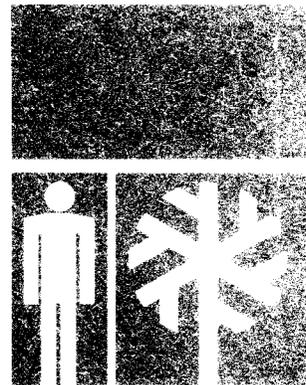


final environmental impact statement  
volume I - general management plan and alternatives

**"FES-86-27"**

**LAKE MEAD**

NATIONAL RECREATION AREA / ARIZONA - NEVADA



UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

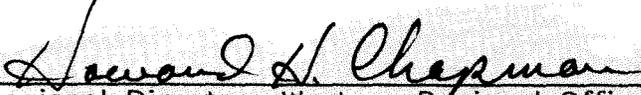
FINAL ENVIRONMENTAL IMPACT STATEMENT  
VOLUME I - GENERAL MANAGEMENT PLAN AND ALTERNATIVES

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

This document presents a general management plan (GMP) for Lake Mead National Recreation Area (NRA), three alternatives to the plan, and an analysis of the environmental consequences of implementing the plan or its alternatives. The plan would accommodate increasing visitor use through a combination of providing new developed areas, improved access points, acceptable levels of expansion in existing developed areas, and maximum resource protection. Visitor safety hazards from flash floods would be reduced by providing structural flood protection in five developed areas and nonstructural protection in other developed areas. Management zoning would restrict land uses on 75 percent of NRA lands, less restrictive zoning would cover 25 percent of the area. Carrying capacity limits have been set for the number of slips in each marina with a parkwide total of 8,370, or an increase of 90 percent over 1978 levels. The information/education program would encourage visitor safety and resource protection, provide information and orientation, and educate visitors about the area's resources. The GMP would not change the cabin site policy and would allow expansion of short-term trailer sites. No lands are proposed for wilderness designation. Under the no-action alternative present management strategies would continue with no major changes in existing conditions. Under alternative A increasing use would be accommodated by expanding existing developed areas and resource protection would be emphasized. Under alternative B resource utilization would be emphasized and increasing use would be accommodated by maintaining existing developed areas, improving existing shoreline access points, and providing new developed areas. The environmental analysis also serves as a compliance instrument for Executive Order 11988, "Floodplain Management" and 11990, "Protection of Wetlands."

For further information contact:

Jerry D. Wagers  
Superintendent  
Lake Mead National Recreation Area  
601 Nevada Highway  
Boulder City, Nevada 89005  
(702) 293-4041

  
Regional Director, Western Regional Office



## SUMMARY

This Final Environmental Impact Statement for the General Management Plan (GMP) for Lake Mead National Recreation Area contains the proposed action, alternatives that were considered, and impacts of the proposed action and alternatives.

### DESCRIPTION OF RECREATION AREA

Lake Mead National Recreation Area (NRA) is in southern Nevada and northwestern Arizona. Other nearby national park system areas include Joshua Tree and Death Valley national monuments and Zion and Grand Canyon national parks. Las Vegas is less than an hour's drive from the NRA, while portions of southern California (e.g., Los Angeles, San Diego, and San Bernardino) are within a 6-hour's drive, as is Phoenix, Arizona's largest metropolitan area.

Most of the NRA is arid desert. Temperature extremes range from 32° to 110°F and precipitation averages 3 to 5 inches annually. Snow falls on the highest peaks and on the Shivwits Plateau. Late summer and early fall thunderstorms create extreme flash-flood hazards. Rugged mountains, expansive alluvial fans, and dry washes dominate the landscape. Soils are generally shallow, friable, wind-deposited, and of alluvial materials that are very susceptible to wind and water erosion. Sparse desert vegetation is most common, with the creosotebush community dominating almost three-quarters of the NRA.

The NRA encompasses two reservoirs formed by the Colorado River, which flows through Glen Canyon National Recreation Area and Grand Canyon National Park before reaching the recreation area. The first reservoir is Lake Mead, 110 miles long and formed by Hoover Dam, which has 162,677 acres of water surface (or 247 square miles at an elevation of 1,229 feet) and over 822 miles of shoreline. The second is Lake Mohave, 67 miles long and formed by Davis Dam, which has 28,800 acres of water surface (or 45 square miles at an elevation of 647 feet) and over 254 miles of shoreline. The NRA contains 1,482,476 acres of federal land and 28,212 acres of nonfederal land.

The NRA has nine major developments around the two lakes; six of these developments are on Lake Mead and three are on Lake Mohave. These developments are centered around marina activities, and most have concession services for overnight visitors and day users. Both lakes have undeveloped coves that are accessible by water or approved roads; Lake Mead has 258 undeveloped coves in comparison to Lake Mohave's 194. Although the primary use of the recreation area is water-oriented, activities such as hiking and four-wheel driving on approved roads are also accommodated. Average annual visitation currently exceeds 6,500,000 and is projected to reach over 11 million during the life of the plan.

Because the NRA is so large and complex, it has been divided into several geographic planning zones for ease of discussion. A brief description of each zone follows. These geographic zones should not be confused with the management zones discussed later that are land use zoning classifications.

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. The flood hazard is severe throughout the main development and in North and South Telephone coves, and it is considered the third most hazardous developed area for potential flooding.

Cottonwood Zone. Access to this area is primarily through Cottonwood Cove, a popular resort during the summer months for waterskiers and boaters; during the fall, winter, and spring the area primarily serves fishermen from nearby communities in southern California and Nevada. This area has the second greatest flood hazard of any developed area, with most developments being vulnerable.

Willow Beach Zone. Willow Beach is the only developed area in this zone. It is a small concession operation that functions primarily as a fishing resort and serves the highest percentage of fishermen of any developed area within the NRA. This area has the most severe flood hazard of any development in the recreation area.

Boulder Basin Zone. The majority of visitors to this zone are day users; overnight accommodations are limited. Most day use is from the Las Vegas metropolitan area. Southern Californians make up a large percentage of users in the summer months, and many of the people attracted to Las Vegas from all parts of the country visit here. The developed areas in this zone include the following:

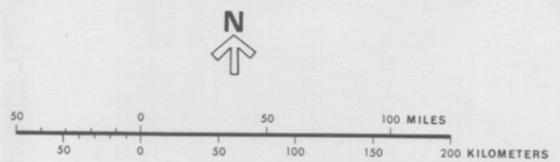
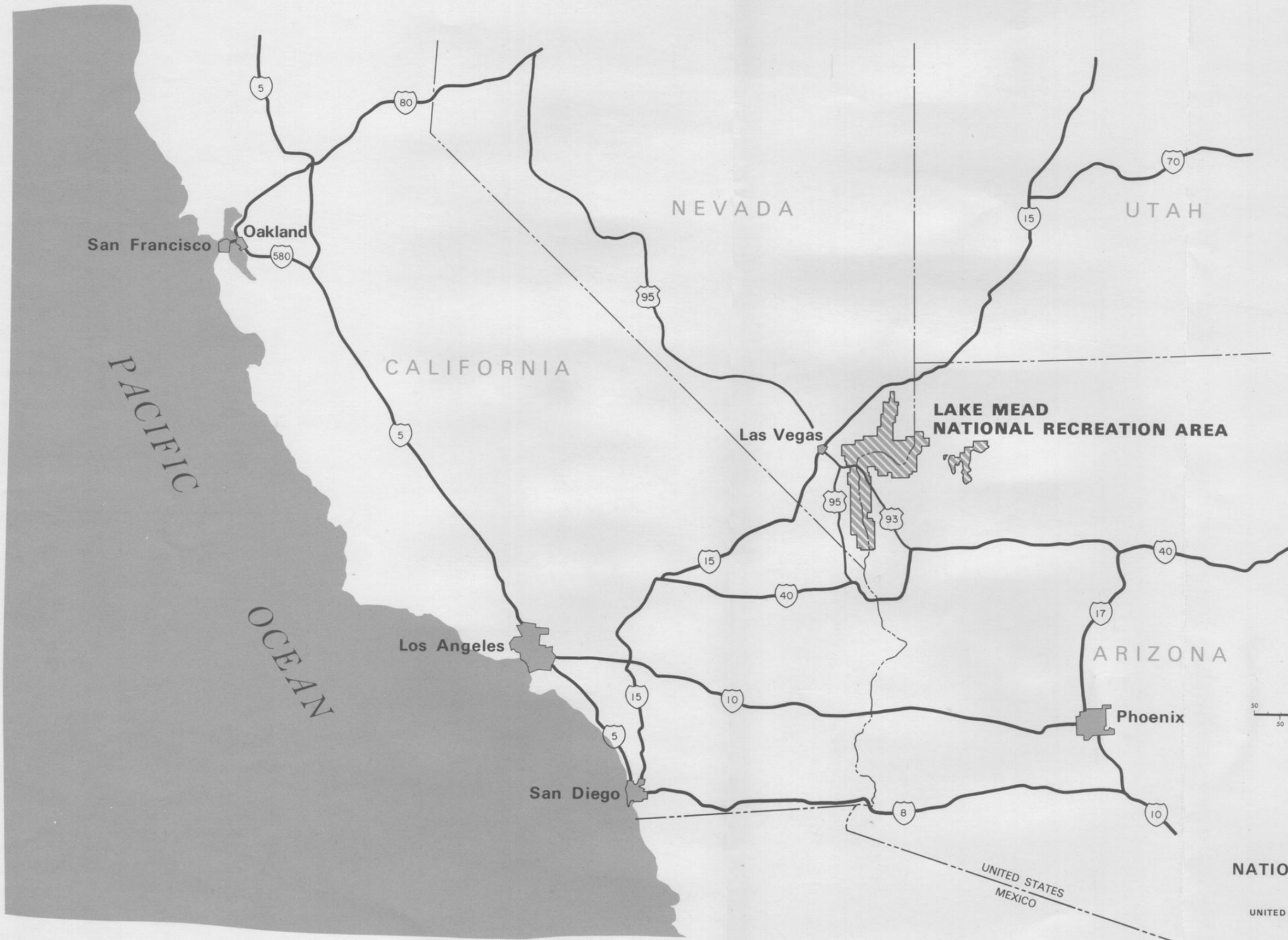
Boulder Beach is the largest and most heavily visited development in the recreation area; most of the area is susceptible to flooding across a broad alluvial fan.

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 concession maintenance area and launch ramp.

Callville Bay is also a very popular area and is heavily used by visitors from Las Vegas; it is one of the few developed areas without flood hazard.

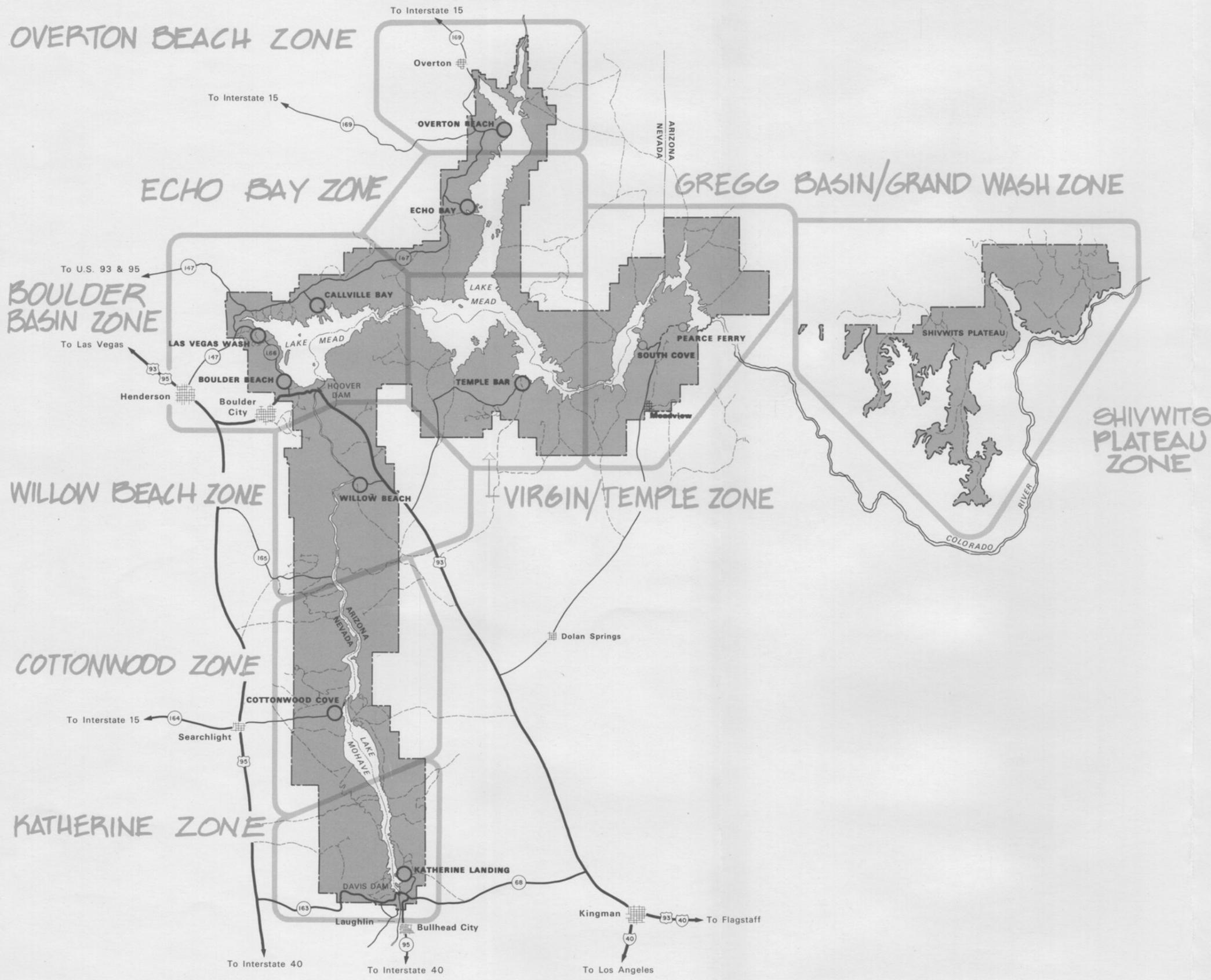
Echo Bay Zone. Echo Bay developed area provides a full range of services and facilities for day and overnight use. The area has not been heavily used because of its distance from southern California and Las Vegas. The area is not threatened by flood hazard.

