Fire with Bureau of Land Management.

Do not allow mining next to Highway 93 in the Wilson's.

Where is Alternative "C" - or the proposed action?

Why is the fishing going downhill - you should improve it?

Las Vegas, Nevada - June 18, 1985

28 Public in Attendance

Official Comments

Sierra Club - President Local Chapter

Concur on proposal, but would like to see Alternative "A" implemented.

Install chart like Table Two which has alternatives and impact perameters such as impact to sheep, water quality, soil erosion, acres of development, cost to National Park Service, and to Concessioner, etc.

Define terms of visitation which you will allow for the carrying capacity and optimum use.

Indicate current staff and budget and percent of budget and increase in personnel to serve the added development. Should equal projected visitation.

Sierra Club Member

Close Shivwits to mining.

Uranium production in United States has decreased world wide so the demand is not great.

Plants are closing and prices down on uranium.

Demand is low.

Sierra Club Member

Protect natural and scenic areas.

Demand is low.

Sierra Club Member

Protect natural and scenic areas.

Must reduce Resource Utilization Zone so as you hike you will not run into a zone of mining. Not just visible from road.

Oppose any development on Shivwits.

No facilities on Shivwits - use no action.

Talk with Bureau of Land Management on adjacent wilderness.

Use Alternative "A" for Resource Utililzation Zone.

Preserve on U.S. 93 the visual view. Do not allow mining.

Do not allow existing applications for mining to be processed outside of plan limits.

Likes Alternative "A", but proposed action is an acceptable alternative.

Must protect natural and scenic and historical resources.

Shivwits must be put into wilderness. Do not put any other facilities on it.

Bowl of Fire and Mount Wilson should be in wilderness.

Close Shivwits to leasing and mining.

General Comments

Should address the overcrowding problem by limiting access to remote areas.

Are budget cuts going to affect lake patrols?

Can you use helicopters to manage Shivwits instead of fixed wing?

Are the cabin sites to be removed in any alternatives?

What is potential wilderness?

Are you going to upgrade your flashflood warning systems?

When will you trade or buy out Santa Fe inholdings?

How can Sierra Club assist you in getting funds for purchase of inholdings?

Phoenix, Arizona - June 19, 1985

6 Public in Attendance

Official Comments

Rex Maughan - Same comments as voiced by Mr. Ham of Forever Living Resorts.

George Byers - Santa Fe Pacific

Is willing to exchange their lands and was hoping the details of an exchange would be in the document.

Mineral potential is great in the area and was curious who you talked to about the mineralization of the area.

Black Mountains very high potential for minerals and was ignored.

Who did your study and what were his qualifications - no professional geologic input.

Other agencies do know a lot about the minerals - should consult.

Should address the Sierra Club lawsuit.

Do not develop anything on the Shivwits, it will only hurt the isolation.

Do not allow any mining on the Shivwits.

Proposed development is the same as Alternative "B" - full development. Why?

These lands at Shivwits are actually the Grand Canyon.

Support Alternative "A".

Need good flood control for area.

Need more parking at Temple Bar.

Do not remove any cabin sites at Temple Bar.

Most of the time no visitors at Temple Bar.

Bullhead City, Arizona - June 20, 1985

23 Public in Attendance

Official Comments

Is a larger swim beach going to be constructed at Telephone Cove?

Are the cabin sites at Katherine going to be retained?

Which eight cabin sites are going to be removed?

The cabin site point is too small for any use such as lauching, too deep for swimming, too small for camping.

Keep swim beach open.

Need toilets at Telephone Cove.

Do not like Alternative "A" because it calls for removal of cabin sites.

What would trigger the use of the cabin sites in the future.

Chamber of Commerce - need much more parking for restaurant.

Need much more parking for boaters also.

Use the big basin this side of Cottonwood for more people.

Many days the campground at Katherine is empty.

General Comments

Has there been a date set for us to move from the cabin sites?

Can we again after the 5 year period sell our interest in the cabin sites?

Can we transfer our interest in the cabin sites?

Where on Lake Mead and Lake Mohave are restrooms - should publicize so they can use them.

Are you selling or trading the lands at the cabin sites to the state?

Should develop the Nevada side of the lake.

Flood control needed.

Is the concessioner going to be able to use the cabin site area for development?

Pasadena, California - June 24, 1985

17 Public in Attendance

Official Comments

Extend leases for 10 to 25 years on all cabin sites.

At Temple Bar crowding only occurs on holidays.

Katherine Trailer Village Residence

Need additional launching ramp at Katherine - possibly between Katherine and Cottonwood.

Make Telephone Cove a swim beach.

Extend cabin site leases--7-10 years.

Like proposed action the best.

Which eight cabin sites will be removed?

General Comments

Are condominiums and motels going to be allowed to be built in the cabin site area at Temple Bar?

Can we get more than 5 years on a lease?

What happens to the lease on a cabin site when you die?

Why does the concessioner get a long lease period and the cabin siters with a substantial amount of money invested only get a short lease?

Informal Meetings

Mining Interests - June 26, 1985

Three Firms Represented
British American Mining Corp.
Energy Fuels
Uranerz USA, Inc.

Are all of the previous lease applications going to have to be redone when the process is reopened or do they stay in the same priority as they were before the moratorium?

Is the Resource Utilization Zone what was left after everything else was recorded?

Does a mineral survey need to be done before it possibly goes into wilderness zoning?

The fact should be known that the Shivwitz Area has a very high potential for mineralization and for the finding of valuable sources of uranium.

Mining interests are not here to destroy the land and will agree to major reclamation projects after mineral extraction occurs.

What is the possibility of going in and mining one, two, or three breccia pipes as a trail on the Shivwitz.

Before the National Park Service makes a final decision on the mining that can take place on the Shivwits they should know all of the possible mineralization which has occurred there and armed with the best knowledge of the area, then make a decision. Don't base your decision on a literature search alone.

Hualapai Indian Tribal Council - June 28, 1985, Peach Springs, Arizona

Many sacred grounds and burials are or have been disturbed in the past in the areas adjacent to the Colorado River.

Would like to begin planning for a development at Diamond Creek and at a site on the west boundary overlooking the river. This site does have easy access to Meadview area from the western boundary.

They are going to try to become more self supporting by opening up developed areas on the river and also by working with mining operators looking for uranium. Their funds are also being cut back from Bureau of Indian Affairs.

Sierra Club, Mark Bird - July 15, 1985, Boulder City, Nevada

Presented and discussed written comments on the GMP/DEIS.

LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE STATEMENT WERE SENT OR DISTRIBUTED

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
    Forest Service
    Soil Conservation Service
Department of Defense
    Department of the Army
        Corps of Engineers
    U.S. Air Force
    Coast Guard
Department of Energy
    Federal Energy Regulatory Commission
Department of the Interior
    Bureau of Land Management
    Bureau of Mines
    Bureau of Reclamation
    Fish and Wildlife Service
        National Fish Hatchery
        Region 2
    Geological Survey
    Grand Canyon National Park
    Mining & Minerals Service
    National Park Service
Department of Transportation
    Federal Highways Administration
Environmental Protection Agency
Federal Emergency Management Agency
Western Archeological and Conservation Center Library

State, Local, and Other Agencies

Arizona Dept. of Transportation
Arizona Department of Fish and Game
Arizona Governor
Arizona Office of Economic Planning and Development (clearinghouse)
Arizona Office of Tourism
Arizona State Historic Preservation Office
Boulder City Mayor
Bullhead City Library
Bunkerville Town Board
City of Las Vegas
Clark County Board of Commissioners
Clark County Department of Comprehensive Planning
Coachella Valley Water District
Colorado River Board of California
Department of Boating and Waterways (California)

Lake Havasu City
Lake Havasu State Park
Las Vegas Convention/Visitors Authority
Las Vegas Mayor
Mesquite Town Board
Moapa Valley Town Board
Mohave County Planning and Zoning
Nevada Department of Transportation
Nevada Department of Wildlife
Nevada Division of Forestry
Nevada Division of State Parks
Nevada Governor
Nevada Magazine
Nevada State Clearinghouse Program
Nevada State Historic Preservation Office
Nevada State Planning Coordinator
Phoenix Public Library
San Diego Public Library
Searchlight Town Advisory Board
Tonto National Forest
Upper Colorado River Commission
Utah Department of Natural Resources
Valley of Fire State Park

Tribes and Local Governments

Chemehuevi Tribe
Colorado River Indian Tribes
Fort Mojave Indian Tribe
Hualapai Tribal Council
Kaibab Band of Paiute Indians
Pahrump Valley Paiute
Paiute Indian Tribe of Utah

Non-Government Organizations

AORCC
Arizona Center for Law
Arizona Daily Sun
Arizona Natural Heritage Program
Arizona Republic
Audubon Society, Red Rock Chapter
Boulder City News
Chambers of Commerce:
- Boulder City
- Henderson
- Kingman
- Las Vegas
- Virgin Valley

Citizens Utility Co.

Desert Dispatch
Eagle Standard
Katherine Cabin Sites Association
Kingman Daily Miner
Lake Havasu City Herald
Las Vegas Review Journal
Las Vegas Sun
Las Vegas Tribal Council
Meadview Civic Association, Inc.
Moapa Business Council
Mohave Valley News
National Parks & Conservation Assoc.
National Wildlife Federation
Nevada Appeal
Nevada State Journal/Gazette
Radio and TV Stations

Community Cable	KFSE	KORK
KAAA	KLAS	KRAM
KBAS	KLAV	KRRI
KCLS	KLUC	KTNV
KDWN	KLVX	KVBC
KELK	KNPR	KVEG
KELY	KOLO	KVVU
KENO	KONE	
KFMS		

San Diego Union
Sierra Club, Las Vegas Chapter
Sierra Club, Legal Defense Fund
Sierra Club, South Chapter
Southern California Edison
Temple Bar Leaseholders Association
University of
- Arizona
- Nevada, Las Vegas
- New Mexico
- Northern Colorado
- Southern California

Valley Herald and Lake Mead Monitor
Washington County News

Individuals

Approximately 280 individuals.

COMMENTS AND RESPONSES

A total of 36 written comments were received on the draft EIS. Of these, eight were from federal agencies, four were from state agencies, two were from local agencies, eight were from companies and organizations, and 14 were from individuals. All written comments have been included in the final EIS.

Responses were made only to substantive comments on the draft EIS. Comments were considered to be substantive when they questioned, with reasonable basis, the accuracy of information in the draft EIS; questioned, with reasonable basis, the adequacy of the environmental analysis; presented reasonable alternatives other than those presented in the draft EIS; or caused changes or revisions in the proposed action. No attempt was made to address comments stating a position or an opinion.

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

July 19, 1985

REPLY TO ATTENTION OF

Office of the Chief
Environmental Resources Branch

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

We have reviewed the Draft Environmental Impact Statement (EIS) for the Draft General Management Plan and Alternatives for the Lake Mead National Recreation Area, as requested in a letter from your office.

1 The proposed plan does not conflict with existing or authorized plans of the Corps of Engineers. A separate letter has been sent from our Construction-Operations Division which summarizes the permit requirements and procedures of our Regulatory Program as they would apply to the proposed Management Plan. We have no additional comments on the EIS.

Thank you for the opportunity to review and comment on this document.

Sincerely,

Robert S. Joe
Acting Chief, Planning Division

390

1 Comment noted, no response required.

Department of Energy
Western Area Power Administration
Boulder City Area Office
P.O. Box 200
Boulder City, NV 89005

JUL 12 1985

Refer To: G1010

Mr. Jerry D. Wagers,
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

Thank you for the opportunity to review volumes 1 and 2 of the draft Environmental Impact Statement for the management of Lake Mead National Recreation Area.

Western's comment is as follows:

1 We noticed that the documents do not address utility corridors. As you are aware there are at least two existing transmission line corridors crossing the Colorado River below Hoover Dam. With the rapid development in the western part of the Las Vegas Valley it may be necessary that Western find future transmission paths out of Mead Substation adjacent to the recreation area. Therefore, we suggest that a discussion regarding utility corridors be included in the EIS.

Corridors could be located in the fringe areas on the west side north of Boulder City; on the east side of the LMNRA, e.g., Spring Canyon Project; or other areas. We would work with your office to locate the necessary corridors.

Sincerely,

G. J. Giles
Assistant Area Manager
for Management Services

1 The National Park Service has contacted the Western Area Power Administration and will work with the Bureau of Reclamation and Department of Energy on corridors necessary for projects identified in this document. These include the possible development of the Spring Canyon pumped-back storage project, which will require a corridor from the Spring Canyon site south to the Mead-Liberty transmission corridor. This 200-foot-wide corridor will cross approximately 7 miles of NRA lands. A proposed inland intertie, which passes through the NRA on its way from Oregon to Arizona, will require a 6-mile-long corridor running next to the NRA boundary in the Las Vegas Wash area adjacent to the city of Henderson. Neither of these corridors will affect wilderness areas.

Three additional utility corridors cross the NRA area below Hoover Dam. Once these corridors are full, future transmission lines or other utilities originating and terminating outside the NRA will have to be routed around the NRA and cross the river south of the NRA boundary.

IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEVADA STATE OFFICE
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

1793
(NV-920.3)

JUL 29 1985

MEMORANDUM

To: Jerry D. Wagers, Superintendent, Lake Mead National Recreation Areas, Boulder City

From: State Director, Nevada

Subject: Lake Mead Draft General Management Plan

Attached are our comments on the Draft Lake Mead Environmental Impact Statement. As BLM maintains certain regulatory responsibilities as to mineral development, we keyed our comments in this area.

Generally, the mineral analysis needs to be reviewed and updated with information generated since 1980. The conclusions that elimination of mineral leasing in 88% of the National Recreational Area would not affect the current or future mineral and fossil fuel production locally or nationally does not appear to be adequately supported in the analysis.

If you have any questions or need more information regarding this matter, please contact Tom Leshendok, Deputy State Director, Mineral Resources, at (702) 784-5676.

1 Enclosure:
Encl. 1 - Review of Lake Mead Draft General Management Plan

392

Review of Lake Mead
Draft Management Plan - Minerals

General

National Park Service (NPS) continuously states that there is very little likelihood of finding sufficient mineral to make a lease possible, anywhere within the National Recreation Area (NRA).

1 This plan makes no mention of the fact that any leasing of minerals, through rentals and/or royalty payments, provides revenue to the Federal Government.

Appendix G: Evaluation of Mineral Resources

2 The evaluation of mineral resources needs to be updated. A verbal discussion with the author, Mr. Robert D. O'Brien on July 18, 1985, disclosed that he had only done on-the-ground reconnaissance of the area north of Cottonwood Cove, south of Temple Bar; and a helicopter reconnaissance of the Shivwits Plateau area prior to current uranium discoveries. He has not examined 80 percent of the NRA, in even a reconnaissance capacity. Most of his report is based on Longwell et al., 1965, Geology and Mineral Deposits of Clark County, Nevada, which in itself presents very little information on the Lake Mead NRA.

Reports by others that do go into more detail on the Lake Mead NRA were apparently unknown to Mr. O'Brien, which is unfortunate and would have given better depth to his report and would have saved several misstatements and omissions. Five of these reports are listed below.

Hewett, D.F. et al. 1936. Mineral Resources of the Region Around Boulder Dam U.S.G.S. Bulletin 871.

Sanderg, C.A. 1984. Petroleum Potential of Wilderness Lands in Nevada. U.S. Geological Survey Circular 902-H.

Scarborough, R.B. 1981. Radioactive Occurrences and Uranium Production in Arizona. Arizona Bureau of Geology and Mineral Technology Geological Survey Branch.

Schrader, F.C. 1909. Mineral Deposits of the Cerbat Range, Black Mountains and Grand Wash Cliffs, Mohave County, Arizona. U.S.G.S. Bulletin No. 397.

Wilson, E.D., Cunningham, J.B. and Butler, B.M. 1967. Arizona Lode Gold Mines and Gold Mining. Arizona Bureau of Mines Bulletin No. 137.

3 Additionally, there have been two exploratory oil wells drilled in the vicinity of the NRA since 1980. The USGS has rated several nearby WSAs having low to medium potential for future petroleum production. The region including the Muddy Mountains and nearby related rocks, is considered to have the best potential, and the older sedimentary rocks in extreme southeast Nevada and the adjacent lands in Arizona have a low potential.

1 The NPS organic act and the Lake Mead enabling legislation allow mineral leasing only where it will not adversely affect park resources or their administration. Only when the Park Service can determine that no adverse effects will occur can it grant consent to leasing. Generation of revenue is not a criteria in the decision. Thus far in the history of leasing at Lake Mead, no lease has ever been developed and no royalties have been generated on the nearly 300 leases that have been issued. The Park Service has reviewed nearly 700 lease applications during this period and is required to complete environmental compliance on each application or group of applications. The annual rental charge for leases at Lake Mead is small compared to the cost of reviewing applications.

2 In January 1983, Robert O'Brien, a mining engineer, submitted his report to the National Park Service concerning mineral potential in the recreation area. This report was prepared as a summary of known information and was a year old when the mineral portions of the GMP were written. The information was supplemented in 1985 by a senior staff geologist of Morrison-Knudsen (M-K) Engineers, Inc., of Boise, Idaho. Both papers were based on research of the U.S. Geological Survey (USGS), including CRIB listings; U.S. Bureau of Mines (USBM), including MILS listings; state geologic survey; state bureau of mines; and other publications.

Of the five named publications, only one was specifically mentioned in any of the NPS reports. This was the most recent report, Sandberg, C.A. 1983, USGS map I-1537, circular 902-H. The other reports are not specifically listed as being used, although some of the dates on these reports were from 1909, 1936, and 1967. Both contractors were trying to get the most up-to-date information available. The M-K report alone listed 63 different reports upon which its conclusions were based, as well as field data collection. In addition, the Park Service used the 1985 report, "Principal Deposits of Strategic and Critical Minerals in Nevada," USBM IC 9035, by N. T. Lowe, R. G. Raney, and J. R. Norberg, for supporting information.

The Park Service believes that it has adequately reviewed the literature and collected necessary field data upon which to base its management decisions.

3 Our analysis included two exploratory wells drilled by Mobile Oil Corporation in 1979 and 1980. These were the last wells we were aware of at that time. Both these holes were dry. Information provided to us recently in the M-K report indicates that three additional wells have been drilled in the area since 1980. All of these holes were reported to be dry.

The M-K report agrees with your conclusion that the majority of the NRA has low potential for future petroleum production. The area of greatest potential for oil and gas, lying north of the lake on the Nevada side, has been subject to extensive oil and gas leasing in the

4 Page XIX, Impact on Soils. The statement is made that under the proposed action only about 300 acres of soils would be affected by mining over the next 10 years. This is 1% of the total land under lease/permit application within the NRA. Under the no action alternative, the amount of disturbance is anticipated to be the same. Under the proposed action, statements such as "Up to 30,000 acres of the NRA could be subject to mineral development..." misleads the reader into thinking that up to 30,000 acres would/could be damaged by leasing, when in reality, only about 1% of this number is actually anticipated to be disturbed by mining over a 10-year period, an average of 30 acres per year. This is admitted to in the last sentence of the paragraph, the least likely sentence to be read or remembered. The actual acreage anticipated to be mined should be moved up in the paragraph, and references to 30,000 acres to be leased should be dropped down in the paragraph and qualified with a statement to the effect that only about 1% of this acreage would ever be subject to actual mining (at a rate of 5-10 acres, per mine underground shaft).

5 Page XX, Impact on Significant Natural Features. The majority of breccia pipes with mining potential are not visible from Whitmore Point. Any that are visible, could be mitigated on a case-by-case basis rather than have the entire area of an important potential uranium province closed to all mining.

6 Page XX, Impact on Vegetation. The report states that at worst, several hundred acres could potentially be destroyed through mining, and yet no mention is made of the analogous effects on the plant community of new flood prevention dikes, new campgrounds, new concessions, visitor centers, new view and access roads and other improvements. Revegetation can also be required after mining.

7 Page XXIII. The proposed Draft Management Plan (DMP) would eliminate 88 percent of the NRA to leasing of any mineral. The statement is made that the proposed action "...would not significantly affect the current or future mineral and fossil fuel production locally or nationally." Considering that a new uranium district has been discovered in the Shivwits Plateau area and one of the few active high grade uranium mines in the U.S. is located a short distance from the NRA, this is a misleading statement. A large potential for uranium, a limited mineral resource on a national scale, is present in the Shivwits Plateau area. Active mining and exploration by several companies is currently underway throughout the area. The potential benefits to local economies through jobs and infusion of monies into the local economies by these companies is significant. Although uranium is currently in a short term depressed market, on a long term basis care needs to be taken as to arbitrarily shutting off a significant domestic national resource.

8 Page 48. The Santa Fe Railroad owns the mineral rights to 55,000 acres (alternating sections) of the Shivwits Plateau area. The NPS should discuss the affect of the plan on these lands, especially if the intent is to declare these lands as closed to mining.

9 Page 67-68. The other actions for Lake Mead NRA, including the proposed DMP, were triggered by the tremendous increase in numbers of visitors putting heavy pressure on a selected number of areas within the NRA, primarily the boating, boat launching, swimming and near shoreline areas, and secondarily by off-road vehicle use in other areas. As admitted to frequently in the DMP, very little pressure from mining is expected for at least the next ten years. To preclude 90 percent of the NRA from mineral leasing is unfair to the public without adequate mineral analysis as to potential.

past. No drilling activities have ever been proposed for oil and gas leases which have been issued in this portion of the NRA. Since the draft EIS was released for public review, 6,400 acres of existing oil and gas leases in the Pinto Valley area were relinquished by the lessee, presumably due to lack of oil discoveries in adjacent areas. A total of 14 oil and gas wells drilled in the area adjacent to the NRA in the Muddy Mountains vicinity have been dry. Thus, although the area may be geologically favorable for oil and gas deposits, all previous exploration activities support the conclusion that preventing future oil and gas leasing in this area of the NRA will not have a significant impact on the petroleum industry.

4 The section referred to has been revised in the final EIS to clarify the issue.

5 Whitmore Point and the road leading to it provide spectacular views of both Whitmore and Parashant canyons, as well as the Grand Canyon country. Activities associated with mining anywhere in these canyons would be highly visible from this plateau, particularly the significant upgrading of existing roads and associated daily traffic from transporting unprocessed ore to the mill and transporting personnel and supplies to and from the mine site. Currently, views into the canyons are rarely interrupted by vehicles traveling the primitive roads. Mining in this area would greatly increase the number, frequency, and character of vehicles (pickup vs. large haul truck) traveling these roads. Mitigation of noise and dust is primarily done through water use, which is also in short supply. Therefore, mitigating the effects of noise and dust generated by truck traffic and the highly visible nature of a newly widened and constantly maintained road would not be feasible.

6 The text in this section has been changed to add similar effects of development.

7 The effect of the proposed action is to reduce the acreage open to leasing from the current 1,162,550 acres to 148,970 acres, a reduction of 87 percent. Although the Shivwits Plateau portion of the NRA will be closed to future exploration and leasing, the effect on the local and regional uranium development opportunities is minimal. Only a small portion of the total number of known breccia pipes in the Grand Canyon region are found in the NRA. It is unknown if any pipes in the NRA contain commercial grade uranium deposits; however, two of the pipes have been drilled in the past for uranium and no commercial grade deposits were found. Two other pipes will remain available for exploration in the NRA under all of the alternatives. One is on the unpatented Copper Mountain claim group, which is currently being explored. The other is on a mineral lease owned by Energy Fuels Corporation. NPS actions in the GMP have no effect on development opportunities on adjacent lands, and therefore, opportunity for exploration and development of uranium deposits locally has not been affected significantly.

8 The first paragraph on page 294 of the draft EIS discusses the effect of the proposed action on nonfederal mineral rights.

COMMENTS

10 Page 193. Shivwits Plateau, is the "...most isolated and least visited..." area in Lake Mead NRA. "It is actively grazed and visitors are generally limited to hunters...." This region has the highest potential for mineral leasing and the lowest visitation and use. To close this area to mining seems short sighted.

11 Page 200. "Uranium occurs in a series of breccia pipes, diatremes, silica plugs, kimberlite pipes, and marrs throughout the Grand Canyon region...." A nearly totally erroneous statement. Uranium has not been located in any diatremes, silica plugs, or kimberlite pipes (there are no kimberlite pipes in the Grand Canyon region.)

12 Page 200-203. When referring to uranium bearing breccia pipes, the report states that "Most of these geologic features have been explored for their copper, silver and gold content." The report should have stated that the breccia pipes, that are accessible by foot, have been examined when recognized. Breccia pipes are very difficult, geologically, to spot. Very sophisticated technology and highly trained geologists, with extensive experience in breccia pipe occurrences, are needed to locate breccia pipes, complimented by careful geochemical, geophysical and radiometric surveys. Only during the past several years has either the expertise or equipment been available to locate these breccia pipes. Several have been located by helicopter survey and other airborne techniques.

For example, prior to the current exploration efforts there were four known uranium bearing breccia pipes in Parashant Canyon. Now there are 11 known uranium bearing breccia pipes in Parashant Canyon, two with major potential for uranium mining.

13 Page 203. "Uranium is only suspected as a companion mineral with the copper...." In 1981, prior to the recent finds in the Shivwits Plateau - Parashant Canyon area of uranium bearing breccia pipes, Robert Scarborough authored Radioactive Occurrences and Uranium Production in Arizona, published by the State of Arizona Bureau of Geology and Mineral Technology. The excerpts following show how misleading the above statement is:

> "The Copper Mountain mine contains uranium and base metal mineralization in fractures around periphery of pipe-like collapse structure. Workings are in Supai Fm., above an unconformable contact with Redwall limestone. The grade in the ore has been estimated at .13 - 14.1% U_3O_8.

14 The Chapel mine, located in NE1/4, Section 25 of T. 33 N., R. 10 W., in Parashant Canyon produced 1.08 tons of ore at .23% U_3O_8, 4.02% Cu, three analysis showed U_3O_8 levels of .34%, .31%, and .31%. Autunite, uranophane and copper minerals in Supai Sandstone and/or Hermit shale. A breccia pipe structure. Produced in 1954.

> The Copper House mine, #1 and 2, in Andrus Canyon just outside recreation area boundary. Sections 1 & 2, T. 32 N., R. 11 W. Several analysis for U_3O_8 show .18% to .165%; and .01% V_2O_5 and 3.99% Cu.
>
> Copper House Colition #2, Sections 1 and 2 of T. 32 N., R. 11 W., near Copper House #1. Analysis .048% U_3O_8, .02% U_2O_5, 4.57% Cu."

These mines were explored (and mined in one case) for copper, not uranium. Recent exploration efforts have shown uranium values in excess of .5 percent, in several cases.

RESPONSES

9 NPS management decisions concerning zoning are based on protection of natural and cultural resource values and recreational needs, not on mineral resource values or occurrences. As a result, the areas open or closed to mineral leasing are not located according to known mineral potential or lack of potential. However, in analyzing the impacts of the proposed action, we have considered the mineral potential of the area. The NPS understands that the zoning proposal will result in exclusion of some medium and high mineral potential sites from mineral leasing, but this restriction is minimal compared to other available federal acreage of similar medium or high mineral potential which remains open to such mineral exploration and development outside the park. The proposed management zoning will provide necessary protection for park values within the NRA without greatly affecting the total availability of medium to high mineral potential sites in the region or the nation as a whole. See the revised discussion on minerals in the "Affected Environment" section of volume II.

10 Management zoning decisions for the Shivwits Plateau were based on resource values, not on current uses such as grazing or low visitation levels. The Park Service is charged with protecting the resources of the area and this mandate is not tied to particular visitation levels.

11 This comment has been revised in the final EIS.

12 Statements referring to uranium occurrence in breccia pipes have been clarified in the final EIS. In reference to the number of known breccia pipes in Parashant Canyon, as early as 1977 there were nine known pipes, four of which occur outside the NRA in Parashant Canyon. The National Park Service authorized exploration of breccia pipes in Parashant Canyon in the late 1960s and 1970s. No uranium exploration proposals have been received in recent years, with the exception of the recent drilling proposals on the Copper Mountain mine pipe, which were approved. No past exploration efforts in the NRA have resulted in development of uranium deposits.

The Park Service has not approved any recent exploration within the NRA, except for the Copper Mountain pipe, so it is not clear what "current exploration efforts" is referring to. No information available to the Park Service indicates that two pipes in the NRA have "major potential for uranium mining."

13 The Copper Mountain mine pipe was not considered in our discussions because it is under claim and remains available for development under all the alternatives.

14 The reference to the "Chapel Mine" in NE¼, Sec. 25, T33N, R10W is evidently referring to the Parashant pipe in the SE¼, Sec. 25, which was formerly known as the "Chapel House." To our knowledge, this property has never been operated as a mine and, with total production being 1.08 tons of ore, can only be considered a prospect at best. The Cotter Corporation drilled five holes in 1968 in the Parashant pipe. Although anomalous radioactivity was present and some copper mineralization occurred at the surface and at depth, no commercial grade uranium mineralization was indicated.

COMMENTS

15 The summary paragraph on Minerals, Page 203, is both correct and very misleading at the same time. The first sentence, "The results of the mineral resources evaluation indicates that there are no minerals within the recreation areas of significant quantity or quality to affect the nation's supply of any given commodity." In regards to the Shivwits Plateau/Parashant Canyon area, this could be considered as a misleading statement. It is only during the past few years that the potential for uranium production from this area has been recognized. The major exploration efforts and large sums of money being spent by mining companies in this area for uranium exploration, during a time of severely depressed uranium prices, is a self-evident example of the importance of this area to the United States uranium industry. This region is just beginning to be explored for uranium breccia pipes, and has every indication of becoming one of the largest uranium producing regions in the United States, as the involved mining companies have pointed out, during this authors examination of the area.

16 Gold is another commodity that has only recently been realized, due to current and foreseeable high prices, to have potential for bulk mining of large low-grade deposits. The altered volcanic rock areas north and west of Cottonwood Cove, on the west side of Lake Mohave may have potential for this type of deposit as well as the extension of the Black Mountains on the north side of Lake Mead. British American Mining Corporation's current exploration activities near Nelson also points out that industry sees the area as having potential. Although with the large number of bulk, low-grade gold deposits discovered during the past few years, Lake Mead may not be a major factor on the national scale but would certainly be significant on a regional scale.

17 The statement that, "there are no known mineral reserves in the recreation area, and possible mineral resources are classified as geologically speculative, the lowest possible category of importance", is quite misleading. An explanation of what "reserves" are and what "resources" are, should be included. Reserves are known quality, quantity and value, currently mineable. Reserves are tied very strongly to price and price can fluctuate wildly in a short period of time, depending on a whole gamut of factors from politics to weather. The term "reserve" should be stricken from this entire report, unless speaking of a known mineral deposit. A reserve is a known economical resource and this term is preferred by Economic Geologists (The Appraisal of Mineral Resources, 1981). "Speculative", as used in this report, has been given a different meaning than that which appears in a standard dictionary. This misuse appears to bias the meaning toward a connection with those individuals known as speculators, hence less than desirable. Because this word should be used only in its properly defined role, we recommend striking it from the report except where its use is required to clarify a geologic concept.

18 The mineral deposits of the Lake Mead NRA should be viewed as mineral resources. Yesterdays resources are todays ore deposits (reserves). When gold was $35.00 per ounce, about 13 years back, most of todays active gold mines were considered as nothing more than uneconomic, nearly valueless occurrences; an uneconomic resource by todays definition. Lake Mead has both occurrences and resources of gold, silver, lead, iron, uranium and others. Siderite is an iron carbonate, mined for its iron content in some countries. Large dikes, some nearly a mile long, occur in the Bearing Peak area of Lake Mead. These dikes also contain low grade gold values of .01 - .02 ounces gold per ton. These have been mined on a small scale and have shafts scattered along them. The dikes are mentioned in no geologic reports nor are the small mines mentioned in any reports or shown on any maps. This example should be considered a mineral occurrence and a possible resource (iron, and gold). The gold deposits north of Cottonwood Cove, those near Gold Butte and in Gold Basin on the Arizona side, should all be classified as mineral resource areas currently uneconomic to mine, until proven otherwise, but with significant potential.

RESPONSES

15 As early as 1968 the Park Service approved uranium exploration drilling by the Cotter Corporation on three breccia pipes in Parashant Canyon. Again in the mid-1970s, the Park Service approved uranium exploration drilling by the Exxon Company on approved leases on the Shivwits Plateau. All previous drilling efforts indicated that commercial grade uranium was not present in sufficient quantities to warrant development.

16 The known mineralized areas referred to west of Lake Mojave are encumbered by patented mining claims in most cases. A large area of resource utilization subzone also surrounds these areas in the proposed action, and thus remains available for leasing consideration.

17 This section of the report has been rewritten in the final EIS to clarify the issue.

18 As discussed in the legislation establishing the NRA (PL 88-639), the first responsibility of the National Park Service is to protect the scenic, historic, scientific, and recreational resources of the area. Although these mineral resources have been restrictively zoned, they will still be available in the event of a national emergency.

The uranium deposits of the Shivwits Plateau area are now considered economic resources (potential supply) but they will not attain known economic resources (reserves) status until current exploration projects are concluded. A price rise for uranium could quickly change the economic resources to known economic resources (reserves) and a price drop could influence them in the opposite direction.

19 Page 210, Proposed Wilderness, Unit 30 - Shivwits Plateau. The area is considerably broken up by mineral reserves to private industry and numerous roads. It has the highest potential for new uranium production in the United States. It is composed of rolling grasslands and juniper/pinyon pine and some ponderosa pine forests. It is similar to the high plateau country of most of northern Arizona and much of southeast Nevada and Utah.

Units 34, 35 and 36. This area, where canyons break away from the Shivwits Plateau is not totally undeveloped. Roads exist in the bottoms of the canyons and some old mines are also present. These canyons are typical of the Grand Canyon region and do have scenic impact. The point of consideration is that these canyons are the sight of the most significant uranium finds in recent years. They have strong potential for major uranium production. Would a multiple use concept, with careful stipulation of the mines that develop, be a more reasonable use and a higher value for the land? Currently, these lands are in a primitive state frequented by hunters, cattlemen and prospectors. Changing them to wilderness status would deny their use to everyone, but the smallest minority of the most wealthy or strongest backpacker that can carry his/her own water.

20 Page 285, 2nd paragraph. "Under the proposed action, up to 30,000 acres would be subjected to mineral development...." This can be a misleading statement. The average, modern, small underground mine involves less than 5 acres of disturbance. Other than the Parashant Canyon/Shivwits Plateau uranium area, most mining activity in Lake Mead would be the small mine type. The larger mines that might be needed on the uranium discoveries would be on the order of five to ten acres, not over this. Currently, in the Parashant Canyon area, there are reportedly two mines possible on good breccia pipes. Barring additional discoveries, there would be 20 acres maximum disturbance plus the roads to them of 21,000 acres under application. This paragraph and several other very similar to it, should be reworded objectively and clearly.

It should be noted that the DMP admits that none of the 30,000 acres under mineral lease/prospecting permit applications "...are in areas where they could potentially affect any threatened or endangered animal species." Only two leases and one prospecting permit are within five miles of any threatened or endangered plant species.

21 Page 294-303, Impact on Mineral Leasing Opportunity. Page 294, "The areas having the highest potential for mineral resources within the Shivwits zone are in mineralized breccia pipes of which approximately 10 are known to exist in the area." Eleven mineralized breccia pipes have been found in Parashant Canyon alone. The total number of pipes is considerably greater and the likelihood of many more being discovered is 100 percent.

22 "Reports by the U.S. Geological Survey of reserves and resources in the Parashant-Whitmore Canyon structures are highly speculative..." (U.S. Dept. of the Interior, 1977). These reports should be referenced, at least, to title and number. Any U.S. Geological Survey publications listing reserves/resources of this time period (1977) are out dated. All of the current exploration has commenced since 1980. Current estimates would change those numbers generated in the 1977 report substantially, and as exploration continues, will continue to change those numbers rapidly with time.

19 The map and description included in the section on wilderness suitability indicates those lands which meet or potentially meet the criteria of the Wilderness Act of 1964. The lands described and mapped on the Shivwits Plateau potentially meet the criteria of the Wilderness Act.

20 The projection in the draft EIS that approximately 30,000 acres of the NRA may be subjected to potential mineral development activities has been revised and clarified, since eight leases have been terminated or relinquished since the draft EIS was released for public review.

21 The Park Service recognizes the high potential for uranium deposits to be found in and adjacent to the recreation area and has used this information in their analysis. We agree that many other breccia pipes probably occur in the Shivwits area, but the statement in the draft EIS refers to the number of pipes known within the recreation area. There has been no authorized exploration in recent years in the Shivwits portion of the NRA, and given the difficulties of locating breccia pipes as you have elaborated on earlier, the total number of pipes within the NRA could not have changed.

22 The 1977 USDI reference was inadvertently excluded from the bibliography and has been added. The reference is to the "Environmental Assessment: Management Options for Exxon Uranium Leases," prepared by the Park Service in July 1977. No exploration has been authorized by the Park Service within the Shivwits portion of the NRA since release of that report (with the exception of the recently approved exploration on the Copper Mountain pipe), so the numbers could not have changed. No evidence has been provided that "current estimates would change those numbers."

23 Page 295, "Under the current price structure for uranium, it is unlikely that any of the uranium resources contained in the known breccia pipes would be developed..., a price of $60/pound would be necessary...." Energy Fuels is attributed to have made this statement. To be currently mineable, at todays prices (1985), a grade of .5% uranium is needed. Reportedly at least two new
24 pipes have been discovered that meet or exceed this value. The three factors affecting uranium price structuring should be left out. If they are included, then detailed analysis of why gold prices are higher should be included as well as other commodities. The paragraph on the "worldwide oil glut" should be reviewed and referenced. Care needs to be taken as to use of subjective statements.

25 Several statements have been made about the "speculative" nature of the uranium breccia pipes as to grade, whether there is even any uranium in them, they are too low grade to mine, etc. The next to the last paragraph on this page states, "Although the extremely high grade of ore found in the breccia pipes might make these deposits more attractive then more conventional mines,...." What is a more conventional mine? Here the report admits these breccia pipes are high grade uranium deposits. This is contradictory to all the other comments about the low quality and speculative nature of the breccia pipes.

Page 296. Most of this page deals with the O'Brien report, which is reviewed elsewhere in this document.

26 Page 301. The 5th paragraph down, which begins "Irreversible and irretrievable loss of vegetation..." needs to be reviewed in light of modern day mining, milling and reclamation practices. They state that several hundred acres of vegetation could be destroyed by mine development. Surface facilities at a modern mine, such as might be developed in the Shivwits Plateau/Parashant Canyon area, would occupy a maximum of 10 acres and probably less. Waste rock/tailings can usually be deposited in underground mined out areas to enhance wall rock stability. A road to and from the mine would be necessary, but in most cases up-grading of existing roads would be 80 percent or more of the road building done. New road usually is restricted to a short joiner road from the mine to an existing road. The Lake Mead NRA is so riddled with roads that major new road construction may not be needed. This paragraph in the plan exaggerates the amount of surface disturbance involved in working an underground mine.

27 Page 302. The report states, "Removal of the Shivwits Plateau from any further mineral leasing consideration would favor long-term provision of recreational benefits over short-term economic and energy supply gains." Mining would not destroy the Shivwits Plateau for recreational use. Individual underground mines on the plateau would use about 10 acres each.

"The highly speculative nature of the mineral resources within the NRA indicates that the long-term gains obtained from preserving the recreational values of the park far outweigh the uncertain, relatively short-term gains from mineral development." Again, mining would not destroy the recreational values of the NRA. The uranium resource is not "highly speculative" as shown by the mining companies investing millions of dollars on exploration. This kind of exploration is only done when there is a good chance of discovering mineable ore. Additionally, no thought or consideration is given as to the benefits of mining, which includes employment, increased business for local towns, royalties to the Government for leasing and increasing the strength of the economy.

28 In the following paragraph on page 302, one sentence is devoted to the fact that 500 acres of soil and vegetation would be destroyed for recreational development. This could be compared to mining disturbance and several analogies drawn.

23 Statements referring to the economics of mining uranium have been removed from the final EIS.

24 Statements regarding uranium price structuring have been removed from the final EIS.

25 Statements referring to an extremely high grade of ore found in the breccia pipes are in reference to pipes with known commercial grade deposits that are currently being developed. The use of the term "extremely" has been removed from the sentence. The use of the phrase "conventional mine" in this paragraph refers to typical low-grade uranium deposits that are mined by underground or surface methods which result in deposition of tailings at the surface from concentration of the ore before transportation.

26 Statements regarding disturbance associated with a potential mining operation have been adjusted to reflect projections in the M-K report that disturbance caused by a medium-sized mine is the maximum expected.

Lake Mead National Recreation Area, particulary the Shivwits Plateau, is not "riddled with roads," and the assumption that no new road construction would be needed is invalid.

27 It is the position of the National Park Service that mining on the Shivwits would impair the scenery and natural and cultural resources as described in the draft EIS.

Despite the money and effort being expended on current exploration efforts by industry, nothing more than potential has been demonstrated on the Shivwits Plateau within the NRA. Therefore, the primary impact of closing the Shivwits to further leasing is on additional exploration opportunties within the NRA. Because the potential exploration is only a small piece of the total regional uranium exploration picture, closing the Shivwits to further mineral leasing is not anticipated to have a significant effect on local employment, generation of royalties for the government, or increasing the strength of the economy. To date, no breccia pipes have been identified within the NRA which contain commercial grade uranium deposits.

28 The mining and development impact discussions have been combined because they deal with similar impacts.

COMMENTS

29 The next paragraph again shows the need to review modern mining techniques:

> "In the event that mining did occur in the recreation area with concomitant destruction of several hundred acres of soil and vegetation, these recreational resources owned by the nation would be lost in exchange for the economic gain of shareholders of the mining company. Other industries might benefit from the development of the mineral resources. Over the long term--no less than 50 to 75 years--productive soils and vegetation might be restored in mined areas through reclamation."