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

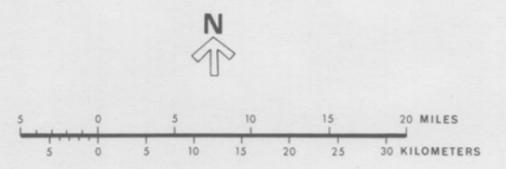


**REGION**  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
 ARIZONA - NEVADA  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE





- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINT.
- PLANNING ZONE
- - - APPROVED BACKCOUNTRY ROADS



## GEOGRAPHIC PLANNING ZONES

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Also in the Echo Bay zone are several features apart from the lake and accessible by the Northshore Road. Rogers and Bluepoint springs provide two inviting oases, complete with large trees. Redstone picnic area features large sandstone rock outcroppings that rise from the ground in dramatic formations.

Overton Beach Zone. A small, uncrowded, developed area provides primary access to the zone. Overnight accommodations are limited to a primitive camping area, which is the only part of the area in a flash-flood zone.

Virgin/Temple Zone. Temple Bar serves as the last concession area (or fuel stop) for boaters traveling east on Lake Mead toward the Grand Canyon. Temple Bar has a full range of services; however, it 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. Pearce Ferry is a takeout point for river runners in the Grand Canyon and a gateway for trips into the canyon.

Shivwits Plateau Zone. This zone is the most isolated and least visited in the recreation area. It is actively grazed and visitors are generally limited to hunters, yet it affords some spectacular views into the Grand Canyon. Access is over a county dirt road. The roads within the area are rough and slow. Most are not maintained and are suitable only for four-wheel-drive vehicles.

#### PROPOSED ACTION SUMMARY

The proposed action follows a strategy that centers on accommodating increasing visitor use while protecting the area's most outstanding natural and cultural resources. It also solves visitor use and flash-flood safety problems that face most developed areas.

In a 1983 estimate, visitation was projected to increase by about 68 percent to more than 11 million visitors per year over the 25-year projected life of the plan. However, because visitation reached 7,200,000 visitors per year by 1985, it is likely that the NRA will receive 11 million visitors before the projected life of the plan. Solving existing crowding/congestion problems and accommodating projected increases in visitation would require expansion and improvement of existing developed areas, circulation improvements, improvement of existing shoreline access points, and establishment of new developed areas (see table 1). The proposed action establishes maximum levels of development that could accommodate increasing use in the future, while not exceeding reasonable capacity limits. These are maximum levels, not goals; development within the maximum levels would occur only when demand and economic feasibility justify the expansion.

Congestion and conflicts between users have resulted in six popular coves being designated flat-wake zones. Four more coves would be designated as flat-wake zones under the proposed action.

Major visitor safety hazards result from flash-flood potential. Mitigating the flood hazard would be done by protecting five developed areas against floods up to the 100-year level with concrete channels or levees and other structures that contain or control the flood flows; and up to the probable maximum level with nonstructural mitigation measures like warning systems, evacuation plans, and emergency preparedness measures. Other developed areas would rely entirely on nonstructural flood protection measures for their mitigation. Some facilities would be relocated out of floodplains, and information would warn visitors about flood hazard in specific developed areas and undeveloped use areas. A detailed discussion of compliance with Executive Order 11988 is provided in a statement of findings in appendix H of volume II of this document.

Management zoning for the NRA would restrict land uses on 1,110,090 acres (75 percent). These restrictions are necessary to protect significant natural or cultural features, or areas critical for recreational development or activities. Less restrictive zoning would cover 372,385 acres (25 percent) that include nonfederal land, Bureau of Reclamation managed land, utility corridors, the reservoirs, and lands not significant for their resource or use values. Lands amounting to 148,970 acres, or 10 percent of the total acreage, and not significant for their resource or use values, would be open to mineral leasing.

There are several actions designed to protect the natural and cultural values of the area. To reduce illegal use of vehicles off approved roads, damaged areas would be reclaimed (more than 300 acres), the more than 300 miles of approved roads numbered and signed, and enforcement efforts increased. Shoreline areas would be protected and managed through several techniques. Carrying capacity limits, based on the 1980 Carrying Capacity Study for the NRA, would be applied to restrict the number of boat slips that each marina could have. Parkwide, the number could not exceed 8,370, or an increase of 90 percent over 1978 levels; but there is a maximum number identified for each marina based on each zone's particular characteristics. To protect the unique Black Canyon shoreline and side canyons, 150 people/day is the maximum that could float through the canyon. Due to shoreline trash and human waste accumulation problems that currently affect more than 50 acres of shoreline, a crew on each lake operating by boats would clean up the shorelines.

The information/education program would encourage visitor safety and resource protection, provide information and orientation, and educate visitors about the area's resources. To accomplish this program, the visitor center displays would be rehabilitated, three ranger/contact stations added and six rehabilitated, eight new wayside exhibits added and 13 rehabilitated, an amphitheater added, two roving contact/patrol boats added. Other similar actions would occur.

Traffic accident problem areas and the deterioration of existing roads are issues being dealt with in a separate planning process with the Federal

Highway Administration. Those findings are summarized in the proposed action.

A Resources Management Plan and a Land Protection Plan have been approved for Lake Mead. Their proposals are summarized in the GMP. For example, there are tamarisk and burro control studies, water quality monitoring, bonytail chub recovery efforts, grazing management, archeological surveys, museum collections management, and measures proposed to resolve landownership and use threats to Lake Mead's resources.

Current policy allows long-term trailer sites to remain at existing levels and/or be converted to short-term RV (recreation vehicle) sites. However, there is a great demand for short-term RV sites. The proposed action would change this policy by allowing short-term RV sites to be expanded at selected areas even if long-term sites were not reduced (see table 1). There are 135 cabin sites permitted at three developed areas in the recreation area. Changes would not be made in the policy or number of cabins.

The proposed action would help implement Clark County's Las Vegas Wetlands Park proposal. A trailhead and horse/hiking trail would be developed near Las Vegas Wash developed area, to join with the rest of the Wetlands Park trail system.

No lands are proposed for wilderness designation in the GMP. A map is included which shows those lands (674,375 acres) that meet or potentially meet the criteria of the Wilderness Act of 1964. Following completion of the GMP, a new wilderness plan will be prepared. Lands considered for wilderness designation in that plan will be taken from the lands which meet the Wilderness Act criteria as shown on the Wilderness Suitability map in the "Affected Environment" section. Other NRA lands will not be considered.

Following is a summary of all development proposals recommended under the proposed action. Corresponding quantities related to these proposals are shown in table 1. It is not an all-inclusive listing but presents the numbers for the items most critical to visitor use or safety.

Katherine Zone: Provide structural and nonstructural flood mitigation; redesign parking/circulation; relocate swim beach; expand motel and store; add RV park; relocate and expand NPS facilities; provide road access, parking, launch ramp, and store at Lower Mohave East, a small new developed area north of Katherine.

Cottonwood Zone: Provide structural and nonstructural flood mitigation; redesign circulation and increase parking; relocate swim beach; relocate NPS and concession housing; expand restaurant, store, and motel; improve access at Six-Mile Cove and in the vicinity of Cottonwood East Cove.

Willow Beach Zone: Provide structural and nonstructural flood mitigation; relocate trailer village, campground, and housing; retain restaurant/store; expand motel; if NPS facilities cannot be safely protected from floods, relocate to U.S. Fish and Wildlife Service fish hatchery; increase parking.

Boulder Basin Zone: Boulder Beach - Provide nonstructural flood mitigation; redesign auto and add pedestrian circulation system; increase parking; separate uses; redesign campgrounds for existing use and group sites and activities; expand motel, store, and dry boat storage; add ranger station. Las Vegas Wash - Provide nonstructural flood mitigation; relocate dry boat storage and maintenance area; redesign auto circulation; increase parking; add concession housing and RV sites; expand NPS facilities. Callville Bay - Redesign circulation, increase parking, add motel/restaurant, RV sites, and housing; no flood mitigation is necessary. Boxcar Cove - Provide a new developed area in the vicinity. Northshore Area - Provide access by improving existing roads and adding new spur roads

Echo Bay Zone: Echo Bay - Redesign auto/pedestrian circulation and increase parking; add picnic area and overflow launch ramp; retain lower and upper campgrounds and convert one loop to RV sites; expand motel, store, and maintenance building; add housing in trailer village; no flood mitigation is necessary. Stewarts Point - Provide improved access. Rogers/Bluepoint Springs and Redstone Picnic Area - Redesign development sites for increased use and interpretation.

Overton Beach Zone: Provide nonstructural flood mitigation; relocate campground and convert to developed campground; add new convenience store, cafe, laundry, and showers above high waterline; relocate trailer village and RV sites; relocate NPS and concession housing.

Virgin/Temple Zone: Provide structural/nonstructural flood mitigation; redesign auto/pedestrian circulation and increase parking; expand restaurant, motel, and store; add RV sites; relocate swim beach; relocate and expand housing; relocate NPS ranger station; provide for future expansion on northwest point at Temple Bar; provide improved access at Detrital Bay and Gregg's Hideout.

Gregg Basin/Grand Wash Zone: Pearce Ferry - Pave launch ramp and access road; provide restrooms and ranger/contact station. South Cove - Expand parking; provide restrooms; no flood hazard.

Shivwits Plateau Zone: add information/orientation and primitive campsites; maintain existing access; add airstrip for administrative access.

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	Motel Units	Picnic Sites	Swim Beach (acres)	Lunch Ramp (lanes)	Marina Slips	Flood Mitigation Structures	Nonstructural Flood Mitigation
Katherine Zone Katherine Landing	1,400/1,400		6.6/0	39/39	104/104	79/39	173/173	104/52	10/10	4/2.8	8/8	805/764	levees-1550', 2437' channels-1,2437' bridge - 24'	W, EV, EP, R
Lower Mohave East Side	200/0	7 paved/ 7 Gravel									2/0			
Cottonwood Zone Cottonwood Cove	1,000/728		5/0		223/223	75/75	149/149	48/24	30/4	7/5	6/6	535/237	levees - 850', 650', 200' channels - 4364', 1545' bridges - 30', 30'	W, EV, EP, R
Six-Mile Cove Cottonwood East Fire Mountain	225/0 225/0 200/0	5.5 paved/ 5.4 Gravel	10/0 10/0			50/0	30/0 100/0	25/0			2/0 2/0 4/0	200/0		
Willow Beach Zone Willow Beach	225/164				60/60	18/18	0/0	48/24	20/15		8/8	270/182	levees - 550', 626'	W, EV, EP, R
Boulder Basin Zone Boulder Beach	13,000/12,250		.5/0		215/215	150/75	348/338	88/44	112/56	10/10	8/8	8/5/400	levees - 2,000', 2,200', 2,000', 4,600', 1,200'	W, EV, EP
Las Vegas Wash Callville Bay Northshore Area Box Car Cove	2,250/750 1,800/1,700 225/0 200/0	3.5 gravel	.2/0 .3/0		94/94	80/0 30/6 50/0	105/89 50/80 30/0 100/0	100/0 35/0	26/16 15/6		5/5 13/13 2/0 4/0	630/595 1,045/300		W, EV, EP, R
Echo Bay Zone Echo Bay Stewart's Point Redstone Picnic Area Rogers/Bluepoint Springs	1,500/1,040 225/0 30/15 30/20		.2/0 .8/0		69/69	100/58	124/166 30/0 10/0	104/52	10/0 5/0 14/6	.7/.7	9/9 2/0	530/314		W, R
Overton Beach Zone Overton Beach	880/830		.1/0		30/19	13/13	130/100			.9/.9	6/4	140/50		W, R
Virgin/Temple Zone Temple Bar	1,500/1,400		.1/0	36/36	93/103	6/13	153/153	88/22	10/0	.7/.7	6/4	980/64	levees - 1800', 570', 225' channels - 2485', 1470' bridges - 30'	W, EV, EP
Detrital Bay	225/0						120/0				2/0			
Gregg Basin/Grand Wash Zone Pearce Ferry South Cove	500/300 75/25						60/30 30/0				2/2 2/2			
Shivwits Plateau Zone Shivwits Plateau	5/0						10/0							
TOTAL	25,920/20,622	23.5 paved/ 15.4 Gravel	33.8/0	135/135	883/887	718/297	1,782/1,278	570/218	243/113	17.3/15.6	93/69	5,910/2,906	levees - 9458' channels - 12,303' bridges - 114' gabions - 45,500 cu. Yds.	
Percentage Increase (from existing to proposed)	26%	NA	NA	0%	0%	142%	39%	160%	115%	11%	35%	74%		

W = Warning System  
EV = Evacuation Plan  
FP = Emergency Preparedness

Development costs to implement the proposed action would be \$35,269,500 for concessioners and \$34,762,500 for the National Park Service. Concession costs have been estimated from development plans concessioners have proposed or completed for the area. National Park Service costs will be funded by Congress through the normal budgetary process. General development would be phased so that the high costs necessary for structural flood mitigation, new roads, and new facilities could be spread over many years. This plan is expected to be in effect for 25 years or more. In all cases, first priority would be given to actions necessary for visitor health or safety and resource protection and correction of existing visitor use problems such as crowding, trash, and conflicts. Second priority would be to meet demands of increasing visitation by developing new areas. Additionally, \$11,159,000 would be needed to implement flood mitigation measures which would have to be completed before most of the general development priorities could be undertaken.

## SUMMARY OF ALTERNATIVES CONSIDERED

### No-Action Alternative

Existing management strategies would continue, suggesting that Lake Mead has reached an optimum level and distribution of use. The assumption under the no-action alternative is that only minor modifications are needed to solve the recreation area's problems. Planning would be more piecemeal than comprehensive. When resource damage or visitor conflicts occurred, they would be dealt with on a case-by-case basis. Developments would remain basically as they are, but minor improvements would be accomplished through routine maintenance when money and manpower became available.

To increase the safety of visitors at existing developed areas, flash-flood warning systems and evacuation/preparedness plans would be implemented at the seven developed areas that have flood hazard. These actions would cost the National Park Service \$538,000. Property in the flood-hazard areas would remain susceptible to flood damage.

Under the no-action alternative, management zoning would be based on the Land Management and Use map from the revised 1981 "Statement for Management." Consideration for mineral leasing would be based on the 1966 Excepted Areas map that defines what areas would be considered for leasing on a case-by-case basis and what areas would be excepted from mineral leasing and development. Because the excepted areas have not recently been updated to reflect the most current resource information, the zoning and excepted areas do not relate to each other. Accordingly, mineral leasing is considered on a case-by-case basis in portions of most zones and subzones--78 percent of the recreation area.

Zoning of natural or cultural features or areas for recreational development or activities includes 1,259,060 acres (85 percent). Other zoning covers 223,415 acres (15 percent) that includes nonfederal lands,

utility corridors, Bureau of Reclamation managed lands, and the reservoirs. About 1,162,550 acres of the recreation area are currently open to consideration of mineral leasing on a case-by-case basis.

Development costs to implement the no-action alternative would be \$0 for concessioners and \$0 for the National Park Service.

#### Alternative A

Increasing use would be accommodated by expanding existing developed areas, and resource protection would be emphasized. This would result in a clear choice for those who seek an active social experience at developed areas and for others who prefer a more primitive experience along the shoreline.

Flood hazard would be mitigated with channels, levees, and other structures, or by relocating facilities. All floods up to the probable maximum flood would be mitigated by these measures, so that the hazards to visitors and facilities in the existing floodplains would be mitigated. These actions would cost the National Park Service \$17,403,000.

Under alternative A, management zoning would restrict land uses on 1,207,510 acres (81 percent) that contain significant natural or cultural features or areas for recreational development or activities. Less restrictive zoning would cover 274,965 acres (19 percent) that include nonfederal land, utility corridors, Bureau of Reclamation managed lands, the reservoirs, and lands not significant for their resource or use values. This last category, resource utilization, would be open to mineral leasing and includes 51,550 acres (3 percent).

Other actions would be the same as those described for the proposed action.

Development costs to implement alternative A would be \$24,450,000 for concessioners and \$17,509,000 for the National Park Service.

#### Alternative B

Increased use would be accommodated by maintaining existing developed areas, improving existing shoreline access points, and providing new developed areas. Visitors would be spread more evenly around the reservoirs to reduce crowding and congestion. Resource utilization would be emphasized.

Flood hazard would be mitigated by closing Willow Beach and Cottonwood Cove as developed areas and using them for day access, relocating some facilities, and constructing channels, levees, and other structures to protect all remaining areas. The flood hazard for visitors and facilities would be mitigated for all floods up to the probable maximum flood level. These actions would cost the National Park Service \$12,120,000.

Under alternative B, management zoning would restrict land uses on 938,510 acres (63 percent) that contain significant natural or cultural resources, or areas for recreational development or activities. Less restrictive zoning would cover 543,965 acres (37 percent) that include nonfederal lands, utility corridors, Bureau of Reclamation managed lands, the reservoirs, and lands not significant for their resource or use values. This last category would be open to mineral leasing and includes 320,550 acres (22 percent).

Other actions would be the same as those described for the proposed action.

Development costs to implement alternative B would be \$12,362,000 for concessioners, and \$40,067,000 for the National Park Service.

Table 2 summarizes the major differences among the proposals for each alternative.

## SUMMARY OF IMPACTS

### Impact on Public Safety in Floodplains

The number of people in the 100-year floodplain would be greatly reduced under the proposed action compared to no action (160 compared to 1,250). There would be a net decrease in the number of people in the probable maximum floodplain (PMF) of about 365. However, this is a small 8 percent reduction, and about 4,155 people would still be estimated to use the PMF in the developed areas during a summer day. The potential hazard to them would be reduced by the warning system, evacuation plan, and emergency preparedness efforts. The degree of hazard would depend on how well the warning systems and evacuation plans worked and how well individuals responded to the situation.

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.

Under alternative A, about 135 people in the daytime would remain in the PMF where their hazard would be mitigated only by warning systems, a 97 percent reduction compared to no action. At night there would be no one in areas protected only by warning systems. All other visitors in the PMF (day or night) would be protected by structures like dikes and channels. This alternative provided the greatest level of protection of any alternative. For the 100-year floodplain, 135 people during the day and none at night would remain in the floodplain only protected by a warning system, an 89 percent and 100 percent reduction compared to no action.

Under alternative B, about 415 people in the daytime would remain in the PMF where their hazard would be mitigated only by warning systems, a 92

Table 2: Summary of Major Differences Among Alternatives

	<u>Proposed Action</u>	<u>No Action</u>	<u>Alternative A</u>	<u>Alternative B</u>
<u>Development (# areas)</u>				
Expand Existing Developed Areas	9	0	9	0
Improve Existing Access Points	4	0	0	6
Add New Developed Areas	3	0	0	3
Close Developed Areas	0	0	0	2
Replace Cabin Sites with Recreational Facilities	0	0	75	8
<u>Flood Mitigation (# areas)</u>				
Relocate Selected Facilities out of Floodplain	4	0	4	3
Close Developed Areas	0	0	0	2
Structural Mitigation	7	0	7	5
	(100-yr level)		(PMF level)	(PMF level)
Warning System, Evacuation Plan, Emergency Preparedness	7	7	7	7
<u>Management Zoning (in percent)</u>				
Natural Zone	70	80	77	58
Historic Zone	3	3	3	3
Development Zone	1	1	1	1
Special Use Zone	26	16	19	38
Open to Consideration for Mineral Leasing	10	78	3	22
Wilderness and Potential Wilderness Lands that may be Affected by Mineral Leasing	12	83	0	31

percent reduction compared to no action. At night there would be no one in areas protected only by warning systems. All other visitors in the PMF floodplain would be protected by structures like dikes and channels.

For the 100-year floodplain, 200 people during the day and none at night would remain in the floodplain only protected by a warning system, an 84 and 100 percent reduction compared to no action.

#### Impact on Property in Floodplains

Property in the flood-hazard zone would remain susceptible to flood damage and could be damaged or destroyed in the event of a flood. Under the proposed action, the cost of replacing structures left unprotected in the 100-year floodplain would be approximately \$330,000, for replacing those in the PMF approximately \$20 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. The cost to replace structures damaged by the probable maximum flood would be about 98 percent of the cost of replacing structures in the same floodplain under existing conditions.

The cost of replacing structures that remain in the floodplain under the no-action alternative would be \$6.6 million for the 100-year floodplain and \$20.4 million for the probable maximum floodplain.

The cost of replacing structures left unprotected in the 100-year floodplain under alternative A would be approximately \$1 million; for replacing those in the PMF approximately \$1.1 million. 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.

The cost of replacing structures left unprotected in the 100-year floodplain under alternative B would be approximately \$1.6 million. The cost to replace facilities damaged by the 100-year flood would be approximately 25 percent of the cost under existing conditions. The cost to replace facilities damaged by the PMF would be about 20 percent of the cost under existing conditions.

#### Impact on Reservoir Water Quality

Under existing conditions there are periodic problems with water quality at some swim beaches and coves because of lack of sanitary facilities, resulting in temporary closure of the areas when fecal coliform counts exceed the limits of state standards. The no-action alternative proposes no

actions that would alleviate this problem. Water pollution levels would probably be worse in this alternative than in any of the others. The remaining alternatives--proposed action, A, and B--contain identical proposals for relocating some swim beaches and shoreline-related activities to areas where there would be increased mixing of polluted water with cleaner water. It is hoped that these relocations would have the effect of eliminating the necessity for closing areas because of high pollution levels. It is possible, however, that the level of increased visitation would offset the gains in water quality obtained by the relocations.

#### Impact on Desert Spring Communities

Desert spring communities of Bluepoint and Rogers springs would be better protected by the proposal or alternative B. Both of these alternatives include increased visitor facilities and monitoring for visitor use impacts by resource management staff. In the event that adverse impacts began to be observed, management actions would be taken to stop them. The springs would be less protected under the no-action alternative or alternative A which propose no increase in facilities and no monitoring but which would probably result in the same increase in visitation to the springs. Under the no-action alternative or alternative A, up to one-fourth of the spring habitat at these two springs could be lost. These two springs account for 10 acres of the 100 acres of spring habitat in the NRA. Springs account for 0.01 percent of the acreage in the NRA.

Selection of the proposed action, alternative A, or alternative B would protect all desert spring ecological communities from mineral leasing.

Under the no-action alternative, five of the NRA's 33 springs could be affected by uranium mining if the current prospecting permit applications were approved and mining were to occur. The springs might have hydraulic connections through breccia pipes (from which uranium may be mined) to the upper perched aquifers. Mining of uranium from breccia pipes could cause partial or complete loss of flow from seeps and springs that support sensitive ecosystems. In addition, mining could cause contamination of the groundwater that feeds the springs.

#### Impact on Soils

Development of roads and other structures (does not include those for mineral exploration or development) under the proposed action would destroy or severely damage about 500 acres of lithosols and red desert soils and cause minor disruptions in drainage patterns which temporarily increase erosion potential. The rate of damage and erosion from offroad vehicles would be moderately diminished and about 350 acres of damaged soils would be rehabilitated; 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. Up to 20,000 acres of the NRA could be subject to potential mineral development

on 8,238 acres of existing leases and 11,640 acres of pending permits (if approved). Some damage to soils could be expected from sporadic mineral exploration activities; however, fewer than 300 acres are expected to be affected over the next 10 years if present mineral development trends continued in the area.

Under the no-action alternative there would be no new destruction or damage to soils from NPS or concessioner construction and no increases in soil erosion from runoff from impervious surfaces. Damaged soils in the recreation area from off-road vehicle use would double to about 700 acres in a decade and would remain in that condition permanently because of the lack of restoration activities. As a result of mineral exploration and development activity, approximately 150 acres of soils on the Shivwits Plateau could be damaged through excavation, erosion, and compaction, with additional damage expected from associated excavation and removal for road construction and similar earthwork. In remaining areas of the park, damage to soils from sporadic exploration activities is expected to be fewer than 300 acres over the next 10 years if present mineral development trends continued.

Under alternative A, 178 acres of lithosols and red desert soils would be destroyed or severely damaged by NPS and concessioner development proposals. The rate of damage and erosion from offroad vehicles would increase over the current level of 30 to 40 acres per year and be offset only partially by rehabilitation efforts. Under alternative A, up to 9,200 acres of the NRA could be subject to potential 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. Impacts on soils from mineral activity under alternative A are the same as for the proposed action.

NPS and concessioner construction of roadways and other facilities under alternative B would destroy or severely damage about 238 acres of lithosols and red desert soils. The rate of damage and erosion from off-road vehicles would continue at its present level of 30-40 acres per year and only be marginally offset by restoration efforts. Under Alternative B, up to 22,100 acres of the NRA could be subject to potential mineral development on 8,238 acres of existing leases and 13,900 acres of pending permits (if approved). Impacts on soils from mineral development under alternative B are the same as for the proposed action.

#### Impact on Significant Natural Features

Under the proposed action, alternative A, or alternative B there would be no impact on significant natural features from pending permits because areas containing significant natural features would not be open to mineral leasing.

Under the no-action alternative, development of uranium resources in the Parashant and Whitmore Canyon areas adjacent to the Shivwits Plateau would lead to significant degradation of the scenic vistas from Whitmore

Point and the road leading to it. There would be significant upgrading of existing roads and associated daily traffic from ore transportation in the immediate foreground of the view from the point. Sporadic oil, gas, and mineral exploration in other parts of the NRA are not likely to cause significant impact to the scenic vistas because of stringent lease application review procedures for the protection of visual quality.

#### Impact on Threatened, Endangered, or Candidate Species

There would be no significant impacts on threatened, endangered, or candidate species from visitor use and development proposals of any of the alternatives.

Under the proposed action, alternative A, or alternative B, the only potential impact on threatened, endangered, or candidate species from mining activity are from two existing leases and one pending prospecting permit that are located near threatened, endangered, or candidate plant species. When specific development proposals are received in these areas, surveys would be conducted and protective stipulations applied to the plan of operation. Therefore, there would be no impacts on these plants and wildlife as a result of implementation of the proposed action.

The no-action alternative would have the greatest potential for impact on threatened, endangered, or candidate wildlife and plant species because 78 percent of the NRA would remain open to consideration for mineral leasing. These effects would be evaluated in case-by-case environmental assessments of each lease or permit application, and specific mitigating measures would be recommended.

#### Impact on Vegetation

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 history of mineral leasing in the NRA has been primarily speculative and has resulted in almost no surface disturbance. Impacts under this alternative would be greatest in the event that an ore deposit was discovered and production of a mine was initiated. Over 100 acres of vegetation could potentially be destroyed through such development. Exploration activities on mineral and oil and gas leases would disturb only a small amount of native vegetation. Significant impacts to vegetation under this alternative are unlikely.

Under the no-action alternative, if oil and gas seismic exploration was to proceed, the amount of vegetation lost throughout the NRA would not be significant. However, if a uranium mine was developed in the Shivwits area, the effect might be significant because of loss of vegetation, the extended duration of the loss (length of time necessary for reclamation), degradation of the currently pristine visual scene, loss of wildlife habitat, decreased soil stability, and increased surface erosion.

Impacts of alternative A are the same as impacts of the proposed action.

Under alternative B, 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 prospecting permits if approved. Impacts on vegetation are the same as for the proposed action.