Mining would not cause "...destruction of several hundred acres of soil and vegetation." No "...recreational resources owned by the nation..." would be lost. Many more people than just shareholders would gain from a domestic mining operation, the nation as a whole would benefit. There is no "might" about it, other industries would benefit from mining. Ninety-five percent of lands affected by mining could be completely restored in far less than 50 years.

30 Page 308-309, Impact on Desert Spring Ecological Communities. These pages are filled with guesswork and conjecture on the effects of mining. Only a hydrologist, with experience in mining and groundwater control, could evaluate potential problems with springs near breccia pipes and how they might be affected. All other effects mentioned could be handled by careful monitoring of any mining operation.

31 Page 310, last paragraph. "Development of the 10 known breccia pipes...." A misleading statement. Of the many breccia pipes discovered so far, only one or two may have provable reserves. Mining of 10 pipes would not occur, and is a gross exaggeration. Furthermore, 400-500 acres of soil would not be lost, as each mining operation would involve less than 10 acres, and nearly complete restoration of soils can be done by the companies once mining ceases.

32 Page 312, 1st paragraph. "Uranium development in the Shivwits area...would lead to significant degradation of the scenic vistas from Whitmore Point because most of the activity would take place in the immediate foreground of the views from the point." This is a misstatement and it appears that the writers of this DMP have never been to Whitmore Point. The only thing visible from the point is a road. The possible mining sights are in side canyons and not visible from the point. The conclusion that uranium development could significantly degrade the scenic vistas from Whitmore Point needs to be reviewed and considered for revision.

33 Page 314, next to last paragraph. "Blading of areas for location of access roads, drill pads, or mine facilities would result in local destruction of vegetation on approximately 50-100 acres for each surface mine,...." Another gross exaggeration. Drill pads are 1/4-acre for truck mounted rigs and less for air-carried rigs. Mine facilities are from 5-10 acres for each mine.

RESPONSES

29 The paragraph has been clarified to indicate that it is referring to the potential effect of mineral development activities throughout the NRA, including all associated activities such as access road and utility corridor construction. Also, this section refers to short-term uses, and it is true that public recreational resources would be lost in the area of operation during the life of the operation. The reference in the draft EIS to shareholders of the mining company has been deleted, and the term "might" in the following sentence has been changed to "would" as suggested.

Lake Mead is an extremely arid environment with little organic soil development. Commercial seed sources for most of the common native species in the area have not been developed and little reclamation has been done in this environment. To restore a disturbed area to its previous pristine condition may require far more than 75 years.

30 The impact discussion referred to has been revised in the final EIS.

31 The statement regarding development of 10 breccia pipes has been revised in the final EIS. However, estimates from Energy Fuels Corporation indicate that approximately 62 acres were required for the Pidgeon Mine, not 10 acres as indicated in the comments. The statement referring to the direct loss of soils has also been revised.

32 Refer to comment 5.

33 Refer to comment 31.

400

United States Department of the Interior

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Memorandum

To: Superintendent, Lake Mead National Recreation Area, NPS

From: State Director, Arizona

Subject: Lake Mead Draft General Management Plan and EIS

This memorandum provides our comments on the Draft General Management Plan and EIS (DEIS 85-29) for the Lake Mead National Recreation Area, dated April 1985. The notice of availability of the draft plan and EIS was published in the Federal Register on May 17, 1985, and copies of the plan and EIS were received by BLM in June. The Regional Director, Western Region, notified this office, by letter dated July 10, 1985, that the comment period was extended to July 31, 1985.

These comments include the consolidated review of the BLM Arizona Strip District, Phoenix District, and State Office. Additional comments are being provided by the BLM Nevada State Office. The following general and specific comments are provided:

General

The Draft General Management Plan commendably addresses flood plain hazards and increased recreational visitor use. However, as a management plan for mineral resources, the draft plan is seriously deficient. We fully recognize that a Minerals Management Plan for the Lake Mead National Recreation Area will be prepared following the completion of the General Management Plan. We have been assured, by both your office and the Regional Director, that this office will be provided an opportunity to provide input to the development of the Minerals Management Plan. However, the Minerals Management Plan only relates to those lands identified in the General Management Plan as open to consideration for mineral leasing. Mineral leasing will be prohibited in all management zones, except for the "resource utilization" subzone. This resource utilization subzone, under the Proposed Action alternative of the General Management Plan, only encompasses 148,970 acres (10%) of the Lake Mead National Recreation Area. Some 1,162,550 acres (78%) of the NRA are currently available for mineral leasing.

1 Congress established the Lake Mead National Recreation Area for "the general purpose of public recreation, benefit and use, and in a manner that will preserve, develop and enhance...the recreation potential and in a manner that will preserve the scenic, historic, scientific and other important features of the area" (Public Law 88-639, October 8, 1964). Congress, in consideration of the scenic, historic, scientific, and other important features of the

1 When the regulations in 43 CFR governing federal mineral leasing in NPS areas were revised in 1981, the excepted areas were not revised because major planning efforts were not complete and it was thought to be premature to exclude additional areas from leasing at that time. The Federal Register notice, dated December 22, 1980 (FR 84393), which accompanied the proposed regulations, indicated that the excepted areas for Lake Mead would be revised at ". . . an appropriate time in the planning sequence." The GMP is the major, long-term planning document for NPS units which establishes management zoning and guides management of the unit over the long term. The GMP evaluates existing knowledge of natural and cultural resources and proposes management actions as appropriate. Mineral leasing may be allowed, pursuant to Lake Mead's enabling legislation, only where it ". . . will not be inconsistent with either the recreational use or the primary use of that portion of the area heretofore withdrawn for reclamation purposes." The enabling act further states: "Lake Mead National Recreation Area shall be administered by the Secretary of Interior for general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area. . . ." Therefore, the NRA is zoned according to the need to protect resource values, not according to mineral occurrences. Mineral leasing is then permitted only in the resource utilization subzone where it will not conflict with preservation of resources.

COMMENTS

area, specifically provided for mineral leasing as a public benefit and use in the NRA. The clear intent of Congress was expressed by the mineral leasing regulations for the Lake Mead National Recreation Area which identified those specific areas to be excluded from mineral leasing (43 CFR 3109.2d and 3566.2-2). It is difficult to understand why only 319,925 acres of special areas were excluded from leasing by the regulations, and the Proposed Action of the management plan now identifies some 1,142,005 acres

2 of special areas. The regulations also further define Congressional intent by stating that consent by the Regional Director of the NPS for issuance of a lease or permit will only be granted if the activity "will not have significant adverse effect upon the resources or administration of the area." The determination of "significant adverse effect" cannot be made until a specific proposal has been received and analyzed using the NEPA process. The NPS has established blanket management zones which prohibit mineral leasing and mining without benefit of analysis of site specific proposals.

3 The NPS has determined that the only method to mitigate the potential impacts from mineral leasing and development is to preclude leasing from 90% of the NRA. Management zones could have been identified which allowed for leasing with various degrees of restrictions and protective stipulations. Sensitive areas could be protected by "no surface occupancy" stipulations, seasonal closures to exploration, visual screening of operations, or specific reclamation stipulations. Protection of other resource values can be a high priority, but it does not have to totally exclude mineral leasing. The "no leasing" alternative is the easy solution to resource conflicts.

Specific

Maps: 4 The maps presented throughout the General Management Plan are not of sufficient detail to determine the location and boundaries of management zones. Township and range lines would assist in determining the location of specific areas of interest. The maps and figures within the plan should also be numbered for easy reference.

Page 20: 5 Table 4 provides acreages of various management zones for the alternatives in the General Management Plan. The acreages presented for the Natural Environment subzone, Development zone, Resource Utilization subzone, and Reservoir subzone under Alternatives A and B are not consistent with the acreages presented on the management zone maps on pages 77 and 85.

Page 21: 6 The management zoning map for the Proposed Action indicates that no lands in the Shivwits Plateau area will be available for mineral leasing. This restriction to mineral leasing is of significant concern because of the potential for uranium mineralization in the area. Exploration is needed to further define this uranium potential. Some 11 prospecting permits, encompassing 16,640 acres, are currently pending completion of the General Management Plan. This seems to indicate that the minerals industry has great faith in the mineral potential of the area, yet it is proposed to be closed to leasing.

RESPONSES

2 The determination of "significant adverse effect" must be made at the lease issuance stage before the regional director can consent to lease issuance. Issuance of a lease or permit conveys the right to develop mineral deposits discovered. Once a specific proposal for development is received, stipulations can be added; however, it is then too late to determine that no level of mineral development activity is acceptable. It is more appropriate for the Park Service to plan ahead and identify resources where mineral activities categorically interfere with conservation of the resources.

3 The use of no surface occupancy on a large scale is unacceptable because it does not allow adequate and reasonable access to the minerals. Additionally, mining activities will still be visible during times of operation, regardless of reclamation methods. The National Park Service has chosen to use no surface occupancy only as a stipulation on leases, permits, and plans of operation where a sensitive resource in a particular area requires additional protection. Seasonal closures of areas to exploration only works well if no mineral deposits are discovered. If development activities were subsequently proposed, it would be difficult to mandate seasonal operation. Visual screening of operations only protects one aspect of the environment, visibility.

4 The maps in the GMP are necessarily general because of the nearly 1.5 million acres under consideration in the plan. Where specific development is proposed, detailed maps or drawings are included. The zoning boundaries of the resource utilization subzone will be defined in detail down to township, range, and section lines in the minerals management plan.

5 Corrections were made to the acreages noted on the maps on pages 77 and 85 in the draft EIS by pasting revised legends over the incorrect legends. Some copies may have been inadvertently overlooked in the process.

6 Refer to Nevada BLM responses 7, 15, and 27.

COMMENTS

Page 23: **7** Historic and archaeological sites are proposed to be protected by a restricted management zone of an entire section (640 acres) around each site. The plan should consider site specific buffer zones which would provide for adequate protection, based upon the significance of the site and the environment surrounding the site.

Pages 26-29: **8** Table 6 provides a discussion of the rationale for the proposed management zone of specific areas within the NRA. The common rationale for identification of Resource Utilization zones (Areas 7, 11, 15, 17, 22, 24, 32, 40, and 41) is whether the area is visible from the Lake. Large acreages of the NRA have apparently been excluded from mineral leasing based solely upon visual considerations. But discussions of visual resources in Volume II of the EIS (page 233) do not indicate site specific visual resource management classifications have been prepared for the NRA. Site specific visual resource values should be considered before excluding a use in an area.

Page 30: **9** The General Management Plan discusses the control of tamarisk in the area. Vegetation management in the form of salt cedar removal and cottonwood and willow introduction should also be explored.

There is a brief comment made in the plan regarding the control of burro populations in the area. A more complete discussion of the existing situation and the specific areas where efforts are being made to control the population should be provided.

Page 31: **10** The discussions indicate that both the gila monster and desert tortoise are listed as endangered by the State of Arizona. The desert tortoise is a group 3 listed species by the State, but the gila monster is not listed. Both species are Federal candidate species.

Page 33: **11** The General Management Plan refers to an Approved Roads map which will be revised. There is no indication in the plan as to the specific roads which will be included on the map. Some back country roads are shown on a map on page 35. It is unclear whether these are the only approved roads in the NRA.

There are no discussions of access needs across NPS lands to adjacent lands. This is especially a problem for access to public lands adjacent to the NRA in the Shivwits Plateau area. The Grassy Mountain area, south of Parashant Canyon, is of specific concern.

RESPONSES

7 These factors were considered in establishing this zone. That is why it is also stated on this page that other activities may occur within the zone as long as they are compatible with the larger zone surrounding the historic zone.

8 Although site-specific visual resource management classifications have not been prepared for the NRA, each of the management zoning areas was evaluated on its individual resource characteristics before zoning in a specific category. One of the most important of these factors was visibility of an activity from the lake. The primary reason for this was the need to preserve the scenic quality of the area as required by the legislation establishing Lake Mead NRA. While visibility from the lake is the common rationale for identification of the resource utilization zones mentioned, it is not the sole criteria, as suggested. For example, area 7 was also set aside as resource utilization because of management efficiency, areas 11 and 32 because of existing mining activity. In areas 22 and 24, visibility from major access roads was a factor. In areas 40 and 42, visibility from major developed areas was a determining factor.

9 Both vegetation management and control of burro populations have been discussed and analyzed in detail in the Resource Management Plan for the NRA. This document was publicly released in 1975 and is updated biennially.

10 These corrections have been made in the final document.

11 This section of the document has been revised and updated to more clearly explain current and future actions regarding the approved roads in the NRA.

Page 37: **12** An Interagency Agreement between the NPS and BLM regarding mineral leasing is discussed. This agreement is not included in Appendix D (page 384) with other agreements.

13 It is indicated that oil and gas leases have been obtained for "speculative" purposes in the Lake Mead area. These lands may be considered to be of low potential, but judgments regarding the intent of leasing should be avoided. These leases in this specific area were leased in 1980, 1981, and 1982 for terms of 10 years. The lack of any specific drilling proposal, to date, does not preclude an interest in drilling during the remainder of the term of these leases.

Page 38: **14** Mineral leasing is currently excluded from some 45% of the NRA because of suitability or potential suitability for wilderness. It is unclear in the management plan whether those areas that are not eventually designated as wilderness will be open to leasing, or whether they will be placed into some resource protection zone. Comparison of maps (page 21 and page 205) would indicate that some areas would be in resource utilization zones and available for leasing.

Page 51: **15** The management plan indicates that management zoning for the Proposed Action would provide for protection of adjacent BLM lands. Several specific areas are identified. Other areas may need to be reevaluated. Several Resource Utilization zones may border on BLM Wilderness Study Areas. A specific example is a Resource Utilization zone adjacent to the Mt. Wilson WSA (2-001A).

Page 68: **16** The total acreage of excepted areas (319,925 acres) is not consistent with the acreage shown on page 71.

Page 111: **17** Throughout the draft management plan (pages 111, 141, 149, 161), references are made to screening existing and proposed NPS initiated developments from view by using vegetative plantings or creating naturally appearing land forms. Also, new housing for both NPS and concessionaire personnel are oriented for a view of the Lake, which means they can be seen from the Lake. Yet mineral development is excluded from significant acreages of the NRA because of being viewed from the Lake. Mineral development should be provided the same opportunity for mitigation of possible visual impacts as other uses on the NRA. The plan even discusses removing a natural feature, a knoll at Echo Bay, which can be seen from the Lake. The knoll will be used as common rock fill in the concession housing area or proposed launch ramp parking. It is difficult to understand the NPS "mining" a natural feature visible from the lake for low value fill material, and not allowing leases or permits for potential high value minerals.

Page 184: **18** The Proposed Action for the Shivwits Plateau area includes the construction by the NPS of a dirt landing strip for improved administrative access. It would appear that limited mineral exploration could be provided for in the area, if the impacts from a landing strip are acceptable to the NPS.

12 A statement has been included in appendix D of the final EIS regarding the proposed interagency agreement between the BLM and NPS on mineral leasing.

13 The word speculation has more than one meaning. The broad definition of the word is to assume a business risk in hope of gain. In this sense all mineral activity is speculative. The narrower meaning is to assume a business risk with the expectation of profiting from market fluctuations. This meaning implies an intent of the lessee to hold the lease and sell it without actual work. The way it is used in the GMP is as a higher risk associated with wildcat exploration drilling. This is the most marginal type of drilling, with wildcat drilling funds diminishing quickly in response to oil and gas industry downturns.

The GMP has also adopted the terminology of section 3031 (Mining Potential Classification System) of the "BLM Manual" to describe mineral potential more accurately.

14 It is the intent of the National Park Service that only the areas shown in the resource utilization subzone be open to consideration for mineral leasing within the NRA.

15 Unit 24 on the Management Zoning map is located between the BLM Mount Wilson Wilderness Study Unit (WSA 2-001A) and U.S. Highway 93 in Arizona. This unit is approximately 10 miles long but only averages 1½ miles wide, with one area being only ½ mile wide. Three dirt roads to old mine sites entering the area total approximately 6 miles. Numerous flood control dikes protect highway 93 and approximately 3½ miles of old highway 95 (now abandoned but still open to public use) that loops into unit 24. Mining in this unit has occurred as recently as the late 1950s, and it is still an area of mineral interest. There are a number of short spur roads in the vicinity of the old mining activity and numerous articles of trash, such as junked cars, bedsprings, cans, and other items.

Because the area still shows so much disturbance from the past, it does not meet wilderness criteria. Although the most recent recommendation from BLM for the adjacent Mount Wilson WSA is for wilderness status, unit 24 would not be suitable for wilderness. Also because of the number of roads and other disturbances, such as flood control dikes and mining scars, the area would best be managed as a resource utilization unit rather than for natural area values. If mining is to occur in this unit, visual intrusion from highway 93 and other resource values that may be present will be protected through stipulation. These stipulations will also take into account the adjacent BLM wilderness areas.

16 The acreage figure on the map in the draft EIS has been revised in the final EIS.

17 Each of the lands within the recreation area has undergone a rigorous zoning process. During that process certain management zoning criteria were developed. These criteria are directly linked to the NRA's enabling legislation and were used in placing all lands in the appropriate management zones. The logic behind what is an acceptable land use in each of the different management zones is discussed in the text and tables of the section on management zoning in volume I.

17 The enabling legislation from the area directs the National Park Service to administer the area ". . . for the general purposes of public recreation, benefit, and use in a manner that will preserve, develop, and enhance the recreation potential. . . ." The Park Service has enhanced the recreation potential of the area primarily in the development zone. This is the main zone in which the majority of visitors make contact with and gain access to the NRA. As such the amount of development and environmental manipulation necessary in this zone would not be acceptable in other areas of the NRA. Although much development for public access is permitted in this zone, efforts are still made to visually screen it from public view. Sometimes this is not always possible, as is the case with the two examples cited.

18 Management access must be provided to the Shivwits Plateau so it can be managed in the manner set by Congress in the enabling legislation and the guidelines set by the National Park Service, whether it be as a natural zone, a special use zone, or a development zone. This isolated area is susceptible to unwanted uses such as vandalism to historic structures and archeological sites, poaching of animals, and other activities.

An airstrip is proposed to provide for proper supervision and delivery of adequate supplies in an economical method and timely manner. The proposed strip will be available for use only by the NPS airplane (a single engine with STOL equipment) and will not be large enough to allow larger twin-engine planes to land. To minimize the number of these flights, the superintendent will review each trip to determine the necessity and efficiency of aircraft use consistent with park goals. If the airplane is not the most efficient method of accomplishing the purpose of a trip, alternative access means will be used. We do not foresee the use of this airstrip by virtually any aircraft other than NPS planes. As we mentioned earlier, the flight pattern to and from the Shivwits Plateau for administrative purposes does not approach the Grand Canyon.

We believe that adequate consideration has been given to the potential impacts to be generated from mineral exploration, particularly on the Shivwits Plateau, and that these impacts cannot be satisfactorily mitigated. See the Nevada BLM response 5, and Arizona BLM response 3.

Page 199: It would appear that the mineral assessment prepared for the
19 Lake Mead National Recreation Area (O'Brien, 1982) was only a literature search. There is no geologist or mining engineer identified on the List of Preparers (page 414) for the management plan and EIS. There appears to have been no physical examination of the NRA for mineral deposits. The U.S. Geological Survey, Arizona Department of Mineral Resources, Arizona State Geologist, and Santa Fe Minerals (which has extensive mineral estate holdings in the NRA) should also have been consulted to determine if any additional information exists regarding the mineral resources. The Arizona Bureau of Geology and Mineral Technology identifies 8 metallic mineral districts within the Lake Mead National Recreation Area. The Bureau of Land Management has Geology-Energy-Minerals (GEM) Reports available on Wilderness Study Areas immediately adjacent to the NRA. These reports classify the mineral potential of the areas adjacent to these WSAs.

Page 200: There are no discussions in the minerals section of the
20 patented mining claims. The discussion of metallic minerals should include the 7 prospecting permit applications for base metals in Arizona, and the discussion of energy minerals should include the 11 pending applications for uranium. The fact that permit and lease applications have been received indicates that the minerals industry acknowledges a greater mineral potential for the area than is depicted by the EIS.

The discussions indicate that "most of these geologic features (breccia pipes) have been explored." The exploration for breccia pipes continues in areas adjacent to the NRA. Pending prospecting permit applications are an indication of this continued interest. Further exploration is needed to delineate future mineral deposits.

Page 201: The pending permit and lease applications should be
21 identified on this map of the NRA. These include the 18 applications in Arizona in the Willow Beach zone, Grand Wash zone, Temple zone, and Shivwits Plateau zone.

Page 203: The EIS indicates that "uranium is only suspected as a
22 companion mineral with the copper" in breccia pipes in the Shivwits Plateau area. In many of the breccia pipes to the immediate north of the area, the uranium is not a companion mineral but is the primary mineralization. It could be assumed that this is also the case for those unexplored breccia pipes in the subject area. The inferred reserve estimates (250 tons) by the USGS for this area may be somewhat outdated. The statements regarding uranium potential should be revised to indicate that "conditions exist that are highly favorable to uranium deposition. Only exploration by drilling can discern its actual presence or absence."

19 Refer to Nevada BLM response 2.

20 Refer to Nevada BLM responses 7, 8, 15, and 27.

21 The status of pending lease and permit applications changes too rapidly to report in this document. The location of applications has no bearing on management zoning decisions as discussed in Nevada BLM response 9. Those located in areas outside the final resource utilization subzone will be rejected while those inside will be processed on a case-by-case basis.

22 The statements regarding the relation of uranium and copper in breccia pipe mineralogy have been corrected. The terminology used to describe mineral potential has been changed to conform with section 3031 of the "BLM Manual." As such, NPS recognizes the high potential for uranium deposits within and adjacent to the NRA. See also Nevada BLM responses 7, 14, 15, and 21.

Pages 207-210: Discussions of individual wilderness study units within
23 the NRA should identify those adjacent BLM Wilderness Study Areas. Unit 4 is adjacent to the Black Mtn. North WSA (2-009), Unit 5 is adjacent to the Mt. Davis (2-021) and Mockingbird (2-008) WSAs, Unit 7 is adjacent to the Van Deeman WSA (2-007), Unit 13 is adjacent to the Mt. Wilson WSA (2-001A), and Unit 28 is adjacent to the Grapevine Wash WSA (2-014). Unit 36 is adjacent to the designated Mt. Logan Wilderness Area (Arizona Wilderness Act of 1984).

23 These changes have been incorporated in the document.

Page 217: There are no discussions of peregrine falcon habitat in the
24 NRA. The Black Mountains, which are adjacent to the NRA, have known peregrine falcon habitat.

24 Additional information on the peregrine falcon has been added to the document.

Page 221: The gila monster is not a listed species by the State of
25 Arizona but is a Federal candidate species.

25 This correction has been made in the document.

Pages 233-237: The EIS discusses those "significant natural features"
26 which were considered for protection in the management plan. These features are identified on the map on page 237. This map does not correspond to the Proposed Action map on page 21, which depicts significantly larger areas of mineral restrictions.

The Significant Natural Features map (page 237) does not accurately depict all known bighorn sheep habitat, especially in the Mt. Davis area.

26 The significant natural features zones of these maps correspond. The area of mineral restriction is larger on the Management Zoning map because it encompasses several zones. The map also affects all known bighorn sheep habitat in the NRA known to the National Park Service.

Page 289: The EIS should discuss the impact to wildlife from the
27 increased visitation to springs by recreation users.

27 These impacts are discussed under the topic, "Impact on Desert Spring Ecological Communities."

Pages 294-296: The discussion of impacts to mineral leasing should
28 clearly indicate that the Proposed Action represents an 89% reduction in the area available to mineral leasing and
29 exploration. Breccia pipe uranium deposits are presently the most economic uranium deposits in the United States. The EIS indicates that it is unlikely these breccia pipes would be economically feasible to mine for many years. This conclusion does not recognize those activities at the Hacks Canyon, Pigeon, North Kanab, and Tusayan or Canyon mines in the area.

28 The text has been changed to clearly indicate that the proposed action represents an 87 percent reduction in the area available to mineral leasing consideration, as you requested.

29 The economic costs of mining in the Shivwits area would include transportation of ore to the Blanding mill, 100 miles each way over unpaved roads in addition to 200 miles of paved road. Sources of utilities are not readily available, nor is a water supply. These would significantly increase the cost of mining deposits in this area.

Page 296: Some 109,500 acres of potential wilderness lands are
30 identified as impacted by the Proposed Action. This is not consistent with the acreages presented on page 299 (Conclusion).

30 This correction has been made in the document.

Page 301: This page includes 3 paragraphs and 23 lines on the
31 potential impacts caused by mineral activities on fewer than 300 acres in the NRA. NPS proposed activities on some 500 acres are discussed in 3 lines for essentially the same type of impact.

31 Since the same type of impact was being discussed, discussions have been combined.

COMMENTS

Page 302:
32 The short term use for mineral exploration or development will not seriously nor significantly affect the long term recreational benefits from the Shivwits Plateau. With present day technology, most mining impacts can be mitigated to an acceptable level within 5 years of cessation of mining. Uranium and copper/gold/silver mining occurred in the Grand Canyon National Park at the Orphan Mine for over 50 years without significantly affecting the resources and administration of the Park.

Page 303:
33 Statements on this page indicate that soil will be destroyed or lost from exploration or development activities. The soil structure or character may change and productivity may be reduced, but soil is not destroyed or lost. The proper handling of soil can eliminate or mitigate the impacts on the soil resource.

34 The third paragraph on page 303 inaccurately depicts the impacts of a mine in this area. Only large open pit metallic mineral mines have the potential to impact "several hundred acres of vegetation." The Orphan Mine at the Grand Canyon occupied about 4 acres of surface and operated for more than 50 years. The recently proposed Tusayan or Canyon mine will impact less than 20 acres.

35 The last paragraph on page 303 indicates that the wilderness values of the NRA would be lost by any exploration or mining activities on potential wilderness area lands. This appears to be unfounded since areas of the NRA that currently meet wilderness criteria contain two past producing mines and a mining company railroad.

Page 309:
36 The significance of impacts caused by uranium mining on specific springs in the Shivwits Plateau area would not be known until a groundwater study was completed in a site specific area. Water analyses of a specific spring would be required to indicate if water had passed through a breccia pipe. Current information is inconclusive regarding the relationship of any specific spring's productivity and water quality to any breccia pipe.

37 Also on page 309, a statement is made regarding the contamination of groundwater from "post-operational mine water, leachate from ore stockpiles, accidental spills, and discharges from fuel tanks." These impacts can be mitigated through stipulations (e.g., ore can be stockpiled on impervious material).

RESPONSES

32 The Park Service must protect short-term and long-term recreational benefits, as well as other resource values. The Park Service is concerned with impacts occurring during mining and after cessation of activities. The Park Service does not necessarily agree with the conclusion that most impacts can be mitigated within five years, nor necessarily with statements about the operation of the Orphan Mine.

33 Statements regarding destruction of soils have been revised in the final EIS.

34 The statement has been revised; however, the Pidgeon Uranium Mine occupies approximately 62 acres, including access roads and utility corridors.

35 The language states that these values could be lost and this is a definite possibility.

36 The impact discussion referred to has been revised.

37 Some of these impacts might possibly be mitigated; however, the potential for these impacts still occurs as discussed in this section. The impacts of accidents are not possible to mitigate in advance.

Page 310: The "Development of 10 known breccia pipes" under the
38 no-action alternative is not consistent with other information provided in the draft management plan (page 294). Two breccia pipes are located on an existing mining claim and an existing lease, two pipes are located in the Grand Canyon National Park, and one pipe has been determined to not contain commercial grade uranium. This leaves 5 breccia pipes that would potentially be developed.

The total acreage impacted by development of a breccia pipe should also be reduced. Mining a breccia pipe does not require 40 to 50 acres of surface. The Orphan Mine in the Grand Canyon only encompasses 4 acres, and the recently proposed Tusayan or Canyon mine will impact less than 20 acres.

It is hoped these comments will be considered in the development of the final General Management Plan for the Lake Mead National Recreation Area. The exclusion of mineral leasing from some 90% of the NRA should be reconsidered prior to preparation of the Minerals Management Plan. Management zoning should be used to define various areas, with stipulations necessary to mitigate the impacts of mineral exploration and development.

Please contact this office for clarification of any of our concerns or comments. We look forward to providing input on development of the Minerals Management Plan and continued coordination on other land management issues.

Tom Allen

38 Refer to Nevada BLM response 31.

United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY
REFER TO: LC-159
120.1

AUG 2 1985

Memorandum

To: Mr. Jerry D. Wagers, Superintendent, Lake Mead National Recreation Area, National Park Service, 601 Nevada Highway, Boulder City, Nevada 89005

From: Acting Regional Director

Subject: Draft Environmental Impact Statement (EIS) and Draft General Management Plan (GMP) for the Lake Mead National Recreation Area, Arizona-Nevada

We have reviewed the subject documents and have the following comments:

1 On page xii of the GMP (Proposed Action Summary), it states that the plan's development costs would be $35,269,500 for concessioners, and $34,762,500 for the National Park Service (NPS). A statement concerning how this financing would be effected would be helpful. Would the NPS obligation be funded by the Congress? How would the concessioners be induced to pay their share of the implementation costs? If all costs for the GMP are to be borne by the U.S. taxpayer, this should be brought out in the Summary.

The No-Action Alternative discussion in the GMP (page xiv) appears to be misleading as it implies that the existing recreation area management plan is "piecemeal" and done on a case-by-case basis. More discussion is needed concerning the existing management strategy. On page 47, reference is made to a comprehensive Land Acquisition Plan which was prepared and released to the public in July 1984.

On page 204 of the draft EIS, mention is made of a wilderness plan that will be prepared following completion of the GMP. When this wilderness plan is available, we would like to receive a copy for review.

Thank you for the opportunity to review the documents.

Robert A. B. Cullen

409

1 These changes have been made at the appropriate places in the document.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

JUL 26 [illegible]

Memorandum

To: Regional Director, Western Region, National Park Service, San Francisco, California

From: Regional Director, Region 2 (SE)

Subject: Section 7 Consultation - Draft General Management Plan and Alternatives (DEIS 85-29), Lake Mead National Recreation Area (NRA)

410

This responds to your request of June 4, 1985, for informal Section 7 consultation on the effects of the proposed Lake Mead National Recreation Area General Management Plan (GMP) upon threatened and endangered species. Even though your letter indicated you were requesting a formal Section 7 consultation, a June 11, 1985, telephone conversation with Mr. Francis Jacot indicates the request is for an informal consultation. We have reviewed your documents and have the following comments.

1 The Endangered Species Act requires Federal agencies to determine if their proposed actions may affect listed species. If the agency determines that an action will or may affect a listed species, formal Section 7 consultation must be initiated. Formal consultation would be required even if the effects were judged to be insignificant or beneficial. It is a Federal agency's responsibility to prepare an assessment of their proposed action sufficient to make this determination of "will or may affect". The discussion of listed species in the subject document is inadequate to make a determination of "may affect."

For example, the GMP does not address the possible effects of increased visitation or the construction of new access at Cottonwood East upon listed species in the National Recreation Area. Before a determination of no effect can be made, any impacts and the specific measures to be used to prevent or eliminate these impacts should be addressed. If an effect still occurs, formal Section 7 consultation would be necessary.

1 Changes have been made in the affected environment and impact sections to better explain the nature of the impacts related to threatened or endangered species. The data on species listed in table 19 is the only information currently available. That is why special studies of the species that might be affected are proposed. The conclusion with current information is that there will not be an impact on any of the species listed in table 19. But, because of the remote probability of an effect on these species, special studies will be implemented. Once information from the special studies is available and more specific development proposals are formulated for Fire Mountain and improved access points in the Cottonwood East and Detrital Bay areas, a more precise determination of effects can be made. If impacts on threatened or endangered species cannot be mitigated, then the new areas will not be developed.

COMMENTS

2 We recommend the study plans for the bald eagle suggested on page 31 be developed. We also recommend that discussions with the Arizona Game and Fish Department, the Colorado Fishes Recovery Team, and our agency concerning rearing in bonytail chub rearing coves be initiated as soon as possible to facilitate determination of effect on that species.

3 We also wish to point out that since the peregrine falcon occurs as a breeding species on the NRA, effects on this species should be addressed.

Thank you for the opportunity to comment on this document. If you have questions or require further information, please contact our Phoenix Ecological Services Field Office (FTS 261-2493).

cc: Field Supervisor, Ecological Services, Phoenix, AZ
Ecological Services, Reno, NV
Regional Director (SE), Region 1

RESPONSES

2 These study plans will be developed with the appropriate state and federal agencies, as you suggested. Prior to implementation of any development plans, the agencies mentioned will be consulted with and mitigation developed for the species of concern. If impacts cannot be mitigated, then the new areas will not be developed.

3 Management of the peregrine falcon will be coordinated with the appropriate state department of wildlife and the United States Fish and Wildlife Service. Falcons are known to breed in sites near heavily populated areas (even in large cities). In fact, the only known breeding pair within the recreation area in 1985 nested in a cliff site above one of the most heavily used visitor areas. The pair seemed to be unaffected by the heavy public use of the area. The disclosure of falcon nesting areas is not thought to be in the best interest of peregrine falcons, but management steps will be taken to protect any nesting areas discovered from close public contact. As with all threatened or endangered species, consultations will be made with the appropriate state and federal agencies and mitigation developed prior to implementation of plans for new areas. If impacts cannot be mitigated, then the new areas will not be developed.

UNITED STATES
DEPARTMENT OF THE INTERIOF
FISH AND WILDLIFE SERVICE

Ecological Services
2934 W. Fairmount Avenue
Phoenix, Arizona 85017

Memorandum

July 11, 1985

To: Superintendent, Lake Mead National Recreation Area, National Park Service, Boulder City, NV

From: Field Supervisor

Subject: DEIS and Draft General Management Plan and alternatives, Lake Mead National Recreation Area (DEIS 85-29)

We have reviewed the subject documents and have the following comments.

The documents adequately describe the proposed action and alternatives and addresses some of the major impacts. However, impacts to wildlife and important wildlife habitats have not been adequately addressed in this document.

412

1 We are concerned about the proposed channelization of washes that enter the lakes through developed recreation areas. Even though these desert wash systems have been impacted by human use, they are very important to wildlife. The use of concrete channels to carry flash flood waters to the lakes may be an effective method of flood control, but does nothing to enhance the natural values of the area. We believe that more attention should be given to the losses of this habitat type and possible enhancement and/or restoration efforts. We are also concerned about the attitude expressed in the documents regarding desert springs. Regardless of the proximity or availability of the lake as a water source, these spring areas are as important to many animals as they were historically. Further, as human use increases around the lakeshore, these springs will become even more important.

2 Although grazing is mentioned on page 32 as a use of the NRA, there is no discussion of grazing impacts on other plans to be implemented other than the 1 paragraph on page 32. Why isn't the area that is under grazing leases but not suitable for grazing removed from the leases? What is the effect of grazing on bighorn sheep in the NRA?

3 We believe that the endangered species section should also address the peregrine falcon, an endangered species known to breed in the NRA. The peregrine tends to hunt in riparian areas that could be affected by increased visitor use.

Thank you for the opportunity to review this document and provide comments to you.

Gilbert D. Metz

cc: Director, Arizona Game and Fish Department, Phoenix, AZ
Regional Director, FWS, Albuquerque, NM (AHR)

1 The use of concrete channels to protect public life and property far outweighs the slight impacts on wildlife. The channels used to control flood waters will cover less than 2½ miles of the hundreds of miles of wash bottom within the recreation area. Channelization of the identified development areas at the end of the washes will have minimal impact on wildlife species.

As stated in the document, we recognize springs as important habitat but not as critical to many species of wildlife when water is available from the lake a short distance away. Only two selected springs, which have been altered in the past and are no longer in a "natural" state, are being proposed for recreational improvement. Other spring communities in the recreation area will be managed for their importance to wildlife.

2 When original grazing allotment lines were drawn, there was no attempt to identify areas as suitable or nonsuitable for grazing. Water availability is a limiting factor for the areas where cattle can graze, and all of the allotments within the recreation area have been identified as ephemeral range except those on the Shivwits Plateau. Two areas have been removed from grazing since 1980, where grazing was thought to have some impact on bighorn sheep. Distribution of cattle on grazing allotments is controlled primarily by water holes and terrain. Sheep grazing, which could have the biggest impact on bighorn sheep by transmission of disease, has been eliminated from the recreation area. Grazing, under present management plans, has shown no detrimental impacts to bighorn sheep populations.

3 Refer to USFWS, Albuquerque, response 3.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Jerry D. Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

AUG 2 1985

Dear Mr. Wagers:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) titled LAKE MEAD NATIONAL RECREATION AREA, DRAFT GENERAL MANAGEMENT PLAN, CLARK COUNTY, NEVADA and MOHAVE COUNTY, ARIZONA. We have the enclosed comments regarding this DEIS.

We have classified this DEIS as Category EC-2, Environmental Concerns - Insufficient Information (see attached "Summary of Rating Definitions and Follow-Up Action"). This DEIS is rated EC-2 because of water quality and wetlands concerns. The classification and date of EPA's comments will be published in the Federal Register in accordance with our public disclosure responsibilities under Section 309 of the Clean Air Act.

We appreciate the opportunity to review this DEIS. Please send three copies of the Final Environmental Impact Statement (FEIS) to this office at the same time it is officially filed with our Washington, D.C. office. If you have any questions, please contact Juli Jessen, Federal Activities Branch, at (415) 974-0257 or FTS 454-0257.

Sincerely yours,

Charles W. Murray, Jr.
Assistant Regional Administrator
for Policy and Management

Enclosure (3 pages)

413

Water Quality Comments

1 1. The DEIS does not address environmental impacts of construction activities such as building berms for flood protection, roads and boat docks. These activities have the potential to deteriorate water quality during construction and operation. The FEIS should discuss these impacts and outline mitigation measures.

2 2. The section on impacts from the proposed action includes a lengthy discussion of water quality problems and health risks associated with human feces in swimming areas. The DEIS states (p. 280) that these conditions have nearly closed Boulder Beach and Katherine Swim Beach on several occasions. The document continues (p. 281), "...the proposed action contains several actions that would change shoreline visitation patterns...These actions could indirectly lead to greater increases in visitation than projected and could thus affect water quality and the related public health." Also on p. 281, the DEIS states, "Under the proposed action the existing conditions described above would likely get worse, because of the increasing visitation that is anticipated. Increased visitation along the shoreline would create pollution of shoreline water..." Yet the DEIS concludes on the same page that "Although visitation is expected to increase, the proposed action would not pose significant public health hazards from water pollution in the recreation area..."

We do not believe that this conclusion is supported by the facts discussed in the DEIS. The DEIS should include plans to protect public health by reducing the amount of human waste entering the shoreline waters. Additional convenient public sanitation facilities could be included in the FEIS plans for beach improvement.

In the section "Adverse Impacts That Could Not Be Avoided," (p. 302) the DEIS states, "Should water quality deteriorate below the level required by state standards, some swim beaches might have to be closed to use. There is a possibility that shoreline users would contract disease from contaminated water." EPA does not support implementation of any project which could cause violation of state water quality standards and could impact human health. The FEIS should include plans for adequate sanitation facilities to serve additional visitors and avoid contamination.

1 The "Derivation of the Impact Topics" section has been revised to explain why this impact was not considered to be significant: "Construction activities involving earth movement will not add measurably to siltation. The dry wash bottoms and alluvial slopes are either 1) dry and soil movement cannot affect the lake's water quality or 2) flooded very briefly during a flash flood that carries a full sediment load to the lake whether construction activity is in the flood path or not. Construction of marinas is done from the marina or barges, and siltation from anchor placement is not measurable compared to wind-induced wave action."

2 After reviewing the proposed actions that will affect water quality and related public health, we do not feel that the impact discussion you cited accurately assesses the effects of these proposed actions. The statements regarding water quality and public health because of increased visitation are accurate. However, the proposed action discussed several mitigating measures that would minimize the impacts of increased visitation on water quality and public health. The revised impact discussion references these measures to include changing shoreline visitation patterns to reduce crowding, congestion, and resultant water quality/human health problems; implementing an improved water quality monitoring program; and improving the existing public sanitation and trash removal program.

Although these mitigating measures will be taken, there is a remote chance that anticipated use at the swimming areas could degrade water quality and cause human health problems. In the "Adverse Impacts" section that you cited we are simply acknowledging the fact that this is a remote possibility at any swimming area on the lake. We are not advocating violation of state water quality standards but stating what would happen if the mitigating measures described did not work. We will close the area to protect public health, and this will have an adverse effect on users who enjoy or prefer the area.

COMMENTS

Wetlands Comments (Clean Water Act, Section 404(b))

3 1. The discussion on page 213, paragraph 5, under Desert Shrub Complex, and on page 215, paragraph 6, under Aquatic Community Complex, identifies desert and stream riparian communities as occurring within Lake Mead National Recreation Area. However, with the exception of the larger riverine, spring, and desert wash complexes, these habitats are given only cursory discussion in the analysis of impacts under each alternative. Specifically, the FEIS should identify riparian communities along washes and streams that are likely to be impacted by structural flood protection. Development of flood control features along these washes and streams may be regulated under Section 404(b) of the Clean Water Act; these activities would have to comply with provisions for the regulation of dredged and fill material under the 404(b)(1) Guidelines (40 CFR 230).