Impact on Bighorn Sheep

Existing oil and gas leases in the Pinto Valley totalling 4,480 acres are located in an area of bighorn sheep habitat. Under the proposed action and all the alternatives, seismic exploration would have the potential to cause adverse impacts on the herd. However, 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

Over the life of the plan visitation is expected to increase from the current 6.5 million to 11 million (70%). Visitation might increase less under the no-action alternative because frustration at the increased crowding and congestion expected under no action might discourage visitation to the extent that use levels would stop increasing. While there is no great difference in the levels of increased visitation that the various alternatives would accommodate, the proposed action would accommodate the most, followed by alternative A, alternative B, and no action.

<u>Example Facilities</u>	<u>Proposed Action</u>	<u>No-Action (Ex. Cond.)</u>	<u>Alt. A</u>	<u>Alt. B</u>
Parking spaces	+7,470 (49%)	19,660	+5,990 (40%)	+1,880 (10%)
Overnight accom.	+1,180 (67%)	1,755	+1,110 (64%)	+90 (5%)
Launch ramps	+22 (30%)	73	+10 (14%)	+16 (22%)

Impact on Vacation Cabin Site Residents

The proposed action and the no-action alternative would have no impact on cabin site residents.

Under alternative A the 39 cabin sites at Katherine and the 36 sites at Temple Bar would be removed and replaced with visitor facilities. Under alternative B, eight sites at Katherine would be removed to make room for visitor facilities. Under alternative A occupants of the 75 sites (56

percent of the sites at the NRA) and under alternative B occupants of the 8 sites (6 percent) would experience varied levels of emotional and economic impacts because of the loss of the opportunity to use these sites.

#### Impact on Trailer Village Residents

Proposed actions to add RV sites or to 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 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 all 13 short-term residents would be relocated, 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 10 long-term residents at Temple Bar. To mitigate the effect on these long-term residents, the Park Service would first rely on normal attrition before relocation is 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 is 10 out of 887 for the entire recreation area, or 2 percent of the total long-term sites. Only seven of the 297 short-term sites, or 2 percent, would be affected.

Proposals under the no-action alternative would not affect trailer village residents.

Impacts of alternative A would be the same as impacts of the proposed action.

Implementation of alternative B would affect trailer village residents in the following areas: 15 long-term and 33 short-term residents who would be relocated within the Katherine Area, all 206 long-term and 75 short-term residents at Cottonwood Cove, and all 60 long-term and 18 short-term residents at Willow Beach. 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 because they would have to relocate out of the developed area and away from the lake. Implementation of alternative B would result in the loss of 29 percent of all long-term sites and 31 percent of all short-term sites in the NRA.

#### Impact on Mineral Leasing Opportunity

Reduction of the area available for leasing consideration from 78 percent to 10 percent of the NRA under the proposed action would not significantly affect the current or future mineral and fossil fuel production locally or nationally and would have no measurable impact on

## Impact on Wilderness Lands

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. Designating these lands as areas open to mineral leasing could affect the wilderness qualities of these lands. Exploration or mining activities as a result of mineral leasing could scar the landscape and alter the wilderness character of these lands. The number of acres affected and the percentage of total NRA acreage meeting the criteria for wilderness or potentially meeting the criteria for wilderness under each alternative is shown below.

	<u>Proposed Action</u>	<u>No-Action Alternative</u>	<u>Alternative A</u>	<u>Alternative B</u>
Number of NRA acres meeting criteria for wilderness that would be affected	76,435	495,390	0	199,312
Percentage of NRA acres that meet the criteria for wilderness that would be affected	14%	89%	0	37%
Number of acres potentially meeting the criteria for wilderness that would be affected	4,950	106,380	0	10,312
Percentage of NRA acres potentially meeting the criteria for wilderness that would be affected	4%	91%	0	8%

Table 3 presents a summary of the impacts on all topics considered for each alternative.

Table 3: Summary of the Impacts of the Alternatives Considered

Resource Parameter	No Action	Alternative A	Alternative B	Proposed Action
People in floodplains				
Daytime 100-year <sup>1</sup>	1,250	135	200	160
Probable maximum floodplain <sup>2</sup>	4,845	135	415	4,155
Property in floodplains <sup>3</sup>				
100-year	\$ 6,578,000	\$ 1,020,110	\$ 1,628,640	\$ 327,970
Probable maximum floodplain <sup>4</sup>	\$20,454,960	\$ 1,102,080	\$ 4,192,050	\$20,094,340
Cost of flood mitigation Mostly to NPS	\$ 538,000	\$17,403,000	\$12,120,000	\$11,159,000
Desert Spring ecological communities	Adverse effects on springs	Same as proposed action	Same as proposed action	Increased use of Rogers/Bluepoint springs
Effects on water quality	Remain poor in some areas requiring periodic closure of some beaches	Improved by relocation of some facilities	Same as A	Same as A
Acres of soils and vegetation destroyed				
Mineral related <sup>5</sup>	700-800	300	300	300
Other proposals	700	578	638	500
Rehabilitated	None			350
Significant natural features	Significant degradation	None	None	None
Endangered species effects	None	None	None	None
Effects on bighorn sheep	Insignificant	Insignificant	Insignificant	Insignificant
Congestion effects	Most	More than proposed action	More than A	Least
Vacation cabin site residents	None	75 sites removed	8 sites removed	None
Trailer village residents	None	Little or no effect	Adverse effect at Cottonwood Cove and Willow Beach because of removal of 32% of all NRA long-term sites and 31% of all NRA short-term sites	Same as A
Level of concession operations	No change	Large increase	Small decrease	Small increase
Mineral leasing opportunity In acres	1,162,550	51,550	320,550	148,970
Effects of mineral leasing opportunity on wilderness lands--acres				
Meet criteria	495,390 (89%)	0 (0%)	199,312 (37%)	76,435 (14%)
Potentially meet criteria	106,380 (91%)	0 (0%)	10,312 (8%)	4,950 (4%)
Development cost to NPS	0	\$17,509,000	\$40,067,000	\$34,762,500
Development cost to concessioner	0	\$24,450,000	\$12,362,000	\$35,269,500

1. Estimated number of people in the 100-year floodplain at any one time on an average summer weekend who would only be protected by warning systems and evacuation plans.

2. Estimated number of people in the probable maximum floodplain at any one time on an average summer weekend who would only be protected by warning systems and evacuation plans.

3. These costs do not include utilities, furnishings, equipment, vehicles, flood-control devices, debris removal, search and rescue, or expenses of victims.

4. Probable maximum flood damage to property in floodplain is 98 percent of existing conditions, which calculates to the number shown in this chart.

5. Per 10-year period.



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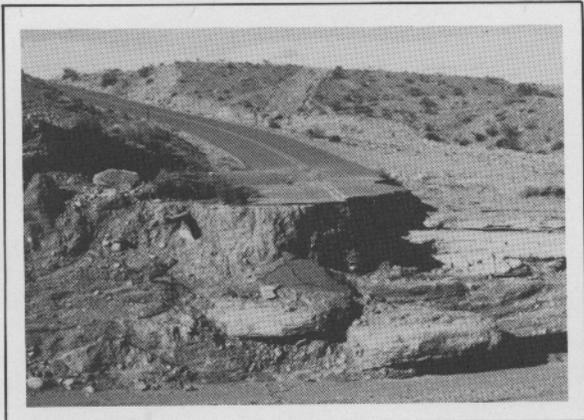
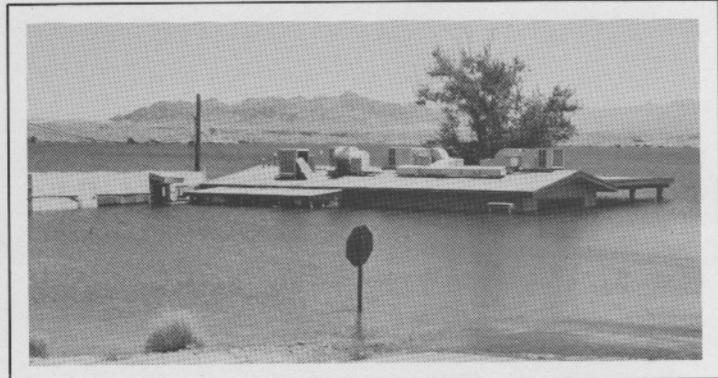
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## PREFACE

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, the 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 the list of document preparers are also included.





PURPOSE OF AND NEED FOR THE PLAN



The National Park Service proposes to implement a general management plan (GMP) for Lake Mead National Recreation Area (NRA) to improve the visitor experience and resource management. A GMP is a parkwide plan for meeting park management objectives. It presents short-term and long-term strategies for solving resource management, visitor use, and park development problems. In this document the final plan is referred to as the proposed action. Once approved the GMP will guide park management activities at the NRA for the next 25 years or longer. A new GMP will be prepared only when conditions change so much that a reanalysis is required.

Without an approved GMP to provide guidance for management of the developed areas, problems have occurred as visitation has increased. Such problems include visitor crowding, lack of proper sanitation facilities, inability of concessioners to make long-range plans and improvements, and the park staff being forced to respond to crises rather than being able to manage the area in a well-defined direction. The GMP for Lake Mead will provide a cohesive framework for management decisions, development proposals, concession planning, and guidance for short-term decision making so that primary management objectives can be achieved.

#### ISSUES ADDRESSED BY THE PLAN

To understand all issues relevant to planning for Lake Mead NRA, meetings were held in the spring of 1982 with concerned government agencies, concessioners, and the public in Boulder City, Nevada; Bullhead City, Arizona; Las Vegas, Nevada; and Pasadena and Santa Ana, California. Worksheets presenting GMP issues that face the recreation area were distributed to all concerned individuals in the spring of 1982. (For more information on this subject, refer to the "Consultation and Coordination" section in volume II.) The following issues are addressed by the plan:

Increasing Visitation--The growth rate of visitation to the area from 1962 through 1983 averaged 156,343 more visitors each year; however, during the last decade the rate has been impacted by gasoline shortages in 1974 and 1979. The Las Vegas regional population has shown a dramatic increase of 12 percent per year from 1960 to 1980, a total increase of 248 percent. Because a large portion of visitors to Lake Mead are from the Las Vegas area, the recreation area will continue to attract these visitors, especially during times of gasoline shortages.

Developed Areas--Facility improvement, relocation, or expansion have been identified as needs at all developed areas. High reservoir levels have damaged some facilities, some utility systems need to be modernized, the trend of increasing visitation indicates the need for expansion of many facilities, and crowding and congestion at certain locations require rearrangement, expansion, or development of new facilities. The plan evaluates solutions to these problems. Although NPS policy generally requires trailer village and cabin site levels to

remain static or be reduced, this document evaluates alternatives to that policy.

Flood Mitigation--Flash flooding is the most limiting environmental constraint in many of the developed areas. Protection of people and property at a reasonable cost is one of the most important issues of this planning effort.

Wilderness--The recreation area has 545,645 acres of land that meet the criteria of the Wilderness Act and 128,730 acres that potentially meet those criteria. This GMP will not make a wilderness recommendation. However, management zoning proposed in the GMP would allow some lands meeting the criteria of the act to remain open to mineral leasing. Exploration or mining activities resulting from mineral leasing on these lands could scar the landscape and alter the wilderness character.

Minerals Management--Mineral leasing often conflicts with other management goals such as wilderness preservation, unique or sensitive resources, and visitor services. The plan presents various zoning alternatives that define which areas of the recreation area would remain open to mineral leasing and which would be closed to further leasing.

Shoreline Access--The plan discusses alternative methods of reducing crowding and congestion along the shoreline at the end of approved roads, and reducing illegal off-road vehicle use resulting from attempts to gain access to additional shoreline camping sites.

Illegal Vehicle Use Off Approved Roads--Illegal vehicle use occurs in areas of the recreation area that are flat or rolling. Soils, vegetation, wildlife habitat, and wildlife are being destroyed or damaged. Alternatives for reducing or stopping this illegal vehicle use are discussed.

Boating and Shoreline Use--The proposed action estimates the number of boats that can use the lake at one time without creating serious problems and discusses methods for reducing conflicts between different types of boaters and for resolving shoreline trash and sanitation problems.

Visitor Experience and Safety--A great range of visitor opportunities are available at Lake Mead. Wilderness experiences, active recreational activities within developed areas, and most experiences in-between are available. Fatalities caused by drowning or motor vehicle accidents are a critical safety issue. Alternatives for modifying visitor opportunities and methods to reduce the number of accidents are examined.

Resources Management, Roads, and Land Protection--Many natural and cultural resources management issues are addressed in a separate resources management plan. Road safety hazards and

chronic maintenance problems are being addressed in a separate planning process with the Federal Highway Administration. All land in the recreation area was evaluated for protection, acquisition, or exchange. Boundary revisions were also considered in the Land Protection Plan released in July 1984. The interrelationships of these other plans with the GMP are topics of concern.

#### ADMINISTRATIVE AND LEGISLATIVE CONSTRAINTS

Lake Mead National Recreation Area was established October 8, 1964, by Public Law 88-639 (78 Stat. 1039), 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." Within the provisions of this act, and "to such extent as will not be inconsistent with either the recreational use or the primary use of that portion of the area withdrawn for reclamation purposes, the following activities may be permitted: (1) general recreation use, such as bathing, boating, camping, and picnicking; (2) grazing; (3) mineral leasing; and (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, and trapping will be permitted in accordance with applicable state and federal laws and regulations.

Various administrative constraints restrict development and use of certain areas within Lake Mead NRA, including grazing leases and permits, mining/mineral policies, energy development, and utility corridors. These constraints are described below.

The act of October 8, 1964, section 2, states that "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." (See discussion in "Land Protection and Boundary Revisions" section.)

The act further provides for mineral leasing and grazing within the recreation area subject to such limitations, conditions, or regulations as the secretary 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 withdrawn for reclamation purposes. Regulations governing the issuance of mineral leases and operations on those leases are contained in 43 CFR 3100 and 3500. Areas of the NRA where mineral leasing currently will not be considered were established in the regulations as excepted areas, and include: the lake surfaces, a 300-foot setback from the lakes, a 200-foot setback from roads and utilities, a ¼ mile setback from springs, developed areas/or concentrated public use areas, areas of outstanding recreational significance, and areas under the supervision of the Bureau of Reclamation. In addition, prior existing valid mineral rights are also available for mineral development at the owner's discretion. NPS review and approval of these operations is

governed by 36 CFR 9A for mining claims located under the Mining Laws of 1872, and by 36 CFR Part 9B for nonfederal oil and gas rights.

Section 3 of the enabling act further excepted the inclusion of any tribal or allotted lands of the Hualapai Indians within the exterior boundaries of the recreation area without approval of the Hualapai Tribal Council. Because the Hualapai Tribal Council has not approved this inclusion, the National Park Service has no administrative jurisdiction over these lands.

The act provided authority for the secretary of the interior to revise boundaries subject to the requirement that the total acreage not exceed the October 8, 1964, acreage (1,813,354.87) and to acquire lands through acceptance of donations, procurements, or exchange. There was \$1.2 million authorized to be appropriated for land acquisition. The land acquisition ceiling was increased to \$7.1 million by the act of October 26, 1974 (Public Law 93-477, 88 Stat. 1445).

The National Park Service exercises concurrent jurisdiction in the states of Nevada and Arizona.

The Code of Federal Regulations directly influences management of Lake Mead NRA. Specifically, regulations affecting the national recreation area are contained in title 36, chapter I; the sections under title 43 related to sales and exchange of lands, occupancy of cabin sites on public conservation and recreation areas, and mineral, oil, and gas leases; the sections under title 50 relating to endangered plants and wildlife and associated permits; and the sections under title 33 pertaining to the Coast Guard's and the Corps of Engineers' administrative and enforcement responsibilities and jurisdiction on the waters of the United States.

Many requirements stipulate that management confer with the other agencies and enter into cooperative agreements to implement area programs. These cooperative agreements are listed in appendix D.

#### RELATIONSHIP OF THIS PLAN TO OTHER PLANNING

This General Management Plan (GMP) sets forth the basic management philosophy and provides the strategies for addressing issues/problems and for achieving identified management objectives. Strategies are developed to properly manage the area's resources and to provide for appropriate visitor use and interpretation of the resources. Based on those strategies, programs, actions, and support facilities necessary for efficient park operation and visitor use are identified. The GMP will guide the management of Lake Mead for the next 25 years or more. A new plan will be completed if and when the circumstances at the recreation area change so much that they require reanalysis.

General direction is provided by the plan for all facets of management and often requires subsequent plans that are more detailed and specific. Because of pressing needs, administrative direction, or budgetary opportunities, more specific plans are occasionally completed before the

GMP. At Lake Mead the Resources Management Plan (RMP), which contains natural and cultural resource management proposals, was completed before the GMP and was evaluated in an accompanying Environmental Assessment. The RMP will be reviewed on an annual basis. The Land Protection Plan and Environmental Assessment have been completed, and the GMP contains summaries of both plans. Because both plans have been evaluated in environmental assessments and no new proposals have been made, the GMP will not reanalyze these impacts.

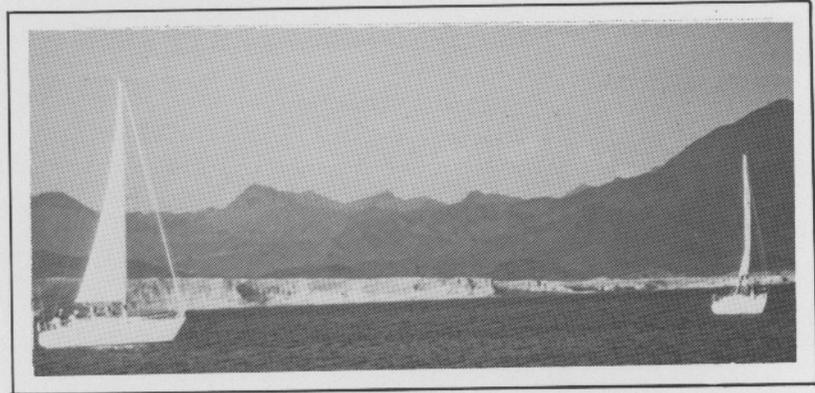
A separate plan for resolving chronic maintenance problems or safety hazards along several road sections is being done through a planning process in conjunction with the Federal Highway Administration. Analysis of costs and environmental impacts of those projects will be presented in that plan.

A series of detailed development concept plans (DCPs) would normally be completed after the GMP; however, to resolve the many specific problems that were apparent within the developed areas, the DCPs were done as a part of the GMP. These specific development proposals are presented in the "Alternative Development Concept Actions" section.

Other specific plans that will follow the GMP are a minerals management plan (MMP) and a wilderness plan. The GMP, through its management zoning alternatives, will determine land use patterns. That determination will establish lands to be protected because of significant natural resource values, lands to be available for public use, and lands to be open or closed to mineral leasing. The MMP will describe how mineral activity will be controlled within the resource utilization zone. Management objectives will be specified for lands remaining open for leasing consideration and additional surface protection stipulations needed to protect resource values within those areas. The MMP will cover such things as standard surface protection stipulations, which will be required on each lease and permit issued to protect particular resource values and/or visitor safety in the park. Stipulations may include provisions to ensure protection of the visual integrity of views from the lake and major park roads, provisions regarding access and facilities siting, road construction standards, and reclamation of the site following abandonment. Development of the MMP will include public involvement. Along with completion of the MMP, the excepted areas defined in 43 CFR 3109.2(d)(1) and 3566.2-2(a) will be revised to be consistent with the selected alternatives for the GMP and the corresponding Management Zoning map.

The GMP includes a map that identifies those lands which meet (545,645 acres) or potentially meet (128,730 acres) the criteria of the Wilderness Act of 1964. This map is the result of a long process which began in 1974 when the National Park Service completed a wilderness review of all the lands within Lake Mead National Recreation Area. At that time, 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 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. The baseline data from the old analysis and the management zoning scheme from the GMP will be used and revised in the development of a new draft wilderness plan and environmental statement that will follow the GMP.



ALTERNATIVES  
INCLUDING THE PROPOSED ACTION



## INTRODUCTION

This portion of volume I is divided into three parts: management strategy, parkwide alternative actions, and alternative development concept actions.

The "Management Strategy" section briefly describes the general strategy for managing the park. The "Parkwide Alternative Actions" section presents the proposed action and alternatives. They describe the general management direction for the entire park and an explanation of how each developed area would be managed, highlighting the major differences among alternatives. The "Alternative Development Concept Actions" section describes, in detail, actions proposed for each developed area.

In response to National Park Service and other agency concerns, issues voiced by the public, and opportunities available for the recreation area, the interdisciplinary planning team (including park staff) formulated alternatives for Lake Mead NRA. After formulation of the alternatives, an alternatives workbook was prepared and distributed to interested parties in the fall of 1982. Responses to the workbook and additional fieldwork were used to revise the alternatives and to formulate the proposed action; these refined alternatives and the proposed action are being presented in this volume.

## MANAGEMENT STRATEGY

The primary management objective of Lake Mead National Recreation Area is to provide a quality visitor experience in a manner that will ensure visitor safety and will protect the significant resources of the area. Other objectives are to provide sound resource management and visitor use programs, which will be implemented in close cooperation with interested publics and governmental agencies. A continuation of the area's recreational environment, natural environment, and its significant cultural resources will be ensured.

These objectives will be achieved by first providing the visitor with adequate and timely information to understand the beauty, fragility, and dangers of the desert and water recreation. Second, development planning will be done to allow visitors to achieve their goals more quickly and easily so that they can enjoy their time in the NRA. Development will also be planned to reduce resource impact caused by increased visitation. Finally, areas of special natural or cultural resource value will be protected wherever possible from intensive visitor use.

The GMP will strive to solve existing problems and to anticipate future visitor needs. All alternatives, except the no-action alternative, establish maximum levels of development that can accommodate increasing use in the foreseeable future, while not exceeding reasonable capacity limits. This strategy can be applied in different ways, and the "Parkwide Alternative Actions" section explains the rationale behind each alternative. The maximum levels of development identified are not goals; they are the absolute maximum that would be allowable. When a concessioner makes a proposal for expansion of facilities, it must be within the limits set by the GMP. Proposals will be evaluated to determine if there is adequate visitor demand and if it is economically feasible at that time. Approval for expansion will be granted only after these criteria have been met.

The proposed maximum expansion levels should be able to satisfy visitor demand well beyond the year 2000; however, problems will arise because demand is uneven around the recreation area. The areas that are in the greatest demand in the near future should be developed to their identified maximums first. Once this happens, the National Park Service will simultaneously develop a strategy to encourage visitors to use developed areas that are not as crowded.

## PARKWIDE ALTERNATIVE ACTIONS

### PROPOSED ACTION

#### Visitor Use and Development

A combination of providing new developed areas, improved access points, acceptable levels of expansion in developed areas, and maximum resource protection will be the method for implementing the management strategy. The proposed action provides a balance between the contrasting implementation methods of alternatives A and B presented at the end of this section.

It is assumed that existing developments are currently located to best serve visitors and could be expanded. Use of improved access points (existing primitive access points that would be improved--see the Glossary for definition of terms) and new developed areas would relieve congestion in existing developed areas. The flood hazard would be structurally mitigated against the 100-year flood, nonstructurally mitigated for floods above the the 100-year level, mitigated with relocations, and avoided at improved access points and new developed areas. A detailed explanation of measures taken to comply with EO 11988 is provided later in this section.

Following are specific actions proposed for each zone. Greater details related to each zone are located in the "Alternative Development Concept Actions" section.

Katherine Zone. Overnight visitors would be accommodated at Katherine Landing, and the day users would be directed to adjacent coves for swimming and picnicking. To draw visitors away from the frequently congested Katherine developed area, a road would be constructed to a cove 6 to 8 miles north of Katherine Landing where a launch ramp, gas, and limited supplies would be provided. The conditions that would trigger this action are facilities at Katherine Landing reaching 85 to 90 percent capacity for 45 days or more during the heavy use season for two to four years consecutively.

Cottonwood Zone. Cottonwood Cove would continue to accommodate a wide variety of visitors. Facilities would be improved, expanded, or relocated to better accommodate visitors and to provide safety from flood hazard. Cottonwood East and Six-Mile Cove would function as two additional boating access points. Fire Mountain would be developed as a day use improved access point initially and as a major developed area if use warrants such development. Development of Fire Mountain would be considered only when facilities at Cottonwood Cove are at 85 to 90 percent capacity for 45 days of the heavy use season for two to four years consecutively. However, if the Cottonwood Zone was experiencing carrying capacity problems, like resource degradation or overcrowding, Fire Mountain would remain an improved access point, and additional use would be encouraged in less crowded zones. The new developed area would also have to be justified according to an economic feasibility study.

Willow Beach Zone. Visitors would continue to be provided convenient access to northern Lake Mohave, and more overnight accommodations would be provided. The capacity of other facilities; however, would be reduced after relocation to avoid flood hazard areas.

Boulder Basin Zone. Increasing visitor use would be accommodated by expanded developed areas, improved access, improvements of existing gravel roads and addition of new spur roads in the Northshore area, and new development in the Boxcar Cove vicinity. The majority of day use would be accommodated at improved access points along the Northshore Road and at Boulder Beach. Boxcar Cove development would be considered only after Las Vegas Wash and Callville Bay have been developed to the maximum level identified in this plan, and their facilities are used at 85 to 90 percent or greater capacity for about 45 days during the heavy use season for two to four years consecutively. However, if the Boulder Basin zone was experiencing carrying capacity problems, the new development at Boxcar Cove would not be implemented. Boxcar Cove development, like Fire Mountain, would also have to be justified according to an economic feasibility study.

Echo Bay Zone. Visitors would be provided a full range of services and facilities in this major destination resort and houseboat staging area. Day use would be accommodated but it would not be a major function. Stewarts Point launch ramp and access would be improved.

Overton Beach Zone. Wash and beach camping would be replaced with a developed fee campground, a new convenience store would be constructed, and the trailer village and RV sites would be relocated.

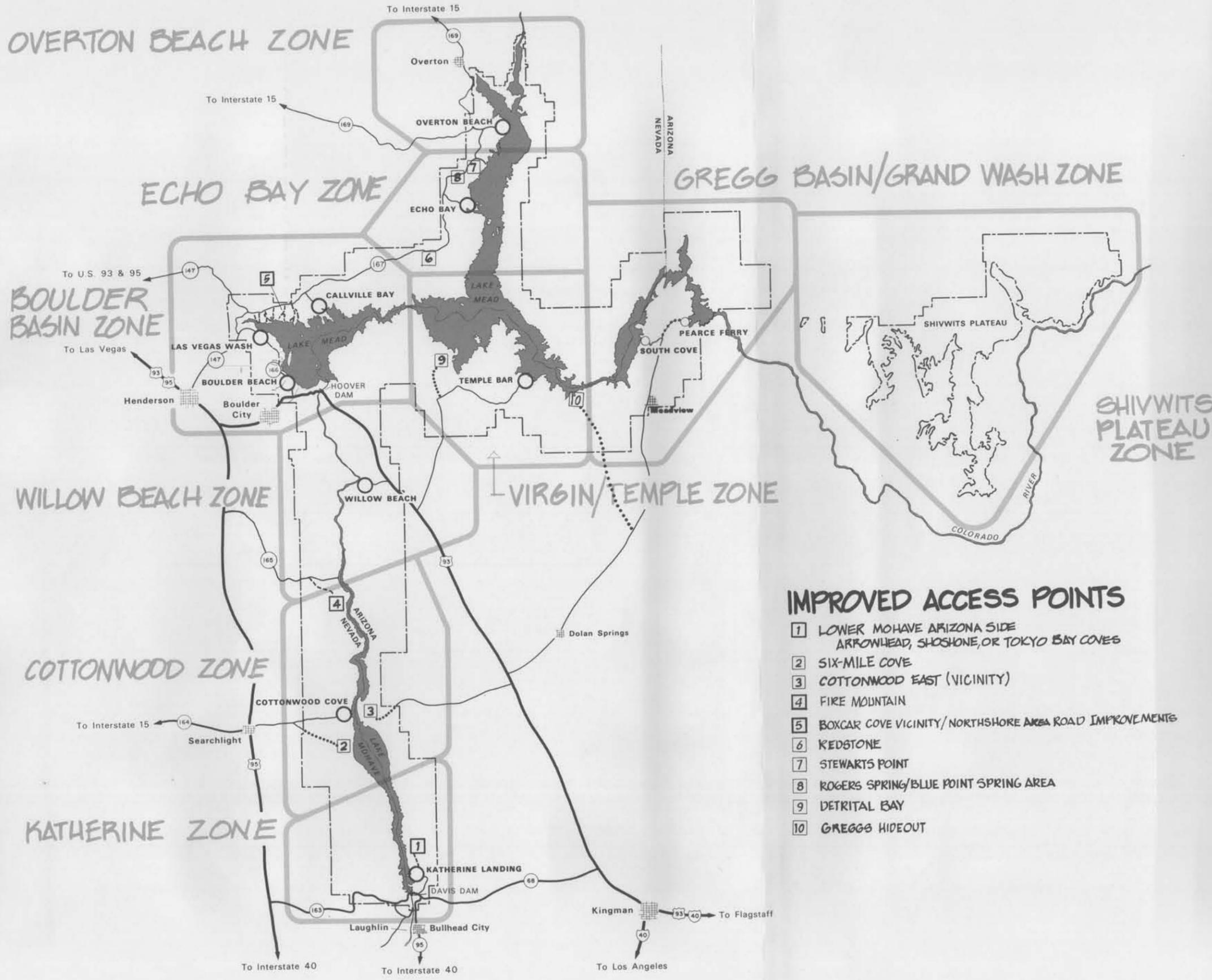
Virgin/Temple Zone. The greatest variety of visitors would be accommodated, with Temple Bar providing a complete range of visitor services and access. Detrital Bay and Gregg's Hideout would be improved access points.