4 2. Desert washes provide a source of gravel to Lake Mohave and Lake Mead, and the Muddy, Virgin, and Colorado Rivers. Some fish species may use these gravels in shallow coves near the mouths of washes for spawning. Recreation development and construction of structural flood control projects in washes may disrupt the recruitment of gravel to these inshore habitats; such has been the case in other portions of the lower Colorado River. The FEIS should identify habitats at the mouths of washes that are used, or have the potential to be used, by fishes for spawning. Special attention should be given to cove habitats that have the potential for spawning use by the federally endangered bonytail chub (Gila elegans) and candidate razorback sucker (Xyrauchen texanus). As an example of this concern, in 1983 spawning aggregations of razorback sucker were observed in Whipple Bay in Lake Havasu, another large reservoir.

RESPONSES

3 The "Derivation of the Impact Topics" section explains that the riparian habitat along the Virgin River and Las Vegas Wash would not be affected by any GMP proposals and that only two springs are located where they might be affected. Those potential impacts are described in the draft EIS. Otherwise there are no development proposals that could affect riparian communities along washes and streams or springs. Lake Mead NRA is a desert environment and the proposed development is on dry washes and dry alluvial slopes. Bare unconsolidated soil predominates and vegetation is sparse.

4 Scientific information is not available on what areas around Lakes Mead and Mohave are used for spawning. Periodic observations at the coves where development is proposed have not revealed evidence of spawning by the bonytail chub or razorback sucker. Additionally, the impacts from structural flood control measures would not affect the recruitment of gravel to any significant degree. Most rocks, gravel, sand, and silt are transported during the larger flood events. Such sediment will still be transported to the lakes, whether in the existing dry washes or in man-made structures. Also, the value of spawning habitat is marginal in coves with developed areas because of existing activities around the shoreline and marinas.

The razorback sucker is more abundant in Lake Mohave, and they are known to spawn in gravelly shorelines. The areas they use seem to be gravelly shorelines that are developed by wave action and are not dependent on gravel recruitment from washes. None of the development proposals are in the areas where wave action creates gravelly shorelines.

Cottonwood East is identified as an area suitable for possible future development. Before any final decision is made on development of this area, consultation with the U.S. Fish and Wildlife Service concerning the endangered bonytail chub and the razorback sucker will take place. Development will only occur to the extent that any impacts to these species can be mitigated. If impacts cannot be mitigated, the new area will not be developed.

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION*

Environmental Impact of the Action

LO—Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC—Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO—Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU—Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1—Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2—Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3—Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment

BRUCE BABBITT, *Governor*

Commissioners
CURTIS A. JENNINGS, Scottsdale, Chairman
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ROGER J. GRUENEWALD

Assistant Director, Operations
DUANE L. SHROUFE



ARIZONA GAME & FISH DEPARTMENT
2222 West Greenway Road Phoenix, Arizona

Jerry D. Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

The Arizona Game and Fish Department has reviewed the April 1985 Draft Environmental Impact Statement (DEIS) prepared for the General Management Plan of the Lake Mead National Recreation Area (LMNRA).

Our Department agrees with the 10 issues and concerns displayed in the DEIS, however, we feel wildlife and wildlife habitat, a major issue involved in the management of the LMNRA, should have been included as a priority in the analysis of the General Management Plan.

The Department was unable to select a preferred alternative from those described in the DEIS, primarily because of the inability to compare and evaluate each of the alternative's effects and benefits to fish and wildlife resources.

Our review of the DEIS resulted in the identification of the following issues or problems:

- The DEIS fails to adequately and accurately identify impacts to wildlife species other than threatened and endangered species or bighorn sheep.
- Provisions for developing specific actions to improve habitat conditions should have received consideration within the General Management Plan.
- Provisions to replace structural habitat elements lost through salt cedar removal were omitted.
- Acreage figures depicting habitat loss, by vegetative type for proposed developments, were omitted.
- With the exception of flash flooding, the DEIS failed to adequately describe public safety impacts which may result from a 69% increase in visitor use.

An Equal Opportunity Agency

The Department's detailed comments in reference to the DEIS are included as an attachment to this letter.

We appreciate the opportunity to review the DEIS and to provide comments. We look forward to a continued cooperative working relationship between our agencies in the management of the fish and wildlife resources associated with the Lake Mead National Recreation Area.

Sincerely,

Bud Bristow
Director

BB:JEB:lea

Attachment

cc: State Clearinghouse, AZ 85-80-0020

Arizona Game and Fish Department
Review of the
April 1985 Draft General Management Plan
Lake Mead National Recreation Area

General Comments

Impact Analysis

We believe the document is incomplete in its analysis of impacts to wildlife and public safety. Consistently throughout the document, mining activities are the only conflicting land use described in any detail as a potential adverse impact to natural features, threatened and endangered species, vegetation and desert bighorn sheep. Although the document commendably recognizes the potential significance of mining to wildlife, it does not describe in detail the potential impacts of other land use activities such as feral and domestic livestock grazing, utility corridors and highway rights-of-way. The impacts of increased visitor use are virtually ignored.

Increased visitor use may be one of the most significant factors adversely affecting wildlife within the LMNRA. A 69 percent increase in visitor use (6.5 million to 11 million annually) is expected to: increase disturbance in sensitive backcountry habitats (e.g. springs, riparian habitats and bighorn sheep habitat); increase summertime shoreline use conflicts between bighorn sheep and recreationists; and increase consumptive use of a finite fishery resource.

Increased use within the LMNRA will include unauthorized as well as permitted use of backcountry areas. Impacts from off road vehicle use and increased visits to sensitive habitats can be anticipated. Such impacts may include degraded habitat conditions, and human disturbance of wildlife populations.

During summer months bighorn sheep and other wildlife species rely more significantly on the lakes as a water source. If water-based recreationists increase during these months as anticipated, adverse impacts will likely increase proportionately. Such impacts may include common disturbances, harassment by people and camp dogs, and poaching.

Increased visitor use within the LMNRA will likely increase the consumptive demand for the lakes' fisheries. Increasing the supply to meet this demand is not likely. The production of hatchery-reared fish for Lakes Mead and Mohave is presently at its maximum potential. Significant enhancement of the natural reproduction of warm-water species is likewise considered improbable. To increase natural production commensurate with the anticipated increase in demand through artificial lake fertilization would probably be cost prohibitive and politically sensitive. Improvement of aquatic habitat through development

efforts is possible. However, since habitat condition is not the present limiting factor, the results of such efforts are not expected to compensate for a potential 69 percent increase in demand. Because of the reasons described above, regulation changes (e.g., bag and possession limits) may be necessary to partially compensate for increased consumptive use. Because of the limits on both natural and artificial production, a decrease in the value of a fishing experience is anticipated to result from the increase in visitor use at the LMNRA.

1 Additionally, we recommend that the DEIS address impacts to all wildlife species, rather than limiting its scope to threatened and endangered species and desert bighorn sheep.

2 The potential impacts to public safety are also inadequately addressed. Although the document adequately describes the impacts of flash flooding to public safety, the impacts of increased visitor use are not described. Various public safety statistics such as accidents/year, injuries/year and victim-related crimes/year should be extrapolated to project the increase in these events as a result of the increased visitor use. The boating accident rate within the LMNRA is significant. For example, in 1982 at least 46 boating accidents resulting in ten deaths were reported within the LMNRA. This total was 50 percent of the total boating deaths in the State of Arizona for that year. In 1982 visitor use was approximately 5.6 million, or roughly one-half of the projected annual visits within the life of the plan. We believe that each alternative should include an appropriate increase in law enforcement and emergency services to compensate for the increase in visitor use.

3 Another threat to public safety which should be addressed in the DEIS is that resulting from high winds. On occasion, excessive winds have resulted in significant property damage. For example, on July 11, 1984 high winds which accompanied a thunderstorm occurred at Callville Bay. These winds sunk or swamped 21 boats, and possibly 100 others suffered significant damage. At Echo Bay another 100-150 boats were damaged and two were sunk. Fortunately, no deaths or significant injuries occurred. The GMP should consider measures to minimize such impacts such as constructing breakwaters at marinas which are relatively unprotected from extreme winds. Such marinas may include Callville Bay, Echo Bay, Temple Bar, Las Vegas Wash, Lake Mead Marina, Cottonwood Cove and Katherine Landing.

Management Issues

4 We believe that the GMP inadequately describes the significance of land-based recreation (primarily hunting and trapping) within the LMNRA. Eighty-nine percent (or 14.9 million acres) of the area within the LMNRA boundaries is terrestrial. Significant recreational use occurs within this area. For example 31 percent of the bighorn sheep permits issued in Arizona during 1984 involved recreation area lands.

1 To focus on the most significant impact topics, the issues, alternatives, and impacts were evaluated throughout the GMP planning process. A few impact topics, like threatened or endangered species, were raised by the public in the scoping process. However, all impact topics, including wildlife, were evaluated by the GMP planning team and narrowed to specific topics that include only those of significant environmental concern. Bighorn sheep and threatened or endangered species were felt to be of the most significant environmental concern and most likely to be affected.

2 A key factor in reducing impacts to public safety is to adequately plan for increased visitation. The plan accomplishes this by attempting to reduce visitor crowding and congestion by redesigning existing developed areas. The plan also attempts to reduce visitor crowding and congestion by resdistributing visitor use to new areas. Impacts of the plan on visitor safety are evaluated under the "Impact on Visitor Crowding/Congestion" section.

As part of the ongoing planning for the recreation area, additional funding and staffing will be requested to adequately manage and protect resources, provide for visitor needs, and maintain facilities. Statistics relating to all aspects of visitor activities and to the status and condition of park facilities are collected, maintained, and utilized to identify and justify the need for additional staffing and funds.

Once the GMP is approved and implemented, we would continue to seek additional funding and staffing as required by major development proposals and increases in visitation.

3 It has been determined by the National Park Service that a concessioner must protect his marina without any financial assistance from the Park Service. Many of our concessioners have provided breakwaters in the last few years with varying success. We will assist the concessioner as much as possible in the design and experimentation of floating breakwaters so this problem may be corrected in the future. It has been determined that building a landfill breakwater because of water depths and water level fluctuations is not a feasible task.

4 The Lake Mead National Recreation Area encompasses approximately 1.49 million acres (not 14.9 million acres), of which 88 percent is terrestrial. Of the 6 million ± visitors per year, only 42 people were issued permits to hunt bighorn sheep during 1984 within the recreation area. Although there is much opportunity for land-based recreation, water is the major attraction for over 95 percent of the visitors.

COMMENTS

5 As stated in our previous responses during the early planning process, we recommend that management planning within the LMNRA include measures for improving fish and wildlife habitat. We do not believe that the fish and wildlife resources within the LMNRA have been maximized, as implied on page 30, paragraph two of the GMP. Opportunities still exist to improve habitat conditions and increase habitat availability within the recreation area. We, therefore, recommend that a fish and wildlife habitat management plan be developed to further enhance these resources.

We believe the GMP is somewhat remiss in planning for conflict resolution amongst users. For example, anticipating a low interest in mining based on past interest may not be reasonable. Future economic conditions, or new exploration and processing techniques may make mining desirable within the life of this plan. In this event denial of such interests may also become infeasible. Therefore, the DEIS should discuss in detail the impacts of mineral leasing, and the GMP should state mitigation preferences should such activities occur. The above also applies to other land uses such as feral and domestic livestock grazing, transportation rights-of-way and new hydroelectric needs such as pump-back storage reservoirs and transmission line corridors.

6 We are somewhat disappointed that neither alternative provides for increased access for two-wheel drive vehicles to unimproved shoreline. We realize that in many cases increased vehicle access is adverse to wildlife. However, considering the habitat-type surrounding much of Lakes Mead and Mohave, we believe that substantial opportunity exists to increase access for shoreline recreationists without creating significant adverse impacts to wildlife. Within Arizona there are only nine undeveloped points on Lakes Mead and Mohave, combined, which can be accessed at most times by two- wheel drive vehicles. The other 13 access points in Arizona have either some form of development or require a four-wheel drive vehicle.

7 As stated in previous responses during the early planning stages of the GMP, our Department is concerned with the plans to eradicate tamarisk within the LMNRA. If eradication efforts are immediately followed by revegetation efforts which employ native riparian species, our Department would be supportive of such plans. Without such revegetation efforts we oppose the eradication of tamarisk. Although a prolific exotic, tamarisk does provide habitat value to various wildlife species. Tamarisk provides a foraging guild and nest sites for birds, thermal-cover for many wildlife species, a source of invertebrate food for fish, and when inundated, escape cover for fish. Tamarisk also provides soil stabilization along shorelines, washes and the riverine portion of Lake Mohave in Black Canyon. We cannot endorse any plans to eradicate tamarisk for the purpose of increasing beach area.

RESPONSES

5 The production of hatchery-reared fish for Lakes Mead and Mohave is at its maximum potential, and significant enhancement of the natural reproduction of warm-water species is considered improbable. Bighorn sheep have been transplanted from the recreation area in the recent past at the recommendation of the two state game agencies (Arizona and Nevada) because of overpopulation. It is the policy of the National Park Service to improve habitat conditions only in instances where man has altered those conditions to the detriment of wildlife. Recommendations for habitat improvement are found in the Lake Mead National Recreation Area Resources Management Plan.

6 The rugged terrain prevalent on the Arizona side of the recreation area precludes the development of access points to the shoreline in many cases or through roadless areas still being considered for wilderness designation. The Lake Mead Backcountry Management Plan identifies approved roads within the recreation area. Maintaining roads for two-wheel-drive vehicles is also very expensive, and those roads that offer the best opportunity for shoreline recreation, as much as funds will allow, are maintained for two-wheel-drive access.

7 It is not proposed to eradicate tamarisk from the recreation area. Concerns with tamarisk are that 1) it is drying up some springs so that surface water is not available to wildlife, and 2) it is reducing available beach space for the recreationists. In light of these two concerns, tamarisk would only be removed from selected beach sites which have heavy tamarisk encroachment that eliminates preferred beach space and from springs that no longer have surface flow over much of the year due to evapotranspiration from thick stands of tamarisk. The National Park Service will consult with the Arizona Game and Fish Department on selected eradication sites.

As you requested, sentence 1, paragraph 2, page 364 from the draft EIS has been changed to read concerned with rather than interested in.

Additionally, we do not believe that tamarisk eradication can be justified as a water conservation measure. The question of how much water is actually saved by phreatophyte control has been debated almost since vegetation control was first suggested (Lacey, et. al., 1975 and Paylore, 1974). The amount of water transpired by the relatively few acres of tamarisk within the LMNRA is probably insignificant, particularly when compared to the evaporative losses which occur from 191,500 acres of surface water.

Furthermore, it is the policy of the Arizona Game and Fish Commission to:

> ". . . (oppose) implementation and authorization of future vegetation eradication programs until such programs are evaluated by the sponsoring agencies, development agencies, and the Arizona Game and Fish Department for the purpose of determining the nature and extent of benefits to be derived therefrom, and the nature and extent of resource losses resulting from the projects, and until appropriate recommendations for mitigation of resource losses resulting from the implementation of a clearing project are incorporated in the project."

We believe that Sentence 1, Paragraph 2, Page 364 is misleading. Although this statement is true if interpreted literally, we believe it implies a favorable position toward tamarisk control. There is no way that our previous responses concerning this issue can be interpreted in this manner. All of our prior responses regarding tamarisk control have been in opposition. We request that this sentence be reworded to reflect our correct position.

COMMENTS BY PLANNING ZONE

8 Katherine Zone

We believe that developing an additional boating access site at Lower Mohave as described by the proposed action will likely result in increased congestion problems in an already crowded zone. Increased traffic and other people-related problems should be anticipated. A corresponding increase in law enforcement effort and public services should be provided. Because the proposed action describes a "day-use" facility, we do not anticipate significant adverse impacts to fish and wildlife as a result of this alternative. However, we wish to discourage future plans to add overnight facilities at this new site.

We question the need for additional fuel facilities within this zone. We do not believe that the need for such facilities outweigh their potential for adverse impacts to adequate resources and public safety.

8 The additional day use launch facility is needed to disperse traffic from the present launch facility and parking area, which also supports traffic for the restaurant, store, boathouse operation, ice house, etc. During summer weekends, especially three-day weekends, boaters have long, hot waits to launch or retrieve their boats. A second day use ramp would help alleviate the congestion and long waits now experienced. Increased public services and law enforcement are also being sought to improve services to visitors. Additional fuel facilities would again alleviate the long wait at the present gas dock during the summer weekends.

COMMENTS

9 Cottonwood Zone

We are not in favor of adding facilities at Cottonwood East. Increased use, either boating or shoreline, may further jeopardize the spawning habitat of bonytail chubs and razorback suckers which occur in this vicinity. Furthermore, Cottonwood East is one of the few access points on the lakes which have two-wheel drive access and are undeveloped. We believe there is a shortage of such sites for use by shoreline recreationists.

10 Willow Beach Zone

Because no other overnight facilities occur in the vicinity of Willow Beach, we encourage the LMNRA to retain existing, or add overnight facilities at Willow Beach. If the relocation of existing facilities or addition of new facilities are implemented, it is important to avoid locating them within bighorn sheep habitat. We do not anticipate any adverse impacts at any of the potential sites described in the DEIS.

11 Virgin/Temple Zone

Because of the increase in wintering bald eagle occurrence at the Detrital Bay and Bonelli Landing areas, we recommend that the plans to provide improvements in this area be carefully reevaluated. The proposed launch ramp, campground, parking lot, and restrooms could encourage long-term use by winter visitors similar to that at Pearce Ferry. Such increased long-term winter use may be adverse to the endangered bald eagle.

12 Adding facilities at either South Cove or Pearce Ferry would increase recreational opportunity at Upper Lake Mead. However, this may be adverse to bighorn sheep. Much of the shoreline of the upper lake is bighorn sheep habitat. Increased visitor use in this zone is expected to result in increased incidences of bighorn disturbance and harassment. For these reasons we prefer the no action alternative within the Gregg Basin/Grand Wash Zone. Because of the fuel facilities proposed by Alternative B, we find this to be the least favorable alternative.

Shivwits Plateau Zone

Although no significant adverse impacts to wildlife are anticipated as a result of the proposed developments within the Shivwits Zone, we question the demand for such facilities. Because of this site's location (about a three hour drive from pavement), it is doubtful that the proposed improvements are warranted.

RESPONSES

9 Cottonwood East is identified as an area suitable for possible future development. Before any final decision is made on the development of this area, consultation with the U.S. Fish and Wildlife Service concerning the endangered bonytail chub and the razorback sucker will take place. Development will only occur to the extent that any impacts to these species can be mitigated. If impacts cannot be mitigated, the areas will not be developed.

10 The Willow Beach development is within bighorn sheep habitat. Sheep still come down to water near the fish hatchery and the mouth of Jumbo Wash. The option to expand the overnight capacity of this area was investigated in the 1979 study for Willow Beach, entitled "Alternatives for Future Use." Relocation of existing facilities or addition of new facilities will be confined to sites mapped on the development concept plan for Willow Beach, thereby avoiding bighorn sheep habitat.

11 Detrital Bay and Bonelli Landing are identified as areas suitable for possible future development. Before any final decision is made on development of this area, consultation with the U.S. Fish and Wildlife Service concerning impacts to the endangered bald eagle will take place. Development will only occur to the extent that impacts to this species can be mitigated. If impacts cannot be mitigated, the areas will not be developed.

12 Wheeler Ridge and adjacent areas near South Cove and Pearce Ferry are indeed bighorn sheep habitat. The shoreline for much of this area is steep and rocky and does not lend itself to beach camping or beach use. Increased visitor use in this zone will result in increased conflicts between visitors and bighorn sheep similar to what is experienced around the Willow Beach developed area. Sheep herds adjacent to the Willow Beach developed area have adjusted to the recreating public and show no long-term population declines. The development of a paved launch ramp, restrooms, and a ranger/contact station at Pearce Ferry and provision of parking and restroom facilities at South Cove (proposed action) should not promote an increase in visitation that would have detrimental consequences to the bighorn sheep population.

COMMENTS

RESPONSES

SPECIFIC COMMENTS ON TEXT

Page 25; Table 5

13 How will grazing be precluded in areas where it is not a permitted activity? If fencing is really to be considered over such an extensive area, we would appreciate the opportunity to coordinate regarding fence specifications and locations to avoid adverse impact to wildlife.

13 Fencing of allotment lines is not anticipated for the control of trespass cattle. Management of water holes along with natural barriers will be used to control movement of cattle. Control of water holes may include fencing of the water. The National Park Service will coordinate with the Arizona Game and Fish Department regarding any fencing projects.

Page 30; Paragraph 2; Sentence 2

14 Mule deer occur in at least low densities within all habitat types throughout the LMNRA, not just on the Shivwits Plateau as implied.

14 Mule deer may be transient through all habitat types in the recreation area but are not year-around residents like they are on the Shivwits Plateau.

Page 30; Paragraph 4, Sentence 2

15 We are unaware of any ongoing study of bighorn sheep ecology and their competition with burros within the LMNRA. We would appreciate learning the details of such a study and its results.

15 Personnel of the Kingman Office of the Arizona Game and Fish Department have been kept informed of the bighorn sheep ecology study.

Page 30; Paragraph 4; Sentence 3

6 It is doubtful that puncture vine or mosquitoes are significant causes of discomfort to visitors of the LMNRA.

16 Mosquitoes are only a significant cause of discomfort during a few weeks in midsummer when hatches occur. Puncturevine is not a cause of significant discomfort.

Page 31; Paragraph 3; Sentence 1

17 The bonytail chub recovery team should read Colorado River Fishes Recovery Team.

17 The reference has been changed to read Colorado River Fishes Recovery Team as you requested.

Page 35, Resource Damage Map

18 Stop Sign Cove on Lake Mohave should be listed as a "lakeshore sanitation and trash problem area."

18 Stop Sign Cove has a lakeshore sanitation and trash problem and has been included as such on the Resource Damage map.

Page 46; Table 9

19 Additional existing flat-wake zones include: Stop Sign Cove, Little Stop Sign Cove, and Ski Cove on Lake Mohave; and South Cove and Pearce Ferry on Lake Mead.

19 These coves have been added to the table as you requested.

Page 47; Paragraph 2; Sentence 2

20 Arizona Public Health Department should read Arizona Department of Health Services.

20 Reference to Arizona Public Health Department has been changed to Arizona Department of Health Services as you requested.

Page 57; Table 10

21 There are no existing Interpretive Trails and/or Waysides at Grapevine Canyon as indicated here.

21 There is a parking lot just off the Christmas Tree Pass Road. A trail leads to the petroglyphs approximately ¼ mile west. Wayside exhibits and interpretive signs are currently in place along this trail.

Page 213; Paragraph 5

22 Sidewinders generally prefer more xeric habitats. They are not considered a good representative of the desert riparian community. Mule deer and several raptor species are good representatives of this habitat-type.

Page 214; Paragraph 2

23 Pinyon or single-leaf pine should read single-leaf pinyon. Bighorn sheep are not considered good representatives of the woodland vegetation complex.

Page 215; Paragraph 2

24 Arizona has not planted kokanee salmon into Lake Mohave, only the State of Nevada has. Money Cove should read Monkey Cove.

Page 216; Paragraph 5

25 Pack rat should read woodrat. Field mouse should read deer mouse. Red-shafted flicker should read common flicker.

Page 221; Table 18

26 Peregrine falcon (Arizona Group 2, endangered equivalent), and osprey (Arizona Group 3, threatened equivalent) should be added to this table. Additionally, the Arizona Group 2 designation should be indicated for bonytail chub and the Arizona Group 3 designation should be indicated for the desert tortoise and razorback sucker.

Page 233; Paragraph 4

27 Important bighorn sheep lambing grounds within the Arizona portion of the LMNRA should be included in this list of significant natural features which deserve special protection. These include the lambing grounds at Mt. Davis, Malapais Mesa, Monkey Cove, Black Canyon (Triangle), Fortification Hill, Fortification Ridge, Canyon Ridge, Arch Mountain, and Wishing Well.

Page 235; Sentence 2

28 The Arizona Department of Game and Fish should read Arizona Game and Fish Department.

22 The reference to sidewinders has been deleted because they would be found more often in more xeric habitats. Very few mule deer are found within the recreation area, except on Shivwits Plateau.

23 We make no statment that bighorn sheep are considered a good representative of the woodland vegetation complex; however, bighorn sheep are found in this habitat within the recreation area and in many other mountain ranges containing this habitat throughout the Southwest.

24 The reference to the state of Arizona has been deleted because the state was not involved in the planting of kokanee salmon. Monkey Cove is the correct spelling.

25 These changes have been made in the document as you requested.

26 Changes to reflect the latest Arizona Group designations have been made in the document.

27 The lambing grounds identified are shown on the Significant Natural Features map; they are shown as evironmental protection zones on the Management Zoning map.

28 The reference has been changed to read Arizona Game and Fish Department as you requested.

Page 282, Paragraph 1; Sentence 3

29 We do not agree that desert spring ecological communities are "not as critical as they once were because the reservoirs provide some comparable shoreline habitat." The shorelines of Lakes Mead and Mohave do not provide the same habitat-type nor value as natural desert springs. Because of the increased demand placed upon these communities by conflicting users, these springs are possibly more critical than ever.

29 See response 1 to the USFWS, Phoenix, Arizona.

Page 384; Paragraph 3; Last Sentence

30 The memorandum of understanding between the Arizona Game and Fish Department and the National Park Service was approved on June 7, 1984.

30 The correction to show the memorandum of understanding approved on June 7, 1984, has been made in the document.

Cove Map

31 The GMP and DEIS consistently refer to specific coves by name. A map featuring these coves would be a helpful addition to the document.

31 A map showing all the names of the coves within the NRA is available at all visitor centers. It will not be reproduced in this document.

We hope these comments prove helpful in developing the Final Environmental Impact Statement and in selecting a management alternative.

ARIZONA
OFFICE OF THE GOVERNOR
BRUCE BABBITT

OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT
Beth S. Jarman, Ph.D., Executive Director • (602) 255-5371

D18

MEMORANDUM

TO: National Park Service

FROM: Arizona State Clearinghouse

DATE: July 19, 1985

RE: National Park Service
Lake Mead Draft Environmental Impact Statement Vol. I & II
Environmental Consequences DEIS 85-29
SAI NO: AZ 85-80-0020

427

1 This memorandum is in response to the above project submitted to the Arizona State Clearinghouse for review.

The project has been reviewed pursuant to the Executive Order 12372 by certain Arizona State officials and Regional Councils of Government.

The Standard Form 424 is attached along with any comments that were received for submission with the project. The comments are advisory.

Attachments

cc: Arizona State Clearinghouse
Applicant

Executive Tower 4th Floor • 1700 West Washington • Phoenix, Arizona 85007

1 Comment noted, no response required.

SIGNOFF

EXHIBIT A 67

OMB Approval No. 0348-0006

FEDERAL ASSISTANCE

1. TYPE OF SUBMISSION (Mark appropriate box)	☐ NOTICE OF INTENT (OPTIONAL) ☐ PREAPPLICATION ☐ APPLICATION	2. APPLICANT'S APPLICATION IDENTIFIER a. NUMBER / b. DATE Year month day 19	3. STATE APPLICATION IDENTIFIER NOTE TO BE ASSIGNED BY STATE a. NUMBER 85-80-09 / b. DATE ASSIGNED Year month day 19
Leave Blank	JUL 19 [redacted]	Janice Dunn	

4. LEGAL APPLICANT/RECIPIENT
- a. Applicant Name: National Park Service
- b. Organizational Unit: Lake Mead National Recreation Area
- c. Street/P.O. Box: 601 Nevada Highway
- d. City: Boulder
- e. County:
- f. State: Nevada
- g. ZIP Code: 89005
- h. Contact Person (Name & Telephone No.):

5. EMPLOYER IDENTIFICATION NUMBER (EIN):

6. PROGRAM (From CFDA) a. NUMBER 15.919 MULTIPLE ☐ b. TITLE DOI, NPS

7. TITLE OF APPLICANT'S PROJECT (Use section IV of this form to provide a summary description of the project.) LAKE MEAD DRAFT ENVIRONMENTAL IMPACT STATEMENT VOLUME II-AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES DEIS 85-29

8. TYPE OF APPLICANT/RECIPIENT (A—State, B—County, C—Municipality, D—Township, E—Interstate, F—Intermunicipal, G—Special District, H—Independent School District, I—State Controlled Institution of Higher Learning, J—Private University, K—Indian Tribe, L—Individual, M—Profit Organization, N—Other (Specify)) FEDERAL AGENCY. Enter appropriate letter: K

9. AREA OF PROJECT IMPACT (Names of cities, counties, states, etc.): Mohave County, Arizona; Clark County, Nevada

10. ESTIMATED NUMBER OF PERSONS BENEFITING

11. TYPE OF ASSISTANCE (A—Basic Grant, B—Supplemental Grant, C—Loan, D—Insurance, E—Other) Enter appropriate letter(s):

12. PROPOSED FUNDING

a. FEDERAL	$ .00
b. APPLICANT	.00
c. STATE	.00
d. LOCAL	.00
e. OTHER	.00
f. Total	$ .00

13. CONGRESSIONAL DISTRICTS OF: a. APPLICANT / b. PROJECT

14. TYPE OF APPLICATION (A—New, B—Continuation, C—Revision, D—Augmentation) Enter appropriate letter: A

15. PROJECT START DATE Year month day 19

16. PROJECT DURATION Months

17. TYPE OF CHANGE (For 14a or 14d: A—Increase Dollars, B—Decrease Dollars, C—Increase Duration, D—Decrease Duration, E—Cancellation, F—Other (Specify)) Enter appropriate letter(s):

18. DATE DUE TO FEDERAL AGENCY ▶ Year month day 19

19. FEDERAL AGENCY TO RECEIVE REQUEST

a. ORGANIZATIONAL UNIT (IF APPROPRIATE)

b. ADMINISTRATIVE CONTACT (IF KNOWN)

c. ADDRESS: SAME AS ABOVE

20. EXISTING FEDERAL GRANT IDENTIFICATION NUMBER

21. REMARKS ADDED ☐ Yes ☐ No

SECTION II—CERTIFICATION

22. THE APPLICANT CERTIFIES THAT ▶ To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved.

a. YES. THIS NOTICE OF INTENT/PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE _____

b. NO. PROGRAM IS NOT COVERED BY E.O. 12372 ☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW ☐

23. CERTIFYING REPRESENTATIVE a. TYPED NAME AND TITLE / b. SIGNATURE

SECTION III—FEDERAL ACTION

24. APPLICATION RECEIVED Year month day 19

25. FEDERAL APPLICATION IDENTIFICATION NUMBER

26. FEDERAL GRANT IDENTIFICATION

27. ACTION TAKEN
- ☐ a. AWARDED
- ☐ b. REJECTED
- ☐ c. RETURNED FOR AMENDMENT
- ☐ d. RETURNED FOR E.O. 12372 SUBMISSION BY APPLICANT TO STATE
- ☐ e. DEFERRED
- ☐ f. WITHDRAWN

28. FUNDING

a. FEDERAL	$ .00
b. APPLICANT	.00
c. STATE	.00
d. LOCAL	.00
e. OTHER	.00
f. TOTAL	$ .00

29. ACTION DATE ▶ Year month day 19

30. STARTING DATE Year month day 19

31. CONTACT FOR ADDITIONAL INFORMATION (Name and telephone number)

32. ENDING DATE Year month day 19

33. REMARKS ADDED ☐ Yes ☐ No

NSN 7540-01-008-4162 PREVIOUS EDITION IS NOT USABLE

424-103

STANDARD FORM 424 PAGE 1 (Rev. 4-84) Prescribed by OMB Circular A-102

COMMENTS

RESPONSES

TO:

, SHPO
Arizona State Parks Board
1688 W. Adams, Rm. 109
Phoenix, AZ 85007

State Application Identifier (SAI)
State A-Z No. 85-82-5029

Transportation
Game & Fish
Parks
Tourism

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

☐ No comment on this project ☐ Proposal is supported as written ☒ Comments as indicated ~~below~~ on back

429

1. Is project consistent with your agency goals and objectives? ☐ Yes ☐ No ☐ Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☐ Yes ☐ No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? ☐ Yes ☐ No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? ☐ Yes ☐ No
5. Does project violate any rules or regulations of your agency? ☐ Yes ☐ No
6. Does project adequately address the intended effects on target population? ☐ Yes ☐ No
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):
This draft document was not received until 13 June 1985

Reviewers Signature Teresa J. Hoffman for AS (SHPO) Date 6-14-85

Title Archaeologist Telephone 255-4174

COMMENTS

RESPONSES

State Application Identifier (SAI)

State AZ No.

TO:

Robert J. Darr
Advanced Planning Section
Department of Transportation
206 S. 17th Ave., Room 310B
Phoenix, AZ 85007

Transportation
Game & Fish
Parks
Tourism

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

☒ No comment on this project ☐ Proposal is supported as written ☐ Comments as indicated below

430

1. Is project consistent with your agency goals and objectives? ☐ Yes ☐ No ☐ Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? ☐ Yes ☐ No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? ☐ Yes ☐ No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? ☐ Yes ☐ No
5. Does project violate any rules or regulations of your agency? ☐ Yes ☐ No
6. Does project adequately address the intended effects on target population? ☐ Yes ☐ No
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? ☐ Yes ☐ No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature L. P. Stingley Date 6/4/85

Title State Planner Telephone 255-8138

United States Department of the Interior
NATIONAL PARK SERVICE
WESTERN REGION
450 GOLDEN GATE AVENUE, BOX 36063
SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO:

H4217 (WR-RH)

July 1, 1985

Mr. Bob Fink
Denver Office
Advisory Council on Historic Preservation
730 Simms Street, Room 450
Golden, Colorado 80401

Dear Mr. Fink:

Enclosed are the comments of Arizona State Historic Preservation Officer On the Lake Mead General Management Plan.

We have not received the Nevada State Historic Preservation Officer's comments but will forward them on receipt.

Sincerely yours,

(Sgd) John S. Adams

John D. Cherry
Associate Regional Director
Resource Management and Planning

Enclosure

cc:
WASO-418 History Division, w/c enc.
DSC-TWE Mr. John Latcher, w/c enc.
LAME Superintendent, w/c enc.

ARIZONA STATE PARKS

1688 WEST ADAMS STREET
PHOENIX, ARIZONA 85007
TELEPHONE 602-255-4174

BRUCE BABBITT
GOVERNOR

STATE PARKS BOARD MEMBERS

GWEN ROBINSON
CHAIR
YUMA

REESE G. WOODLING
VICE CHAIRMAN
TUCSON

ELIZABETH A. DRAKE
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PHOENIX

DUANE MILLER
SEDONA

PRISCILLA ROBINSON
TUCSON

JAMES STALNAKER
FLAGSTAFF

ROBERT K. LANE
STATE LAND COMMISSIONER

MICHAEL A. RAMNES
DIRECTOR

ROLAND H. SHARER
DEPUTY DIRECTOR

June 17, 1985

Mr. Howard H. Chapman
Regional Director, Western Region
National Park Service
450 Golden Gate Avenue
P.O. Box 36063
San Francisco, CA 94102

Re: Lake Mead NRA
- Draft EIS
DOI-NPS

Dear Mr. Chapman:

1 We have reviewed the draft Environmental Impact Statement for Lake Mead National Recreation Area. The report appears to consider adequately the cultural resources of the project area at this stage of investigation pursuant to 36 CFR, Part 800 of the Advisory Council's regulations ("Protection of Historic and Cultural Properties"). We look forward to continuing the consultation process regarding the cultural resources of this project.

We appreciate your cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions, please contact me at (602) 255-4174.

Sincerely,

Teresa L. Hoffman

Teresa L. Hoffman
Archaeologist

for Donna J. Schober
State Historic Preservation Officer

TLH:mes

1 Comment noted, no response required.

STATE OF CALIFORNIA—THE RESOURCES AGENCY

COLORADO RIVER BOARD OF CALIFORNIA
107 SOUTH BROADWAY, ROOM 8103
LOS ANGELES, CALIFORNIA 90012
(213) 620-4480

JUL 12 1985

July 10, 198

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

We have reviewed the Draft Environmental Impact Statement Lake Mead National Recreation Area, dated April 1985, and offer the following comment for your consideration.

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1 Volume II, page 232. We suggest that the first full paragraph be modified to read as follows:

"Another water quality problem common throughout the lower Colorado River is the increasing salinity levels. Present levels of salinity have been attributed to a number of sources, with about half coming from natural sources, irrigated agriculture contributing about 37%, reservoir evaporation causing 12%, out-of-basin exports responsible for 3%, and municipal and industrial uses causing 1%. Salinity increases result from two processes: salt loading and salt concentration. Salt loading increases the quantity of salt in a given amount of water, and salt concentration decreases the amount of diluting water for a given quantity of salt. Salt loading is seen in the discharge of mineral salts from natural and manmade sources to the river system. Salt concentration occurs through the consumptive use of water in the basin and in the diversion from the basin of water with a low salt concentration. High levels of salinity have adverse economic effects on agricultural, municipal and industrial water users in both the United States and The Republic of Mexico. A basinwide federal-state program for salinity control is underway."

Thank you for the opportunity to comment on the report.

Sincerely,

Vernon E. Valantine

Vernon E. Valantine
Chief Engineer

1 This paragraph has been changed as suggested.

Clark County

Department of Comprehensive Planning
RICHARD S. HOLMES
DIRECTOR
JAMES L. LEY
ASSISTANT DIRECTOR
JNTY BROGER BUILDING
/ENUE, SEVENTH FLOOR
; VEGAS, NEVADA 89155
[702] 386-4181

July 2, 1985

Mr. Jerry D. Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

DRAFT-ENVIRONMENTAL IMPACT STATEMENT
FOR THE LAKE MEAD RECREATION AREA

Dear Mr. Wagers:

1 The Clark County Department of Comprehensive Planning has reviewed the Draft Environmental Impact Statement (D-EIS) for the Lake Mead Recreation Area. Our concerns center on the water quality of Lake Mead and Lake Mohave and on the flash flood protection of visitors to the lakes. The alternative proposed by the D-EIS appears to provide the maximum protection for both concerns and yet allows the best possible access to recreation activities of Lakes Mead and Mohave.

We would also like to inform you that Clark County is currently actively seeking a consulting firm to provide a plan for flash flood protection for key areas in the County. We would like to stay in close contact with the National Park Service on this matter and possibly coordinate our efforts to provide flash flood protection. We have been in contact with Dennis Davis of your Denver office and he has briefed us on the progress of Flood Loss Reduction Associates in their effort to provide you with a flash flood protection system and emergency plan.

Sincerely,

ADVANCED PLANNING DIVISION

Ted Carraso

Ted Carraso
Planner II

TC:ii

COMMISSIONERS
Thalia M. Dondero, Chairman • Manuel J. Cortez, Vice-Chairman
Jay Bingham, Paul J. Christensen, Karen Hayes, William U. Pearson, Bruce L. Woodbury
Donald L. "Pat" Shalmy, County Manager

1 Comment noted, requested coordination is underway.

The Resort Bargain Of The World

June 13, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National
Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

1 First, I want to thank you for sending a copy of the draft environment impact statement for my review.

As you know, the tourism and convention industry in Clark County is expanding every year. It is our number one industry and the life blood of all of Nevada.

To offer our visitors upgraded facilities and service is our number one priority and our duty.

The tourism and convention business is highly competitive. Every area of the United States is offering the visitor and delegate more and more amities. We must maintain our competitive edge if we are to keep and increase our market share.

Along with the millions of dollars we spend to advertise and promote Las Vegas and our outlying areas the Governor of Nevada has formed the Commission on Tourism who also spends millions of dollars on advertising and promoting "The Other Nevada".

So, with all the dollars being spent to influence the consumer on what the outlying areas have to offer, we can also expect them to stay one or two extra days in our area.

We highly endorse Plan "A" for the next twenty five years. This plan would keep pace with the 68% increase in visitors, offer more services from the concessioners, and safety for our visitors.

Thank you for your time.

Sincerely,

Frank C. Sain
Executive Director

FCS:lb

1 Comment noted, no response required.

energy fuels exploration company
executive offices • suite 900 • three park central • 1515 arapahoe • denver, co

July 29, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

FEDERAL EXPRESS

Re: Lake Mead National Recreation Area General Management Plan

Dear Mr. Wagers:

Energy Fuels Exploration Company ("Energy Fuels") appreciates the opportunity to submit its comments to the National Park Service ("NPS") on the Lake Mead NRA Draft General Management Plan ("DGMP"). As you know, Energy Fuels has participated at all stages in the planning process for the NRA in an attempt to provide the NPS with meaningful and factual information regarding the uranium mineral potential of the Shivwits Plateau and the ability of Energy Fuels and other mining companies to develop the uranium mineral resources which are either known or believed to exist within the NRA. Specifically, we met extensively with you and members of your staff in San Francisco on November 18, 1983 during which we made known to you the nature of the uranium deposits which we believe occur within the NRA as well as describing to you in some detail the de minimus nature of the surface impacts necessary to develop and mine these breccia pipe type deposits. In addition, we took two of your representatives, along with representatives from the Grand Canyon National Park, and the Glen Canyon NRA on a site visit of our Pigeon Mine to more concretely demonstrate the nature and quality of our other mining operations of these types of mineral occurrences.

At the outset, we would indicate our concurrence with the comments submitted by Patrick J. Garver of Parsons, Behle & Latimer on behalf of the Utah Mining Association. Specifically, Energy Fuels expressly incorporates those comments as its own by reference. In addition, we would reiterate our strong belief that any decision by the NPS to eliminate from mineral leasing the areas of the Shivwits Plateau within the NRA is arbitrary, without foundation in law or fact, and directly contrary to the

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1 language and intent of the enabling legislation for the NRA. There is more than ample evidence, both geologic and otherwise, that the Shivwits Plateau area of the NRA has very high uranium mineral potential -- evidence which the NPS has apparently chosen to ignore. Moreover, we submit that, with respect to uranium, the various references in the DGMP to mineral evaluations, mineral potential and expected adverse impacts of mineral development within this area of the NRA are not factually based and that the approach to the issue of mineral leasing within this area of the NRA demonstrates an unwillingness on the part of the NPS to adequately and thoroughly evaluate and consider the probably mineral potential of this area of the NRA. Because of this apparent unwillingness, the NPS has failed to make an adequate record upon which to base any decision to eliminate mineral leasing in this area of the NRA. Importantly, the failure of the DGMP to present anything more than unsupported conclusory statements with respect to mineral resources and activities within the NRA has served to deny the public of the meaningful opportunity to comment upon the proposed alternatives set forth in the DGMP with respect to mineral leasing alternatives.