Gregg Basin/Grand Wash Zone. Pearce Ferry - Pave launch ramp; provide restrooms and ranger/contact station. South Cove - Expand parking; provide restrooms; no flood hazard.

Shivwits Plateau Zone. Major emphasis would not change; the primitive experience would be maintained with the addition of a primitive campground near the ranger station. A dirt airstrip would be added for administrative access.

### Flood Mitigation

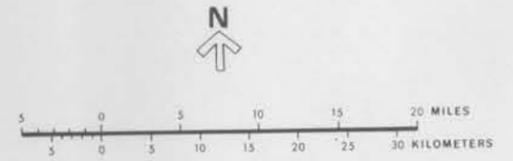
The flash-flood hazard is a critical issue at several of the developed areas. For a complete discussion of floodplain existing conditions and the numerous studies that the National Park Service and consultants have completed on the flood hazard and mitigating designs/plans, see floodplains and wetlands in the "Affected Environment" section in volume II.



THIS ALTERNATIVE SEEKS A BALANCE BETWEEN THE CONTRASTING STRATEGIES OF ALTERNATIVES A AND B, THROUGH A COMBINATION OF NEW DEVELOPED AREAS, IMPROVED ACCESS POINTS, AND EXPANSION OF EXISTING DEVELOPED AREAS.

- PROPOSED ROAD
- ..... IMPROVE EXISTING ROAD
- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINTS
- PLANNING ZONE
- PROPOSED MAJOR DEVELOPED AREA
- PROPOSED IMPROVED ACCESS POINT

- IMPROVED ACCESS POINTS**
- 1 LOWER MOHAVE ARIZONA SIDE  
ARROWHEAD, SHOSHONE, OR TOKYO BAY COVES
  - 2 SIX-MILE COVE
  - 3 COTTONWOOD EAST (VICINITY)
  - 4 FIRE MOUNTAIN
  - 5 BOXCAR COVE VICINITY/NORTHSHORE AREA ROAD IMPROVEMENTS
  - 6 REDSTONE
  - 7 STEWARTS POINT
  - 8 ROGERS SPRING/BLUE POINT SPRING AREA
  - 9 DETRITAL BAY
  - 10 GREGG'S HIDEOUT



**PROPOSED ACTION**  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
 ARIZONA - NEVADA  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE



During preparation of this document, considerable discussion occurred on the level (100-year versus probable maximum) and type (structural versus nonstructural) of flood mitigation which should be provided for those areas subject to flash-flood hazard. NPS guidelines specify protection against the probable maximum flood within flash-flood hazard areas.

Several possible methods for mitigation are presented in the alternatives. Other structural flood mitigation methods considered during planning, but rejected, can be found in appendix F.

All flood mitigation methods discussed in this document were developed within NPS guidelines for compliance with Executive Order 11988, "Floodplain Management". The intent of the executive order is to reduce loss of life and property resulting from floods. Consistent with these guidelines, the National Park Service has developed the following objectives (listed in priority order) for floodplain management: protect life, allow existing visitor use areas to remain open to the public wherever possible, and protect property.

To achieve these objectives and to comply with the intent of the guidelines, all proposed flood mitigation plans would need to be phased over the next five years. The first phase of this plan would be to implement certain nonstructural (not requiring major construction) mitigation measures that are applicable to all developed areas having flood hazards regardless of alternative selection. These nonstructural measures include the following:

Education and information activities: People would be made aware of a flood hazard and be provided information about coping with the threat. These activities would include erecting warning signs, posting notices, distributing pamphlets, presenting information at public meetings, and distributing inundated area maps. Education and information activities are applicable nonstructural measures at all developed areas having a flood hazard, regardless of other measures that might be considered or implemented, excepting total relocation.

Flood warning systems: People would be given notice of an impending flood so that they could protect themselves and their property. These systems would include provisions for early identification of an impending flood; analysis of the magnitude, severity, and potential impact of an impending flood; and dissemination of appropriate warnings to parties likely to be affected by an impending flood. (Two developed areas, Willow Beach and Cottonwood Cove, already have warning systems in operation).

Evacuation planning and emergency preparedness: Arrangements would be made for evacuation of endangered areas when a flood is anticipated and other emergency preparedness actions. These arrangements would consist of assignments of responsibility for various actions, provision of transportation or other assistance to evacuees, traffic control, and opening and operation of shelters to provide refuge in flood-safe areas. Evacuation planning for developed areas at Lake Mead is influenced by two factors. First,

flooding can occur very quickly; therefore, 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.

The proposed action would mitigate adverse effects of a 100-year flood with structural means, and adverse effects of floods above the 100-year level would be mitigated by using the warning system packages and relocation of facilities in some areas. In the rare cases where flooding is above the 100-year level, property in the floodplain would be vulnerable to flood damage, and visitor safety would depend on the warning system packages. See appendix H for further details regarding compliance with Executive Order 11988.

### Management Zoning

Definition of Management Zones. Table 4 provides definitions, examples of activities and development permitted in each zone, and the management strategy for each zone. These definitions are applicable for alternatives A, B, and the proposed action; the no-action alternative varies from the definitions. The acreages and percentages of each zone are presented in table 5 for easy comparison among alternatives. Lands containing nonfederal mineral rights might occur in any of the management zones. When this occurs, the National Park Service would manage the surface of those lands according to the surrounding zoning category, subject to the exercise of the nonfederal right.

Several of the zones or subzones are fixed by their definition (see table 3) and do not change among alternatives. This condition is applicable for the historic/archeological zone, reservoir subzone, nonfederal lands subzone, and Bureau of Reclamation project lands subzone. The development zone changes very little among alternatives. Mineral leasing is prohibited in all of these zones and subzones. The significant differences among the alternatives are found in the natural zone and resource utilization subzone.

Development of Management Zoning Criteria. The intent of Congress for management of Lake Mead NRA is stated in the act establishing the area (PL 88-639). The act states that Lake Mead NRA shall be administered for the general purposes of public recreation, benefit, and use in a manner that will preserve, develop, and enhance the recreation potential, and the scenic, historic, scientific, and other important features.

The act also permits other activities within the NRA subject to regulation, provided that they are not inconsistent with either the recreational use or the primary use of the area withdrawn for reclamation. These permitted activities are general recreational use (such as bathing, boating, camping, and picnicking), grazing, mineral leasing, vacation cabin site use, trapping, hunting, and fishing.

Table 4: Definition of Management Zones

Management Zone	Definitions	Management Strategy	Development Permitted	Examples of Permitted Activities		
				Recreational	Nonrecreational	Comments
Natural	<p>The <u>environmental protection subzone</u> emphasizes perpetuation of geological or ecological features. Features are protected because they are rare, fragile, unique, or otherwise significant, and they include such things as threatened/endangered species habitat and desert bighorn range.</p> <p>The <u>outstanding natural feature subzone</u> emphasizes appreciation and perpetuation of geological or ecological features possessing unusual intrinsic or scenic value. Included within this subzone are features such as Bowl of Fire, Iceberg Canyon, Newberry Mountains, and Fortification Hill/Paint Pots.</p> <p>The <u>natural environment subzone</u> emphasizes conservation of natural resources and provision of environmentally compatible recreational activities. This subzone contains lands possessing natural values that are not within one of the other two subzones just discussed and is open to grazing.</p>	<p>Maintenance of isolation and natural processes. Consumption of renewable resources subject to protection of recreational, natural, and wilderness resource values where applicable.</p> <p>Restoration of natural resources when mandated by law or deemed appropriate by professional analysis.</p>	<p>Management facilities necessary for the preservation and enjoyment of recreational values only when not in conflict with wilderness areas and species protection mandated by the Endangered Species Act as amended. Management facilities and practices necessary to sustain grazing limited to minimum management tool.</p>	<p>Hunting, hiking, camping, picnicking, horseback riding, backpacking, riding trailbikes and dunebuggies on approved roads, scenic touring by auto or four-wheel-drive vehicles on approved roads.</p>	<p>Grazing only when not in conflict with system/species protection mandated by the Endangered Species Act, as amended.</p>	<p>Examples are not all-inclusive. Grazing may be subsequently prohibited in certain areas identified in the <u>Resources Management Plan</u> or only when not in conflict with system/species protection mandated by the Endangered Species Act as amended. Recreational uses of motorized equipment allowed only on approved roads. Motorized equipment permitted where it constitutes a "minimum management tool." Mineral leasing not allowed.</p>
Historic/ Archeological	<p><u>No subzones.</u> This zone emphasizes preservation, protection, and interpretation of cultural resources and their settings.</p>	<p>Protection and preservation. Restoration where deemed appropriate by professional analysis. Interpretation.</p>	<p>Access to the cultural resources. Trails for confining and containing use. Protective enclosures. Interpretive facilities.</p>	<p>Interpretation of historic and archeological features; hiking and backpacking.</p>	<p>Scholarly study, grazing.</p>	<p>Examples not all-inclusive. Grazing and agriculture may be permitted. Mineral leasing not allowed.</p>
Development	<p><u>No subzones.</u> This zone contains development that serves the needs of park management and visitors. These areas have been substantially altered to accommodate development.</p>	<p>Maintenance of the facilities. Provision of visitor services.</p>	<p>Approved roads and permanent structures necessary to support recreational activities.</p>	<p>Bicycling, picnicking, horseback riding, swimming, fishing, trailer and motorhome camping, arts and crafts activities, outdoor resort activities, interpretive programs.</p>	<p>Grazing</p>	<p>Examples are not all-inclusive. Grazing prohibited in the developed areas within the development zone. Mineral leasing not allowed. Vehicle use restricted to approved roads.</p>
Special Use	<p>The <u>reservoir subzone</u> includes all waters impounded behind Davis and Hoover dams. NPS management is limited to recreational use only; these waters are also managed by the Bureau of Reclamation for flood control, state and international commitments of water, irrigation, and power generation.</p> <p>The <u>nonfederal lands subzone</u> includes nonfederal public lands in the recreation area, which are managed as open space by the owner or used by the owner for development purposes. This subzone also includes those lands encumbered by patented mining claims which may be subject to future mining activity.</p> <p>The <u>resource utilization subzone</u> is intended to show which lands the National Park Service considers suitable for possible prospecting or mineral leasing. This is the only subzone where mineral leasing and development is permitted. This subzone will be discussed in greater detail in the minerals management plan, which will be prepared following finalization of the GMP. Some lands that are under existing mineral leases are not shown in this subzone, as it is the intent of the National Park Service to manage those lands according to the surrounding management zone once the current lease expires.</p> <p>The <u>Bureau of Reclamation project lands subzone</u> includes Hoover and Davis dams and associated structures. These lands were excluded from the recreation area by the establishing act of October 8, 1964, and they are managed by the Bureau of Reclamation for facilities to generate and transmit electricity, store water and regulate its flow downstream, and maintain and operate those facilities.</p> <p>The <u>utilities subzone</u> includes these corridors used for aerial transmission lines, managed rights-of-way for underground utilities, pumping stations, storage facilities, and similar developments operated primarily or exclusively to provide service to areas outside the park.</p>	<p>Maintenance of natural processes. Enhancement of fish and game populations. Consumption of renewable and nonrenewable resources subject to protection of recreational values. Land uses carried out by other government agencies or private interests. NPS administrative control may be limited, depending on the land use right.</p>	<p>Same as for the natural management zone, except in certain subzones it includes mining facilities, utility lines, Bureau of Reclamation dams and associated structures, primitive trailhead facilities (such as parking and sanitary devices), and improved access points (parking, camping, launch ramps, and sanitary devices).</p>	<p>Same as natural management zone but includes bicycling, waterskiing, fishing, sailboating, houseboat touring, river rafting, and shoreline camping.</p>	<p>Mineral exploration and development (only in the resource utilization subzone), grazing (except as prohibited in reclamation project lands subzone and reservoir subzone), utility installations and corridors, and management of Bureau of Reclamation dams and utility structures.</p>	<p>Grazing may be prohibited in certain areas identified in the <u>Resources Management Plan</u>. The reservoir subzone includes exposed shoreline and reservoir surfaces below the 1,230-foot elevation for Lake Mead, 650-foot elevation for Lake Mohave, and 300-foot setback from this high waterline retained by the Bureau of Reclamation.</p>

Table 5: Acreages of Management Zones

	No-Action Alternative		Alternative A		Alternative B		Proposed Action	
	Acreage	Percentage	Acreage	Percentage	Acreage	Percentage	Acreage	Percentage
<u>Natural Zone</u>								
Environmental Protection Subzone	71,735	5	317,930	21	317,930	21	317,930	21
Outstanding Natural Feature Subzone	66,590	4	51,580	3	51,580	3	51,580	3
Natural Environment Subzone	1,062,125	71	779,390	53	508,940	34	680,520	46
Zone Total	<u>1,200,450</u>	<u>80</u>	<u>1,148,900</u>	<u>77</u>	<u>878,450</u>	<u>58</u>	<u>1,050,030</u>	<u>70</u>
<u>Historic/Archeological Zone</u>	<u>51,280</u>	<u>3</u>	<u>51,280</u>	<u>3</u>	<u>51,280</u>	<u>3</u>	<u>51,280</u>	<u>3</u>
<u>Development Zone*</u>	<u>7,330</u>	<u>1</u>	<u>7,330</u>	<u>1</u>	<u>8,780</u>	<u>1</u>	<u>8,780</u>	<u>1</u>
<u>Special Use Zone</u>								
Resource Utilization Subzone**	---	---	51,550	3	320,550	22	148,970	10
Other Special Use Subzones*	31,915	3	31,915	3	31,915	3	31,915	3
Reservoir Subzone*	191,500	13	191,500	13	191,500	13	191,500	13
Zone Total	<u>223,415</u>	<u>16</u>	<u>274,965</u>	<u>19</u>	<u>543,965</u>	<u>38</u>	<u>372,385</u>	<u>26</u>
<u>Recreation Area Total</u>	<u>1,482,475</u>	<u>100</u>	<u>1,482,475</u>	<u>100</u>	<u>1,482,475</u>	<u>100</u>	<u>1,482,475</u>	<u>100</u>

\* Lands excluded from % acreage calculations because the land uses do not change among alternatives.