2 Finally, the statement made on page 295 of the DGMP and attributable to Energy Fuels that "a price of nearly $60/ pound would be necessary before these pipes would be economical to mine" should be changed as should any suggestion that prices well in excess of the current market are necessary in order for these types of uranium deposits to be economic. Our experience with these types of deposits suggests that a market price of $15 per pound would be more than adequate to justify mining and development within the Shivwits Plateau.

We urge the NPS to reconsider its proposed decision to eliminate mineral leasing within the Shivwits Plateau and to manage the NRA consistent with the Congressional purposes set forth in the enabling legislation. As we have continually acknowledged, the NPS has a demonstrable duty to manage the NRA to protect its recreational purposes. However, the NPS can fulfill this duty without, in essence, ignoring its other responsibilities to permit mineral exploration and development in those areas where to do so is not incompatible with the NRA's primary purposes.

We appreciate this opportunity to convey our comments to you. As in the past, Energy Fuels stands ready to provide such additional information regarding the uranium mineral potential of this area to such members of your staff as the NPS feels may be helpful. We are also quite willing to demonstrate to you that the mining activities associated with the exploration and development of these types of mineral occurrences are only temporary in nature (rather than "irreversible" as stated in the DGMP) and that subsequent to mining those activities can be fully reclaimed, even to the degree of being substantially unnoticeable should such a standard be mandated.

Sincerely,

Brad L. Doores

Brad L. Doores,
Vice President- Legal &
Regulatory Affairs

1 Refer to Nevada BLM responses 2 and 9.

2 References to the "price of nearly $60/pound would be necessary before these pipes would be economical to mine" have been removed from the final EIS.

FOREVER RESORTS

P.O. BOX 29041 · PHOENIX, AZ 85038 · (602) 948-8111

July 30, 1985

Jerry Wagers, Superintendent
National Park Service
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, NV 89005

Dear Superintendent Wagers:

The National Park Service should be applauded for their effort in compiling a comprehensive study that will surely be of tremendous value in providing guidelines encompassing the growth and management of the Lake Mead National Recreation Area. It is apparent that the content of the study was well researched providing a solid foundation from which alternatives and actions could be formulated.

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In reiteration of Forever Resorts' views and comments presented to the National Park Service at the public meetings held in Boulder City, Las Vegas and Phoenix, for the purpose of discussing the content of the GENERAL MANAGEMENT PLAN AND ALTERNATIVES, this letter represents our formal recommendations regarding this matter.

In general, the PROPOSED ACTION alternatives addressed in the management plan does have merit. However, it appears that based on previous history of concessions located in the Lake Mead National Recreation Area that before new developed areas and accesses are implemented as suggested in the PROPOSED PLAN, that the existing concession developments be allowed to grow to their full potential.

1 In order to provide Cottonwood Cove and Callville Bay the latitude to develop to their full potential, it is requested the TABLE 1 SUMMARY OF PROPOSED DEVELOPMENTS be amended as outlined.

NOTE: Development Concept Plan and Summary of Proposed Developments attached.

To ensure your understanding of the proposed changes, Forever Resorts would like a meeting with you at your earliest convenience.

Yours very truly,

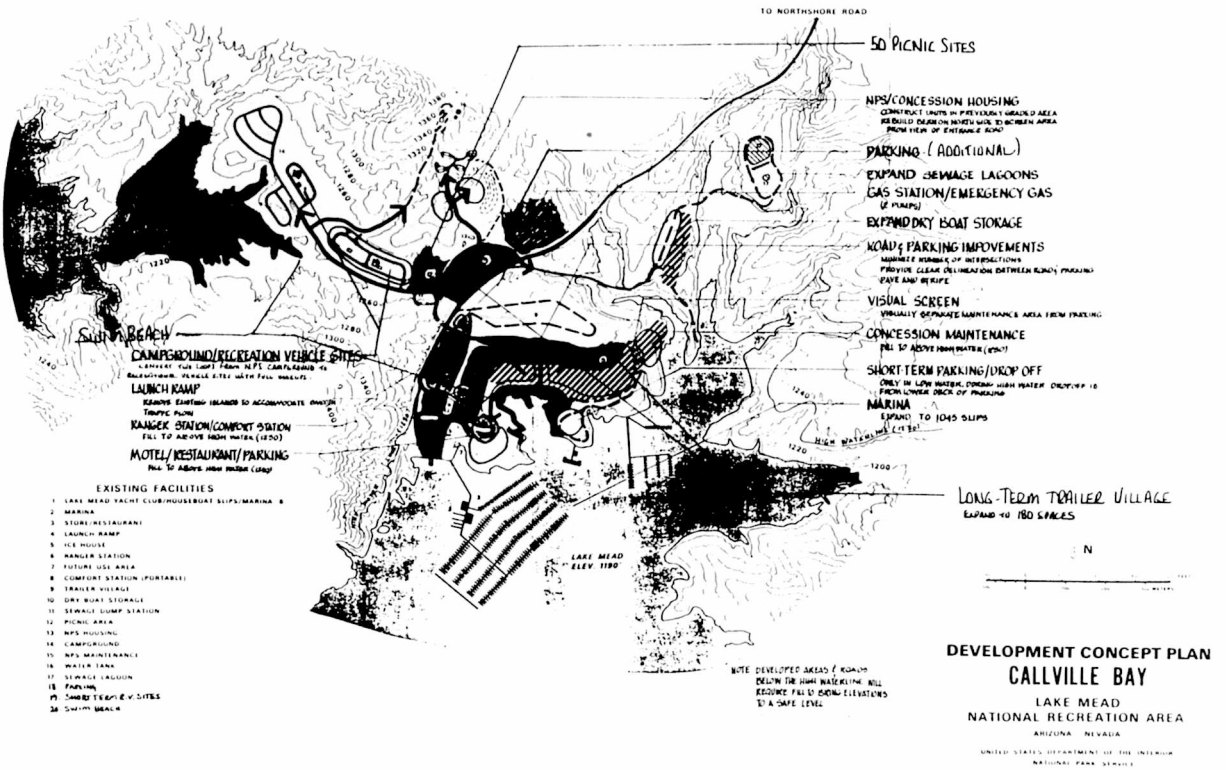
Tom Mace
Senior Vice President - Resorts

Encls:

1 Comment noted, changes which do not conflict with plan objectives have been made.

RESPONSES

COMMENTS



DEVELOPMENT CONCEPT PLAN

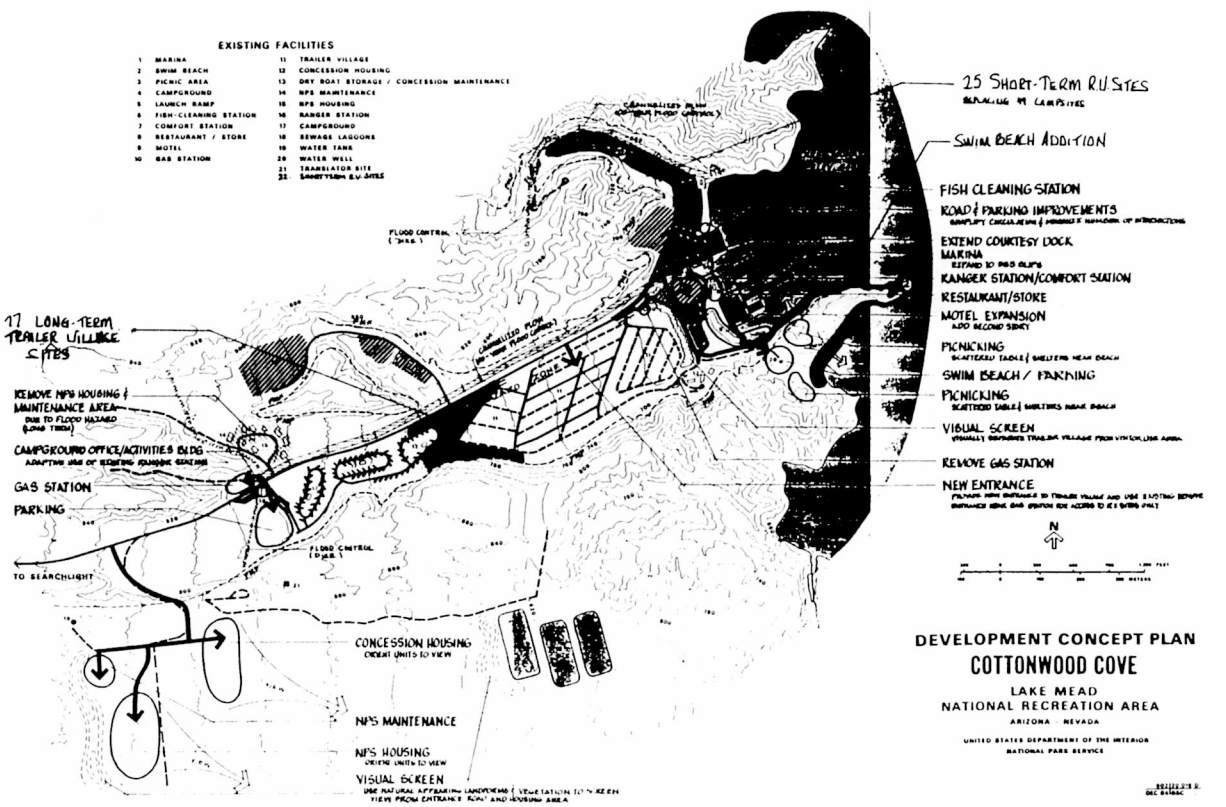
CALLVILLE BAY

LAKE MEAD
NATIONAL RECREATION AREA
ARIZONA · NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

RESPONSES

COMMENTS



RESPONSES

COMMENTS

Table 1: Summary of Proposed Developments (Proposed/Existing)

Zone/Area	Parking Spaces	New Roads (Miles)	Improvements to Existing Roads (Miles)	Vacation Cabin Sites	Long-term Trailers	Short-term RV Sites	Campsites
Cottonwood Cove	1,000/728	-0-	5/0	-0-	300/223	100/75	100/149
Callville Bay	1,800/1,700	-0-	3/0	-0-	180/94	60/6	90/150

	Motel Units	Picnic Sites	Swim Beaches (Acres)	Launch Ramps (Lanes)	Marina Slips	Flood Mitigation Structures	Nonstructural Flood Mitigation
Cottonwood Cove	48/24	30/4	7/5	6/6	535/237	Levees: 850',650',200' Channels: 4364', 1545' Bridges: 30', 30'	W, EV, EP, R
Callville Bay	100/0	50/6	5/0	13/13	1,200/300		

National Parks & Conservation Association

1701 Eighteenth Street, N.W.• Washington, D.C. 20009

RUSSELL D. BUTCHER
Regional Representative
SOUTHWEST & CALIFORNIA
Box 67
Cottonwood, AZ 86326
(602) 634-5758

(202) 265-2717

July 15, 1985

RE; Draft EIS/GMP
for Lake Mead NRA

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Jerry:

442

National Parks & Conservation Association appreciates the chance to comment on the Lake Mead National Recreation Area "Draft Environmental Impact Statement/General Management Plan & Alternatives," of April 1985.

We first want to express our compliments to you, to Bill Burke, and all the other NPS staff who worked to produce this two-volume document. It has clearly required an enormous amount of outstanding research, input, analysis, and writing.

On first encounter, the Proposed Action Alternative along with flood mitigation measures appeared to recommend an unusually large federal investment of federal monies--out of proportion to other National Park Service unit needs. Upon closer scrutiny, plus some field viewing, it appears that such a substantial investment may not be so far "out of line" after-all when considering such factors as: (1) the Plan's projection period covers at least the next quarter century, (2) visitation-growth projections for Lake Mead NRA are extraordinarily high, and (3) flood-mitigation measures to protect human life and property.

Regarding flood-mitigation measures, as required under Executive Order 11988, "Floodplain Management," this effort is a matter of common sense and is based upon some tragic experiences in the past. As the document says (p. 14, Vol. I) "flash-flood hazard is a critical issue at several of the developed areas." The basic question comes down to whether to provide flood mitigation for Probable Maximum or 100-year hazards. We agree with the document's Proposed Action to provide for mitigation of "adverse effects of a 100-year flood with structural means, and adverse effects of floods above the 100-year level...by using the warning

system packages and relocation of facilities in some areas."

The Proposed Action Alternative would allow development at two new sites on the Arizona and Nevada shores of Lake Mohave "if increased visitation warranted it and if an economic feasibility study indicated that new concession facilities were warranted." Assuming that there would be no overall Lake Mohave carrying capacity problems resulting from development of these two sites, we believe they would be a reasonable response to visitation. These would be preferable sites to some that might instead be developed in more remote areas of the NRA, notably in the vicinity of the Grand Wash Cliffs and in the stretches where Grand Canyon opens into wilder parts of Lake Mead. The Fire Mountain site on the Nevada shore of Lake Mohave has the additional advantage of not being a flood-hazard area--thus, not requiring the added level of federal funding to provide flood-mitigation structures.

Concerning the Boulder Basin Zone, we favor plans to upgrade certain facilities, as indicated in the document, improve traffic circulation--including construction of a bicycle/pedestrian path "as a means to link the entire area (Hemenway to Lake Mead marina)." The recently accomplished relocation of the dry boat storage out of the flood-hazard zone is a good move, but we urge that the storage area (now only surrounded by a chain-link fence) be visually screened, either with vegetation or some kind of attractive fence slatting, or both. Such screening would reduce the visual impact of the "clutter" of machinery and stored boats from the surrounding visitor-use area.

On the north shore of the Boulder Basin Zone is potentially one of the most attractive developed areas in the NRA: Callville Bay. This area, which has no flood hazard, is already enhanced by the new concession building. If the projected motel structure is built of the same architectural style, visitors will be greeted by a handsome array of buildings that seems to us appropriate and fitting to Callville Bay, specifically, and to Lake Mead NRA, in general. With other improvements, including traffic flow, this area will be a great improvement, aesthetically and practically, over conditions there in the past.

While commenting on the Northshore area, we should emphasize one of our Association's most serious concerns over the management and protection of Lake Mead NRA's natural ecosystem: the impairment and destruction of the desert terrain--its fragile soils and native vegetation--by off-road vehicles. As is evident from the air as well as from the ground, the Northshore of Boulder Basin is the most extremely impacted by off-roaders (1) who seek to reach areas of the lakeshore not reachable on the legally approved roads, or (2) who get a thrill out of challanging their machines and driving "skills" by roaring all over the gently rolling country. On a recent visit to some of this area, it was clearly evident to us that the past several years' gains in the constant struggle to slow the rate of off-road degradation are now beginning to come unravelled, principally because of substantial cuts in ranger-patrol and land-rehabilitation programs of the NPS.

3-Lake Mead EIS/GMP, NPCA comments

While we strongly favor the Proposed Action Alternative's plans for signing legally authorized roads, constructing several new authorized spur roads to help discourage indiscriminate driving to reach less congested shoreline sites, and increased public information and interpretation efforts, we emphatically urge that the most significant need on behalf of resource protection is to substantially increase both the NRA's law-enforcement capability and to restore resource-protection staffing so that places that are degraded by off-road driving can be "restored" promptly. It is an obvious fact that once a single ORV track scars a hillside, that track scar automatically provides an open invitation to other ORV drivers who are inclined to head off across the terrain. There is also a constant need to replace and repair signs and to rebuild fencing and other "barriers" to commonly used off-roading routes. Unless the NPS has these more substantial law enforcement/management capabilities, with steadily mounting visitation, the Northshore and similar problem areas will eventually become "sacrifice areas" that will simply have to be "written off." This is certainly not an acceptable response to the basic mandate to protect the natural resource values of Lake Mead NRA.

Regarding the additional Northshore Proposed Action Alternative plan for "improving roads to historically popular areas by providing roads that parallel the shore...where physically possible," we can see where this approach could conceivably reduce the tendency by some visitors to cut across the terrain to reach less congested shoreline sites, could possibly allow for the abandonment of some existing legally authorized spur roads to the lakeshore, and could result in enhanced ranger-patrol capability. We believe such shoreline road construction should be approached with caution, beginning perhaps with a single shoreline segment where the need and likelihood of success are greatest.

Concerning developed areas elsewhere around Lake Mead, we are especially [redacted] interested in the Gregg Basin/Grand Wash Zone. We approve of the Proposed Action Alternative's desire to maintain "the primitive, isolated flavor of these areas." [redacted] It was evident, on a visit there a few months ago, that there is some need for minimal improvements in the areas of sanitation and resource protection. We disagree, however, with the Proposed Action Alternative's plan to pave the road in this area. In our view, as soon as the access to Pearce Ferry is upgraded to this extent, visitation---and thus, the need to increase facilities substantially--will increase dramatically. One major way to retain the primitive atmosphere of this wild, remote area is to retain the gravel road. (Incidentally, should the "Actions" chart on page 181, under "Proposed Action" column, read: "Same as Alternative B," rather than "Same as no action?" We believe the latter is in error.)

Regarding the Proposed Action Alternative for mining and minerals management, we understand from our own discussions with both Santa Fe Minerals and the Bureau of Land Management that the company is receptive to exchanging out its subsurface interests (some 55,000 acres) within LMNRA. We hope that negotiations toward this end will continue and will ultimately prove successful. We feel this is an important minerals issue , both in the southern end of the NRA and up on the Shivwits Plateau. We believe it is especially

crucial to exchange out this company's mineral interests from the wild, scenic country on the Shivwits Plateau.

On the general matter of resource utilization zoning (the proposed Resource Utilization Subzone), we believe the document's Proposed Action Alternative has struck a reasonable balance between the need to protect the NRA's natural environmental qualities and the possible development of mineral resources. The areas listed for the Environmental Protection Subzone (317,930 acres); Outstanding Natural Feature Subzone (51,580 acres); and Natural Environment Subzone (680,520 acres) appear to include most of what we believe to be the outstanding natural features and landscapes within the NRA, and compares favorably with the 148,970 acres proposed for Resource Utilization Subzone (which translates to about 10 percent of the NRA).

We have only two suggestions with regard to the Natural Zone: (1) there should be some statement in the GMP to the effect that periodic monitoring will be carried out to determine whether protective designations, such as Environmental Protection and Outstanding Natural Feature, are actually working, or whether increased protection is needed to protect those natural values. This would seems especially important for springs and other fragile riparian and wildlife habitats; and (2) we urge that all or at least some of the outer points of Kelly Point (proposed Natural environment unit #59) deserve an enhanced protection designation--probably the same Environmental protection status as is proposed for Twin Point. Excellent candidates for higher protective designation are: Suicide Point; and then at least the large point off the west side of Kelly Point and the point off the east side of Kelly. This great "peninsula" of Kelly is one of the major scenic features in the western end of Grand Canyon, and as such deserves as much protection as possible.

1

While discussing matters concerning the Shivwits Plateau, we agree that the unsightly, shoddy summer firecamp facility needs to be removed and a new structure provided. In doing so, we urge that every effort be made to design and place a new building so that it blends as harmoniously as possible with that wild setting of ponderosa pines and sagebrush. As for the development of a small, primitive campground, we feel this may be particularly beneficial to the extent that it may help reduce impacts in the general area of indiscriminate camping in ponderosa stands on both NPS and BLM lands.

2

Concerning Reclamation Withdrawal lands within LMNRA, we have tended to view the proposed "Spring Canyon Pumped-storage Project" with some degree of favor, as opposed to possible power-generation alternatives for the region. We have viewed the Spring Canyon site and have reviewed the project report of May 1982, and believe that if the need for substantially increased peaking-power needs can be justified that Spring Canyon does appear to be a relatively environmentally low sensitivity area of Lake Mead NRA in which to build such a facility.

1 The protection given the Shivwits Plateau area was a natural environment subzone with the exception of Twin Points which, as you noted, was given an environmental protection subzone. These zones are equal in protection, but reasons differ as to why they are different subzones. The Twin Points area has a rare plant species, which is in need of protection, while the rest of the Shivwits is protected for visual, aesthetic, and other reasons.

2 The summer fire camp facility will remain in its present location and be renovated rather than expanded. Because there has been a demand for unimproved campsites at the fire camp in the past, two or three level areas with grills will be installed for visitors who choose to stay there. These campsites will reduce the amount of indiscriminate camping on the Shivwits Plateau and the resultant impact on the meadows .

5-Lake Mead EIS/GMP, NPCA comments

3 Finally, we are concerned about a matter not mentioned in the document that could have significant impacts upon Lake Mead National Recreation Area: the possible construction of a dam in Las Vegas Wash, just upstream from the NRA, with related developments: a number of large-scale hotel-casinos, residential complexes, golf courses, etc. Such an array of major projects could pose a serious threat of watershed impairment, principally by greatly curtailing stream flow in Las Vegas Wash; could greatly increase visitation within LMNRA; and could possibly impact the viewshed from within the NRA. We believe there should be at least some reference to the proposed scheme and an indication of possible impacts upon the management and protection of Lake Mead NRA.

We hope that the above comments may prove helpful. Please let us know if we can be of further help.

With best regards,

Russell B. Butcher
Southwest & California Representati
Box 67, Cottonwood, AZ 86326

cc: T. Destry Jarvis
Vice President of
NPCA

3 We have included a reference to the development proposals in the final document. Our major concerns, which we voiced to our Washington Office and the Corps of Engineers, were as follows:

stability of the proposed dam and its threat, if collapse occurs, to downstream visitor use

the view from within the Lake Mead NRA

the tremendous potential for additional visitation for which, considering budget restrictions, we would not be able to provide proper facilities

the question of water stagnation and siltation that could occur in a nonmoving body of water

Santa Fe Mining, Inc.

6200 Uptown Blvd. N.E. Suite 400
Box 27019
Albuquerque, New Mexico 87125
505/881-3050

June 24, 1985

Mr. Jerry Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Superintendent Wagers:

Enclosed is a revised copy of the oral statement which I gave at your June 19 public hearing in Phoenix with respect to the Draft Environmental Impact Statement and the Draft General Management Plan for the Lake Mead National Recreation Area on behalf of Santa Fe Mining, Inc. and its affiliate company, the Santa Fe Pacific Railroad Company. Please include it in lieu of the one I submitted at the hearing. In addition to the comments contained in the enclosure, Santa Fe Mining and Santa Fe Pacific have other concerns with regard to the inadequate assessment in the Draft EIS of mineral potential in the Lake Mead NRA.

447

1 With the primary emphasis at Lake Mead being on recreation and public safety, it is understandable why recreational planners, landscape architects, hydrologists and others were allowed to do in-depth research and analysis regarding planning for the future of Lake Mead. But the Lake Mead NRA contains nearly 1.5 million acres. For this reason alone, a minerals assessment beyond a mere literature search should have been made for this vast expanse.

The Draft General Management Plan proposes zoning for the NRA which would eliminate or severely curtail any minerals exploration and development. Land use planning based on sketchy and inadequate knowledge of an area's resources or potential is backwards land use planning at best. Only when adequate information has been obtained should zoning or uses be proposed for Lake Mead National Recreation Area, the City of Las Vegas, or any other lands.

2 Finally, and also with respect to the minerals recommendations and judgments which these draft documents contained, it appears that the Bureau of Land Management was not consulted. The BLM is an agency with professional geologists with knowledge of Lake Mead NRA's mineral potential. BLM also is an agency with some degree of responsibility for minerals management in the NRA. The Draft EA will remain deficient until BLM's professional staff has had an opportunity to comment and have input with respect to minerals management recommendations. The Park Service should also discuss minerals matters with companies such as Santa Fe Mining which have had an active minerals exploration program in Mohave County, Arizona since 1979.

Thank you for this opportunity to comment.

Very truly yours,

GGB:gem
Enclosure

George G. Byers
Director-Public Affairs

cc: D. Dean Bibles
Paul J. Buff

1 Refer to Nevada BLM responses 2 and 9.

2 The National Park Service is the agency responsible for minerals management and land use decisions at Lake Mead. The Bureau of Land Management (BLM) is responsible for lease administration and is the agency of record in leasing matters. The draft EIS was mailed to BLM and mining companies with interests in Lake Mead to provide an opportunity for input. A meeting was also held in Lake Mead on the draft EIS in which all mining interests were invited to attend.

LAKE MEAD NATIONAL RECREATION AREA
ARIZONA-NEVADA

COMMENTS OF SANTA FE PACIFIC RAILROAD COMPANY
AND
SANTA FE MINING, INC.

To the Draft Environmental Impact Statement, Draft General Management Plan

PHOENIX, ARIZONA JUNE 19, 1985

Santa Fe Pacific Railroad Company is an affiliate of SF Minerals Corporation of Albuquerque, New Mexico and owns about 55,000 acres of reserved mineral estates in the Lake Mead National Recreation Area. Santa Fe Mining, Inc. is the hard minerals exploration and development affiliate of SF Minerals and is engaged in extensive exploration for precious and base metals in northwest Arizona, including exploration in lands within the Lake Mead National Recreation Area.

3 Santa Fe Pacific Railroad Company appreciates the fact that its reserved mineral interests are recognized in this Draft EIS, as well as the concept of exchanging these minerals for others outside of the NRA. However, Santa Fe Pacific believes that this Draft EIS will remain deficient so long as any plans to manage areas within the recreation area which would restrict surface access or mineral exploration and development on Santa Fe Pacific's fee land are considered. The National Park Service acquired the surface of these lands subject in each case to Santa Fe Pacific's reserved mineral interests and to the attendent rights of access, exploration, entry, and development. Any plans by the National Park Service which consider creation of areas of restricted access must consider the surface impacts to these where Santa Fe Pacific's minerals are located. These plans must also consider whether the presence of these mineral estates would render the restricted management zone impossible to properly administer.

4 On behalf of Santa Fe Mining, I would point out that the section entitled "Impact on Mineral Leasing Opportunity" appears extremely deficient for a number of reasons. First, while not doubting for one instance the qualifications of the mining engineer who prepared this report, this section on geologic potential should have been prepared by a qualified geologist, and especially one with experience in the exploration for metals in northwest Arizona. Second, the conclusion of the nine-page report is suspect that a "complete inventory and evaluation of the known mineral resources within the Lake Mead National Recreation Area" was made, particularly when it concludes that the inventory indicates no mineral reserves in the Lake Mead NRA. The report also concludes that "all possible mineral resources are classified as economically submarginal and geologically speculative..."

3 As stated in the draft EIS, nonfederal mineral rights will be managed according to the surrounding zoning category until such time as the owner proposes development of those rights. At that time the development proposal will be evaluated and a determination made as to the significance of the impacts. If a proposal is received in which the impacts cannot be mitigated to an acceptable level, alternative protection schemes as discussed in the land protection plan will be pursued. These alternative schemes may include acquisition of mineral rights through purchase, donation, exchange, or condemnation. These issues will be explored further in the minerals management plan following the GMP.

4 Refer to Nevada BLM responses 2 and 9.

COMMENTS

An absence of mineral exploration or production is not indicative of the absence of an ore body. In 1973 in the Lee Ranch area of McKinley County, New Mexico, there had been little coal exploration nor was there any commercial coal suspected to be present. On October 22, 1984 the first rail shipments of coal from a $140 million coal mine with over 240 million tons of coal reserves was made. Coal is now being delivered by rail to power plants in New Mexico and Arizona from this mine. Had the assumption been made by SF Coal Corporation, an affiliate of Santa Fe Mining, that the area was worthless as an exploration target just because no one had explored and just because no one knew of any coal to be present, then this mining
5 operation would not exist today. Likewise, in the Carlin Trend in north central Nevada, there were no exploration targets or known ore bodies until the mid-1960's. However, as we all know, this area is the largest gold producing region in the United States today.

The twisted logic which is employed in assessing mineral potential in this Draft EIS would have had geologists (and mining engineers) flocking
6 away from the Lee Ranch and Carlin Trend areas in droves. The fact is that the Black Mountains along the east side of the Colorado River are an area of high mineral potential. In fact, the inaccuracy of the report on geologic potential is further amplified by the fact that a pending mineral lease application of Santa Fe Mining is not addressed nor is it an attendant patented lode mining claim shown on maps accompanying the Draft EIS.

7 This Draft EIS will remain deficient until a more objective and accurate assessment of hard minerals potential can be made for the Lake Mead National Recreation Area. A better picture of recent minerals development interest might be made from research with Santa Fe Mining, the Arizona Mining Association, the Arizona State Geologist's office, the Arizona Department of Mineral resources, or into the recent lease applications on file with the Park Service in Boulder City, not on a literature review on past development. Interest in precious metals has intensified since the mid-1970's, and it is likely that careful research may indicate that an interest in mineral development really does exist in the Lake Mead NRA.

8 Finally, the Sierra Club Legal Defense Fund filed a lawsuit in 1983 regarding wilderness designation in the Lake Mead NRA. The status and impacts of this lawsuit are not addressed in this Draft EIS.

Thank you for the opportunity to comment.

RESPONSES

5 The Park Service recognizes the high potential for finding gold in and adjacent to the recreation area and has taken this into account when making its decisions.

6 All known patented mining claims inside Lake Mead are shown on the Outstanding Mineral Rights map in the final EIS.

7 Refer to Nevada BLM response 2.

8 Information on this lawsuit has been added to the "Mining and Minerals Management" section in volume I.



Sunrise, Mt. McKinley Ansel Adams

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SIERRA CLUB'S COMMENTS ON DRAFT GENERAL MANAGEMENT PLAN AND EIS, LAKE MEAD NATIONAL RECREATION AREA

These comments supplement those of the Toiyabe Chapter of the Sierra Club, dated July 16, 1985, and pertain specifically to two issues: (1) wilderness preservation and (2) mineral leasing and development activities. The Sierra Club still has litigation pending in federal district court against the National Park Service over those issues, and these comments are made with an eye toward resolving the issues which gave rise to the suit.

(1) Wilderness preservation.

1 A. Lack of a separate management plan for proposed and potential wilderness. Table 3, Volume 1, illustrates this deficiency. This table outlines the various types of management zones, their management strategies, and the types of development and other activities permitted. However, there is no separate management plan or sub-zone for the areas which NPS has identified as wilderness-eligible in the Wilderness Suitability map (Vol. 2, pp. 205-6). These areas currently are classified as natural sub-zones. Since this proposed and potential wilderness acreage totals 674,375 acres, almost half the NRA, the magnitude of need for appropriate wilderness management is apparent.

NPS' Management Policies (1978), supplemented by provisions of the Wilderness Act, 16 U.S.C. § 1131 et seq. provide the proper directives regarding wilderness management during the period of wilderness review:

> PROTECTION OF ROADLESS STUDY AREAS
>
> Roadless study areas subject to review for wilderness designation will be protected from activities which would endanger or alter their natural, primitive character until administrative study or the legislative process determines their suitability for wilderness designation.

Management Policies, p. VI-2.

Current management strategies for the natural sub-zones allow some activities which are incompatible

1 The text in both the "Management Zoning" and "Wilderness Suitability" sections has been changed to reflect NPS management plans for these areas.

with wilderness preservation. For example, development of management facilities is allowed in the natural sub-zones, even though construction should not take place in wilderness, "an area of undeveloped federal land ... without permanent improvements or human habitation." The Wilderness Act, 16 U.S.C. § 1131(c). Dune buggies, trail bikes, and four-wheel drive vehicles are permitted on "approved roads" within the natural sub-zones, but should not be allowed anywhere within proposed or potential wilderness, since the Wilderness Act forbids all mechanical forms of travel. 16 U.S.C. § 1133(c). Accordingly, NPS should include in the FEIS and final GMP a plan specifically aimed at managing proposed and potential wilderness as wilderness, not simply as natural sub-zones which allow some wilderness-incompatible activities.

2 B. Wilderness management for the Shivwits Plateau region. This point follows directly from the preceding.

The land on the Shivwits Plateau (areas 58 - 60A, inclusive, on the management zoning map) should also be managed for wilderness protection. Although this land is identified as wilderness or potential wilderness on the Wilderness Suitability map, the GMP proposes several actions which contradict wilderness status and are incompatible with wilderness management. These actions include construction of an airstrip, ranger station, primitive campsites with toilets, and interpretive signs. It is unclear from the GMP whether or not all of these facilities fall within potential or proposed wilderness.

Regardless of whether the airstrip would lie within the wilderness, the air traffic will have an adverse effect on wilderness qualities and NPS should not construct this airstrip. The Shivwits Plateau is already experiencing severe environmental problems due to extensive air traffic in the Grand Canyon region. The proposed airstrip lies within the lower Grand Canyon ecosystem and would exacerbate this problem. See Attachment A, a newspaper story describing the problem. Construction of airstrips in wilderness contravenes the Wilderness Act, 16 U.S.C. § 1133(c), and NPS Management Policies (1978), p. VI-8: "Heliports, helipads, and airstrips are not permissible." Although NPS may intend this airstrip solely for "administrative access," its construction would invite use by mineral prospectors and sightseeing planes, among others.

Other development, including ranger housing, primitive campsites and toilets, should be constructed only if absolutely necessary to wilderness preservation and management. NPS Management Policies, P. VI-9. The GMP and DEIS do not establish that there is over-use of these areas, or other special conditions which would justify development in an otherwise-pristine area. The FEIS and final GMP should reevaluate the need for development

2 Management access must be provided to the Shivwits Plateau so it can be managed in the manner set by Congress in the enabling legislation and in the guidelines set by the National Park Service, whether it be as a natural zone, a special use zone, or a development zone. This isolated area is susceptible to unwanted uses, such as vandalism to historic structures and archeological sites, poaching of animals, and other activities. A small facility is needed at the entrance to monitor vehicles, fire potential, and other emergency conditions. The facility will remain in its present location and be renovated. In response to a demand for unimproved campsites at the fire camp in the past, two or three level areas with grills will be installed for visitors who choose to stay there. The impact on the meadows will then be reduced through less indiscriminate camping on the Shivwits Pleateau.

An airstrip is proposed to provide for proper supervision and delivery of adequate supplies in an economical and timely manner. The airstrip will replace the one currently being used on the access road, which is approximately 15 miles (45 minutes) from the fire camp when the weather is good. Airplane service to the fire camp will require one-sixth of the time it takes to drive. Total use of the airstrip for management is likely to be, at the most, twice weekly and only from May 1 to September 30 (the fire season). The only time the airstrip will be used more frequently will be in case of a forest fire.

The proposed strip will be available for use only by the NPS airplane (a single engine with STOL equipment) and will not be large enough to allow larger twin engine planes to land. The normal flight pattern is to the west, which is the shortest route to the NRA's administration areas and not over the Grand Canyon. This flight pattern is currently being used. Although the flights are infrequent, they cause noise and visual intrusions on the wilderness qualities of units 13, 14, 21, 24, 30, and 31 within the recreation area. To minimze the number of these flights, the superintendent will review each trip to determine the necessity and efficiency of aircraft use consistent with park goals. If the airplane is not the most efficient method of accomplishing the purpose of a trip, alternative access means will be used.

in wilderness-eligible lands in light of the Wilderness Act and NPS Management Policies.

C. Zoning. The zoning decision in the GMP may preclude wilderness status for those lands zoned for resource utilization, since mineral leasing activities can go forward in resource utilization zones. Thus, Sierra Club supports Alternative A, which minimizes the acreage open to resource utilization. Further, the proposed action regarding zoning contravenes the Management policy quoted on page 1 of these comments, which requires protection of wilderness-eligible land. Under the rule set out in Management Policies, NPS should adopt Alternative A and continue to manage all wilderness-eligible lands as wilderness, disallowing mineral leasing. Two wilderness-candidate areas deserve special mention because of their proximity to BLM wilderness candidate areas:

3 (a) disallow resource utilization along the U.S. 93 corridor, including the acreage adjacent to BLM's Wilson Mountain wilderness study area. This area (#24 on map of proposed management zoning) should be managed so as to preserve its wilderness character and its eligibility for wilderness designation. According to the map, "Existing Mining Claims and Mineral Leases," there are no leases currently in this area which would conflict with wilderness management.

4 (b) The Bowl of Fire area, which is adjacent to BLM's Muddy Mountains wilderness study area, should be included in the plan for proposed wilderness.

(2) Mineral leasing and development.

5 A. Clarify effect of excepted-area zoning. The FEIS and final GMP should clarify that lands not in the resource-utilization sub-zone are immediately closed to all mineral leasing activities. The DEIS misleadingly indicates that "leasing would gradually be phased out." Vol. 2, p. 294.

6 B. Procedure to amend C.F.R.'s. The excepted-areas map and pertinent regulations must be revised to conform precisely to the management zoning plan contained in the FEIS. Because there has already been notice of this revision process in the Federal Register, and there has been opportunity for public comment, there need not be another notice-and-comment procedure for the amendment of the excepted-area regulation. This should constitute no more than a technical revision of the regulations. To go through yet another notice and comment procedure would simply generate another round of the same comments as are now being submitted. The resources of the NPS and the public are better spent by going on to work on the MMP.

A new map has been added to volume I of the document, showing the location of the facilities and airstrip on the Shivwits Plateau. As shown on that map, neither the facilities nor airstrip are located in potential wilderness areas.

3 See response 4, Sierra Club, Toiyabe Chapter.

4 See response 5, Sierra Club, Toiyabe Chapter.

5 A statement has been added clarifying the fact that all lands outside the resource utilization subzone are immediately closed to any future leasing upon finalization of the EIS. The statement referred to on page 294 of the draft EIS, which states that "leasing would be gradually phased out in the remainder of the recreation area," will also be clarified. This statement refers to existing leases that occur in areas that will no longer be open to mineral leasing. These leases will continue to exist and will not be renewed when their current term expires. This includes all current leases in Lake Mead, including six oil and gas leases and two mineral leases totaling 8,238 acres. The earliest of these expired on April 1, 1986, and the latest will be on December 1, 1992, if not relinquished earlier.

6 The Park Service will consult with the office of the solicitor to seek advice on the revision of excepted areas in the regulations once the EIS is final.

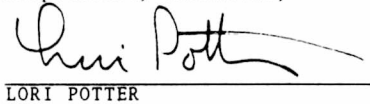
7 C. Lease-applications pending for "excepted areas." All pending lease applications for areas to be within the "excepted" zone should be summarily rejected as soon as the new excepted-area regulation is published in final form in the Federal Register.

8 D. Lease applications pending in resource-utilization zone. All pending lease applications for areas to be in the resource utilization zone should remain pending until finalization of the MMP, so that NPS has developed appropriate surface protection stipulations and a lawful NEPA compliance process to apply to those pending applications. These stipulations and the NEPA procedure can be described and subjected to public comment during development of the MMP.

E. The Shivwits Plateau region. The Sierra Club strongly supports closure of the Shivwits Plateau region to all mineral leasing activity. Sierra Club's research corroborates NPS' conclusion that "under the current price structure for uranium, it is unlikely that any of the uranium resources contained in the known breccia pipes would be developed." Vol. 2, p. 295. See Attachment B, Wall Street Journal story, and Attachment C, Science magazine story, describing the uranium market. The current and long-term outlook for the domestic uranium industry is so totally speculative as to nullify any argument for leaving this spectacular region open to mineral leasing or development.

The Shivwits Plateau region, including management zones 58-60A, inclusive, and wilderness units 33-36, inclusive, is an important part of the Lower Grand Canyon ecosystem. This acreage consists of plateaus and side-canyons with magnificent views into the Grand Canyon and surrounding country. It is primitive, unspoiled, wilderness-quality terrain which merits wilderness designation. This entire region, comprising some 141,810 acres, should not only be excepted from mining but also managed for wilderness preservation. See discussion under point 1(B), above, of these comments.

Respectfully submitted,



LORI POTTER
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Attorney for Sierra Club

July 30, 1985

7 All pending lease and permit applications outside the resource utilization subzone will be rejected once the regulations have been revised.

8 The Park Service will not process lease and permit applications inside the resource utilization subzone until the minerals management plan has been finalized. The Park Service is currently in the process of developing servicewide surface protection stipulations, which will be attached to all future leases and permits and plans of operations.

The Park Service recently completed servicewide guidance for all NPS units open to federal leasing. The document, which is entitled "Procedures for Managing Federal Mineral Leasing and Operations," was released in December 1983 and provides consistent procedures for processing lease and permit applications and completing all necessary compliance actions.

Flight noise fouls Canyon backpacking

Increased aircraft tours threaten 'natural quiet'

By JOHN SCHROEDER
Northern Arizona Bureau

7-15-85
AZ Republic

GRAND CANYON — Deep within the majestic Grand Canyon, backpackers are finding that the serenity and harmony they often seek with nature are shattered by the incessant noise of aircraft.

The problem of noise pollution by aircraft has grown to such proportions that protecting the park's "natural quiet" ranks as a top resource-management issue affecting the vast Grand Canyon National Park.

Most of the noise stems from scenic flights in and over the canyon by fixed-wing aircraft and helicopters, said Steve Hodapp, chief of park resource management and planning.

"We feel there's a conflict between aircraft noise and the experience of back-country visitors to the park," Hodapp said.

Aircraft noise has become the "issue of second-highest concern expressed to park management by the public" he said.

The leading public concern involves problems with mules leaving pungent puddles and piles along canyon trails used by hikers.

In 1976, 13,000 flights were made into Grand Canyon Airport, 90 percent of which were scenic canyon flights. By the early 1980s, the number had soared to 50,000 flights over the park.