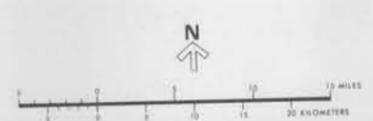
\*\*There is no resource utilization subzone in the no-action alternative, but mineral leasing may be considered in parts or all of most zones (78% of NRA). Decisions on whether to lease or not are made on a case-by-case basis. Areas closed to mineral leasing are identified on the Mineral Leasing Excepted Areas map and do not relate to management zones in the no-action alternative.



ACREAGE	NATURAL ZONE
317,930	* ENVIRONMENTAL PROTECTION SUBZONE
51,580	OUTSTANDING NATURAL FEATURE SUBZONE
680,520	NATURAL ENVIRONMENT SUBZONE
51,280	HISTORIC/ARCHEOLOGICAL ZONE
<b>DEVELOPMENT ZONE</b>	
8,780	DEVELOPMENT SUBZONE
	ACCESS SUBZONE (Not shown, but roads shown on the alternative maps and Approved Roads map.)
<b>SPECIAL USE ZONE</b>	
191,500	RESERVOIR SUBZONE
5,030	BUREAU OF RECLAMATION PROJECT LANDS SUBZONE
14,090	NONFEDERAL LANDS SUBZONE
148,970	RESOURCE UTILIZATION SUBZONE *
12,795	UTILITY CORRIDOR SUBZONE

\* Mineral leasing is only permitted in the resource utilization subzone

Numbered areas 1-60A are described in the table entitled Management Zoning explanation



**PROPOSED ACTION  
MANAGEMENT ZONING**  
(PROPOSED LAND USE)  
**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA  
UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



To protect the features mentioned in the establishing act and to allow the permitted activities to occur without being inconsistent with those features, certain management zoning criteria were developed. These criteria are directly linked to the legislation and were consistently applied to all NRA lands so that they could be placed in the appropriate zone or subzone.

The management zoning criteria were defined as follows:

- (1) Recreation Potential -- Lands important to provide for visitor use and visitor safety and to fulfill visitor expectations.

To help determine those lands most important to visitor use, the results of a visitor use survey were reviewed. This survey was distributed to approximately 6,000 visitors in the NRA during 1978 and 1979. Approximately 1600 of these mailback surveys were completed and returned to the National Park Service. One survey question asked respondents to check from a list of 18, all the activities they engaged in while visiting the NRA. The following activities were most frequently checked by the 1600 respondents:

Relaxing	97%
Scenic viewing	93%
Swimming	89%
Camping	80%
Picnicking	77%
Walking/Hiking	76%
Motorboating	76%
Photography	73%
Fishing	70%

Lands providing opportunities for or support of these activities were considered important for visitor use and to fulfill visitor expectations. Such lands would include developed areas and access routes that were zoned development; the lake which was zoned special use; the shoreline of the lake, popular coves, and backcountry use areas which were zoned natural environment; and important scenic features which were zoned natural environment or outstanding natural features. Lands that were heavily used such as popular access routes, developed areas, coves, and the lake were also considered important for visitor safety.

- (2) Scenic Features -- Lands of outstanding natural beauty or lands important for preserving the scenic viewing opportunities in the NRA. Lands of outstanding natural beauty were zoned outstanding natural features. Other lands which were important to preserve the scenic viewing opportunities in the NRA were zoned natural environment. These lands include the foreground and background of an outstanding natural feature and views from the lake, major developed areas, and access routes.

- (3) Historic Features -- Lands containing identified historic and archeological sites. To adequately protect these sites, the entire section (640 acres) around the site was zoned historic/archeological. Although other activities might occur in this small zone, they must be compatible with the larger zone surrounding the historic zone.
- (4) Scientific and Other Important Features -- Lands important for the preservation of unique geologic features and natural ecosystems. These lands were zoned either natural environment, environmental protection, or outstanding natural feature. They include areas of identified rare, threatened, endangered, endemic, or protected plant and wildlife species populations or habitat; important natural areas such as springs and seeps; and areas important for the welfare of desert bighorn. This latter category is particularly important because the NRA has the most productive desert bighorn herds in Nevada.

Lands not meeting any of the above criteria were placed in the special use zone. Those lands important for Bureau of Reclamation or power transmission were placed in the Bureau of Reclamation project lands subzone or utility corridor subzones of this zone. Lands not owned by the federal government were placed in the nonfederal lands subzone. Lands that did not meet any of the management zoning criteria or were not placed in the above three subzones were placed in the resource utilization subzone of the special use zone. Resource development such as mineral leasing could occur within this subzone without damaging the features that the NRA was set up to protect.

After all lands within the NRA were zoned, each zone was re-examined to determine whether or not any of the permitted activities listed in the legislation could occur in that zone. Table 6 summarizes the results of this analysis by showing which zones or subzones would allow a particular activity to occur under the proposed action. Permitted activities would only be allowed in a particular zone if they did not conflict with the protection objective the zone was set up for. In some cases all of a zone would be open to a particular permitted activity, for example general recreation in the natural environment subzone of the natural zone. In other cases such as the environmental protection subzone of the natural zone, general recreation would need to be restricted from certain portions of the subzone to protect scientific or other important features such as endangered species populations.

Table 7 identifies the reasons each of the numbered land areas on the Proposed Action-Management Zoning map was placed in that zone.

Table 6: Activities Permitted in Management Zones under Proposed Action

<u>Zone</u>	<u>General Recreation</u>	<u>Grazing</u>	<u>Mineral Leasing</u>	<u>Vacation Cabins</u>
<u>Natural</u>				
Env. Prot. (4)	X*	X*		
Out. Nat. (2)	X*	X*		
Nat. Env. (1,2)	X	X		
Hist./Arch. (3)	X*	X*		
Development (1)	X	X*		X
<u>Special Use</u>				
Reservoir (1,2)	X			
Bur Rec Project Lands	X*			
Nonfederal Lands		X		X
Resource Utilization	X	X	X	
Utility	X*	X		

Note: Numbers in parentheses indicate the number of the management zoning criteria which most applies to that zone. Under the proposed action, scenic features take precedence, and the management zoning criteria are applied to NRA lands so that whole natural features are preserved. Management zoning in the proposed action (see Proposed Management Zoning map) includes existing and proposed developments and roads in the development zone. Historic and archeological sites are in the historic/archeological zone. This zone intentionally follows section lines and is larger than the cultural resource sites so that the irreplaceable cultural resources are protected by not precisely revealing their location.

\*Permitted activities would be allowed in areas of these zones where they did not conflict with the protection objective of the zone.

### Natural Resources Management

A Resources Management Plan (RMP) and Environmental Assessment were completed for Lake Mead in 1975. The RMP lists and discusses projects that need to be accomplished. The implementation program is revised as needed. The latest revision of the program for natural resources was completed in 1985 and the latest for cultural resources was completed in 1982. The RMP and its latest programs guide resource management for the recreation area. Only illegal vehicle use off approved roads and minerals management require additional attention in the GMP, and these issues are addressed separately.

The goal of the existing natural resources management plan and program is to provide a quality visitor experience in a manner that would preserve and protect the significant natural resources of the recreation area. Most of the resource management issues are fully addressed by the Resources Management Plan and Environmental Assessment. A description of how the Resources Management Plan addresses the major natural resource issues is presented under the "Summary of RMP Proposals" section.

Table 7: Proposed Action Management Zoning Explanation

Area*	Zoning Criteria**	Zone	Rationale
1	2	Natural environment	Protection of scenic quality, backdrop for developed area, view from access road
2	-	Bureau of Reclamation project lands	Primary purpose of area
3	2,3	Natural environment	Protection of view from major access road, archeological sites
4	2,3	Natural environment	Protection of view of rugged terrain from lake, developed area, and major access road, Homestake Mine
5	4,2,1	Environmental protection	Important bighorn sheep area, includes Pipe Spring and several smaller springs important to wildlife, northernmost occurrence of smoke trees ( <u>Dalea spinosa</u> ) in Nevada and only stand in the NRA, popular backcountry use area, protection of views from Lake Mohave and Christmas Tree Pass Road
6	2,1,4,3	Outstanding natural feature	Newberry Mts., unique and scenic geologic formations, popular backcountry use area, protection of views from lake and Christmas Tree Pass scenic touring road; petroglyphs; includes several major springs--willow, upper grapevine, Dripping and Bridge Canyon which are important to wildlife and as bird nesting areas
7	-	Resource utilization	Gently sloping drainages and alluvial fans, remote from lake, powerline determines boundary for management efficiency
8	2	Natural environment	Protection of views from lake
9	4	Environmental protection	Unique dense stand of teddy bear cholla cactus
10	2	Natural environment	Scenic views from the lake, foreground of Black Mountain and Copper Mountain, includes Opal Mountain
11	-	Resource utilization	Gradually sloping outwash area partially hidden from lake by Opal Mountain, existing mining active in this area
11A	4	Environmental protection	Aztec Spring
12	4,2	Environmental protection	Important desert bighorn range, rugged terrain of outstanding scenic quality
13	2,4,1	Outstanding natural feature	Area of outstanding scenic quality, includes rugged cliffs of the Black Canyon of the Colorado River which provide unique geologic and significant scenic values and winter habitat for bald eagles and habitat for rare plant species <u>Opuntia basilaris</u> var. <u>treleasei</u> ; several popular hot and warm water springs; and river recreation corridor
14	4	Environmental protection	Gila monster habitat
15	-	Resource utilization	Gently sloping, highly dissected outwash terrain, mineral activity would not be visible from lake

\*Keyed to Proposed Action Management Zoning map

\*\*Keyed to text, under Development of Management Zoning Criteria.

- (1) Recreation potential
- (2) Scenic features
- (3) Historic features
- (4) Scientific or other important features

<u>Area</u>	<u>Zoning Criteria</u>	<u>Zone</u>	<u>Rationale</u>
16	2	Natural environment	Protection of scenic views from the lake, developed area (Cottonwood), and existing (Six-Mile) and proposed (Lower Mohave East) improved access points; scenic foreground to the Black Mountains
17	-	Resource utilization	Not visible from lake
18	4	Environmental protection	Wintering bald eagle habitat and habitat for rare plant species <u>Penstemon bicolor</u> ssp. <u>roseus</u>
19	4	Environmental protection	Palo verde ( <u>Cercidium</u> sp.) forest - northernmost natural occurrence of palo verde trees in the United States and only stand in the NRA
20	2	Outstanding natural feature	Fire Mountain area - unique and scenic geologic formations of volcanic origin permeated by very colorful andesitic flows which form scenic backdrop for proposed Fire Mountain developed area
21	2	Natural environment	Protection of scenic views of very rugged terrain from lake and Willow Beach access road, area includes Malpais Flattop Mesa
22	-	Resource utilization	Area of gently sloping terrain hidden from view by lake and major access roads
23	4,2	Environmental protection	Scenic, rugged terrain, important desert bighorn and wintering bald eagle habitat
24	-	Resource utilization	Not visible from lake, although close to visitor access road, major views are to the lake on opposite side of the road
25	2	Natural environment	Protection of view corridor to lake and Black Canyon from major road; protection of view on both sides as the road enters the canyon
26	2,3	Outstanding natural feature	Fortification Hill, paintpots - unique and scenic geologic examples of volcanic activity and erosion
27	4,2	Environmental protection	Black Mountains, habitat and springs, important desert bighorn habitat, protection of scenic views from lake and Boulder Beach
28	2	Natural environment	Detrital Valley - gradually sloping terrain - protection of views from lake and major visitor access road to Temple Bar
29	4,2	Environmental protection	Gypsum beds - unique and scenic crystalline gypsum formations and wintering bald eagle habitat and habitat for rare plant species <u>Arctomecon californica</u> ; scenic views from lake
30	2	Natural environment	White Hills - protection of scenic views from lake and major visitor access road to Temple Bar
31	2	Natural environment	Protection of scenic views from lake and major visitor access road to Temple Bar
31A	4	Environmental protection	Salt Springs and Burro Spring
32	-	Resource utilization	White Hills/Hualapai Wash - rolling hills, outwash terrain, with some evidence of recent mining activity; hidden from view of lake and major visitor access roads
32A	2	Natural environment	If the Spring Canyon pumped-back storage site is approved, management zoning in this area would be changed to Bureau of Reclamation project lands subzone of the special use zone