An Arizona Department of Transportation master plan for Grand Canyon Airport projects the number as exceeding 100,000 flights by the year 2003.

Hodapp said 40 scenic-flight companies conduct tours in canyon airspace. He said most flights originate in Las Vegas, Nev., or at Tusayan, near the park's southern entrance.

Sometime this fall, probably in October, Hodapp said, a series of public meetings will be held around the state to receive public response to a series of options being assembled to resolve the problem.

The proposals will range from a "no aircraft" option to a "no action" option that would permit an increase in air traffic along the lines of the Transportation Department's projections.

"In between those two extremes," Hodapp said, "will be a range of options" for the public to consider. The park official said an information package will be distributed before the meetings.

Hodapp said that in recent years, the noise problem has been reduced through the use of larger aircraft that carry more people on fewer flights, and technological improvements that have reduced engine noise.

He said scenic-tour flights have been holding at about 50,000 annually in recent years.

Commercial airlines flying over canyon airspace have been recognized as a lesser part of the problem.

"It's at night when the perceived effect from commercial airlines is the greatest," Hodapp said.

Forty percent to 60 percent of back-country users "find aircraft as a negative impact on their experiences," he said, adding that more than 90 percent of visitors to the North and South rims do not consider it a concern.

Although noise has an impact, people "still are

— Noise, B3.

Noise

Continued from B1

having a very positive backpacking experience within the park," Hodapp said.

Each year, about 300,000 canyon visitors take the scenic flights, he said.

A study also is being made of noise-sensitive areas, such as the impact on wildlife and potential damage to Indian ruins by vibrations from low-flying helicopters.

Hodapp said the Park Service is working closely with the Federal Aviation Administration.

"We cannot directly promulgate regulations to control airspace," he said. "But we clearly have a mission — to protect park values, and natural quiet is a value we are directed to protect."

Nuclear Reaction

U.S. Uranium Mines, Thriving 5 Years Ago, Are Nearing Extinction

Three Mile Island Is Blamed For Hastening Collapse, But Federal Policy Helped

Will Foreign Ore Be Limited?

By William E. Blundell
Staff Reporter of The Wall Street Journal

GRANTS, N.M. – Not long ago, the U.S. Department of Energy declared that the domestic uranium industry is not dead. If that's so, people here ask, where's that smell of death coming from?

Grants was the Pittsburgh of uranium. In 1980, thousands of men working dozens of area mines dug out a third of U.S. production and, on pay of $35,000 to $70,000 a year and sometimes more, spent like kings. They bought Cadillacs, Lincolns, boats and pickups galore. They drank and fought their way from the Pioneer to Pat's Bar, sometimes finishing a raucous night by mowing down a few light stanchions on bustling Santa Fe Avenue.

Today, every mine but one is closed. Pat's is closed. The Lux theater is closed, its marquee blank and broken. Some 200 homes stand vacant. In the Uranium Cafe, dust settles over stacked-up chairs and tables, and a deadly silence has settled over Santa Fe Avenue. Says Mark Lautman, an industrial developer trying to bring new business to a shrinking Grants: "The game is over. Uranium is history."

Many Depressants

Much the same thing is happening across the West as the domestic uranium business plunges toward extinction. Antipathy toward nuclear power after Three Mile Island is only one reason. Also to blame are colossal misjudgments by major players and Energy Department policies that sometimes seem designed to discourage instead of preserve U.S. mining and milling.

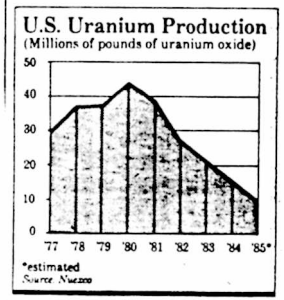
To save the remnants of the industry, producers and others are fighting to limit the use of foreign uranium here and to force the Energy Department to alter its policies. If they fail, most in the business fear that it is finished. In any case, recent discoveries of enormously rich, low-cost foreign deposits blight domestic uranium's future; on pure economics alone, the industry no longer has a reason to exist.

It barely exists now, after a collapse that by industrial standards occurred practically overnight. Five years ago, about 22,000 U.S. workers turned out a record 43.7 million pounds of yellowcake, the uranium oxide that is processed into fuel, to lead the non-Communist world. This year, a work force that has already shrunk almost 90% is expected to produce only 10 million pounds, about a third of Canada's projected output. Capital investment in the domestic business has almost vanished, too.

Lost Jobs

In Wyoming, where 15 of 19 mines are mothballed, Jeffrey City lost most of its payroll in a single year. In Ticaboo, Utah, a town built by a uranium unit of Consumers Power Co. of Jackson, Mich., barely three dozen people now huddle in mobile homes, all that's left of nearly 500 who once worked there. The uranium operation – and with it an interest in Ticaboo itself – is for sale, cheap. So are similar dormant properties across the West as more and more producers abandon the business.

The industry has been hammered by an enormous glut of uranium that still overhangs non-Communist-world markets and



probably won't be worked off for three to five years. The oversupply has already sent spot prices for uranium plummeting from $40 a pound in January 1980 to $15 today – less than half the current cost of producing the metal in the U.S. The only producers here that can make money in conventional uranium mining are those fulfilling contracts signed at much higher prices years ago, and those orders are running out.

The origins of the glut lie in the past of an industry plagued by perennially unfounded optimism. Says George White Jr., the chairman of Nuexco, a Menlo Park, Calif., uranium broker, consultant and industry information bank: "Tomorrow, always tomorrow, was going to bring the golden age. We all went wrong by continuing to believe optimistic forecasts long after we had reason to doubt them."

Clinging to Hope

In the early 1970s, utilities ordered nuclear plants by the fistful to meet electricity demand that they expected to double in 10 years. Even after energy conservation began to short-circuit their forecasts, they were slow to see this or, at least, couldn't afford to believe it; so long as any chance remained that their plants of the 1980s

Please Turn to Page 24, Column 1

ATTACHMENT B

Nuclear Reaction: Uranium Mines Near Extinction, Victims of Three Mile Island and Federal Policies

Continued From First Page

would be needed, they had to fuel them. And they were forced to do this unrealistically far in advance by a new enrichment contract imposed in 1973 by the now-defunct Atomic Energy Commission.

The AEC then had the non-Communist-world monopoly on enrichment, the process by which the tiny percentage of U-235, a highly fissionable isotope in uranium concentrate, is increased to create fuel-grade material. Under the old AEC agreement, utilities could contract for enrichment only months before they needed fuel; under the new one, they had to contract for it up to eight years in advance and were locked into 10-year order schedules.

The AEC wanted to get a better fix on the anticipated heavy demand for enrichment. But the new contract immediately forced utilities into long-term deals for yellowcake when they couldn't be sure, so far ahead of time, that their planned plants would be built on time or needed at all. In effect, the AEC created a wave of artificial advance demand completely divorced from any current need for fuel. After this became apparent, the AEC and its successor agencies tried contract adjustments, but supply remained hopelessly out of whack with demand.

Then Westinghouse Electric Corp. added another complication. It had collared 40% of the reactor market, in part by promising customers uranium at about $10 a pound to fuel their plants. But it hadn't bothered to buy 66 million of the 81 million pounds that it had pre-sold, gambling on a stable market for its later purchases. It lost.

This policy itself helped keep prices low for a while by removing a lot of demand from the market without reducing current supply. But other buying—and, it developed, price-rigging by a producer cartel—jacked prices up to $26 a pound by the fall of 1975. Facing enormous potential losses, Westinghouse abandoned its uranium commitments, was sued by a flock of customers and, in turn, sued producers allegedly involved in the cartel. The utilities that it had left in the lurch poured into the market to cover their uranium needs; prices exploded anew, topping out at $43.40 in 1978.

Feeding on the high prices, uranium mining boomed as never before in 1978-80—precisely when the real need for uranium was clearly shriveling.

By then, it was plain that energy conservation was destroying the need for many of the planned power plants; at the same time, their projected construction costs were soaring. So, some utilities began canceling and delaying power plants years before the 1979 near-disaster at Three Mile Island. After it, the stream of cancellations became a flood—just as a tide of uranium and processed fuel swamped the markets. All the industry's chickens had come home to roost at once, and prices and production plummeted.

Caught Unprepared

The bust caught many unprepared. Gulf Corp. had barely begun production from its giant Mount Taylor mine near Grants, a project that cost Gulf more than $400 million to develop, when it had to shut down. Today, giant pumps still suck warm water from the mine, which a Gulf official has called "the deepest hot tub in New Mexico." The power bill alone for the pumping, which is designed to keep the mine from filling with water and thus becoming much more expensive to reopen some day, exceeds $250,000 a month.

The human cost has been great, too. East of Grants, Indians of the Laguna pueblo stare into the pits of the mammoth Jackpile-Paguate Mine, closed for good. Once an agrarian people, the Lagunas had, for 30 years, increasingly abandoned fields and pastures to rely on a resource now no longer needed.

In Grants, therapists are struggling with heavy caseloads of victims of alcoholism, family breakdown, abuse of wives and children, and deep insecurity. Local 2-708 of the Oil, Chemical & Atomic Workers, once 1,300 strong, is down to about 25 members; its president, Florentino Ortiz, recently lost his own job. "If our members' homes weren't paid for, they lost them and all their credit, too," he says. "How can they ever buy houses again? There is just tremendous frustration."

In neighboring Milan, some remaining miners eke out a living by selling firewood or harvesting, on hands and knees, pinon nuts from the forest. The city water department accepts $3 partial payments, painfully accumulated by families, on $15 monthly bills. "These are proud people who don't want charity," Mayor Toby Michael says. "It just breaks your heart to see this happen to friends who've lived here 20 years."

Foreign Advantages

The uranium glut collapsing the domestic industry, and places such as Milan with it, isn't affecting foreign producers nearly as much. They have the advantages of a strong U.S. dollar, which helps them sell here, and of recently developed deposits so rich—and consequently so cheap to exploit—that domestic mines can't come close to matching them. "The leverage obtained from high-grade ore is tremendous. Grade is the name of this game," says Mr. White of Nuexco.

The U.S. industry and its supporters want protection against such imports, which are rapidly spreading into what is left of the U.S. market. They aren't getting it from the Energy Department, although the Atomic Energy Act requires that agency to preserve a viable domestic industry.

The department could attempt a rescue by sharply curtailing or eliminating its enrichment of foreign uranium for use here. It hasn't. It also could formally declare the industry to be inviable, thus triggering consideration of trade restrictions on foreign uranium. It hasn't done that, either. Indeed, using a complex set of formulas, it declared the business still alive as recently as last December, to the astonishment of practically everyone familiar with domestic uranium's plight.

Last year, moreover, the department converted most of its customers to a new enrichment contract that, though far more

flexible than the old, seems geared to increase Energy Department revenues at the expense of domestic producers. To its many critics, all this makes the department guilty of a conflict of interest. "It is shutting down the industry it is supposed to preserve," says Paul Biederman, New Mexico's secretary for energy and minerals.

Processing Emphasized

There are two ways to get a given quantity of fuel: use a sizable amount of uranium and a modest amount of processing work (which is what the Energy Department gets paid for) or use less uranium and more work. The new contract encourages the latter. What's more, the department has been shaving its own processing costs by drawing from the federal uranium stockpile and adding that to the feedstock provided by utilities. This further robs producers of sales, they argue.

The department denies that it is snuffing out the domestic industry. But it does have a vested interest in processing foreign as well as domestic uranium, and in otherwise increasing its revenues and slicing its costs. It is legally obligated to fully cover the costs of its enrichment program, which has been battered by foreign competition arising over the past decade. The worst threat to domestic producers, it argues, would be the deterioration of domestic enrichment, an event that the new contract seeks to prevent. Stuck with idle capacity, the department has already announced the closing of an old enrichment plant and the abandonment of another still unfinished after a $2.6 billion outlay.

Producers aren't buying that. "If the federal government wants to tell us there is no need for our product, that security of supply is no problem, that the common defense and general welfare provisions of the Constitution are meaningless, then I guess we'll just go away," says Edward Farley Jr., the chairman and president of Atlas Corp., which has had to close its uranium operations. Without help, he gives what's left of the business a year to live.

Three other producers are suing the Energy Department in federal court in Denver, seeking, among other things, a ban on enrichment of foreign uranium for use here pending permanent restrictions, invalidation of the enrichment contract, and a ban on any department moves limiting domestic uranium demand. The industry also is lobbying for protective federal legislation.

Lost Clout

But even if the industry gets such help, it will never again be a power in world markets. Its uranium deposits are no longer competitive and are growing less so with every foreign discovery. At Cigar Lake in Saskatchewan, for example, a foreign consortium is probing for the limits of a huge strike that, if mined, could yield 250 pounds of yellowcake per ton; New Mexico producers get only three to six pounds per ton. Uranium from such rich lodes could drive U.S. supplies out of all unprotected markets. "Cigar Lake is a real gorilla, and a gorilla goes where it wants," says a marketing executive of one producer here.

Grants isn't counting on a uranium revival even though Chevron Corp., Gulf's new owner, has begun limited mining at Mount Taylor to test its costs there. Instead, Grants hopes to draw tourists by building a ski resort, and it seeks retirees who, as City Manager Frank King puts it, "don't want to sit in Florida and sweat a lot." And Mr. Lautman, the industrial developer, offers a bounty of up to $1,000 for a lead that results in a new business settling in Grants.

A few have, and the state has located prison and highway facilities nearby, but Grants has barely begun to replace its losses. "This community never had to compete; it inherited 8,000 uranium jobs," Mr. Lautman says. "Now, every job we bring in will have to be won in battle."

Uranium Shortage Turns to Glut

Paris. A new shadow has been cast over the medium-term commercial prospects for both fast breeder reactors and nuclear fuel reprocessing in Europe. This time it comes from the recent decision of the Australian Labour Party to drop its preelection commitment to tough restrictions on the export of uranium. Since Australia possesses the largest proven reserves in the non-Communist world, this could lead to yet further oversupply in the world's uranium market.

In addition, the Paris-based Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development (OECD) last month drastically revised its forecasts of uranium supply and demand. NEA now estimates that supplies of uranium from known resources are likely to keep up with world demand "for several years beyond the end of the century." This contrasts sharply with a report released only at the end of last year by the agency, which suggested that the crossover point might occur by the end of the 1980's.

The figures reflect sharp upward assessments of known uranium reserves, including those of Australia. In March, the Australian Bureau of Mines placed the country's "reasonably assured resources," which could be processed for less than $80 per kilogram, at 474,000 tonnes; only a year previously, the official figure had been 314,000 tonnes. The other major increase has come from Niger, where estimated reserves have been increased from 213,000 tonnes to 454,000 tonnes.

The new figures also reflect a steep drop in projections of future installed capacity for nuclear power. In 1982, the agency predicted, based on official government figures, that by the year 2000 member countries of the OECD would be producing 489 gigawatts (GW) of electricity by nuclear power; the agency's current official estimate for this date is 392 GW and members of the secretariat feel that the true figure could be as low as 320 GW (the level predicted 2 years ago for 1990).

Based on these new figures, NEA estimates that uranium production capability from existing and committed centers will be 54,000 tonnes a year by 1994, almost exactly the same as anticipated demand from nuclear reactors. If planned and prospective centers were included in the calculation, production could be as high as 72,000 tonnes by the year 2000, still considerably above predicted reactor requirements.

"The exploration push of the late 1970's means that the uranium reserve situation has improved considerably, both in absolute terms and relative to projected demand," says Pekka Silvennoinen, head of the NEA's nuclear development division. However, he adds that with the current depressed state of the uranium market—where the price of uranium oxide has fallen from about $70 per kilogram in 1980 to less than $40 today—mining companies might put off their long-term plans, so that future estimates of production capability could prove to be too high.

Even so, the revised uranium supply figures will undercut the economic argument in favor of the rapid development of fast breeder reactors, and thus by implication the reprocessing of spent fuel from power reactors. They have also taken on a particular significance in the light of the growing conflict between the governments of Australia and France over French testing of nuclear weapons at the South Pacific test site of Mururoa.

Australian Prime Minister Bob Hawke, having persuaded the Labour Party to accept his plans for expanded uranium mining, has also announced that the government will fulfill the party's commitment to ban the shipment of uranium to France as long as the tests are continued. Such a move would cut off a trade worth more than $300 million in 1982.

Although the nuclear industry in France currently depends on Australia for one-third of its uranium needs, with the depressed state of the market it expects little difficulty in finding the uranium elsewhere. Hawke's action has, however, been strongly criticized by French Defense Minister Charles Hernu, who has complained that it represents "interference" in the country's internal affairs.—DAVID DICKSON

Kadec has certainly been frankly critical of the program. In a recent interview, she referred to it as a "management nightmare" and said that it is "too broad-based" to fit with EPA's mission. In a memorandum to her boss last January, she stated her views more emphatically: "I consider the CIS and its management over the past few years as an affront to the American people. . . . I am in no way supportive of the decision to prolong the life of this system, through further investment of time or money, study or any other action designed to cover past mistakes."

Asked for specific examples of problems, however, Kadec said only that the system is "not well defined," and that "files are uneven." But, she adds, "There's no question that [some] files within the system are extremely valuable." She notes that the system is undergoing a complete audit and that the agency's inspector general also is conducting an investigation, but will not elaborate.

There clearly have been serious management problems. For example, no one kept very good track of money flowing in and out of CIS. It never was an easy task because the billings and expenditures were not handled centrally. Besides, users were often agencies that also were providing some of the data bases and thus transactions were muddled on that level as well.

Yet another complication for CIS has been its frequently changing relationships with contractors and subcontractors. The recent handling of this has been sharply criticized by several members of Congress. For example, Fein-Marquart, which has held the major CIS contract for developing software and maintaining the data bases during the past 9 years, switched its subcontractor for computer services in May, even though its own contract runs only 5 months longer. Senator Durenberger and Senator Baucus tried to prevent this move, arguing that it "has the potential for causing additional disruptions in service that will further damage the system." (EPA documents indicate that this change of computers brought forth a rash of complaints from users this spring.)

In referring to "additional disruptions," the senators were alluding to an incident late in 1983 when CIS was shut down for several days due to lack of funds. These incidents and cuts in CIS funding recently led Representatives James H. Scheuer (D–N.Y.), Henry A. Waxman (D–Calif.), and James J. Florio (D–N.J.) to send a strongly worded letter to EPA Administrator William D. Ruck-

ATTACHMENT C

SIERRA CLUB

Toiyabe Chapter – Nevada and Eastern California

July 16, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, NV 89005

Dear Mr. Wagers:

This open letter represents the Las Vegas Group of the Toiyabe Chapter of the Sierra Club's official response to the Draft Environmental Impact Statement (DEIS) on the proposed general management plan for the Lake Mead National Recreation Area (LMNRA). We understand the proposed general management plan will serve to guide park planning activities for the next 25 years.

The Sierra Club is one of the nation's principal independent conservation organizations. The Club played a decisive role in the formulation of the National Park Service (NPS). It has also been instrumental in establishing several national parks. In every EIS distributed by the NPS there is the passage that the Department of the Interior is "the nation's principal conservation agency." We mention the foregoing as a preface so that the following comments by the Sierra Club will be construed as those of an ally, not an adversary, to the NPS.

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Hence, as one conservation agency to another, we would like to applaud you for a quality DEIS. It is a polished and professional document. We wholeheartedly concur with your objective that the primary management goal of the LMNRA is to provide a quality visitor experience in concert with protecting the area's significant resources. We support your finding that the proposed action is the preferred alternative.

Nevertheless, we have nine general recommendations that we hope you consider in formulating the final EIS. The nine recommendations are as follows:

1 (1) We recommend a table (similar to Table 2 on page xv) depicting a summary of the major differences among the alternatives. This table might look similar to the following. At the intersection of the alternatives and resource parameter, we recommend an appropriate numerical figure be supplied. If a numerical figure is inappropriate, we recommend qualified expressions such as "very beneficial," "slightly beneficial," "slightly adverse," or "very adverse" compared to existing conditions.

LAS VEGAS GROUP
P.O. Box 19777
Las Vegas, Nevada 89119

To explore, enjoy, and protect the natural mountain scene . . .

GREAT BASIN GROUP
P.O. Box 8096
University Station
Reno, Nevada 89507

1 Such a table has been added to the "Summary" section of volume I.

Resource Parameter	Proposed Action	No Action	Alterna-tive A	Alterna-tive B
Cost for NPS				
Cost for Concessioners				
People in flood plains				
Effects on LMNRA water quality				
Acres of soils destroyed				
Endangered species effects				
Effects on bighorn sheep				
Acres subject to development				
Congestion effects				
Effects on wilderness lands				
Etc.				

2 (2) We recommend that no development actions be considered for the Shivwits Plateau. This area contains such unique geologic features, scenic vistas, and wilderness potential that it should be preserved untarnished for future generations.

3 (3) We feel that too much emphasis has been placed on protecting the "public" areas from the intrusions of mining. It is important to remember that the backcountry visitor also deserves to enjoy the beauty of the area, unmarred by destructive mining influences. Therefore, we prefer the Alternative A Resource Utilization Zoning.

4 (4) Mineral development should not be allowed along the U.S. 93 corridor south of Hoover Dam. This area is adjacent to the proposed BLM Wilson Mountain wilderness unit and should thereby be considered for wilderness designation, contingent upon Congress designating the BLM area as wilderness. Keeping this area in a natural state is also important for the enjoyment of travellers along the highway.

2 See response 2, Sierra Club, Legal Defense Fund.

3 Comment noted, no response required.

4 Unit 24 on the Management Zoning map is located between the Bureau of Land Management's Mount Wilson Wilderness Study Unit (WSA) and U.S. Highway 93 in Arizona. This unit is approximately 10 miles long but only averages 1½ miles wide, with one area being only ½ mile wide. Three dirt roads to old mine sites entering the area total approximately 6 miles. Numerous flood control dikes protect highway 93, and approximately 3½ miles of old highway 95 (now abandoned but still open to public use) loop into unit 24. Mining in this unit has occurred as recently as the late 1950s, and it is still an area of mineral interest. A number of short spur roads in the vicinity of the old mining activity and numerous articles of trash, such as junked cars, bedsprings, cans, and other items, are still present.

Because the area shows so much disturbance from the past, it does not meet wilderness criteria, and although the most recent recommendation from BLM for the adjacent Mount Wilson WSA is for wilderness status, unit 24 would not be suitable for wilderness. Because of the number of roads and other disturbances, such as flood-control dikes and mining scars, the area would best be managed as a resource utilization unit rather than for natural area values. If mining is to occur in this unit, visual intrusion from highway 93 will be mitigated, and other resource values will be protected through stipulation.

5 (5) Bowl of Fire should also be considered for wilderness designation. As is the situation in point #4, this area is adjacent to the BLM's proposed Muddy Mountains wilderness area. The definite wilderness qualities of this area entitle it to wilderness protection, and it would meet the size qualifications should Congress accept the Muddy Mountains as wilderness.

6 (6) We recommend that the final EIS numerically define, in terms of annual visitation usage, the optimal carrying capacity for LMNRA. Optimal carrying capacity is a concept for approximating the best balance of people and resources for a given geographic area. Defining an optimal carrying capacity would appear to promote further sound management strategies for LMNRA. As an illustration of the benefits that can occur with a defined carrying capacity, we are reminded that the high quality of life in Boulder City is at least in part attributed to its controlled growth ordinance. Conversely, we all regret that sub-Sahara Africa neglected to define its optimal carrying capacity.

7 (7) We recommend that the final EIS contain a chart similar to the following. In recording the historical relationship among visitation, budget, and staff for the previous 10 years, a basis can be formulated for establishing LMNRA's needs for the next 10 years.

YEAR	HISTORIC & ANTICIPATED VISITATION IN MILLIONS	HISTORIC & ANTICIPATED BUDGET IN MILLIONS	HISTORIC & ANTICIPATED FULL-TIME STAFF	HISTORIC & ANTICIPATED SEASONAL STAFF
1975				
1976				
1977				
1978				
1979				
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				

5 The Bowl of Fire area (unit 50 on the Proposed Action/Management Zoning map) has been given the highest protective management zoning (outstanding natural feature) without wilderness designation. The area did not meet wilderness criteria because of its small size (less than 5,000 acres), but with the Bureau of Land Management's proposal to make the adjacent Muddy Mountains WSA a wilderness area, the Bowl of Fire may well be proposed for wilderness status when the upcoming Lake Mead wilderness study is initiated.

6 Carrying capacity is addressed. A total capacity for the entire recreation area is not meaningful. The limiting factor is use levels of boaters and how those boaters affect the shoreline and campsite areas and how they affect each other's experience. The quantified analysis of boating use capacity is contained in the "Carrying Capacities" section.

7, 8 and 9 The budgetary process is separate from the planning process. Funding for implementation of the GMP will be by Congress through the normal NPS budgetary channels. Funding of the projects proposed in the GMP will be evaluated along with other NPS projects in the western region. Staffing, on the other hand, is provided through lump-sum funding for the entire National Park Service.

8 (8) The DEIS indicates that average annual visitation currently exceeds 6,500,000 and is projected to reach over 11,000,000 during the 25-year projected life of the plan. The draft further notes that this constitutes an increase of about 68 percent. We add that the projected annual visitation increase for LMNRA is 180,000--a population slightly greater than that currently incorporated in Las Vegas. Accordingly, we strongly recommend that the final EIS recommend that the staff and budget serving the LMNRA be increased by at least 68 percent during the next 25 years. Only if the staff and budget are kept roughly commensurate with anticipated visitation increases will the quality and standards of the LMNRA be maintained.

9 (9) According to page 18 of the May 20, 1985 issue of U.S. News and World Report, the Reagan Administration "...wants to chop the budget for national parks by 30 percent." A copy of this page follows. In the absence of more precise information, we can only conclude that the budget for LMNRA may be reduced by 30 percent. Hence, we recommend the final EIS contain a detailed analysis of how the operations of LMNRA may be affected by such significant budgetary reductions. Given a scenario of significant budgetary reductions coupled with significant visitation increases, we can only realistically foresee (despite an energetic and dedicated staff) a future of significantly decreased quality management of the LMNRA. Examples of decreased quality management would include less law enforcement, reduced maintenance, and general deterioration of the natural environment. We further recommend the analysis include a discussion of potential effects to Boulder City where the NPS is a major employer, to the economy of Las Vegas, and to tourism in southern Nevada.

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The National Park System includes 39 national parks, 92 national monuments, 10 national seashores, 60 national historic sites, and 17 national recreation areas such as LMNRA. The NPS contains 76 million acres, an area slightly larger than Nevada. The current budget for the NPS is slightly less than 1 billion dollars. For comparison purposes, the Star Wars research budget for 1986 is 2.5 billion dollars.

The NPS is charged with preserving America's national treasures. It is authorized to protect the wildlife of Yellowstone and Yosemite. It is sanctioned to promote the scenery of Sequoia and Shenandoah. It is mandated to preserve the grandeur of the Grand Teton and the Grand Canyon.

The LMNRA is America's largest National Recreation Area. The LMNRA has more annual visitors than virtually any single National Park. The LMNRA is a region of spectacular scenery and superior recreational assets. Half the visitors to the Entertainment Capital of the World also visit the LMNRA. It is

for these reasons we suggest the preceeding recommendations to protect and conserve this most unique national resource.

Cordially,

Mark Bird

Mark Bird, Chair
Las Vegas Group
P. O. Box 19777
Las Vegas, NV 89132

Copies of this open letter have been sent to the following individuals and organizations. Any of these individuals and organizations are welcomed and encouraged to make copies or excerpts of this letter for publication or distribution. Any entities wishing to comment on the DEIS must submit statements by July 31, 1985.

1. Senator Paul Laxalt
2. Senator Chic Hecht
3. Representative Harry Reid
4. Representative Barbara Vucanovich
5. Nevada Governor Richard Bryan
6. Arizona Governor Bruce Babbit
7. Mayor Bill Briare of Las Vegas
8. Las Vegas Councilman Al Levy
9. Las Vegas Councilman Paul Christensen
10. Las Vegas Councilman Ron Lurie
11. Las Vegas Councilman Bob Nolen
12. Mohave County Board of Supervisors
13. Clark County Chairman Thalia Dondero
14. Mayor Lorna Kesterson of Henderson
15. Mayor Bob Farraro of Boulder City
16. The Las Vegas Sun
17. The Las Vegas Review Journal
18. The Henderson Home News
19. Boulder City News
20. Mohave County Minor
21. Toiyabe Trails
22. The Nevada Magazine
23. KVBC TV-3
24. KVVU TV-5
25. KLAS TV-8
26. KTNV TV-13
27. Nevada Commission on Tourism
28. Las Vegas Convention and Visitors Authority
29. Boulder City Chamber of Commerce
30. Henderson Chamber of Commerce
31. Desert Research Institute
32. UNLV Geoscience Department
33. UNLV Biological Sciences Department

34. UNLV Sociology Department
35. UNLV Environmental Research Center
36. Clark County Planning Department
37. City of Las Vegas Parks and Recreation Department
38. Callville Bay Marina
39. Cottonwood Cove Development Co.
40. Echo Bay Resort, Inc.
41. Lake Mead Lodge and Marina
42. Lake Mohave Resort, Inc.
43. Overton Beach Resort
44. Temple Bar Marina
45. Willow Beach Resort
46. National Park Service, Washington, D.C.
47. National Park Service Regional offices
48. Fraternity of the Desert Bighorn
49. Nevada Organization for Wildlife
50. Nevada Wildlife Federation
51. Nevada Wildlife Department
52. Red Rock Audubon Society
53. Soroptimists of Las Vegas
54. League of Women Voters
55. Citizen Alert
56. Sierra Club National Office
57. Sierra Club Legal Defense Fund

Tomorrow *(continued)*

in 1979. The treaty was never ratified, but both sides--on the surface, at least--have been following it. It expires at the end of the year.

SHOULD U.S. KEEP SALT II?

The betting now: Reagan will extend U.S. adherence to pact. Reasons--

Soviets are suspected of having exceeded SALT II limits, but they're putting out the word that they intend to continue observing the treaty.

Letting SALT II lapse would give a go-ahead to the Kremlin to deploy new missiles, planes and submarines without retiring other weapons.

Ending it would stir up protests at home and among allies.

New Labor Secretary Brock is mapping an ambitious agenda.

He plans attacks on youth unemployment, improvements in workplace safety and a new effort toward pension reform.

A top priority is to mend Reagan administration fences with unions. He has appointed a former United Auto Workers attorney to a key job.

Brock met May 8 with top leaders of the AFL-CIO. It was the first such session between the AFL-CIO and a Labor Secretary in four years.

TROUBLED FARM LENDERS

The federal farm-credit system is sending out danger signals.

Eight production-credit associations--prime farm lenders--in the Northwest have failed in the last two years. Many others are troubled.

The nation's 400-plus PCA's will lend 17.5 billion dollars in 1985.

Farmers also are flocking to the Farmers Home Administration for loans. FmHA, under political pressure, is dishing them out by the carload.

FmHA will provide farmers 3.8 billion dollars in loans this year.

What happens if these debts turn out bad?

They will pour more red ink into federal ledgers. Federal lenders will be burdened with farmland, further depressing land values.

All that carries the threat of collapse of the farm-credit system.

DECAY IN NATIONAL PARKS

Visitors to many national parks this summer will find fewer rangers to give them tours, deteriorating nature trails. Familiar reason:

Funds cut for 334 parks visited by 79 million people yearly. Result--

There's no money to restore and reopen most of the health spas at the Hot Springs National Park in Arkansas. Yosemite Park in California has fewer than half as many ranger-naturalists as a decade ago. Staff cuts ahead for parks at old Indian ruins could mean more thefts of artifacts.

The outlook: More of the same. Reagan wants to chop the budget for national parks by 30 percent from the current 860 million dollars.

Whistle-blower laws are getting popular in the states.

Seven legislatures are considering bills to protect employes from retaliation for revealing information unfavorable to an employer.

Since 1981, 19 states have enacted laws. Most laws apply to government employes, but seven states extend protection to private workers.

Your chance of being a violent-crime victim this year is 1 in 33.

How does that compare with risks of some other misfortune? Chance of being injured in an auto accident is 1 in 40. Death of spouse, 1 in 100.

Highest risk: A 1-in-10 chance of an accidental injury at home.

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July 29, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

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Dear Mr. Wagers:

Thank you for the opportunity to comment on the Lake Mead NRP Draft General Management Plan ("DGMP"). My comments, on behalf of the Utah Mining Association ("UMA"), will be limited to the National Park Services' ("NPS") evaluation of the energy mineral potential within Lake Mead National Recreation Area (the "NRA"), and NPS' proposed restriction of mineral exploration opportunities within the NRA.

SUMMARY OF COMMENTS

1 Each alternative within the DGMP, other than the "no action" alternative, virtually eliminates any reasonable opportunity for mineral exploration within the NRA. Unfortunately, the record reflects that NPS has virtually no information about likely mineralization or mineral development, to support this limited selection of alternatives.

2 NPS must be able to demonstrate a compelling reason if it intends to eliminate the existing opportunities for mineral leasing in the NRA. Historically, there has been no apparent land management problem associated with limited mineral exploration within the NRA. Public opinion has not demanded the elimination of mineral leasing activities within the NPS. In fact, public opinion has supported leasing. Yet, despite this history and the existence of ample NPS authority to mitigate or eliminate site-specific impacts of any proposed mineral

1 Refer to Nevada BLM responses 2 and 9.

2 NPS management decisions concerning zoning are based on protection of natural and cultural resource values and recreational needs, not on mineral resource values or occurrence. As a result, the areas open or closed to mineral leasing are not located according to known mineral potential or lack of potential. However, in analyzing the impacts of the proposed actions, we have considered the mineral potential of the area. Leasing has been a land management problem for many years because of lack of adequate planning and the need to review lease applications on a case-by-case basis without the assistance of an overall management guidance document. Over 700 lease applications have been reviewed by the Park Service in the history of the NRA, and approximately 268 have been issued. The review of these leases and the compliance required on the part of the Park Service has presented a substantial manpower commitment and expenditure of federal funds. The mineral leasing program has not resulted in the production of any minerals or the identification of any mineral deposits. The options were limited to streamlining the process by eliminating areas of resource concern from potential leasing, or implementing a cost lease review and compliance (regardless of whether the lease or permit is approved), and then attaching stringent surface protection stipulations to the leases.

exploration or development activities, NPS seeks to essentially eliminate a NPS management option, mineral leasing, specifically approved by Congress. UMA recommends a more thorough analysis of the mineral potential of the NRA and a more flexible and reasoned approach to mineral exploration and development opportunities.

COMMENTS

The DGMP proposal virtually eliminates mineral leasing in the areas of interest to the mining industry. The DGMP suggests that some 78% of the NRA is presently open to mineral leasing. The proposed action reduces this percentage to 10%. Alternatives A and B reduce the "leasable" area to 3% and 22%, respectively. See Table 2. The area of principal interest to the uranium industry, i.e., the Shivwits Zone, has been entirely closed to mineral leasing (p. 20).

These proposed decreases in land available to mineral leasing are staggering, unexplained, and contrary to public opinion on the issue. In 1982, an "issue survey" conducted by NPS concluded that a "clear majority" of responses to the DGMP survey felt that "mining and mineral leasing is acceptable in the Lake Mead NRA within limits (i.e., not visible, etc.)." If NPS seeks to exercise its discretion to fundamentally amend and restrict the areas designated by regulation as available for leasing, it must properly explain the factual basis for doing so. The DGMP fails to offer an adequate explanation of the limited and skewed selection of alternatives.

3 Even the "leasable" area figures presented, i.e., 10, 3 and 21%, do not accurately reflect the true scope of the proposed reduction. Much of the theoretically "leasable" land is within areas that NPS will ultimately designate as wilderness (compare pp. 20 and 204) or effectively withdraw from leasing as a result of restrictions incident to the forthcoming
4 Mineral Management Plan. Or, more importantly, the theoretically leasable land is located within areas that have never been the subject of any demonstrated mineral interest or potential. In comparison, in areas of high mineral interest, e.g., the Shivwits Zone (p. 37), the opportunity for mineral development has been totally eliminated (p. 20).

5 The NPS does not have a record upon which to base such restrictive proposals. A previous NPS study, DES 74-3 ("Draft Environmental Statement for the Lake Mead Wilderness Proposal") acknowledged that NPS did not have any mineral data sufficient for informed decision making. It noted:

3 It is the intent of the National Park Service that all lands shown in the resource utilization subzone be eventually open to consideration for mineral leasing, subject to necessary stipulations and resource concerns (as specified in the minerals management plan).

4 Refer to Nevada BLM responses 2 and 3.

5 The National Park Service has changed its terminology to fit BLM mineral potential terminology. The O'Brien report is a summary of the known mineral occurrences. Although this report may have overlooked some information, the Park Service took the necessary steps to improve on this information as noted in Nevada BLM response 2.

> Because no comprehensive mineral inventory of the recreation area has been prepared, future discovery of commercially exploitable mineral deposits remains possible.

DES 74-3 at 38. The DGMP, however, inexplicably contends

> the results of the mineral resources evaluation indicates that there are no minerals within the recreation areas of significant quantity or quality to affect the nation's supply of any given commodity.

6 (p. 203). A review of the principal authority for this conclusion, the O'Brien report, and the sources upon which it relies, reveals no meaningful information concerning mineralization of the area. In particular, it virtually ignores the high grade uranium deposits that are now thought to widely occur throughout the Grand Canyon region. Unlike uranium deposits throughout much of the Colorado Plateau, the Grand Canyon deposits are the only domestic uranium deposits that presently are economically developable. One UMA member, Energy Fuels Nuclear, Inc., described the nature and occurrence of these deposits to NPS representatives in detail in a meeting in the Regional Director's office on November 18, 1983 and, I understand, gave NPS representatives a tour of a representative uranium deposit and mining operation near the NRA. Some 27 prospecting permit applications relating to such deposits are apparently presently before NPS. Many additional permit applications have no doubt been put "on hold" by mining companies due to NPS' longstanding inaction on pending permit applications. Had NPS permitted any prospecting under these permits, mineral information would now be available to permit informed decision making. On the limited record that exists, however, it is inconceivable that NPS could conclude in the DGMP that "the probability of future mineral development . . . is remote because of an unfavorable mineralized environment of the recreation area.' (p.203)

7 I was more than mildly surprised to read that any "mineral resources evaluation" had purportedly been completed in connection with the DGMP. In a Freedom of Information Act request dated October 17, 1983, I requested all such information. After receiving a reply from NPS on December 13, 1983, that did not include any mineral data, I again requested that NPS provide such documents so that my mining clients could utilize such documents in the DGMP process. The NPS response, dated December 22, 1983, was as follows:

6 Refer to Nevada BLM responses 2, 7, and 15.

7 As stated in our letter of December 22, 1983, the staff at Lake Mead National Recreation Area, when preparing the FOIA response, was not aware of any additional information not already submitted to Mr. Garver.

> In response to your letter of December 13, 1983, we are not aware of any additional material, documents, or papers, that exist in our files concerning mining and mineral resources used in conjunction with the development of the General Management Plan.

Copies of these FOIA letters are attached to these comments, and incorporated herein. On January 31, 1984, Superintendent Wagers confirmed by telephone that no minerals analysis had been prepared. Yet NPS now contends it is relying principally upon a 1982 study by O'Brien (p. 37) and certain "other sources" of mineral data (p. 199) none of which were identified by NPS in the FOIA process. In view of the continuing NPS inaction on pending prospecting permits, apparent disregard for the information provided by Energy Fuels, and statements of the NPS that minerals studies did not exist, UMA members and the public have had no reasonable opportunity to evaluate or participate in the so-called "minerals analysis" of the NPS before the instant remarkably restrictive alternatives were formulated.

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8 In the absence of quality data concerning mineral resources in the NRA there seems to be little basis for departure from the existing system of mineral leasing described in the DGMP:

> Lease applications are [presently] considered within all other lands of the NRA, subject to a determination of effect upon surrounding park resources. Applications are reviewed through the NEPA process, which identifies significant resources. Those resources are then either excluded from the lease or stipulations are applied to mitigate the impact to them.

9 (p. 68). Conceptually, at least, the existing system makes sense. NPS should not rule out any area from exploration until it has some facts concerning the mineralization of the area, the nature and duration of any mineral exploration or development proposal and the opportunities to mitigate or eliminate adverse impacts to other values. Notwithstanding this comment, however, you should not be misled. UMA is not enthusiastic about the existing leasing system. In practice, it has not worked to permit any meaningful exploration. On the other hand, it does not engage in the unfounded presumptions contained in the DGMP, i.e., that no minerals exist or that minerals may not be developed consistent with other values and

8 Refer to response 2 above.

9 Refer to response 2 above.

Congressional objectives for the NRA. In the absence of compelling reasons to eliminate the public's opportunity to determine whether minerals exist within the NRA, NPS should retain the existing system and attempt to improve it to provide meaningful exploration opportunities consistent with other public values.

Lake Mead NRA is not a typical unit of the National Park System. Unlike other NPS areas, Congress specifically chose to protect the possibility of mineral development within the NRA. NPS should attempt to manage the NRA consistent with all Congressional purposes. Clearly it is appropriate to protect non-mining NRA values. However, there are less restrictive management options available to NPS than a total ban on prospecting within the principal areas of interest to the mining industry.

Very truly yours,

Patrick J. Garver

PJG:ss

0082Q

WILLOW BEACH RESORT

WILLOW BEACH, ARIZONA

Mailing Address:
Post Office Box 187
BOULDER CITY, NEVADA 89005
602/767-3311

D16

July 30, 1985

Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers:

It is six years this month since the National Park Service launched it's drive to protect Willow Beach Resort facilities from a floodplain situation. Closing of the N.P.S. campground July 19, 1979, has hurt our business. Frequent rehashing of our hazardous area by the media also has had its effect on business.

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We would urge that this Resort be put on a high priority for construction of an R.V. campground between the Resort and the Fish Hatchery. We understand frequent mention of Willow Beach Resort as a flood hazard in the Draft Environmental Impact Statement - Volumes I and II - qualifies this area for high priority. In view of this, we request that the campground relocation be the first consideration.

1 Relocation of the trailer village will not create the trauma your report suggests among our trailer village residents. Only a few of those residing here in July, 1979, remain. New tenants have been told what to expect if the government relocates the trailer village.

We also wish to point out that James Kelly only rents a trailer space and boat slip and is not a spokesman for Willow Beach Resort. Two members of the Denver team [redacted] he was responsible for one of the engineers transferring. We feel he damages our relationship with N.P.S.

implied

Having personally witnessed two floods in Las Vegas recently and two in Boulder City last year, we feel minor attention to the canyon roads at Willow Beach Resort will greatly alleviate our flood hazard.

We placed Willow Beach Resort on the market in June of 1984 but the General Management Plan stalls any prospect because of its uncertainty. We feel we have been kept in limbo long enough and urge action.

Sincerely,

Audrey W. Webb

Mrs. Audrey W. Webb
President

AWW:chg

1 The comment regarding trauma to trailer village residents because of relocation only applies to alternative B, not the proposed action. Under alternative B (which was considered and rejected), the trailer village would be removed and not replaced.

WALTER BARBUCK
4050 Palos Verdes, Apt 19
Las Vegas, NV 89119

29 July 1985

Mr Jerry Wagers
Superintendant
Lake Mead NRA
601 Boulder Hgy
Boulder City, NV 89005

Comments Concerning the Draft EIS for the Lake Mead NRA

Mr Wagers:

The Mining Industry is attempting to procure leases for Uranium exploration on the Shivwits Plateau. It's common knowledge of the depressed state the Uranium industry is in. This could only be considered a blatant and obnoxious act to hold a cloud over these beautiful lands. Please consider the verbal comments I made at the public hearing in Las Vegas, June 18, 1985. It must also be emphasized the Uranium possabilities are speculative at best (O'Brien 1982). It is my opinion there is no need to even consider the feelings of the Uranium industry because of the comments and my factual verbal comments.

1 Aside from the above, the undeveloped back-country will be protected. This contains side-canyons (Whitmore, Parashant and Andrus) to the Grand Canyon with views into Grand Canyon National Park. With the uproar over noise pollution in GCNP the back-country could use all the help it can get. This should make it easier for the Park Service to reconsider its decision to build an airstrip for "administrative purposes" at Shivwits. This is of course inconsistant with proposed wilderness status of the area. The wilderness act prohibits acess by airplane. It it is essential to gain acess to the area, a helicopter should do just fine. For the above proposes wilderness status the Park Service should also reconsider its plan to build a ranger station, primitive campsites and toilet facilities at Shivwits.

I support the NPS management zoning plan. Particularly the "Special use zone" subsegment "resource utilization subzone"(mining). This would give the mining industry 148,970 acres in which to apply for permits or work their current claims such as All815, A10896, A10897. It would deny them all other areas of the NRA where it's legal for the Park Service to do so.

2 Bowl of Fire (area 50) of "Management Zoning" is classified as having "Significant Natural Features"(area 9). It would not, because of it's size (less than 5000 acres) meet wilderness criteria. The area is however contiguous with the BLMs' proposed Muddy Mountain Wilderness and could certainly meet all criteria if Muddy Mountain is so designated by congress. Please keep this fact in mind when the final EIS is drafted or for future wilderness studies.

3 The BLM is expected to recommend wilderness status for their land on Wilson Ridge. This lies in view of scenic highway 93. In-between according to "Management Zoning" is area 24. The purpose of granting this a zoning criteria #2 would be to protect wilderness values on nearby BLM lands(Wilson Ridge) and protect natural atmosphere and views along scenic hgy 93. I realize #2 is worded to include lands only in the NRA but perhaps could be reworded to reflect above.

1 See response 2, Sierra Club, Legal Defense Fund.

2 See response 5, Sierra Club, Toiyabe Chapter.

3 See response 4, Sierra Club, Toiyabe Chapter.

According to the document (DEIS Vol II P. 201) there are no mineral leases or other mineral interests in Area 24. The availability to mining in the entire NRA would be reduced from 148,970 acres by the amount of acerage in area 24. It's duly noted by the undersigned that issues raised in the above 2 paragraphs are addresses on P. 51 titled "Adjacent Federal Lands".

Illegal vehicle use is always a cancer on public lands. Perhaps cemented wooden poles in the ground would help or combination helicopter and jeep operation. Confiscation of illegal vehicles could be, if allowed, an answer. Stiff fines or jail sentences should be considered. Ignorance in a crucial matter like this should be no excuse. Fines and sales of violating vehicles could help defray expenses. Perhaps congress could help.

In summary: The highly speculative nature of the mineral resources within the NRA indicates that the long term gains obtained from preserving the recreational values of the park far outweigh the uncertain relatively short term gains from mineral development(P. 302). No justification other than informational has been demonstrated for even the slightest development on Shivwits. Please don't develop. Don't add 30 campsights to the South Cove of the GB/GW zone. Hopefully this would not make any trash problems worse. Please keep this area as wild and prestine as possible. NPS to be commended on their multi-year formula for when to further develop the NRA. Hopefully this could be confined to already developed areas. The proposed action for the other seven management areas, except where noted(area 24), is a good comprimise.

Sincerely

Walter Barbuck

WALTER BARBUCK
member
Sierra Club

3370 Frontier St.
Las Vegas, NV 891
June 28, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, NV 89005

Dear Mr. Wagers:

I would appreciate my remarks in this letter being included in the official record of public comments on the Draft Environmental Impact Statement (DEIS) for a proposed General Management Plan (GMP) for the Lake Mead National Recreation Area (LMNRA).

I feel very strongly about the importance and need for a GMP to provide long-term direction to the management and development of LMNRA. I have been enjoying the Recreation Area, both its land and water resources, throughout the 28 years of my residence in southern Nevada, and I have become increasingly aware of the degradation of the environment there over the years as a result of the problems attending growth in visitation. This planning effort should help immeasurably in addressing these problems.

I especially feel good about the plan to zone the Recreation Area for various uses, especially with respect to oil and gas and mineral activities. The protection of the scenic views as well as the natural environment and significant features is especially appreciated. The phase out of mining in areas other than an acceptable Resource Utilization zone is a critical part of any plan. This is also true for the recognition of areas answering the basic suitability criteria for wilderness, since wilderness can complement and enhance without conflicting with the basic purposes of the Lake Mead Act or the Park Service's mission. Portions of the Recreation Area are to me integral with the contiguous Grand Canyon National Park, and I appreciate the effort to protect opportunities for enjoying this incredible natural wonder.

Many of the objectives of the Proposed Action Alternative are excellent. Addressing the growth of visitation is realistic so long as such growth does not become a self-fulfilling prophecy. Proposed flood control efforts seem reasonable and desirable. Protection of the environment through education, ranger contact, beach cleanup, ORV control and land rehabilitation is excellent.

Despite agreement with the general objectives and most specific proposals, I wish to express some concerns with the Proposed Action Alternative. These are as follows:

1 1. The proposed Resource Utilization Zone exhibits a tendency for an "out of sight, out of mind" mentality in its attempt at screening possible mining from public view, as if the public's perception of the area's vastness and naturalness can be maintained by a sort of facade, an illusion which would be destroyed upon closer exploration. Granted that mineral development would be eliminated in views from the lakes or most major corridors and that the best of the de facto wilderness

1 Comment noted, no response required.

would be maintained, but what of the visitor touring the accepted primitive roads or hiking into the backcountry from roads or lakeshore? He should also be assured unmarred views and a feeling of naturalness and beauty. From this standpoint, I prefer something closer to an Alternative A Resource Utilization Zone while endorsing most other elements of the Proposed Action zoning.

2 2. The DEIS recognizes the wilderness qualities of the Shivwits and Sanup Plateaus yet advocates an administrative airstrip on the Shivwits. My feeling of wilderness has been repeatedly violated by aircraft overflights while visiting remote areas of the Grand Canyon, and I think encouraging increased aircraft intrusions through an airstrip is unwise. The Shivwits provides the closest thing to a wilderness experience I know of that is possible by auto, and I feel that primitive campgrounds or a ranger station would seriously impair the experience.

3 3. The scenic US 93 corridor through the Recreation Area south of Hoover Dam should be preserved in its entirety by zoning against mineral development east of the highway, as is already proposed to the west. This I feel is important in protecting the overall feeling of naturalness for the motorist. It is also important in eliminating a narrow wedge of potentially destructive zoning activity in the foreground of the expected BLM Wilson Mountain wilderness unit, which would be contiguous with the Recreation Area on the east. Indeed, this narrow strip would best be recognized in the plan as potential wilderness contingent upon Congress accepting a BLM proposal for wilderness on Wilson Ridge.

4 4. Similarly, the Bowl of Fire has intrinsic wilderness qualities of outstanding note and no conflicting management intentions. Its small size is not an obstacle to recognition of these qualities, especially if the area is viewed as potential wilderness contingent upon the BLM's contiguous Muddy Mountains wilderness proposal being accepted by Congress.

5 5. The Park Service says it intends to phase mineral leasing out of all zones except the finally determined Resource Utilization Zone. This logically implies that no approval of existing applications for prospecting permits would be granted on that portion of the 11,640 involved acres which fall outside this approved zone. But nowhere in the DEIS could I ascertain this essential criterion for approval or denial. I think this should be the most important criterion and should be explicitly stated.

I very much appreciate the hard work of the Park Service in formulating this document and the opportunity I have had in commenting on it.

Sincerely,

Howard G. Booth

Howard G. Booth

2 See response 2, Sierra Club, Legal Defense Fund.

3 See response 4, Sierra Club, Toiyabe Chapter.

4 See response 5, Sierra Club, Toiyabe Chapter.

5 Refer to responses 7 and 8, Sierra Club Legal Defense Fund.

2621 Bella Dr
No. Las Vegas, NV
28 July 1985

Jerry D. Wagers
LMNRA
601 Nevada Hwy
Boulder City, NV 89005

Dear Sir,

I support the decision to zone the Shivwits Plateau closed to mineral leasing. This will probably draw industry's wrath because of the interest in uranium mining there, but this decision will protect undeveloped back-country containing side canyons (Whitmore, Parashant, Andrus) to the Grand Canyon and will also protect the air and water quality of Grand Canyon National Park.

1 I object to building a landing strip for "administrative access" to the Shivwits area because this is inconsistent with the proposed wilderness status of this area. Also, it is inconsistent to build a ranger station, campsites, and toilet facilities.

I support the proposal to eliminate mining from all but 148,970 acres of the Recreation Area and that all pending permits be denied which involve lands outside of the area zoned for mining. Vol. II, p. 296, states that only one lease of over 200 leases issued in the recreation area has resulted in commercial production.

1 See response 2, Sierra Club, Legal Defense Fund.

COMMENTS

2 I propose that the Bowl of Fire be included in Lake Mead lands for wilderness as it is contiguous with the BLM's proposed Muddy Mtns wilderness,

3 I also propose that mining be prohibited in the narrow strip between U.S. Hwy 93 and the east boundary of the Rec. Area in order to protect wilderness values on the nearby BLM lands and to protect the natural atmosphere and views along the scenic highway.

Sincerely,
Bob Furtek

RESPONSES

2 See response 5, Sierra Club, Toiyabe Chapter.

3 See response 4, Sierra Club, Toiyabe Chapter.

Mr. Jerry Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

July 25, 1985

Dear Mr Wagers,

I am writing you in response to the "Lake Mead Recreational Area Environmental Impact Statement" published and distributed recently by your services. That I am long in replying can be attributed to the fact that in spite of my several years association with Willow Beach living, it was only by chance that I learned of aforementioned report and request for responses.

Your report fails miserably to be an Environmental Impact report. Its greatest impact is a maneuver to modify the Willow Beach establishment, either totally or in great part. Your real objective is obfuscated! It could be an attempt to justify an earlier (and miserably) failed effort to close Willow Beach. It could be a bureaucratic attempt at face-saving withdrawal from that ill-fated exercise. By initiating a ponderous "Government hearing" process, you could be hoping to reverse that earlier defeat through default!

If your researchers have genuine concern for people safety, they have all the intuition of a blind mole! If they were totally concerned about the "PMF" of any portion of the river basin, they would abandon the 100 year flood syndrome! It has already been proven inaccurate in the case of Willow Beach!

They should recommend the removal of all humans along the river basin from Page, Arizona, to the Mexican border! Just one "incident" (in the next 100 years, mind you) at Glen Canyon, Hoover, Davis or Parker could wipe out untold human lives! An earthquake! Deterioration from [illegible]! Oräge! Some damn fool radical with a semi load of TNT! Or WAR!
Your people have an understandable presence over the El Dorado Canyon disaster. Yet, those conditions hardly began to exist at Willow Beach. Why, the gullies feeding the main channels to the resort are so minor that the State of Arizona didn't even put a bridge on them! Bridges at 8-mile and 4-mile are miles away from Willow Beach tributaries crossing Highway 93.

1 The authors of your report ignored consideration of a broad scope of alternatives towards providing for increased people participation and protection in the Willow Beach area. While obliterating the structure of the Willow Beach resort, they conveniently ignored the supposed adjacent safety risks to the launch ramps, the parking area, the courtesy dock, the rent-boat dock, the pump out dock, and the marina. How inconsiderate can they be?
Instead of re-building the world, why not just build on greater structural protection in the trailer village ditch! To answer increased participation, increase the trailer sites "someplace"! Create a new campground (or repair the old one!). And, get off our backs!

Sincerely

Nat K Gay

N.K. GAY
13606-G LA JOLLA CIR.
LA MIRADA, CA
90638

1 The alternatives presented for Willow Beach were the result of a long process begun in 1979. Structural protection of existing facilities was considered initially, but it was found to be economically infeasible. Expansion of facilities at Willow Beach was also considered but rejected because of high cost and site limitations. The alternative to close Willow Beach was also discarded at that time because of the strong public support to keep it open.

Jerry D. Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nv 89005

Dear Mr. Wagers:

I am submitting a written reply to your requested input on the General Management Plan published in April, 1985.

Please do not misinterpret the next statement as an "I told you so, Jerry", but if you will recall, at the public hearing held in the Federal Building in Los Angeles in 1976, I testified as a professional witness that if expansion of facilities were granted to the concessionaire at Katherine's Landing i.e. allowing more slips, houseboats and the construction of a berm, that the day would come when pollution would take over. Well, it happened in 1984.

1 It is still my strong opinion that, as was pointed out in your present impact statement, Katherin's Landing is over utilized and any additional development will merely increase a known and recognized problem. Development, if any, should be considered 10-12 miles north. This would relieve the overloaded condition and over utilization presently existing in the Katherine Area.

2 I would also suggest that serious consideration be given to restoring a realistic bilateral lease agreement with the cabinsite leasees. This holds many advantages for both the Park Service and the leasees. It provides a substantial guaranteed annual income ($86,400.00) for the Park Service with virtually no cost except clerical billing and occasional field trip for compliance inspections. At Katherine's we provide our own water, sewers, electricity, phone service, trash pick up and VIP services, i.e. pick up of trash along access road to cabinsite point. This is a customary practice by several of our ladies who routinely clean up after a weekend. In fact, one of our gals is presently recovering from a broken leg sustained while cleaning up trash on the beach at cabinsite point. We also act as a deterrent to off road travel, vandalism of NPS informational road markers, destruction of natural vegetation, rock formations, fires, etc. We are the eyes and ears for the NPS just by our mere presence in a remote but congested area.

3 In accordance with the original presentation for the lease sites, Congress expressed itself very clearly that the location of the cabin site area could not conceivably be utilized for any other purpose due to terrain and and natural run off without unwarranted heavy expenditures which would violate the natural growth and terrain.

In addition, the original lease agreement contained the two-year notice of cancellation. I must, at this point, agree with your conclusion that any thought of lease cancellation would indeed be a very traumatic and tragic event to allow to happen to the lease holders.

1 A secondary launching facility is proposed approximately 7 miles upstream from Katherine Landing. The purpose is to disperse use in the lower portion of Lake Mohave and to alleviate a portion of the use and congestion at the Katherine Landing ramp area.

2 A public meeting was held to discuss the policy of the National Park Service in relation to the cabin site policy at Lake Mead National Recreation Area. The results of that meeting were that extensions of the existing leases will be granted, but the leases will be nontransferable. All annual lease fees that are collected go directly into the United States Treasury. The National Park Service does not actually receive any of that money.

3 The enabling legislation does not make reference to the suitability of the terrain for cabin site use. The legislation does, however, declare cabin site use as one of the permitted activities within the recreation area. As a permitted activity cabin sites are allowed, subject to regulation by the secretary of the interior, provided they do not conflict with the recreational or reclamation use of the area. Regulations for cabin site use have been developed and published in 43 CFR, 21.4. The regulations state that cabin site permits will be "reviewed at least once in every 5-year period to determine that the continued use of the individual cabin site is not inconsistent with the needs of the general public for use of the area. In periodically reviewing whether the existence of private cabin sites conflicts with the best public use of an area, consideration will be given to (i) existing and projected public need for the area, (ii) compatibility between public uses and private cabin sites, (iii) development potential and plans for the area, and (iv) other relevant factors.

This review was completed as part of the GMP planning effort. The cabin sites were found to be compatible with public use, and no need for these sites was projected.

Without exception, I feel confident in saying that the lease holders have a high level of pride in contributing to the Lake Mead Recreation Area monetarily, through lease fees, by maintaining respectable neat private structures and by their unsolicited services provided to the NPS. I feel it is well within the realm of the NPS to grant a reasonable lease with the right to transfer said leases.

With reference to the right of lease transfer, this is more adventageous to the NPS due to a guarantee of continuous leese fees. A leasee who loses a spouse and finds it difficult to retain the lease invites degradation of the area and demolition of private structures one at a time until there is left a burned-out ghetto type area. The loss of revenue to NPS and the loss of pride in the area by the public are ugly compromises to a reasonable and responsible request.

4 In view of the present endeavors by the Arizona Land Commission to acquire portions of land within the Katherine area, to be sold to developers, I feel the NPS and the cabinsite lease holders should join hands to avoid such a travesty from occurring.

I am looking forward to the continuation of compatible and acceptable conditions to all parties concerned in this most important matter.

Sincerely,

N R Hettman

N.R. Hettman, President
Katherine Cabinsite Ass'n. Inc.

4 The National Park Service has related to the Arizona Land Commission that no land within the Katherine area will be considered for their acquisition.

July 30, 1985

Douglas Holmes

PRESCOTT COLLEGE

National Park Service
Lake Mead Recreation Area
Comments on Management Plan.
Attn. Jerry Weavers

To whom it May Concern:

I have read the N.P.S. management proposal for the Lake Mead National Recreation Area. I am familiar with the region and the ecological importance of the area. I generally agree with the recommendations proposed by the N.P.S. and would like to support their opinion on the preferred alternative as a management option. Specifically I would like to emphasize the following points:

1. I feel it is extremely important to close the Shivwits Plateau to mineral leasing. The area is geographically adjacent to Grand Canyon National Park and should be managed as a wilderness to protect the ecological integrity of this area. It should have originally been included in the Park, as it is a part of the same geographic and ecologic unit. Any mining or exploration in this area would affect air and water quality of the Shivwits and Grand Canyon National Park.

220 GROVE AVENUE / PRESCOTT, ARIZONA 86301 / (602) 778-2090

1 As shown on the Proposed Action/Management Zoning map in volume I, the Shivwits Plateau has been zoned as a natural zone which precludes mining activity. It must be noted that there are a few nonfederal parcels of land on the Shivwits Plateau which the National Park Service does not have any jurisdiction over and within reason must allow access to the owner.

COMMENTS

2 I disagree with the N.P.S. opinion that a landing strip be built on the Plateau. Air traffic is already a major negative factor in the canyon, and any further encouragement of air traffic should be avoided.

3 While it was not specifically mentioned in the N.P.S. statement, a review of boating regulations should be made to create a consistent policy between boaters on Lake Mead, and those utilizing the Grand Canyon. Boats should not be allowed to motor above Separation Canyon in the Lower Granite Gorge, and Lake Mead Boaters should be required to maintain the same strict camping ethics as those who boat through the canyon.

I have used this area both as a recreational and an educational resource. It is a significant wilderness and ecological resource. (One day we counted 36 desert big horns) My compliments to the N.P.S. for their hard work in preparing the management proposal.

Sincerely,
Doug Holmes
Instructor of Env. Studies.

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RESPONSES

2 Management access must be provided to the Shivwits Plateau so that the area can be managed in the manner set by Congress in the enabling legislation and the guidelines set by the National Park Service, whether it be as a natural zone, a special use zone, or a development zone. This isolated area is susceptible to unwanted uses, such as vandalism to historic structures and archeological sites, poaching of animals, and other activities. A small facility is needed at the entrance to monitor vehicles, fire potential, and other emergency conditions. The facility will remain in its present location and be renovated. In response to a demand for unimproved campsites at the fire camp in the past, two or three level areas with grills will be installed for visitors who choose to stay there impact on the meadows will then be reduced through less indiscriminate camping on the Shivwits Plateau.

An airstrip is proposed to provide for proper supervision and delivery of adequate supplies in an economical method and timely manner. The airstrip will replace the one currently being used on the access road, which is approximately 15 miles (45 minutes) from the fire camp when the weather is good. Airplane service to the fire camp will require one sixth of the time it takes to drive. Total use of the airstrip for management is likely to be, at the most, twice weekly and only May 1 to September 30 (the fire season). The only time the airstrip will be used more frequently will be in the case of a forest fire.

The proposed strip will be available for use only by the NPS airplane (a single engine with STOL equipment) and will not be large enough to allow larger twin-engine planes to land. The normal flight pattern is to the west, which is the shortest route to the NRA's administration areas and not over the Grand Canyon. This is the same flight pattern that is being used now. Although the flights are infrequent, they cause noise and visual intrusions to the wilderness qualities of units 13, 14, 21, 24, 30, and 31 within the recreation area. To minimize the number of these flights, the superintendent will review each trip to determine the necessity and efficiency of aircraft use, consistent with park goals. If the airplane is not the most efficient method of accomplishing the purpose of a trip, alternative access means will be used.

3 We will be discussing this with the superintendent of Grand Canyon in the near future.

July 12, 1985

Dear Mr. Wagers,

We are writing in regard to the General Management Plan for Lake Mead. We are cabin owners at Stewarts Point and have a vested interest in what happens to that particular area and to the whole area in general.

Concerning the Stewarts Point Site we were greatly relieved to see there were no changes planned for the cabin area.

As former campers and now cabin owners we would like to see the area remain the way it is. We were drawn to the area because of its remoteness and lack of facilities. We feel by paving the access road and putting in a launch ramp it would draw many more people to the area and it would lose the quality we appreciate the most.

There are many places on the lake that have facilities for those people who want that kind of experience but we feel that there should also be places for those people who don't want that kind of experience.

1 We would like to thank you for giving us the opportunity to voice our opinion.

Sincerely,
Charles & Arlene Jenkins

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1 Comment noted, no response required.

James C. Kelley

July 13, 1985

Mr. Jerry Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

Dear Mr. Wagers,

This is in response to the "Lake Mead Recreational Area Environmental Impact Statement" as published by the National Park Service.

I put the title of the report in quotations because it is purely a title and certainly not an Environmental Impact Statement.

As with the Mooseburner report on Willow Beach, this is a very poor quality report written with no actual, current, nor proposal for future, knowledge of the situation.

As with the Mooseburner report and the accompanying Falvey Mitigation report, it appears that this report was written with the same reckless abandon of, "Do something". It doesn't have to be good but make it expensive and controversial so that we can have many, many meetings.

Due to the fact that my primary knowledge is the Willow Beach Resort area, I will limit my comments to this area.

1 First of all the pictures, and especially the picture of the canyons around Willow Beach, are misleading. The canyon picture is taken from a spot almost up to the restriction cable. This is at least eight miles upstream.

2 I am sure that when the Sierra Club or the press find that you are proposing to move the trailer village to what you call the old settling ponds from the sewage plant, the headlines will probably read that the Reagan Administration is now subdividing Toxic Waste Dumps. Which these are, indeed, abandoned Toxic Waste dumps and would certainly never even be considered in a true Environmental Impact Statement.

3 We then come to the tremendous growth of the visitors to Willow Beach and the need for 100 additional boat slips.

This is absolutely ludicrous!

1 All pictures at the beginning of a section relate to the zone, not a specific developed area. Thus these pictures represent the Willow Beach zone, not the Willow Beach development.

2 We have had the public health officials inspect the settlement ponds that have not been used for 15 years and to approve their usage. The ponds never contained and were never used for disposal of toxic wastes.

3 This number of slips is not proposed but represents the maximum number that will be allowed in the area.

James C. Kelley

Your projections, I am sure, were used and enhanced purely to get the budget increased. The figures were projected upward from the large number of visitors to Hoover Dam during the 1983-84 fiasco.

Tremendous crowds half of which were fascinated by the spectacular waterfall over the spillway and the other half in total awe at the mistake of the century by the Government agencies who carried on the carnival spirit through those quasi congressional hearings, pointing the finger at one another and blaming the Reagan Administration. I am quite sure that if they could, they would also have blamed El Nino.

Yet you use these projections for the benefit of the report and state further that the steady drop has been 14% at Willow Beach.

4 There is absolutely nothing said about the water flow through this area from the installation of the new generators at Hoover Dam, and the Central Arizona Project which comes on stream December 1985 and will be moving a great deal of water through 1992.

Some of the projections of the Bureau of Reclamation again propose 60 million CFS through the dam. No consideration is given to the damage or devastation this causes.

Probably with the interest in the carnival atmosphere and the wet T Shirt contests, no one noticed that the feed along the bottom of the river for fifteen plus (15+) miles below the dam was destroyed by the scouring action of the water. Fishing. as we once knew it, is not back yet and with the heavy flow, it will never return.

Now if you are going to turn Willow Beach into a Ghost Town, why should a great deal of money be spent rearranging it into a dangerous, toxic and disease ridden residential resort other than to be able to write many more reports and spend millions changing it back.

I just don't get it.

James C. Kelley

JCK:pf

4 A document entitled "Hoover Powerplant Modification - Environmental Impact Statement" was prepared by the Bureau of Reclamation in 1983 and addresses all impacts to the river below Hoover Dam, including the expected high flows during peak electrical use and the environmental impacts associated with them.

Americantourist
July 19-85

Jerry D. Wagers
Superintendent
Lake Mead Recreation Area
Dear Sir,

Thank you for sending me a copy of the impact statement.
I can see that a lot of work & planning has been done.
But also know that our government, haven't the money now or in the near future; so the government is cutting in every project it can do to cut the budget.
So I do appreciate all the work & planning for the

COMMENTS

1 many years, but to think it would be best interest of the cabin owners, to extend our leases for 25 more years, with the opinion of selling our cabin in those 25 years. It would really make a hardship on me, if I had to move the cabin!

Thank you very much for letting me express my opinion on this matter. You have been very nice to deal with.

I remain

Ora P. Nielsen
592 E 700 North
American Fork Ut
84003

RESPONSES

1 No use has currently been identified for the cabin site areas, thus, we do not, for the length of the plan, foresee any cabin site lessees being asked to vacate their lots.

COMMENTS

Mr. Jerry D. Wagers, Superintendent
Lake Mead National Recreation Area
601 Nevada Hiway
Boulder City, NV 89005

July 16, 1985

Dear Mr. Wagers,

Thank you for the opportunity to respond to the Lake Mead National Recreation Area/Arizona-Nevada Draft Environmental Impact Statement, dated April, 1985.

After reading both volumes, the proposed General Management Plan (GMP) seems to be the most appropriate for each zone in the Lake Mead area. The National Park Service (NPS) recognizes the need for expanded facilities for our increased tourist and local use.

I would like to commend the NPS for the flood hazard mitigation measures they have proposed. Any plan that is agreed to should incorporate these measures.

1 Wilderness should be included in the GMP. Coordinating several different plans, written at different times creates a problem when trying to tie all aspects of any given plan together. Time constraints are difficult but a complete package is more cohesive to work with and to comprehend.

Mining has been minimal over the years and will probably continue to be. Prospects for any significant find is unlikely, therefore, the proposed plan will not hurt mining.

In closing, the NPS has done an outstanding job in these two volumes. The proposed GMP should be the one chosen.

Sincerely,

Rebecca Parr
5303 Stampa Ave.
Las Vegas, NV 89102

RESPONSES

1 Additional information on plans to follow the GMP, such as the wilderness plan and the minerals management plan, as well as present NPS plans for these lands, has been added to the document.

L. Cordell Peterson
994 North 1725 West
St. George, UT 84770
July 28, 1985

Mr. Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, NV 89005

Dear Mr. Wagers:

Thank you for the opportunity to respond to the Lake Mead National Recreation Area Draft Environmental Impact Statement. The individuals that participated in compiling such an extensive document should be highly commended for their extraordinary effort.

The proposed action appears to be a viable alternative to meet the next 25 year NRA's expansion requirement without adversely affecting the pristine nature or jeopardize flora and fauna survivability within the NRA. In most cases, confining development to already established sacrifice area's or imposed sacrifice area's (i.e. areas of unauthorized encroachment) is a rational approach to meet projected recreational demand.

In reviewing volumes 1 and 2, the below listed comments are forwarded for final EIS consideration:

1 (a). Desert Bighorn Sheep (DBH) protection and preservation should, other than human safety needs, be considered the number one priority within the framework of the NRA General Management Plan (GMP). DBH protection and preservation should take precedence over mineral development, grazing or any human recreational development improvements. This includes new access routes into wilderness or potential wilderness areas. In this priority placement context, how does the expansion of the Boulder Beach and Las Vegas Wash areas, with associated increased human activity, impact area #57 (pps. 21 and 29)? On page 234, area #57 was identified as "significant natural feature" #8 which implied necessary protection is being properly focused. However, it is not clear if this is the only area within the NRA considered critical DBH lambing grounds or essential to DBH habitat need? If not, why are other lambing ground/critical habitat not considered and identified in the "special natural subzone" (p. 234).

Pinto Valley (p. 289) was identified as an area with possible DBH and oil/gas conflict. Mitigation measures were identified as a program to collect and record DBH response data to development after the development process commenced. Even though mineral exploration/extraction was considered a minor threat, if past attempts at mitigation by other resource agencies is an indicator, once exploration, including seismic exploration, and extraction commence, mitigation is relatively a meaningless word. The

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1 The River Mountains is an area of approximately 35 square miles that is bordered around its entire perimeter by development. The area has no natural water sources and in the distant past was used as a wintering area by bighorn sheep. The present herd of bighorn sheep is very healthy. They use the recreation area side (where man-made water holes are located) for summer range and the Bureau of Land Management side for winter range, with very limited migration out of or into the range. Some of the sheep currently water in a developed area of Boulder City and have become somewhat tolerant of the perimeter urbanization. Because the sheep have such a limited range within the River Mountains and virtually no unimpeded migration routes, it was felt that the area should not only be put into a natural zone but should be given one of the two special protection zone designations. Unit 57 on the Proposed Action/Management Zoning map was given environmental protection subzone status as were a number of other bighorn sheep lambing grounds.

Expansion of the Boulder Beach and Las Vegas Wash area is not expected to impact the River Mountains herd because almost all of the proposed improvements are between the lake and Lakeshore Road. Those few improvements on the River Mountains side of the road will remain far enough away from water holes and primary grazing areas so they do not impact the herd.

The possible oil/gas - bighorn sheep conflict near Pinto Valley will be mitigated through monitoring bighorn sheep if and when mining activities take place. Through the leasing procedure, some possible sheep conflicts have already been mitigated through stipulation. When a plan of operations is filed, access routes will be identified by National Park Service and appropriate state wildlife personnel so as to cause the least impact to sheep and other resources. All possible avenues to protect bighorn sheep populations from oil/gas development activities will be taken.

action of a "temporary shutdown of operations", would be difficult, if not impossible, to achieve if DBH research data so indicated such action was necessary. This approach to accomodate development, at the expense of the DBH, is not an acceptable alternative. The NRA and the NPS should actively pursue action to protect DBH habitat either through procurement of existing leases or through wilderness designation. It is realized Sec. 3(b) of Public Law 88-639 allows for mineral leasing. However, is it possible under Sec. 6 for the Secretary of Interior to prevent road access to lease areas for development purposes to preserve DBH habitat/lambing grounds. This is especially critical in reducing DBH stress, which may lead to a irreversible population decline prior to any field test assessment being finalized.

Because area #57 (p. 234) is identified as critical to DBH, why was this area not considered for Wilderness Act protection status (Wilderness Suitability, p. 205). Since DBH require infrequent human contact, it would seem reasonable that the imprints of man would be non-existent or at the very most minimal. Therefore, the NRA should consider adding area #57 to recommended wilderness suitability status.

2 (b). Wilderness Act Criteria Designation. Inorder to protect the threatened bald eagle's winter habitat, unique geologic and significant values, and rare species such as Opuntia basilaris var. treleasei from extinction, the potential wilderness acreage of 14,645 acres and 13,030 for units 11 and 12 (p.207) should be changed to Wilderness Act criteria status. If the potential Bureau of Reclamation (BOR) project is as extensive as p. 207 suggests, the potential of Black Canyon's scenic beauty being severely altered is a real possibility. Any BOR promises, written or implied, to mitigate damage must be viewed with much skepticism. As a priority BOR mitigation, based on past BOR projects, is one of non-mitigation compliance or a token mitigation response. The NPS should fight such BOR projects. The first step in this process should be to redesignate units 11 and 12 as Wilderness Act criteria.

The Shivwits Plateau, Unit 33 (p. 210), 83,980 potential wilderness acres should be re-evaluated and the majority of this acreage designated as meeting the Wilderness Act criteria. Under the proposed action, the 17,590 acres under mineral lease for uranium should be rejected. The speculative, relative inaccessibility, the negative imprints (i.e radioactive tailings) left by the uranium industry throughout the West and a horrendous record for waste cleanup should be the basis for reclassification of this land to prevent uranium development. As for oil and gas, 20 years (p. 295) of non-interest, the speculative nature of this fuel and a minimal impact nonavailability of Shivwits Plateau land should have on the oil/gas industry should also justify the upgrading of Shivwits Plateau land to Wilderness Act criteria.

Area #59 (p.29), except for the primitive road that leads to Kelly Point, should be reinventoried and additional acreage identified as Wilderness Act critera land. In addition, included in Wilderness Act criteria land should be area #58 (p.29) which is indicated as roadless to Twin Point, and is already receiving environmental protection subzone status. Again, 20 years of non-interest should qualify these areas for Wilderness Act designation. Wilderness Act criteria land should be so classified, even if potential development conflicts exist.

Would minimum encroachment mean a 50-75 year revegetation cycle for

2 The National Park Service has designated these areas as potential wilderness areas because of the following nonqualifying conditions:

Unit 4 is encumbered by outstanding subsurface mineral reservations, but the quality of this unit does meet the criteria for wilderness.

Units 11 and 12 were candidates for pumped-back storage units being proposed by the Bureau of Reclamation as requested by Congress. Unit 11 is still being considered, but unit 12 will be removed from the potential wilderness category and included with wilderness lands meeting the criteria.

Unit 33 is also encumbered by outstanding subsurface mineral reservations but does meet the criteria. In the case of units 4 and 33, as soon as the outstanding subsurface mineral reservations have been obtained by the National Park Service, these areas will be included in the lands that meet the criteria.

the Shivwits Plateau region, Unit 33? Development speculation should not be allowed in areas where such a time consuming land healing process is necessary to return the natural landscape.

3 (c). Mineral Leasing. Page 5 identified areas in which mineral leasing would not be allowed. This list should be expanded to include all DBH habitat especially lambing grounds. This species' sensative nature, should not be subjected or tested to a point of population decline prior to corrective measures instituted to correct stressful situation. At this time, the Nation does not need the mineral resource the NRA has to offer bad enough to sacrifice a highly restricted range species such as the DBH. Once again it must be re-emphasized - that one mineral exploration/ extraction commence, it is virtually impossible to stop.

4 (d). Shivwits Plateau Dirt Landing Strip. The proposed landing strip should not be considered. Even though the primary purpose of the landing strip is for administrative access, the other uses are of primary concern. The air strip's presence alone could destroy the primative nature of this region. Unless use is strictly controlled, it could be an access point to increased development and provide a base forever increasing encroachment into this relatively undeveloped region. The other uses, if deemed appropriate, should be fully identified in the Final EIS. Would the addition of this landing strip add to an already exorbitant flight congestion problem being experienced over the Grand Canyon region?

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(e). Miscellaneous.

5 (1). Federal and state T & E species and candidate species for such status should be adamantly protected from development encroachment even if minimal impacts are expected to occur in established resource management zones. The 640 acre protection rule established for cultural resources should be adopted for protected species. Without such protection an accidential annihilation of a species could occur.

6 (2). page 27, Table 6 - Area 33 is not listed.

(3). page 210 - Shivwits Plateau should be indicated as unit 33.

7 (4). page 287 - To what extent rare, T & E plants and animal species in Fire Mountain development area and access point to Detrital Bay would be impacted should be more specific and included in the Final EIS.

It has been a pleasure responding to NRA Lake Mead's DEIS. Would you place my name on the list to receive the Final Report, the Draft Wilderness Plan and the Draft Mineral Management Plan and anyother documentation that will assist in my preparation to respond to the two indicated draft plans.

Cordially,

Cordell Peterson

L. Cordell Peterson

3 As shown on the Proposed Action/Management Zoning map, areas with bighorn sheep lambing grounds and other critical habitat have been identified as environmental protection subzones under the natural zone and will not be open to mineral leasing. The areas identified on page 5 of the draft EIS, where mineral leasing will not be considered, were established in the Code of Federal Regulations (CFR). Revisions to the CFR will be made to reflect zoning in the GMP and any other excepted areas after the minerals management plan is completed.

4 See response 2, Sierra Club Legal Defense Fund.

5 Any development that may affect threatened or endangered species will contain mitigating measures to protect those species.

Consultation with the Fish and Wildlife Service would take place before any development to ensure that threatened or endangered species are given the highest possible protection.

6 These changes have been made in the document.

7 Because the possible impacts to threatened or endangered species near these sites will depend on the type and size of development, it is impossible to provide more specific information. If and when these sites are necessary for development, more specific plans will be exhibited, which will, in turn, allow for a much better assessment of the possible impacts to threatened or endangered species. Again, consultation on threatened or endangered species with the Fish and Wildlife Service would take place before any development occurs.

Jerry D. Wagers
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City, Nevada 89005

July 15, 1985

Dear Mr. Wagers,

I have reviewed the United States Department of The Interior Draft Environmental Impact Statement, and I would like to make the following comments concerning it.

I am a cabin site owner at Stewart's Point, and support the proposed actions with a few reservations, additions and corrections.

1 The proposed action of paving the road into Stewart's Point for the unpaved portion of .8 miles is in error. The unpaved portion is 2.4 miles. While this should not require 3 times more money for the proposed action, it will obviously be more than the budgeted amount of $75,000.

2 While the residents of Stewart's Point are greatly concerned about the sanitation facilities available to those members of the public utilizing the primitive beach camping, the question has arisen as to the benefits derived from changing the current 12 square foot pit toilet to a 12 square foot organic toilet at a cost of $16,000. Although the number of campers at Stewart's Point has been declining, I personally feel there is sufficient traffic during the summer holidays to warrant 2 toilets.

3 I feel that the Overton Beach residents raised many valid issues concerning the flood plan, especially as the Bureau of Reclamation has issued statements concerning the expected water level at the dam for this decade. An average of approximately 1212 feet at the dam would not appear to create a need as extensive as is being considered in the Impact Study.

4 The impact study quotes Department of the Interior regulations (43 CFR 21) as prohibiting the sale of lessee improvements after the original period of the lease has expired. This is an error. While a policy statement to that effect has been issued, regulation (43 CFR 21) does in fact permit a transfer of improvements after an extension has been granted.

In summary as a member of the public, I am greatly concerned about the preservation and maintenance of our country's recreation areas. And I feel that with the exceptions previously mentioned the Impact Statement adequately addresses those issues.

Cordially,

James E. Slayton

James E. Slayton
Stewart's Point #32
P. O. Box 725
Overton, NV 89040

1 The figure given for the cost of construction was correct for 0.8 mile of road. The figures for road lengths were transposed and have been corrected.

2 We are currently trying to install the most practical sanitation facilities at the lake for the use of our visitors. The organic restrooms being considered are what we feel is a better solution for our situation than the existing pit toilets. The organic restrooms cost less for us to maintain, are odorless, and present a more pleasing interior than the pit toilet.

3 In the past we were under the impression that the water level would never surpass the 1,221.6-foot (top of raised gates) elevation, but in 1983 the water level rose to 1,225.8 feet, which cost the National Park Service over $1 million in damage, not including what it cost concessioners. We have now made a decision that any new facility constructed on Lake Mead must be above the 1,230-foot level, which is above the highest lake water level possible. The water level in August 1985 was already 1,214 feet, which was above the level predicted by the Bureau of Reclamation for 1985.

4 As stated in the document, the Department of the Interior regulations prohibit granting new leases and are silent on the subject of prohibiting the sale of leases.

Mr. Jerry D. Wagners
Superintendent
Lake Mead National Recreation Area
601 Nevada Highway
Boulder City. NV 89005

Harold von Beck
835 Riverfront Drive
Riviera. AZ 86442.

June 11, 1985.

Dear Mr. Wagners.

Two unrelated tragic incidents cause me to write this letter. A close friend of mine, a former member of the Army Corps of Engineers, died recently. He had ordered your
Draft Environmental Impact Statement,
Volume 1 of April 1985. Lake Mead.
I read most of the material in his copy. You will accept comments. I like to comment as a substitute for my late friend.

The second incident occurred last Sunday. The Southern California Edison Mohave Power Plant was struck by a terrible accident. It could be many months, even years before it can be restarted. This plant was one of my former places of work as an engineer. I am retired now.

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1 Your impact statement has two items missing in my opinion. There is no mentioning of noise polution by inconsiderate power boaters. A certain segment of the boating public feels that it should do on the waterways what can not be done on the highways any more. They pretend going out for relaxation in nature, while in reality these persons intoxicate themselves with feelings of power induced by open air engine exhausts. This is rediculous in as much as little gain in power and performance is realized out of very much noise. Good hull design assures such gains in a much more acceptable way. My observations appear to indicate that the better waterskiers are usually behind quiet boats. Whoever turns out to be one of the better sportsmen just could not afford having his hearing impaired by being behind loud power boats often.

Noisy boats can not be eliminated through Sheriff patrols. Only a national law which would make mufflers mandatory on boats, the same ways it is mandatory on automobiles, will succeed. There may be little political hay to be made with this issue. Combatting noise is not your immediate responsibility. Yet an agency of the government which is concerned with the protection of the environment could initiate action on pertinent legislation. The water jockeys with their noisy boats will increase in numbers. Some water spray in open exhaust pipes is pratically meaningless; and the devices are often defeated. I wish an agency like yours would work on this problem. No commercial interests of any magnitude could be hurt. The same number of boats will be bought and sold. The manufacturers of header type exhausts can sell the mufflers too.

1 A regulation limiting noise levels generated by boats operating in NPS waters became effective in 1984. The regulation prohibits levels in excess of 82 decibels measured at a distance of 82 feet (25 meters). The NRA recently acquired the equipment necessary to begin enforcing the regulation, and enforcement action is now being initiated.

Mr. J. D. Wagners HVB 6/11, 1975.

2 Air, soil, and water polution in the Lake Mohave area is my other concern. Stack emissions from the Mohave Power Plant must have been excessive all along, based on visual observation and on having breathed samples of its flue gases at close range. I have the feeling that Lake Mohave would be a dead lake by now if it was not for the fact that it has considerable throughflow.

The plant is down. That is unfortunate. But now would be the right time to gather base date on the environment with clean air all around. Disregarding the cost factor in all of SCE's trouble, suggestions might emerge which would lead to bettering the emission monitoring and control equipment.

This is a letter by a concerned citizen. I am only trying to bring real problems and possible solutions into the stage of public debate. Your environmental impact statement surely could be rounded out with the subject of a degradation of the quality of life by various forms of polution. Please let me mention that the area south of Davis Dam is effected too.

Sincerely

Harold von Beck

Harold von Beck.

2 Air quality data on emissions from the Mohave Power Plant near Laughlin, Nevada, have been gathered regularly by the Desert Research Institute from two locations within the recreation area since the plan became operational. One station is near Katherine and the other near Cottonwood Cove. The NRA is designated as a class II area, and air quality degradation may not exceed the standards for class II.

The Park Service is having air quality data gathered at the NRA in conjunction with air resources specialists in Fort Collins, Colorado, to ensure that class II standards are not exceeded.

Box 97
Meadview, AZ 86444
30 May 1985

Dear Mr. Wagers:

I have received a copy of the Volume I- draft general management plan & alternatives for LMNRA dated April 1985.

For the Gregg Basib/Grand Wash Zone I have the following comment:

1 You should give serious consideration to moving the South Cove landing contact with the lake to a cove to the north. This cove would provide a more secure site for launching and landing boats during high wind actions which are common. The cove will be less vulnerable to erosion from wave action now experienced at the present site of the landing.

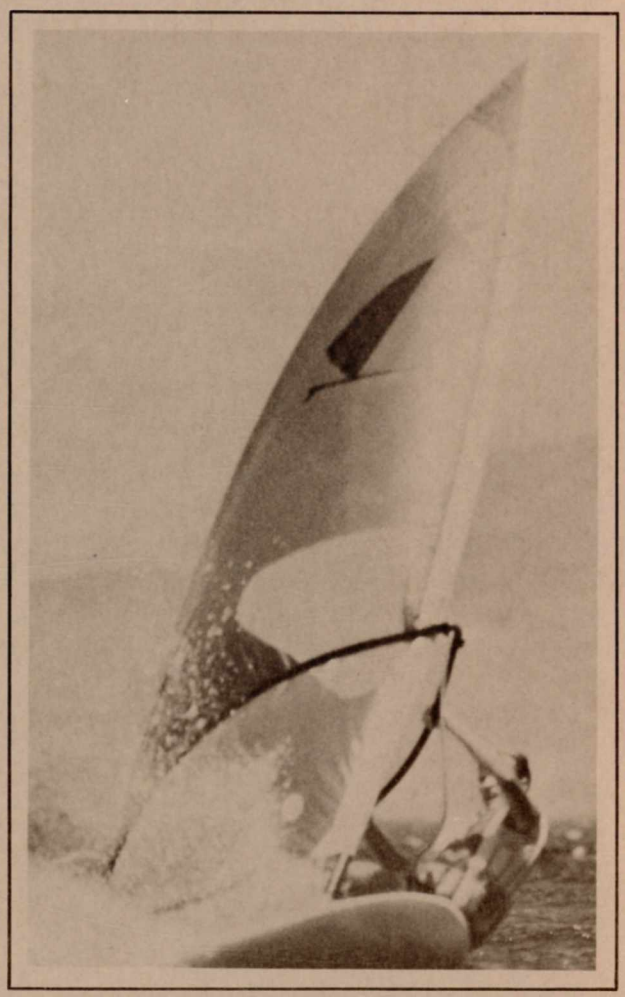
The floating dock now at the landing is of marginal assitance during high wind action.

Sincerely,

F.G.Wilson

F.G.Wilson

1 Initially, consideration was given to moving the South Cove ramp to a cove north of its present location, but use of the present launching ramp did not justify the cost of extensive earth moving and construction.



APPENDIXES
BIBLIOGRAPHY
LIST OF PREPARERS
INDEX

Public Law 88-639
88th Congress, S. 653
October 8, 1964

An Act

78 STAT. 1039.

To provide an adequate basis for administration of the Lake Mead National Recreation Area, Arizona and Nevada, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in recognition of the national significance of the Lake Mead National Recreation Area, in the States of Arizona and Nevada, and in order to establish a more adequate basis for effective administration of such area for the public benefit, the Secretary of the Interior hereafter may exercise the functions and carry out the activities prescribed by this Act. Lake Mead National Recreation Area. Administration.

SEC. 2. Lake Mead National Recreation Area shall comprise that particular land and water area which is shown on a certain map, identified as "boundary map, RA-LM-7060-B, revised July 17, 1963", which is on file and which shall be available for public inspection in the office of the National Park Service of the Department of the Interior. An exact copy of such map shall be filed with the Federal Register within thirty days following the approval of this Act, and an exact copy thereof shall be available also for public inspection in the headquarters office of the superintendent of the said Lake Mead National Recreation Area. Boundaries. Filing with Federal Register.

The Secretary of the Interior is authorized to revise the boundaries of such national recreation area, subject to the requirement that the total acreage of that area, as revised, shall be no greater than the present acreage thereof. In the event of such boundary revision, maps of the recreation area, as revised, shall be prepared by the Department of the Interior, and shall be filed in the same manner, and shall be available for public inspection also in accordance with the aforesaid procedures and requirements relating to the filing and availability of maps. The Secretary may accept donations of land and interests in land within the exterior boundaries of such area, or such property may be procured by the Secretary in such manner as he shall consider to be in the public interest. Boundary revision. Donations of land.

In exercising his authority to acquire property by exchange, the Secretary may accept title to any non-Federal property located within the boundaries of the recreation area and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary, notwithstanding any other provision of law. The properties so exchanged shall be approximately equal in fair market value: *Provided*, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize the values of the properties exchanged. Property acquisition.

Establishment or revision of the boundaries of the said national recreation area, as herein prescribed, shall not affect adversely any valid rights in the area, nor shall it affect the validity of withdrawals heretofore made for reclamation or power purposes. All lands in the recreation area which have been withdrawn or acquired by the United States for reclamation purposes shall remain subject to the primary use thereof for reclamation and power purposes so long as they are withdrawn or needed for such purposes. There shall be excluded from the said national recreation area by the Secretary of the Interior any property for management or protection by the Bureau of Reclamation, which would be subject otherwise to inclusion in the said recreation area, and which the Secretary of the Interior considers in the national interest should be excluded therefrom. Property exclusion.

SEC. 3. The authorities granted by this Act shall be subject to the following exceptions and qualifications when exercised with respect Hualapai Indian lands.

to any tribal or allotted lands of the Hualapai Indians that may be included within the exterior boundaries of the Lake Mead National Recreation Area:

(a) The inclusion of Indian lands within the exterior boundaries of the area shall not be effective until approved by the Hualapai Tribal Council.

(b) Mineral developments or use of the Indian lands shall be permitted only in accordance with the laws that relate to Indian lands.

(c) Leases and permits for general recreational use, business sites, home sites, vacation cabin sites, and grazing shall be executed in accordance with the laws relating to leases of Indian lands, provided that all development and improvement leases so granted shall conform to the development program and standards prescribed for the Lake Mead National Recreation Area.

(d) Nothing in this Act shall deprive the members of the Hualapai Tribe of hunting and fishing privileges presently exercised by them, nor diminish those rights and privileges of that part of the reservation which is included in the Lake Mead Recreation Area.

Recreational purposes.

SEC. 4. (a) Lake Mead National Recreation Area shall be administered by the Secretary of the Interior for general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistently with applicable reservations and limitations relating to such area and with other authorized uses of the lands and properties within such area.

Activities.

(b) In carrying out the functions prescribed by this Act, in addition to other related activities that may be permitted hereunder, the Secretary may provide for the following activities, subject to such limitations, conditions, or regulations as he may prescribe, and to such extent as will not be inconsistent with either the recreational use or the primary use of that portion of the area heretofore withdrawn for reclamation purposes:

(1) General recreation use, such as bathing, boating, camping, and picnicking;

(2) Grazing;

(3) Mineral leasing;

(4) Vacation cabin site use, in accordance with existing policies of the Department of the Interior relating to such use, or as such policies may be revised hereafter by the Secretary.

Hunting, fishing, trapping.

SEC. 5. The Secretary of the Interior shall permit hunting, fishing, and trapping on the lands and waters under his jurisdiction within the recreation area in accordance with the applicable laws and regulations of the United States and the respective States: *Provided*, That the Secretary, after consultation with the respective State fish and game commissions, may issue regulations designating zones where and establishing periods when no hunting, fishing, or trapping shall be permitted for reasons of public safety, administration, or public use and enjoyment.

Regulations.

SEC. 6. Such national recreation area shall continue to be administered in accordance with regulations heretofore issued by the Secretary of the Interior relating to such areas, and the Secretary may revise such regulations or issue new regulations to carry out the purposes of this Act. In his administration and regulation of the area, the Secretary shall exercise authority, subject to the provisions and limitations of this Act, comparable to his general administrative authority relating to areas of the national park system.

The superintendent, caretakers, officers, or rangers of such recreation area are authorized to make arrests for violation of any of the regulations applicable to the area or prescribed pursuant to this Act, and they may bring the offender before the nearest commissioner, judge, or court of the United States having jurisdiction in the premises. Arrests.

Any person who violates a rule or regulation issued pursuant to this Act shall be guilty of a misdemeanor, and may be punished by a fine of not more than $500, or by imprisonment not exceeding six months, or by both such fine and imprisonment. Violations.

SEC. 7. Nothing in this Act shall deprive any State, or any political subdivision thereof, of its civil and criminal jurisdiction over the lands within the said national recreation area, or of its rights to tax persons, corporations, franchises, or property on the lands included in such area. Nothing in this Act shall modify or otherwise affect the existing jurisdiction of the Hualapai Tribe or alter the status of individual Hualapai Indians within that part of the Hualapai Indian Reservation included in said Lake Mead National Recreation Area. Jurisdiction.

SEC. 8. Revenues and fees obtained by the United States from operation of the national recreation area shall be subject to the same statutory provisions concerning the disposition thereof as are similar revenues collected in areas of the national park system with the exception, that those particular revenues and fees including those from mineral developments, which the Secretary of the Interior finds are reasonably attributable to Indian lands shall be paid to the Indian owner of the land, and with the further exception that other fees and revenues obtained from mineral development and from activities under other public land laws within the recreation area shall be disposed of in accordance with the provisions of the applicable laws. Revenues and fees.

SEC. 9. A United States commissioner shall be appointed for that portion of the Lake Mead National Recreation Area that is situated in Mohave County, Arizona. Such commissioner shall be appointed by the United States district court having jurisdiction thereover, and the commissioner shall serve as directed by such court, as well as pursuant to, and within the limits of, the authority of said court. Mohave County, Ariz. Appointment of commissioner.

The functions of such commissioner shall include the trial and sentencing of persons committing petty offenses, as defined in title 18, section 1, United States Code: *Provided*, That any person charged with a petty offense may elect to be tried in the district court of the United States, and the commissioner shall apprise the defendant of his right to make such election, but shall not proceed to try the case unless the defendant, after being so apprised, signs a written consent to be tried before the commissioner. The exercise of additional functions by the commissioner shall be consistent with and be carried out in accordance with the authority, laws, and regulations, of general application to United States commissioners. The provisions of title 18, section 3402, of the United States Code, and the rules of procedure and practice prescribed by the Supreme Court pursuant thereto, shall apply to all cases handled by such commissioner. The probation laws shall be 62 Stat. 831. Probation laws.

applicable to persons tried by the commissioner and he shall have power to grant probation. The commissioner shall receive the fees, and none other, provided by law for like or similar services.

Appropriation.

SEC. 10. There are hereby authorized to be appropriated not more than $1,200,000 for the acquisition of land and interests in land pursuant to section 2 of this Act.

Approved October 8, 1964.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 1039 accompanying H. R. 4010 (Comm. on Interior & Insular Affairs).
SENATE REPORT No. 380 (Comm. on Interior & Insular Affairs).
CONGRESSIONAL RECORD:
Vol. 109 (1963): Aug. 2, considered and passed Senate.
Vol. 110 (1964): Aug. 3, considered and passed House, amended, in lieu of H. R. 4010.
Sept. 28, Senate concurred in House amendment.

GPO 35-139

United States Department of the Interior

NATIONAL PARK SERVICE

WESTERN REGION

450 GOLDEN GATE AVENUE, BOX 36063

SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO:

N1621(WR-PPA)

February 24, 1983

Memorandum

To: Regional Director, U.S. Fish and Wildlife Service, Albuquerque, New Mexico

From: ACTING Regional Director, Western Region

Reference: Lake Mead National Recreation Area, General Management Plan/Land Protection Plan, Environmental Impact Statement

Subject: Formal Consultation Pursuant to Section 7, Endangered Species Act

A planning team composed of members from the Denver Service Center and Lake Mead National Recreation Area is preparing a general management plan, a land protection plan and environmental impact statement for Lake Mead. The plan encompasses actions throughout the recreation area with primary emphasis around established developed or visitor use areas. Per this memorandum we would like to initiate consultation with your office and request an endangered species list covering areas in your jurisdiction within the recreation area. A similar request is being made of your Portland, Oregon office for the portions of Lake Mead in Nevada. We would also be interested in any comments or concerns you may have at this time. The information received from you will be considered during our planning process and we will provide you with draft copies of documents for review when they become available.

Contacts regarding this consultation can be made with Terry Goodrich, National Park Service, 755 Parfet Street, P.O. Box 25287, Denver, Colorado 80225, FTS telephone 234-4509. A timely response to this request would be greatly appreciated since we are working under a very tight schedule. Please advise us which Regional Office and/or area offices will have the responsibility for coordinating this consultation.

(Sgd) John D. Cherry

Enclosure

cc:
Supt., Lake Mead w/o enc.
Assistant Manager, Alaska, PNW/Western Team, DSC w/o enc.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
GREAT BASIN COMPLEX OFFICE
4600 Kietzke Lane - Bldg. C
Reno, Nevada 89502-5093

April 8, 1983

File No.: 1-5-83-SP-16

Mr. Terry Goodrich
National Park Service
755 Parfet Street
P. O. Box 25287
Denver, CO 80225

Dear Mr. Goodrich:

As requested by N1621 (WR-PPA), dated February 23, 1983, you will find attached a list of the listed and proposed endangered and threatened species (Attachment A) that are present or may be present in the area of the proposed Lake Mead General Management Plan. The list is intended to fulfill the requirement of the Fish and Wildlife Service to provide a list of species under Section 7(c) of the Endangered Species Act of 1973, as amended. Please see Attachment B for your requirements.

Also, for your assistance we have included a list of candidate species that are present or may be present within the project area. These species are presently being reviewed by this Service for consideration to propose and list as endangered or threatened. It should be noted that candidate species have no protection under the Endangered Species Act and are included for your consideration as it is possible these could become formal proposals and be listed during the construction period.

Upon completion of the Biological Assessment (see Attachment B), should you determine that a listed species is likely to be affected (adversely or beneficially), then your agency should request formal Section 7 consultation through this office. If there are both listed and proposed species (or candidate species, if included in the assessment) that may be affected; then we will confer on the proposed species (and/or informally consult on the candidate species) during the formal consultation. However, should the assessment reveal that only proposed species (or candidate species) may be affected, then you should consider informal consultation with this office.

One of the benefits of informal consultation to the consulting agency is to provide the necessary planning alternatives should a proposed (or candidate) species become listed before completion of a project.

Should you have any additional questions regarding your responsibilities under the Act, please contact this office. We thank you for your interest in endangered species, and we await your Biological Assessment.

Sincerely yours,

Donald J. King
Complex Manager

Attachments:

cc: Regional Director (AFA-SE)
GBC Files
Boise FO

Attachment A

1-5-83-SP-16

General Management Plan
Land Protection Plan
for
Lake Mead National Recreation Area
Mohave County, Arizona

LISTED SPECIES

Bonytail chub (Endangered)	Gila elegans	Historically found throughout mainstream of Colorado River and major tributaries in eddies and pools; Lake Mohave contains the only universally recognized pure population.
Bald Eagle	Haliaeetus leucocephalus	A winter resident of Lake Mead; found along shorelines.

PROPOSED SPECIES

None

CRITICAL HABITAT

None

CANDIDATE SPECIES

Mammals		
Spotted bat	Euderma maculatum	Found throughout Arizona in rocky cliffs and canyons. Rare in Lake Mead Recreation Area.
Fishes		
Razorback sucker	Xyrauchen texanus	Historically found throughout mainstream of Colorado River and major tributaries; Lake Mohave contains one of the largest populations known.

Birds		
White-faced ibis	Plegadis chihi	A fairly common to uncommon transient visitant along major water courses in Arizona.
Swainson's hawk	Buteo swainsoni	A transient in western Arizona; feeds on gophers and grasshoppers; Rare.
Ferruginous hawk	Buteo regalis	An uncommon resident of grassy plains of northern Arizona, more often seen as a winter visitor; feeds entirely on rodents.
Western snowy plover	Charadrius alexandrinus nivosus	A rare transient visitant along lower Colorado River, found along sandy or alkaline shores, riverbanks, and mudflats.
Mountain plover	Charadrius montanus	A transient, rarely breeding, in western Arizona found along grassy mesas, desert flats, or fallow fields. (one observation in LMRA)
Long-billed curlew	Numenius americanus	A rare transient visitant throughout Arizona found along marshes, mudflats, and beaches.
Western yellow-billed cuckoo	Coccyzus americanus occidentalis	Breeds in extreme northwest Arizona and a transient along wooded streams and in towns; Rare summer visitant.
Reptiles		
Desert tortoise	Scaptochelys agassizii	Found in Sonoran and Mohave deserts along rocky hillsides and washes.
Gila monster	Heloderma suspectum	Found in arid and semi-arid areas particularly desert flats, nearby canyons, and washes. Between Echo Bay and Overton near Katherine's Landing by Davis Dam.

Plants	Camissonia exilis	Known for the eastern base of Virgin Mountains on gypsum covered flats at 3,500 feet elevation.
	Eriogonum thompsonae	Found in Mohave County on red clay hills, Great Basin sagebrush and along highway right-of-way.
Sticky buckwheat	Eriogonum viscidulum	Limited in distribution to area of Riverside near Virgin River, Clark County, NV or washes and flats in sandy soil.
	Perityle megalocephala var. intricata	Associated with shadscale near Overton Beach; on NNNPS Watch List.
Golden bear poppy	Arctomecon californica	Occurs near Las Vegas Wash and Boulder Beach on barren, gravelly desert flats, hummocks and slopes associated with gypsum soils. Also near Stewart Point.
Bicolored penstemon	Penstemon bicolor ssp. roseus	Near Las Vegas Wash on slight elevations, in shallow gravelly washes, roadsides (possible taxonomic problems)

FEDERAL AGENCIES' REQUIREMENTS UNDER SECTION 7(c)

Biological Assessments

This process is initiated by a Federal agency in requesting a list of proposed and listed endangered and threatened species that may be within the area of a construction project.[1/] The purpose of the assessment is to identify any proposed and/or listed species which are/is likely to be affected by a construction project. When present in the project area, proposed species are included on the list even though they do not have legal protection under the Act. Their inclusion recognizes that they may be listed at anytime and have the portent to cause delays or modifications to the proposed action. In light of this, we recommend that those species be included in the biological assessment. The assessment should be completed within 180 days after initiation of the assessment (or within such a time period as is mutually agreed to by our two agencies). The assessment should begin within 90 days after receipt of the species list or a new list should be requested. No irreversible commitment of resources is to be made during the biological assessment process which would result in violation of your requirement under Section 7(a) of the Act. Planning, design, and administrative actions may be taken by your agency; however, no construction may begin.

Your agency should conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species. Review literature and scientific data to determine species distribution, habitat needs, and other biological requirements. Interview experts including those within Fish and Wildlife Service, National Marine Fisheries Service, State conservation departments, universities and others who may have data not yet published in scientific literature. Review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat. Analyze alternative actions that may provide conservation measures. At the conclusion of the assessment as described above, the Federal agency shall prepare a report documenting the results. The report shall also include a discussion of study methods used, any problems encountered, and other relevant information. The report should be forwarded to this office.

1/ "Construction Project" means any major Federal Action which significantly affects the quality of the human environment designed primarily to result in the building or erection of man-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.

APPENDIX C: CULTURAL RESOURCE CONSULTATIONS

In accordance with the September 1981 revision to the 1979 programmatic memorandum of agreement between the National Park Service, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers, the National Park Service has requested the advice and consultation of the Advisory Council and the Nevada and Arizona state historic preservation officers during preparation of this plan. A formal letter indicating that the planning effort was underway and a request for their participation was sent to those three offices on May 13, 1982, along with a list of planning issues. Subsequently, the results of the issues survey was sent to both state historic preservation officers and the Advisory Council in July 1982, and the planning alternatives workbook was submitted for their review and comment in December 1982. The Advisory Council has also attended planning sessions for the general management plan in April, July, and October 1982, and January 1983. The advice and consultation of these offices will continue to be requested as the plan progresses. Review copies of the draft plan will be submitted for comment, and they will be invited to attend all future public meetings.

In February and March 1982, a National Park Service anthropologist conducted preliminary consultations with nine native American groups representing the Mohave, Hualapai, and Chemehuevi/Southern Paiute tribes. These consultations were initiated with the purpose of identifying the locations of any sacred sites within Lake Mead, and of ascertaining any special concerns the native Americans wished to express during the planning process. The results of these consultations were relayed to both the recreation area staff and the planning team, and the native American groups were included on the mailing list for the plan, to ensure them an opportunity to attend all public meetings, and to review and comment on all public information documents released throughout the life of the plan.

Advisory Council On Historic Preservation

1522 K Street, NW
Washington, DC 20005

Reply to:

Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

PLEASE NOTE CHANGE IN ADDRESS

730 Simms Street, Room 450
Golden, Colorado 80401

December 20, 1982

Mr. Kenneth Raithel, Jr.
Assistant Manager
Alaska/Pacific Northwest/Western Team
Denver Service Center
National Park Service
P.O. Box 25287
Denver, CO 80225

Dear Mr. Raithel:

On December 13, 1982, we received the review copy of "Planning Alternatives Workbook" for Lake Mead National Recreation Area, Arizona/Nevada and your letter requesting our informal review of the document pursuant to the Programmatic Memorandum of Agreement ratified by the Chairman September 1981. After reading this document and discussing certain points with Dr. Latschar, we find that we have no comments to offer at this time.

Thank you for the opportunity to examine the "Planning Alternatives Workbook".

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

APPENDIX D: COOPERATIVE AGREEMENTS

The National Park Service (NPS) is under contract to place utilities underground and update all the existing power system at Boulder Beach to allow the Nevada Power Company to maintain the system and to provide the required power. When Nevada Power Company takes over the new system, the National Park Service will release 500 kw of firm energy entitlement to the Western Area Power Administration (WAPA).

The memorandum of understanding between the Bureau of Reclamation and National Park Service, related to land leased by the Bureau of Reclamation to the Nevada Division of Colorado River Resources, provides authorization to operate the Southern Nevada Water Project.

The memorandum of understanding between the National Park Service and the Nevada Department of Fish and Game (July 1971) defines individual responsibilities for the management of fish and wildlife resources within units of the national park system in Nevada. This agreement provides that the National Park Service will consult with and obtain concurrence from the state's fish and game department about programs that significantly affect fish and wildlife resources and cooperate in the joint enforcement of hunting, fishing, and boating laws. The department will consult with the National Park Service before establishing fishing and hunting seasons and regulations affecting NPS areas. The two agencies will meet annually to discuss matters of mutual interest. A similar agreeement is being pursued with the Arizona Department of Fish and Game.

A supplemental agreement of August 1971 was granted to the Nevada Department of Wildlife for exclusive use of lands to be used for construction and operation of a fish hatchery within lake Mead National Recreation Area for a period of 99 years. Fish reared in the hatchery are planted for recreational purposes in Lakes Mead and Mohave.

There is a supplemental memorandum of understanding of 1975 with the Nevada Department of Fish and Game to work cooperatively on a bighorn sheep trapping and management program.

A memorandum of understanding between the Bureau of Reclamation, National Park Service, and U.S. Fish and Wildlife Service (FWS) provided an area at Willow Beach for the use and occupancy by FWS for construction, operation, and maintenance of a fish cultural station. Fish reared in this hatchery are planted in Lake Mohave and in the lower Colorado River.

A memorandum of agreement between the National Park Service, Bureau of Reclamation, and the state of Nevada, related to leasing wildlife managements in Lake Mead National Recreation Area (July 1978), resulted in the leasing of the Overton Wildlife Management Area to the state of Nevada for 25 years. This area provides nesting habitat for waterfowl and recreational hunting opportunities.

The cooperative firefighting agreement between the Bureau of Land Management (BLM) and National Park Service (October 1975) provides for cooperative assistance in wildland firefighting activities. The principal assistance is rendered in the Shivwits Plateau area. BLM personnel are more capable of initial attack on fires in area.

In April 1972, a memorandum of understanding between the Bureau of Land Management, Bureau of Reclamation, and the National Park Service about grazing provides that grazing within Lake Mead will be administered by the Bureau of Land Management in accordance with the act of October 8, 1964. Fees collected will be deposited in accordance with BLM requirements.

A basic agreement between Lake Mead and the American Federation of Government Employees, Local 3062, grants exclusive recognition to the union to represent maintenance personnel and to provide and promote the efficient administration of Lake Mead.

A mutual aid agreement between Lake Mead and Boulder City (June 1975) provides for fire suppression and ambulance service in the Boulder Beach area.

Lake Mead and Bullhead City have a mutual aid agreement (January 1977) that provides for fire suppression in the Katherine area.

There is a letter of agreement with the Clark County Department of Building and Safety to inspect new construction of public structures occurring within Lake Mead National Recreation Area.

APPENDIX E: GLOSSARY OF PLANNING TERMS

Access Point	A location where vehicular access to the water is provided
Carrying Capacity	The population that an area will support without undergoing significant deterioration. In this document, carrying capacity has been further defined by the Lake Mead Carrying Capacity Study as "the maximum number of boats which can be accommodated at one time in each zone of the lake" (USDI 1980). This study defined physical carrying capacity only. Social variables that would determine the social carrying capacity of the lake or the maximum number of visitors who could be on the lake, without the visitor's experience deteriorating, have not been determined as of yet
Courtesy Docks	Docks provided for such temporary use (normally 15 minute zone) as stops to get ice and snacks
Day Use Activities	Activities (boating, picnicking, swimming) that visitors participate in for the day only
Designated Swim Beach	Swimming areas that are staffed by lifeguards; currently available at Boulder Beach and Katherine
Destination Resort/Area	A resort or development that offers a full range of services to visitors who may be a considerable distance away from their homes and/or plan to stay at the resort overnight or for an extended time
Developed Areas	Areas that contain visitor services and facilities (areas with only restrooms, launch ramps, and roads are not considered developed)
Development Concept Plan	A plan that defines specific kinds, sizes, and locations of park developments and facilities
Flat-Wake Zones	Buoyed-off areas with low-speed requirements for watercraft (5 m.p.h.)
Flood Mitigation	Actions that eliminate flooding or make the effects of flooding less severe
Structural Flood Mitigation	Flood mitigation measures that involve major construction, such as dams, channels, diversions, or flood walls

Nonstructural Flood Mitigation	The most feasible combination of flood mitigation measures that do not involve major construction - relocation, warning systems, evacuation plans, closures, information, etc.
Floodplain	Land that may be submerged by flood waters
Full Service	The highest or greatest degree of development where a complete range of services is offered
General Management Plan	A parkwide plan for meeting park management objectives; it divides the park according to future management emphasis and presents short-term and long-range strategies for resource management, visitor use, and park development
Improved Access Point	Improvements that consist of upgrading the quality of gravel/dirt roads that lead to the water so that most vehicles are accommodated, providing a concrete two or three lane launch ramp, primitive camping area, graded parking, and about ¼ mile of dirt road above high water paralleling the shoreline for access to the shoreline
Improved Road	A road that is upgraded through widening or realigning of curves
Long-Term Trailer Site	A trailer site that may be occupied for more than 30 days within a year
Major New Development	A development that offers a full range of visitor services and facilities to accommodate many people; these developments will be phased in gradually, in response to public demand and park funding priorities
Primitive Access	Dirt roads that four-wheel-drive vehicles usually use for access to the water
Primitive Campground	Campsites having no amenities, such as water, restrooms, picnic tables, or grills
Ready Lane	A lane that is usually striped on the launch ramp, which is used to prepare a boat for launching so that boating activities do not tie up the launching area; it is also used for unloading boats after being removed from the water
Rehabilitation	Restoration of a structure or area to a condition of greater usefulness

Relocation	Moving to a new location within the same developed area, unless otherwise specified
Restrooms	Facilities that may range from pit or chemical toilets to flush toilets and sinks
Short-Term Trailer Site	A trailer site that may only be occupied for less than 30 days within a year

APPENDIX F: OTHER FLOOD MITIGATION METHODS CONSIDERED

The following discussion summarizes those additional flood mitigation methods that were considered for each developed area and the reasons they were rejected.

Katherine - Several different methods of channeling flows and lining the channels were investigated, but all were rejected because of high cost ($1-8 million).

Cottonwood Cove - One additional structural mitigation method was investigated, which consisted of a network of dams and diversion channels placed in or above the development. This alternative was rejected because of high cost ($20 million).

Willow Beach - A series of detention dams, diversion dams, diversion canals, and channeling was investigated in 1979 for 100-year flood protection. Costs for implementing these measures were in excess of $40 million. These measures were reevaluated in October 1980 for protection against the probable maximum flood and again found to be infeasible. At that time additional diversion measures suggested by the public were investigated but were also found to be infeasible. All of the above solutions were rejected because of high cost.

Las Vegas Wash - Additional structural methods investigated included channeling of flow around the dry boat storage and boat launch areas, channeling around the dry boat storage area only, and protection of the entire area with an earthen dam above the highway. These methods ranged in cost from $0.5-1 million. Because all methods were more expensive than relocation, they were rejected.

Overton - No structural measures were investigated.

Temple Bar - Additional channeling through the area was investigated to protect the dry boat storage area, but relocation was less expensive.

APPENDIX G: EVALUATION OF MINERAL RESOURCES

AN EVALUATION OF MINERAL RESOURCES

LAKE MEAD NATIONAL RECREATION AREA

ARIZONA AND NEVADA

Robert O'Brien
Professional Mining Engineer
Registered State Washington 8800

PURPOSE:

The purpose of this assessment of the occurrence and significance of minerals in Lake Mead National Recreation Area is to set forth in a useable format the mineral resource data necessary to guide the planning, development and management of the Lake Mead National Recreation Area.

DEFINITIONS:

In correlating, assessing, and evaluating the considerable number of U.S. Geological Survey, Nevada Bureau of Mines, Arizona Bureau of Mines and other professional source data covering the mineral resources of southeastern Nevada and northwestern Arizona, it was found necessary to utilize a generally acceptable measure for mineral resource estimating--one that would adequately define mineral resource terminology. The Department of Interior News Release headed: "Office of the Secretary, for release April 15, 1974, entitled, 'New Mineral Resource Terminology Adopted,'" has been used as common reference point and "measuring stick" in the following summary of such source data.

The definitions covered in the Secretary's release were particularly directed for the use of the Bureau of Mines and the Geological Survey in their assessment of the nation's mineral resources. The more essential definitions used to bring available source data "into focus" in the preparation of this evaluation, follow:

"Mineral Resources - Are defined as concentrations of naturally occurring solids, liquids, or gases, discovered or only surmized that are or might become economic sources of mineral raw materials."

"Mineral Reserves - Are that portion of mineral resources that have actually been identified, and can be legally and economically extracted."

"Identified-Subeconomic Resources - Known deposits not now mineable economically."

"Submarginal - The portion of subeconomic resources which would require a substantially higher price or a major cost reducing advance in technology.

"Speculative Resources - Undiscovered materials that may occur either in known types of deposits in a favorable geologic setting where no discoveries have been made, or in as yet unknown types of deposits that remain to be recognized."

MINERAL RESOURCES, LAKE MEAD NATIONAL RECREATION AREA

Mineral resources will be subdivided, for the purpose of this assessment as handled by the U. S. Geological Survey, The Arizona (State) Bureau of Mines, and the Nevada (State) Bureau of Mines, into metallics, non-metallics, and energy. Uranium, a metallic mineral will be handled under energy, if worthy of mention. The categories in which those identified minerals are placed is my best judgement at this time.

METALLIC RESOURCES

GOLD - Gold in lode deposits has been found in several locations along the westside of Lake Mohave in the Newberry Mountains and the Eldorado Mountains in Nevada and near Davis Dam in Arizona.[1] These deposits are identified on the map accompanying this report. Free milling gold and silver were mined in association with oxides of copper, lead and zinc. The references to these mining districts were written in 1960, but the period of greatest production occurred prior to 1940. When the mines reached depths below the oxidation zone the veins apparently became barren or lensed out.

A portion of the Gold Butte Mining District extends South into T21S, R70E. which is within Lake Mead National Recreation Area.[2] Only the Lake Shore Mine in Section 5, T21S, R70E has had any recorded production and that was prior to 1940.

There has been no successful placer gold mining with the boundaries of Lake Mead National Recreation Area. In 1967 under the Heavy Metals Program the U.S. Geological Survey identified, examined and sampled placer deposits in Gold Basin and Lost Basin. To the best of my knowledge these areas are outside the Recreation Area.

The lode gold-silver mines are, in my opinion, worked out. Periods of high prices bring periods of increased prospecting. Paradoxically, periods of hard times also bring spurts in the prospecting activity for gold and silver. Prices for gold and silver are adequate, at this time, for mine operations if there is ore in place. These minerals have been placed in a speculative category because new and better ore shoots must be found to begin production.

The placer gold deposits south of the Recreation Area have

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[1] See Area 1 on Index Map.

[2] See Area 2 on Index Map.

been placed in speculative category because of the marginal grade at this price ($400 per ounce) and because of the quantity of water needed to recover the gold. A placer gold operation would require approximately 60 gallons per minute for each cubic yard of production capacity.

MANGANESE

Low grade manganese ores are present in the Recreational Area[3] in the Black Mountains north of Lake Mead. These ores are sub-marginal in character in that they require a high degree of concentration to produce a product only partially acceptable in the market. These manganese deposits were mined in response to a U. S. Government buying and stockpiling program which terminated in approximately 1959. No mining has been done since that time.

There would have to be a substantial increase in price, and a substantial improvement in concentrating technology to make these ores attractive for production again. These improvements could happen if the foreign supply of manganese was cut off. Future operations, if any, would be open pit operations as they were when last operated.

MOLYBDENUM

Molybdenum has been reported in the Recreation Area around Capital Camp[4] in the Eldorado Mountains. These occurrences were drilled several years ago by Placer Amex Corporation and subsequently abandoned. Other reports of molybdenum deposits have not been substantiated.

Both of these rumored deposits can only be categorized as speculative since no orebody has been delineated. A molybdenum orebody is normally low grade 0.20% to 0.40% (4lbs. - 8lbs. per ton) and very large, in the range of 100,000 tons and more. Open pit would be the preferred mining procedure. Problems would entail water supply for a large mill in the 10,000 to 20,000 tons/day range with water needed at approximately 240 gallons/ton/day. Another problem would be tailings disposal. The ore at 8 lbs/ton would generate 1992 lbs of waste per ton.

NON-METALLIC RESOURCES

SILICA - Silica is being mined just outside the boundary of the Recreation Area near Overton, Nevada. There are no reported deposits within the Recreation Area.

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[3]See Index Map Area 3

[4]See Area No. 4 Index Map

SALT - Large deposits of salt were mined near St. Thomas wash and Overton Beach, prior to the completion of Boulder Dam in the 1930's. Those deposits were inundated by the creation of the Dam and mining ceased.

There are subsurface deposits of salt under both Detrital Valley and Hualapai Valley outside of the Recreation Area. Since those deposits are from 300 to 1200 feet below the surface, their actual extent has not been determined. Extraction of these salts would probably be accomplished by solution extraction and precipitation (evaporation). Solution extraction would consist of drilling wells into the salt and injecting a fluid (water), then pumping the solution out and to evaporation ponds. To get any sort of production, more than one well would have to be activated. Each well would require from 500 g.p.m., all or most of which would be lost in the evaporite ponds. Extractions from those deposits would only be a factor to visitors on an access road.

PUMICE - A deposit of pumice has been found in the River Mountaines west of Lake Mead. This deposit is not block pumice, but has been classified as a common variety. As a common variety mineral, this pumice is not subject to leasing and should be in a speculative category.

BASE METALS

Base metals such as lead, zinc, and copper have been mined at several locations on the west side of Lake Mohave up to within a few miles of Lake Mead.[5] The base minerals produced have generally been by-products (of lesser value) of gold and silver productions. Presence of known contemplated operations in this area give some indication of being more in the nature of promotional activities and therefore fall in the speculative-submarginal category. The operations have been for the most part outside of the boundary of the National Recreation Area.

There are a number of mineral leases and applications for mineral leases within Lake Mead National Recreation Area. The leases are an attempt to find ore of a value to produce (prospecting only). These leases can only be called speculative at this time.

Withdrawal from leasing of any mineral or area within Lake Mead National Recreation Area would have an impact only upon the individual attempting to obtain the lease.

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[5] See Map No. 2

In 1980, G. Thomas Server, Jr., James P. Calzia, and Barry J. Solomom identified the occurrence of minerals in the region of Lake Mead National Recreation Area in their publication, "A Summary of Mineral Occurrences in the Region of Lake Mead National Recreation Area." This publication was a Pre-Publication copy for Government Use Only. It should be noted that the two authors denote these as occurrences and do not indicate whether the minerals are or ever will be economical to produce. They should be placed in a speculative category.

ENERGY RESOURCES

OIL and GAS - The proliferation of oil and gas leases along the west side of Overton Arm in Nevada and along the east side of the Black Canyon and Lake Mohave leads one to speculate on the reasons for such interest. In Clark County, Nevada[6] thirteen holes have been drilled north of the Recreation Area and all have been abandon. Hole No. 62 is not within the Recreation Area, but is on the border. In Mohave County, Arizona[7 & 8] there have been no holes drilled for oil or gas within Lake Mead National Recreation Area.

Speculation apparently revolves around a deep hole (19, 562 feet) drilled in 1980 by the Mobil Oil Corporation. Reliable information on the results of that drilling is not available. Conjecture would point to a quest for stratigraphic information which could locate the trend of the Overthrust Belt. The Overthrust Belt is a region in northwest Utah, southwest Wyoming, and northwestern Colorado, which has been productive of oil and gas in the past five years. Production has been attained at depths below 13,000 feet, in general. Another look at this activity might have to be made when more information is available.

There are no known oil or gas fields within Lake Mead National Recreation Area. There have been no oil and gas wells drilled within the Recreation Area. This leasing activity within Lake Mead National Recreation Area falls into the speculative category.

URANIUM - Deposits of uranium either large or small have not been proven in the Lake Mead Recreation Area. The Copper Mountain Mine[9] on the East side of Andrus Canyon was mined

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[6] See Map No. 3

[7 & 8] See Maps No. 4 and No. 5

[9] See Area No. 5, Index Map

in the 1960s for copper. Uranium is suspected as a companion mineral with the copper, but has not been proven. There has been no record of production since the 1960's. Uranium mines or mining should be placed in a speculative category since no deposits have been identified to quantity or quality.

The market for uranium is down at this time. Quite a number of mines which were producers 4 or 5 years ago have closed. If and when the price goes up, there will certainly be mining companies and prospectors wanting to look at old mines and prospect for new mining possibilities. The majority of uranium mining operations in the Arizona area would be underground operations.

Uranium ores require concentration. There are only a few concentration plants available and these few are long distances from Northern Arizona. The economics of mining and then hauling crude ore long distances are not good unless the deposit is high grade. The nearest buying plant at this time for uranium ores is at Blanding, Utah. The economics of building a concentration plant in or close to the uranium deposits in Lake Mead National Recreation Area are not good due to the lack of volume for processing.

Future leases for uranium ores should consider carefully the problems of water usage and disposal, waste disposal and truck traffic.

SUMMARY

This report is a complete inventory and evaluation of the known mineral resources within the Lake Mead National Recreation Area. There are no minerals within the Recreation Area which are the sole supply or a major source of supply for the United States at this time. The greatest impact of a withdrawal from leasing of any mineral would be upon the individual attempting to get the lease.

If additional drilling near the Mobil Oil Company deep hole proves the existence of the Overthrust Belt in the area there will be pressures to drill along the West side of Overton Arm. While off-set drilling is possible, the drilling companies will be very reluctant to add that much additional drilling footage to an already very deep hole. It should be pointed out that the greatest impact on the environment of oil and gas production would happen during the drilling (exploration) phase.

The only minerals which could have relative importance to other values within Lake Mead National Recreation Area are oil and gas, and uranium, which are still in the speculative category. Manganese operations could also have a very remote possibility of causing problems, but only if five or six happenings coincided, such as: Cut off of foreign supplies, improvement in the uses of manganese in the steel furnaces, and exhaustion of current stockpiles.

CONCLUSIONS

* The inventory indicates no mineral reserves in the Lake Mead NRA.

* All possible mineral resources are classified as economically submarginal and geologically speculative, the lowest possible classification according to the USGS system.

* Any restriction on mineral exploration or mineral leasing, including the exception of any portion of Lake Mead NRA from mineral leasing can be expected to have no measurable impact on present or future production.

* Consideration of mineral values in secondary to other resource values in preparing the General Management Plan for the NRA.

Robert O'Brien

1/20/83

SELECTED REFERENCES

(1) Arizona Bureau of Mines in conjunction with the U.S. Geological Survey and the U.S Bureau of Reclamation, 1969, Mineral and Water Resources of Arizona: Bulletin 180.

(2) Longwell, C. R., E. H. Pampeyan, Ben Bowyer, and R. J. Roberts, 1965, Geology and Mineral Deposits of Clark County, Nevada: Nevada Bureau of Mines Bulletin No. 62.

(3) Garside, Jarry J., and John H. Schilling, 1977, Wells Drilled for Oil and GAs in Nevada through 1976, Map No. 56: Nevada Bureau of Mines and Geology.

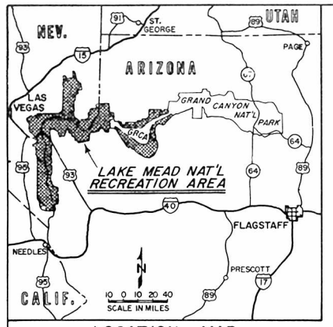
(4) _____, 1982, List of Wells Drilled for Oil and Gas. (Update to Map 56): Nevada Bureau of Mines and Geology.

(5) Conley, J. R., and O. A. Stacey, 1981, Well Location Map Four: Arizona (State) Oil and Gas Conservation Commission, October 1977, (Revised 1981)

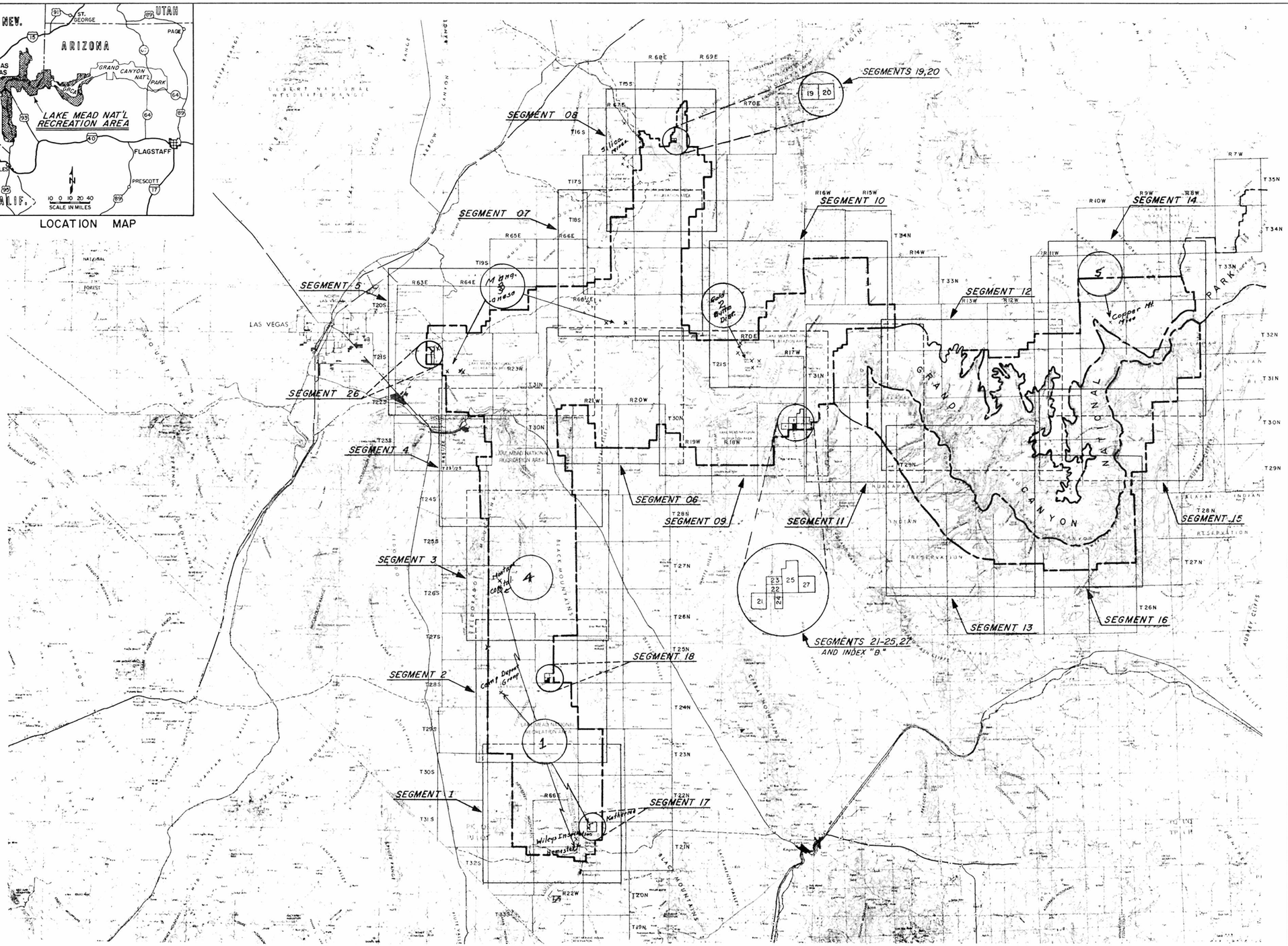
(6) Corrections and Additions to Table 2 of above Publication up to June 1982

(7) Swapp, Cloyd W., Geologist, 1961, The Geology and Gas and Oil Possibilities of Northwestern Arizona: Published by Arizona Board for the Arizona Oil and Gas Conservation Commission.

(8) G. Thomas Server, Jr., James P. Calzia, and Barry Solomon, 1980, A Summary of Mineral Occurrences in the Region of the Lake Mead National Recreation Area. Pre-publication copy, For Government Use Only.



LOCATION MAP



DEED	TRACT	OWNER	ACRES	INT

DATE	REVISIONS	DATE	REVISIONS

ESTABLISHED: OCTOBER 8, 1964

BOUNDARY CHANGE: JANUARY 3, 1975
BASIC DATA: U. S. G. S. 15' QUADRANGLE
DATE: MAY 1975

COMPILED BY
DENVER SERVICE CENTER, COLORADO

MT. DIABLO MERIDIAN, NEVADA
GILA & SALT RIVER MERIDIAN, ARIZONA

5 0 5 10 15 20 Miles
5 0 5 10 15 20 25 30 Kilometers
8,045 Kilometers = 5 Miles

N

6	5	4	3	2	1	
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	23	24	
30	29	28	27	26	25	
31	32	33	34	35	36	

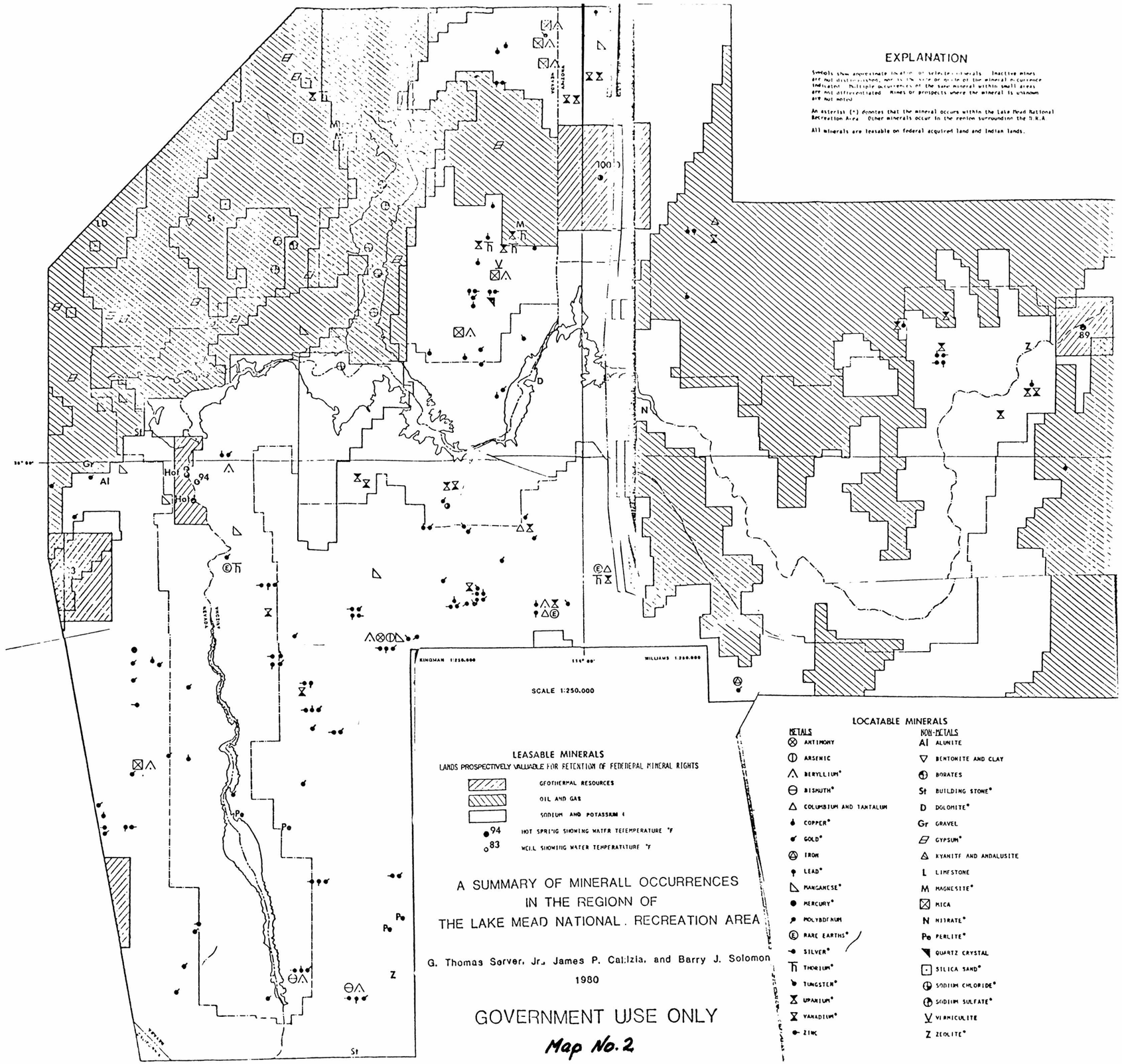
DN. BY: G.R. CK. BY: HWK.
APPR. BY:
REGION WESTERN
DRAWING NO
8360
80,500
SHEET 1 OF 30

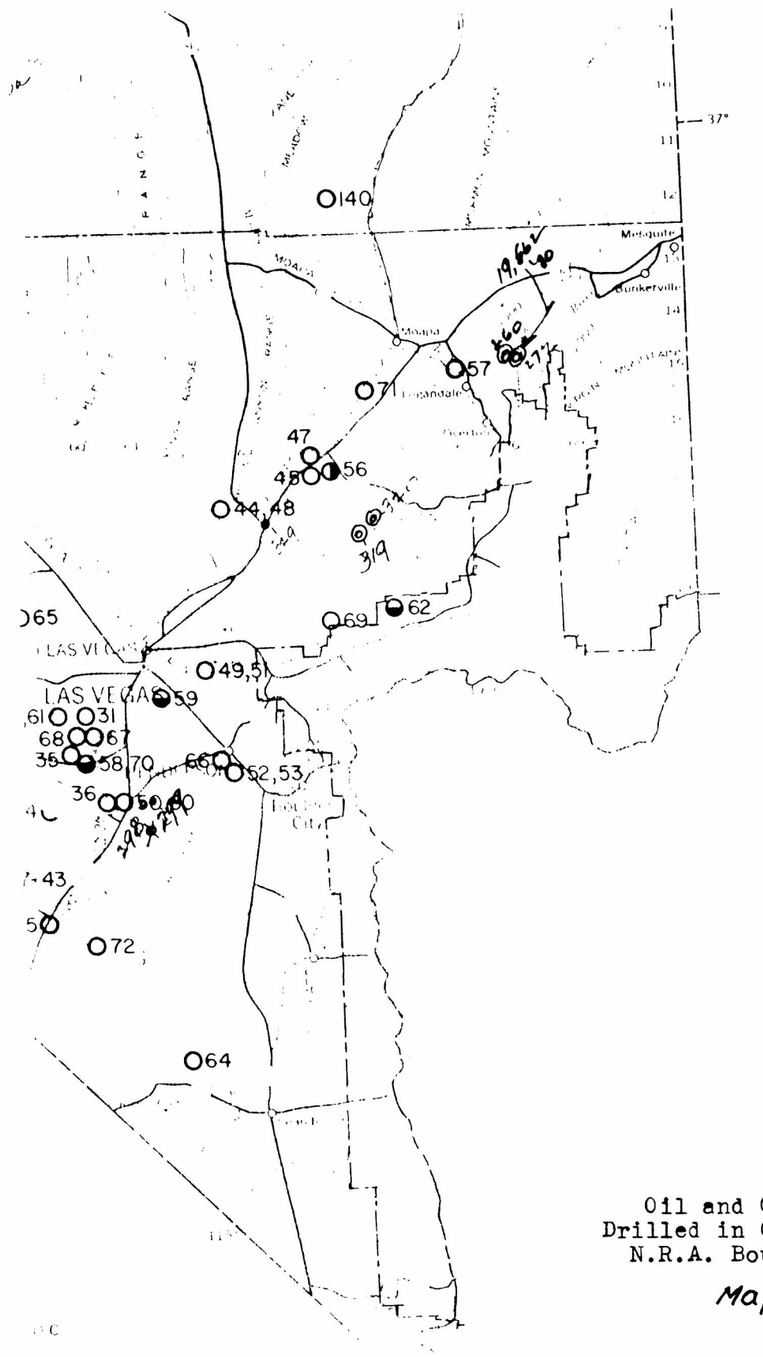
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DIVISION OF LAND ACQUISITION

LAKE MEAD NATIONAL RECREATION AREA

CLARK COUNTY, NEVADA
MOHAVE COUNTY, ARIZONA
Map No. 1

TITLE:
INDEX MAP


EXPLANATION
Symbols show approximate location of selected minerals. Inactive mines are not distinguished, nor is the size or scale of the mineral occurrence indicated. Multiple occurrences of the same mineral within small areas are not differentiated. Mines or prospects where the mineral is unknown are not noted.
An asterisk (*) denotes that the mineral occurs within the Lake Mead National Recreation Area. Other minerals occur in the region surrounding the N.R.A.
All minerals are leasable on federal acquired land and Indian lands.
SCALE 1:250,000
LEASABLE MINERALS
LANDS PROSPECTIVELY VALUABLE FOR RETENTION OF FEDERAL MINERAL RIGHTS
GEOTHERMAL RESOURCES
OIL AND GAS
SODIUM AND POTASSIUM
94 HOT SPRING SHOWING WATER TEMPERATURE °F
83 WELL SHOWING WATER TEMPERATURE °F
LOCATABLE MINERALS
METALS
ANTIMONY
ARSENIC
BERYLLIUM*
BISMUTH*
COLUMBIUM AND TANTALUM
COPPER*
GOLD*
IRON
LEAD*
MANGANESE*
MERCURY*
MOLYBDENUM
RARE EARTHS*
SILVER*
THORIUM*
TUNGSTEN*
URANIUM*
VANADIUM*
ZINC
NON-METALS
Al ALUNITE
BENTONITE AND CLAY
BORATES
St BUILDING STONE*
D DOLOMITE*
Gr GRAVEL
GYPSUM*
KYANITE AND ANDALUSITE
L LIMESTONE
M MAGNESITE*
MICA
N NITRATE*
Po PERLITE*
QUARTZ CRYSTAL
SILICA SAND*
SODIUM CHLORIDE*
SODIUM SULFATE*
V VERMICULITE
Z ZEOLITE*
A SUMMARY OF MINERALL OCCURRENCES
IN THE REGIONN OF
THE LAKE MEAD NATIONAL. RECREATION AREA
G. Thomas Sorver, Jr., James P. Calkins, and Barry J. Solomon
1980
GOVERNMENT USE ONLY
Map No. 2



95. PAN AMERICAN PETROLE
13,116 ft.
96. PAN AMERICAN PETROLE
13,600 ft.
97. ATLANTIC INTERNATION
98. LADD PETROLEUM CORP.
99. LADD PETROLEUM CORP.
100. SHELL OIL COMPANY Gost

ESMERALDA COUNTY

101. CALIFORNIA EXCELSIOR
102. FISH LAKE MERGER OIL C
103. Coaldale Well, 1925, 5280 ft.
104. MONTE CRISTO OIL CORP.
105. NEVADA OIL AND MINER/

EUREKA COUNTY

106. EUREKA OIL AND GAS CO
107. EUREKA OIL AND GAS CO
108. EUREKA OIL AND GAS CO
109. EUREKA OIL AND GAS CO
110. EURKEA OIL AND GAS CO
111. EUREKA OIL AND GAS CO
112. EUREKA OIL AND GAS CO
113. LAST FRONTIER OIL CO. D
3549 ft.
114. JAMES EBERT & EDWARD
115. EUREKA OIL AND GAS CO
116. SHELL OIL CO. Diamond Va
117. CHARLES BEYERBACH (Mt
1205 ft.
118. JACK TAYLOR Govt. No. 1,
119. JACK TAYLOR Govt. No. 2,
120. JACK TAYLOR Govt. No. 3,
121. W. F. ASH Damele Bros. No.
122. CARR & WRATH INC. Feder
123. GETTY OIL COMPANY Nost

HUMBOLDT COUNTY

124. BLACK ROCK OIL, GAS, RE
1921, 800 ft.

Oil and Gas Wells
Drilled in Clark County , Nev.
N.R.A. Boundary - Approx.

Map No. 3

CLARK COUNTY

260. MOBIL OIL CORP. Virgin River USA No. 1, 1300', 1979.
(SE/4,SW/4,S9,T15S,R68E)

272. MOBIL OIL CORP. Virgin River USA No. 1-A, 19,562', 1980.
(SE/4,SW/4,S9,T15S,R68E)

298. FLEETWOOD OIL & GAS CORP. Fleetwood Federal Ger #1, 933', 1981
(SE/4,SE/4,S10,T23S,R61E)

299. FLEETWOOD OIL & GAS CORP. Fleetwood Federal Eva Garten #1, 2850', 1981.
(SW/4,SW/4,S11,T23S,R61E)

319. CHEVRON U.S.A., INC. Colorado Quarry No. 1,
(SE/4, SW/4,SE/4,S22,T18S,R63E)

320. CHEVRON U.S.A., INC. Buffington Pocket No. 1,
(SE/4,NW/4,NE/4,S14,T18S,R63E)

329. GRACE PETROLEUM CORP. Arrow Canyon No. 1,
(NW/4,SW/4,S14,T18S,R63E)

30. MICHEL T. HALBOUTY Federal No. 1, 1976, 7060 ft.

CLARK COUNTY

31. E. W. BANNISTER No. 1, 1929, 522 ft.
32. COMMONWEALTH OIL CO. No. 1, 1933, 1897 ft.
33. L. M. HATFIELD No. 1, 1935, 707 ft.
34. RED STAR OIL CO. J. B. Nelson No. 1, 1943, 2210 ft.
35. RED STAR OIL CO. J. B. Nelson No. 2, 1943, 3767 ft.
36. NEVADA EXPLORATION CO. Porter No. 1, 1947, 2002 ft.
37. NEW HAVEN OIL CO. No. 1, 1947, 716 ft.
38. NEW HAVEN OIL CO. No. 2, 1947, 405 ft.
39. NEW HAVEN OIL CO. No. 3, 1947, 200 ft.
40. NEW HAVEN OIL CO. No. 4, 1947, 226 ft.
41. NEW HAVEN OIL CO. No. 5, 1947, 40 ft.
42. GOODSPRINGS OIL CO. No. 1, 1948(?), 370 ft.
43. NEW HAVEN OIL CO. No. 6, 1948, 130 ft.
44. UNITED PETROLEUM CORP. Apex No. 1, 1948, 1247 ft.
45. G & G EXPLORATION CO. No. 1, 1949, 1130 ft.
46. BLACK GOLD OIL AND GAS EXPLORATION CO. Golden Spike No. 1, 1950, 950 ft.
47. LAST CHANCE OIL CO. Crystal No. 1, 1950, 1002 ft.
48. SOUTHERN NEVADA OIL INVESTORS CO. Apex No. 1, 1950, 1455 ft.
49. McAULEY ASSOCIATES No. 1, 1952, 1970 ft.
50. BIG BASIN OIL CO. Govt. No. 1, 1953, 2000(?) ft.
51. McAULEY ASSOCIATES No. 2, 1953, 3000 ft.
52. LEONARD WILSON Govt. No. 1, 1953, 810 ft.
53. LEONARD WILSON Govt. No. 1A, 1953, 1466 ft.
54. INTERMOUNTAIN ASSOCIATES INC. (Arden Dome) No. 1 (No. 1X), 1954, 3293 ft.
55. INTERMOUNTAIN ASSOCIATES INC. (Jean) No. 1, 1954, 2273 ft.
56. SOUTHERN GREAT BASIN OIL & GAS INC. Govt. No. 1, 1954, 5085 ft. (redrilled as JOHN A. HAEBER Adam No. 1, 1973, 3496 ft.)
57. MOAPA NEVADA OIL & GAS CO. Logandale No. 1, 1955, 575 ft.
58. U. S. OIL CO. (MATADOR OIL CO.) Wilson No. 1X, 1955, 2020 ft.
59. JOE W. BROWN Wilson Govt. No. 1, 1956, 8508 ft.
60. W. T. SMITHDEAL JR. U. S. Lease No. 1, 1956, 300 ft.
61. BONANZA OIL CORP. Arden Dome No. 1 (Consolidated Govt. No. 1), 1959(?), 3260 ft. (redrilled as TIME PETROLEUM INC. Federal No. 31-1, 1971, 3260 ft.)
62. SHELL OIL CO. Bowl of Fire Unit No. 1, 1959, 5919 ft.
63. TRI-STATE OIL EXPLORATION CO. Miskell-Govt. No. 1, 1959, 2602 ft.
64. OSCAR BRAY No. 1, 1961(?), 840 ft.
65. C. J. LICHTENWALTER & C. M. TURPIN Turpin No. 1, 1961, 777 ft.
66. TRANS-WORLD OIL CO. (LEONARD WILSON) Houssels-Wilson-Milka No. 1, 1962, 2300 ft.
67. EQUALITY OIL CO. (ARDEN DOME OIL CO.) Chadek No. 1, 1964, 1627 ft.
68. JACK F. GRIMM (MINERALS DRILLING INC.) Wilson No. 1, 1965, 5686 ft.
69. ROSEN OIL CO. Muddy Dome (Federal) No. 1, 1965, 5666 ft.
70. KAMARDEN OIL & GAS LTD. KOG-1, 1969, 6755 ft.
71. C. P. PHELPS No. 1, 1970, 1625 ft.
72. SANDIA INTERNATIONAL METALS CORP. Duff No. 1, 1971, 438 ft.

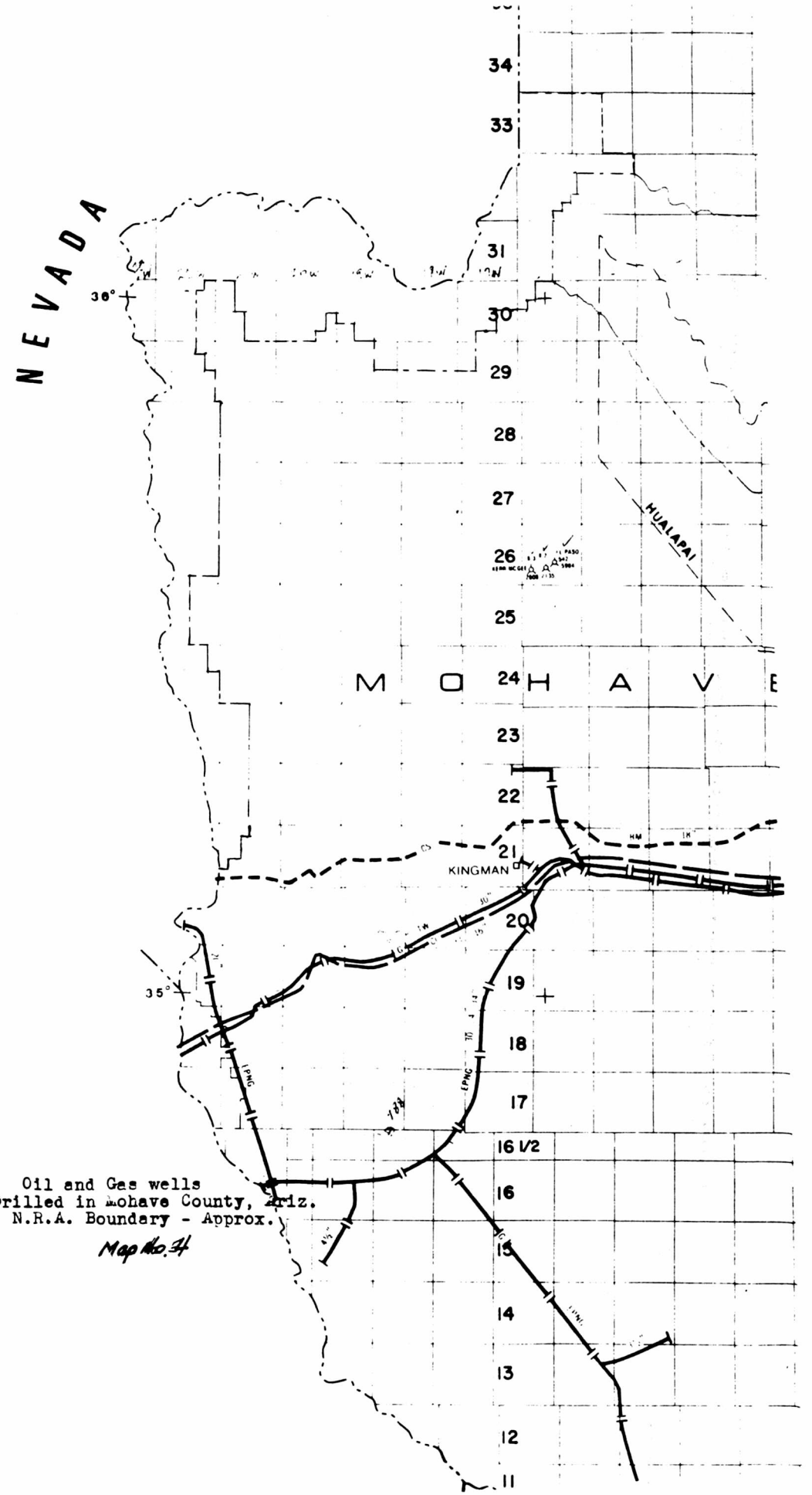
ELKO COUNTY

73. BULL RUN OIL AND GAS CO. No. 1, 1922, 800 ft.
74. ELKO OIL DEVELOPMENT & IMPROVEMENT CO. No. 1, 1924, 3337 ft.

147. SHELL OIL CO
148. SHELL OIL CO
149. SHELL OIL CO.
150. SHELL OIL CO.
151. SHELL OIL CO.
152. WEST END OPO
153. SHELL OIL CO.
154. SHELL OIL CO.
155. SHELL OIL CO.
156. TEXOTA OIL C(
157. STEVE GOSE G(
LANDS INC. I
158. W. C. CO. No. 1,
159. WESTERN OIL L
160. PENNINGTON O
1505 ft.
161. TEXOTA OIL CO
162. TEXOTA OIL CO
163. TRANS WESTERI
No. 1, 1966, 44
164. WESTERN OIL LA
165. GULF OIL CORP.
166. GULF OIL CORP.
167. GULF OIL CORP.
168. GULF OIL CORP.
169. GULF OIL CORP.
170. GULF OIL CORP.
171. GULF OIL CORP.
172. GULF OIL CORP.
173. GULF OIL CORP.
174. GULF OIL CORP.
175. GULF OIL CORP.
176. GULF OIL CORP. F
177. GULF OIL CORP. S
178. PAN AMERICAN PE
1968, 8355 ft.
179. PAN AMERICAN PE
No. 1, 1968, 294
180. WM. N. PENNINGTO
American Big Was
181. TEXOTA OIL CO. E.
182. WESTERN OIL LAN
183. TENNECO OIL CO.
184. A. PAUL SUTHERLA
185. TENNECO OIL CO.
186. NORTHWEST EXPL(
9040 ft.
187. NORTHWEST EXPL(
1976
188. NORTHWEST EXPLO
10,473 ft.

E. EAGLE SPRINGS FIE
SHELL OIL COMP.
SHELL OIL COMP.
SHELL OIL COMP.
SHELL OIL COMP.

10C



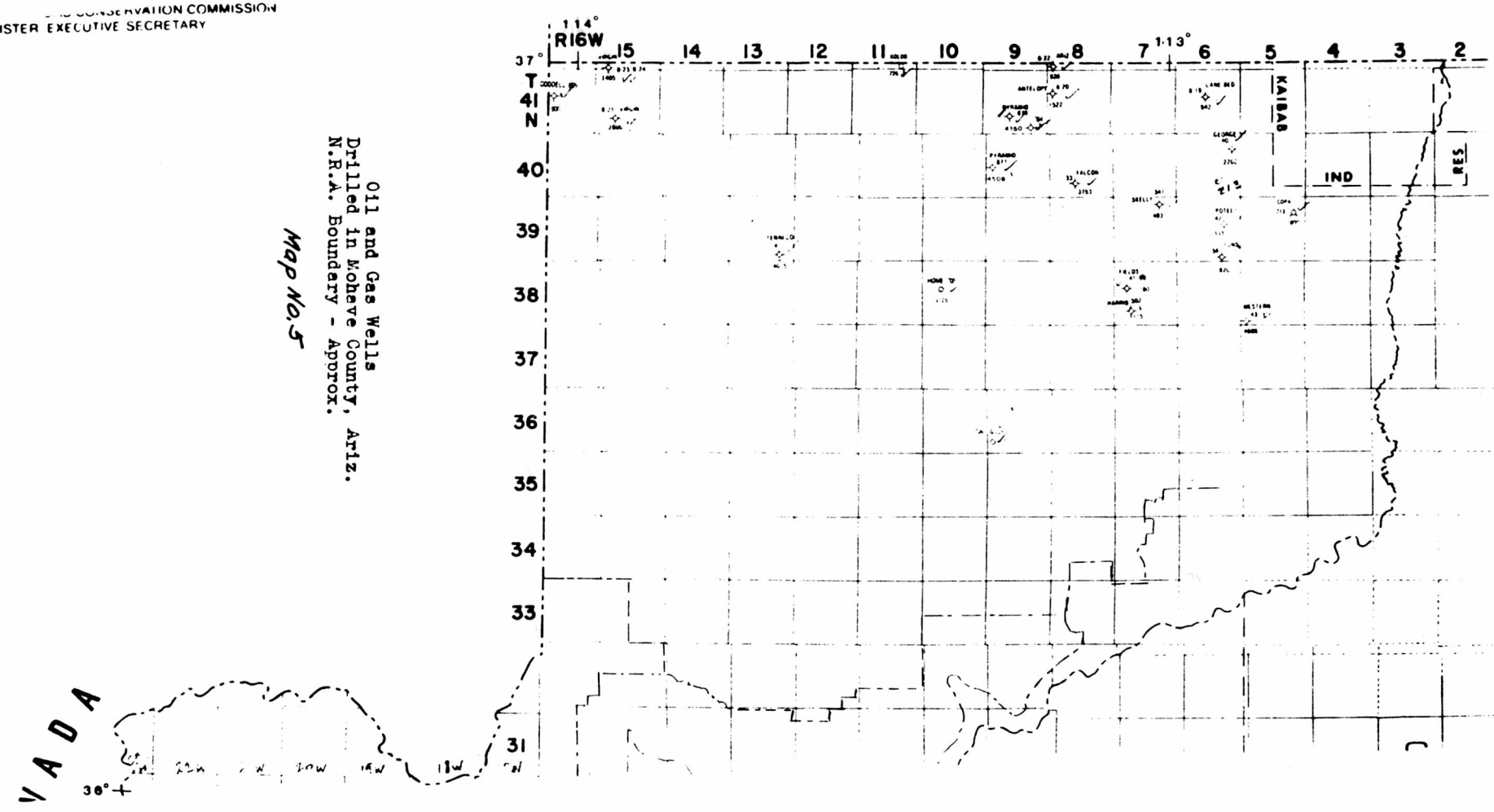
Oil and Gas wells
Drilled in Mohave County, Ariz.
N.R.A. Boundary - Approx.

Map No. 34

...S CONSERVATION COMMISSION
JOHN BANNISTER EXECUTIVE SECRETARY

Oil and Gas Wells
Drilled in Mohave County, Ariz.
N.R.A. Boundary - Approx.

Map No. 5



CHISE COUNTY

14	20S-20E-16	NE NE	Phillips Huachuca Al State (strat)	4261 GL	6/82	D	8513	Confider
16	20S-23E-14	SW SW	Phillips Tombstone Al State	4790 KB	9/81	D	10561	
93	23S-29E-14	NW NW	Phillips Douglas Al State (strat)	4295 GL	6/82	D	7058	Confider
4	23S-30E- 8	NE SW	Union Oil 80-1 State (geothermal)	4210 GL	11/80		715	Confider

ONINO COUNTY

-	41N- 1W-24	SE NE	Shields Exploration 8-24 Fed (strat)	5040 GL		L		
2	-24	NE SW	J. M. Shields 4-24 Federal (strat)	5043 GL			750	
-	-24	NE SW	J. M. Shields 5-24 Federal (strat)	5037 GL			4	
5	-24	NW SE	J. M. Shields 1-24 Federal (strat)	5062 GL	1/82		482	Confider
0	-24	NW SE	J. M. Shields Travis 1-24 Federal	5068 GL			900	
1	-24	NW SE	J. M. Shields 2-24 Federal (strat)	5072 GL			50	
5	-24	NW SE	J. M. Shields 6A-24 Federal (strat)	5066 GL			491	

AM COUNTY

5	9S-26E-16	NW NE	Phillips Safford Al State (strat)	3562 GL	4/82		8509	Confider

e attached list of 8 heat flow test wells, Bureau of Geology & Mineral Technology

COPA COUNTY

5	2N- 7W-27	SW SW	Gemini Oil, Gas & Mineral 1 Heisler	1130 GL	10/81	D	2040	
3	5N- 3W-28	SE SE	Tri Oil 78-28 State	1613 GL		A		
3	-34	SW NW	Salt River Basin Fletcher 1 Federal	1600 GL	10/81	D	3980	

e attached list of Phillips Petroleum temperature gradient wells

MOHAVE COUNTY

78	16½N-19W-20	SW NE	O'Brien Resources AZ-1 (geothermal)	1600 GL	12/81		325	
706	36N- 9W-30	NE SW	Gulf Oil 1 Federal	6350 KB	11/80	D	5961	Precambr
705	38N-10W-17	SW NE	Home Petroleum 17-1A Federal	4565 GL	6/80	D	3125	Pennsylv
813	40N- 6W-26	NW NW	Brooks Exploration 1-26 Federal	5070 GL		A		
676	41N- 9W-28	NW SE	Pyramid Oil 1 Federal	4743 KB	12/77	D	4150	Mississ
704	-33	NW NW	Pyramid Oil Rock Creek 2 Federal	5009 KB	4/81	W	3530	
726	42N-11W-35	SE NW	Kolob Petroleum 35-1 Federal	2890 GL	3/82	D	1432	

NAVAJO COUNTY

2	9N-22E-35	SE NE	Gail W. Sponseller 1 Sponseller	6500 GL		L		
-	-36	NE SE	Gail W. Sponseller Lakeside Al Fed	6500 GL		L		

PIMA COUNTY

9	15S-14E- 4	SE NW	Decker Properties 1 Decker (geotherm)			L		Confider
7	17S- 8E-36	NW SE	Phillips Redondo Al State (strat)	3278 KB	3/82	D	9021	Confider
6	17S-15E-10	SW NE	Phillips Mtn View Al State (strat)	3141 GL	7/82	D	8333	Confider
9	12S- 6W- 9	SE NE	NANO'LTEX JPAZA 1 Federal	1680 GL	12/80	D	1044	Volcani

e attached list of Phillips Petroleum temperature gradient wells

PINAL COUNTY

2	7S-10E- 2	NW SE	Anschutz Texoma 1-10-2 State (Phillips Petroleum 1 State-A)	2044 KB	1/81	D	18013	Precambr

I COUNTY

5	14N- 6W-32	SE SE	Phillips Kirkland Al State (strat)	3628 GL		A		Confider

A COUNTY

e attached lists of Phillips Petroleum temperature gradient wells

APPENDIX H: FLOOD MITIGATION COMPLIANCE

Executive Order 11988 was developed "in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative" (EO 11988; 42 FR 26951).

National Park Service "Floodplain Management and Wetland Protection Guidelines" (Federal Register vol. 45, no. 104, May 28, 1980) list procedures for complying with the executive order. These procedures require identification of floodplain, flood-hazard, and wetland areas potentially subject to public use and/or development, where the magnitude of hazard and impact of human activities is likely to be greatest; determination if the proposed action is in, or could affect, a floodplain or wetland; public review; identification and evaluation of practicable alternatives to locating in the base floodplain or wetland; identification of impacts; minimization of impacts; restoration, preservation, and enhancement of floodplain values; and findings and public explanation.

In preparation for development of the Draft General Management Plan, 100-year floodplains, probable maximum floodplains, flood-hazard areas, and wetlands within Lake Mead National Recreation Area were identified. Input was obtained from the public in the development of alternatives and determination of impact topics. For each alternative of the plan, the facilities that would remain in the floodplain and flood-hazard areas are shown in chart form in the document. Estimates are provided for numbers of people expected to be in the floodplain. The alternatives include those that would remove development in some areas from the floodplain. (Alternatives that were considered and rejected are listed in appendix F.) Impacts on natural and beneficial floodplain values are not discussed in the DEIS because the flash-flood areas at Lake Mead do not contain the elements normally associated with floodplains such as wetlands, groundwater recharge areas, and diverse riparian ecological communities; the flash floodplains at Lake Mead NRA have already been disrupted by their use as developed areas; protecting life and property already in the floodplain was judged to be a higher priority than restoring the natural qualities of the flash floodplain which are the very qualities that endanger life and property; and Lake Mead has been set aside as a recreation area with access to the lakes a primary service. Some tradeoffs in the area of natural values are necessary to provide this access. Although impacts on natural and beneficial values of floodplains are not assessed in the DEIS, the planning team has located no new developed areas in flash-flood areas. Therefore, the plan already exhibits compliance with most of the requirements of the executive order and implementing guidelines. All that remains to be done to complete the compliance process is public review of the DEIS and development and approval of a statement of findings. The statement of findings will be included in the final environmental impact statement.

The steps required for public review are as follows: Treat the issue in an environmental document that complies with public involvement requirements of CEQ; provide public notice to individuals and groups

affected by, or with a direct interest in, the proposed action and allow them to assist in development of alternatives; circulate NEPA and decision documents to at least the following: Environmental Protection Agency, Federal Emergency Management Agency, U.S. Fish and Wildlife Service, U.S. Geological Survey, Water and Power Resources Service (Bureau of Reclamation), U.S. Army Corps of Engineers, U.S. Soil Conservation Service, state and area clearinghouses, coastal or river basin commissions, and state coastal zone management administrations as appropriate; make the DEIS available for public and agency comment for a minimum of 60 days from the date it is filed with the EPA; indicate in the Federal Register notice of availability and on the cover sheet of the EIS that the DEIS is also to serve as a compliance instrument for the orders; and include above agencies in distribution of DEIS.

The first two of these requirements were met before publication of this document. The remaining requirements for public review are being fulfilled in the process of publishing, distributing, and considering comments on this DEIS.

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