Area	Zoning Criteria	Zone	Rationale
33	2	Natural environment	Grapevine Mesa - Protection of scenic views of lake and visitor access road to South Cove/ Pearce Ferry
34	4,2	Environmental protection	Important desert bighorn habitat, protection of scenic views of rugged terrain from the lake
35	-	Nonfederal lands	Meadview - existing private development
36	2,4	Natural environment	Grapevine Mesa - scenic backdrop for Pearce Ferry, foreground to the Grand Wash Cliffs, protection of scenic views from visitor access road to South Cove/ Pearce Ferry
36A	4	Environmental protection	Grapevine Spring, an important bird nesting spring
37	2	Outstanding natural feature	Iceberg Canyon - unique and scenic geologic formation demonstrating tilting and unique distribution of ocotillo cactus
38	2	Natural environment	Protection of views from the lake, Pearce Ferry improved access point, and the entrance to the Grand Canyon
38A	4	Environmental protection	Tassi Spring
39	3,2	Historic/archeological	Grand Wash archeological district, protection of scenic views from the lake
40	-	Resource utilization	Area hidden from view of lake and major developed areas
41	-	Resource utilization	Area hidden from view of lake and major developed areas
42	2	Natural environment	Protection of views from the lake and developed areas and improved access points along the Overton Arm and Gregg and Virgin basins
43	4,2	Environmental protection	Habitat for rare plant species <u>Astragalus geyeri</u> var. <u>triquetrus</u> and potential habitat for rare plant species <u>Arctomecon californica</u> ; protection of scenic views from the lake and Overton Beach developed area
44	2	Natural environment	Protection of scenic views from lake and Overton Beach developed area
45	4	Environmental protection	Overton wildlife management area and surrounding lands - protected aquatic habitat area managed by the state of Nevada; habitat for two rare plant species <u>Eriogonum viscidulum</u> and <u>Astragalus geyeri</u> var. <u>triquetrus</u>
46	2	Natural environment	Protection of views from lake and major visitor access roads, bounded by Valley of Fire State Park to the west
47	4,2,1	Environmental protection	Important gila monster habitat and habitat for two rare plant species <u>Eriogonum viscidulum</u> and <u>Arctomecon californica</u> , also contains Rogers/Bluepoint springs - unique and popular warm water springs, protection of view corridor from major scenic touring road (Northshore Road)

<u>Area</u>	<u>Zoning Criteria</u>	<u>Zone</u>	<u>Rationale</u>
48	4,2	Environmental protection	Stewarts Point area - unique salt deposits, close to the surface or exposed, and habitat for rare plant species <u>Arctomecon californica</u> ; protection of scenic views from the lake
49	2	Natural environment	Protection of view from Northshore Road, a major scenic touring road
50	2,1	Outstanding natural feature	Redstone - unique and scenic geologic formation of aztec sandstone (similar to geology of Valley of Fire State Park) in view from Northshore Road, popular visitor use area
51	4,2	Environmental Protection	Black Mountains - important desert bighorn habitat and habitat for rare plant species <u>Arctomecon californica</u> ; rugged terrain forms scenic backdrop to the lake
52	2	Outstanding natural feature	Pinto Valley - unique and scenic geologic mix of smooth aztec sandstone and jagged granite outcrops demonstrating the mountain building geologic process of tilting
53	2	Outstanding natural feature	Boulder Canyon - area of outstanding scenic quality, includes steep rugged cliffs
54	2,1	Natural environment	Rugged terrain visible from the Northshore Road, a major scenic touring road, high visitor use area
55	4,2	Environmental protection	Habitat and potential habitat for rare plant species <u>Arctomecon californica</u> , protection of scenic views from Northshore Road
56	2,1	Natural environment	Heavy visitor use area, forms scenic backdrop from lake and roads
57	4,2	Environmental protection	Important desert bighorn habitat, habitat for rare plant species <u>Arctomecon californica</u> and <u>Penstemon bicolor</u> ssp. <u>roseus</u> , protection of views from lake and Lakeshore Road, a major visitor use road
58	4,2	Environmental protection	Twin Point, Shivwits Plateau - a roadless point on the Grand Canyon rim permitting spectacular view of the Grand Canyon, habitat for rare plant species <u>Rosa stellata</u>
58A	4	Environmental protection	Twin Spring
59	2	Natural environment	Kelly Point, Shivwits Plateau - a primitive road leads to the edge of the Grand Canyon with spectacular views, whole area is very forested and very remote
59A	4	Environmental protection	Ambush Water Pocket
60	2,3	Natural environment	Parashant, Andrus, and Whitmore canyons are precipitous side canyons of significant grandeur that drain into the Grand Canyon. The entire area is undeveloped and provides an opportunity for solitude or a primitive and unconfined type of recreation. 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.
60A	4	Environmental protection	Includes the following springs: Dripping, Lost, Cupe Seep, Frog, Cedar, Middle, and End. All springs on the Shivwits Plateau and in the canyon areas are small but important to wildlife because water is scarce.

Summary of RMP Proposals. Fishing is one of the most important recreational uses within the recreation area. Several species of game fish have been introduced into Lakes Mead and Mohave. The aquatic resources of these lakes would continue to be managed for sport fishery values in cooperation with the states of Nevada and Arizona and the U.S. Fish and Wildlife Service. Pollution sources and their effects on aquatic resources would continue to be monitored.

Hunting and trapping are permitted within the recreation area under the regulations imposed by the respective states. Several game species exist in the recreation area, including desert bighorn in mountainous terrain and mule deer on the Shivwits Plateau. Management of these species would require the planning and action by both states, the U.S. Fish and Wildlife Service, the National Park Service, and other agencies with jurisdiction over adjacent lands. Mutual efforts would continue to maximize these valuable resources through respective regulatory and habitat responsibilities.

Tamarisk is a nonnative plant species in the recreation area which has negative effects on visitors and the environment. The plant would continue to be controlled in areas where it competes with wildlife for scarce water at isolated water sources. Tamarisk also competes with visitors for usable beach space along the lakes; however, there is a fine line between when the plant is a nuisance and when it provides desirable shade for visitors and escape cover for fish. The situation would continue to be studied, with experiments conducted to determine the most successful and environmentally safe control measures. In cooperation with both state fish and game divisions, test locations would be used to control tamarisk and to find the point at which it is beneficial to visitors and the environment. The Bureau of Reclamation is also interested in tamarisk control studies because of the plants' evapotranspiration rate and their effect on water storage capability.

The National Park Service has a cooperative agreement with the Bureau of Land Management to control feral burro populations that compete with native species, notably bighorn sheep, for food and water. A study of bighorn sheep ecology is underway so their competition with burros can be better understood. Mechanical, nonpolluting, and nontoxic methods to control puncture vine and mosquitos would continue to be applied to reduce the inconvenience, discomfort, and possible health hazards these species present to visitors.

One of the most popular activities at Lake Mead is beach camping in the remote coves, and the effects of this use can be detrimental to the environment and to the quality of the visitor experience. Even though camping occurs in a zone virtually cleansed yearly by fluctuating water levels, the short-term accumulation of trash and the longer-term effects of human waste on water quality can be objectionable or even a health hazard. An improved trash and sanitation cleanup program is underway, which includes additional personnel and equipment on both lakes. Voluntary efforts by local groups would always be encouraged. Water quality monitoring in heavily used areas would continue.

Clean air and water are two of the most outstanding resources of Lake Mead, and every effort to protect them will be made. In cooperation with the Environmental Protection Agency (EPA) and applicable state agencies, an inventory of the water quality within the recreation area has recently been completed. With this baseline data, a program to regularly monitor water quality would be initiated to detect degradation should it occur. This monitoring program is clearly defined in the "Shoreline Pollution" section under the proposed action. Lake Mead NRA is designated as a class II area per standards established in the Clean Air Act. Threats to air quality exist within the park, there are a number of outside sources that could affect the Lake Mead airshed. With the cooperation of the Desert Research Institute, the effects of the Mohave generating station near Katherine Landing would continue to be monitored. Monitoring equipment has been installed in the Boulder Basin to study the effects of Las Vegas pollution that drains into the basin. In cooperation with EPA and state agencies, equipment would be installed at strategic locations throughout the recreation area. Baseline data would be established, and monitoring would continue to detect the degradation in air quality.

Wildfire is not a major problem in the recreation area, with the exception of the Shivwits Plateau. The NRA would continue to staff a seasonal fire watch camp on the plateau and participate in a fire management plan with the Bureau of Land Management. Generally, natural fires would be allowed to burn unless they present a threat of loss of life or property or where they threaten to spread to other public or private lands where fire management agreements are not in effect.

The National Park Service would continue to cooperate with the U.S. Fish and Wildlife Service (FWS), Bureau of Reclamation, Arizona Department of Game and Fish, Nevada Department of Wildlife, University of Nevada at Las Vegas (UNLV), and the Colorado River Fishes Recovery Team to protect and study the endangered species that exist in the recreation area as funding permits. Support for existing projects such as the Devils Hole pupfish refugium and bonytail chub recovery team studies would continue to the extent possible. The National Park Service would encourage studies by UNLV students through the cooperative park studies unit at the university. One such study in the past surveyed the recreation area for plant species that might be nominated to the official FWS threatened or endangered species list and found several candidates, although none have been placed on the list. Because bald eagles wintering in the park have noticeably increased in the past few years, Lake Mead NRA would request funds to survey roosting and perch sites and to study the habits of the eagles in the recreation area to prevent impacts from visitor use and development. The National Park Service would initiate studies of all rare plant and animal species to accurately identify their existing ranges and to determine their habitat requirements and potential/suitable habitat in the recreation area. There are no other endangered species programs proposed at this time. However, as new information becomes available or threats to species occur, the National Park Service would initiate the appropriate studies or actions.

Grazing is a consumptive resource use permitted in the recreation area by the enabling legislation. It can affect the environment and the quality of the recreational experience at Lake Mead. Grazing is administered and monitored by a cooperative agreement between the Bureau of Land Management and the National Park Service. Although 80 percent of the recreation area's land base is subject to livestock grazing under leases issued by the Bureau of Land Management, only a small portion is usable because of limited water and forage. Grazing pressure is heaviest around stock tanks and areas with relatively flat terrain, where access is available over established roadways. If overgrazing and resulting resource degradation occurred, appropriate management actions would be initiated (such as area closures). Studies would be implemented to determine if grazing is having a negative impact on threatened, endangered, or candidate plant or animal species.

Illegal Vehicle Use Off Approved Roads. The use of vehicles (four-wheel-drives, dune buggies, high clearance vehicles, and motorcycles) is one of many recognized recreational uses within Lake Mead NRA. To provide for this use, the park has established over 300 miles of approved dirt roads throughout the recreation area. Included in this category of unimproved roads are those passable with high clearance two-wheel-drive vehicles, four-wheel-drive only roads, and roads that would test the skills of even the experienced enthusiast. The majority of these roads provide access to the lake (on the average, one road reaches the shoreline every 9.7 miles). Vehicle use on anything other than approved roads is not and would not be permitted.

There are many reasons for restricting off-road use. The National Park Service is required by federal law and presidential executive order to apply established criteria for vehicle use on public land. The factors to be considered include resource protection, public safety, minimization of use conflicts, and protection of aesthetic or scenic values. The existing vehicular use program at the NRA complies with all laws and policies. The environmental damage of indiscriminate vehicle use should be obvious, but there seems to be a segment of the population that has serious misconceptions about the fragile nature of the desert. The destruction of plant and animal life, the scarring of the natural landscape, the distortion of soil characteristics, and the disturbance of ecosystems are but a few of the environmental problems associated with off-road travel. The impacts of these problems have been well documented. The legislation that created the recreation area generally provides that a use is appropriate as long as it does not infringe on the rights and expectations of other legitimate uses. The legislation also generally provides that the National Park Service should provide for a quality recreational experience. Two of the most important elements of a quality experience for many visitors to Lake Mead NRA are the quiet solitude and vast expanses of unspoiled landscape. Even though the recreation area encompasses an extremely large area, at the current growth rate of illegal vehicle use these elements are in jeopardy.

There are two distinct types of illegal travel. The first type involves visitors in vehicles that cross the desert for the primary purpose of

exploring new terrain, testing skills and machinery, or just "spinning the tires" in the dirt. This group is definitely in the minority, yet the resulting resource damage is the most destructive. The second type of user has the primary motivation of using a vehicle to gain land access to the lakeshore in an area that is not heavily used. Unfortunately, at the end of most approved roads there is limited camping or beach space. After driving several miles on a dirt road only to find someone already using the beach, this second group of users begins establishing illegal spur roads over the ridge to the next cove. As a result, the closer an approved road gets to the water the more illegal branches develop. This does not imply that there are not enough approved roads, but that there is not enough usable shoreline at the terminus of the roads. Part of the problem is that past planning and development in the NRA emphasized provisions for the boat-owning segment of visitors who have unlimited access around the lakes and leave no tracks. Provisions for land-based visitors have been limited. The plan proposes a positive approach to getting all people to the water in an environmentally sound manner that does not conflict with other uses.

To date, law enforcement, information, and physical barricades have been the primary tools for controlling illegal travel, but none has been successful. The ranger staff is far too limited to adequately deal with the problem. Information and signs are usually ignored by users who are intent on activities that are illegal. Signs are frequently torn down. Also, in order for the ranger to apprehend the violator he often has to follow the same illegal path, which only compounds the resource damage the National Park Service is trying to avoid. Due to the open terrain around the lakes, the dust from the ranger vehicle is quickly spotted and escape is easy. Attempts in the past to physically barricade an unapproved road with mounds or ditches have only provided new challenges to illegal vehicle use. They either go over, through, or around the obstacle.

About 350 acres of roads and tracks have been established by illegal vehicle use in recent years, and an additional 30 to 40 acres are added each year. The Resource Damage map shows what areas around the recreation area are being damaged. Table 8 is keyed to this map and identifies by number the characteristics of areas that have been damaged.

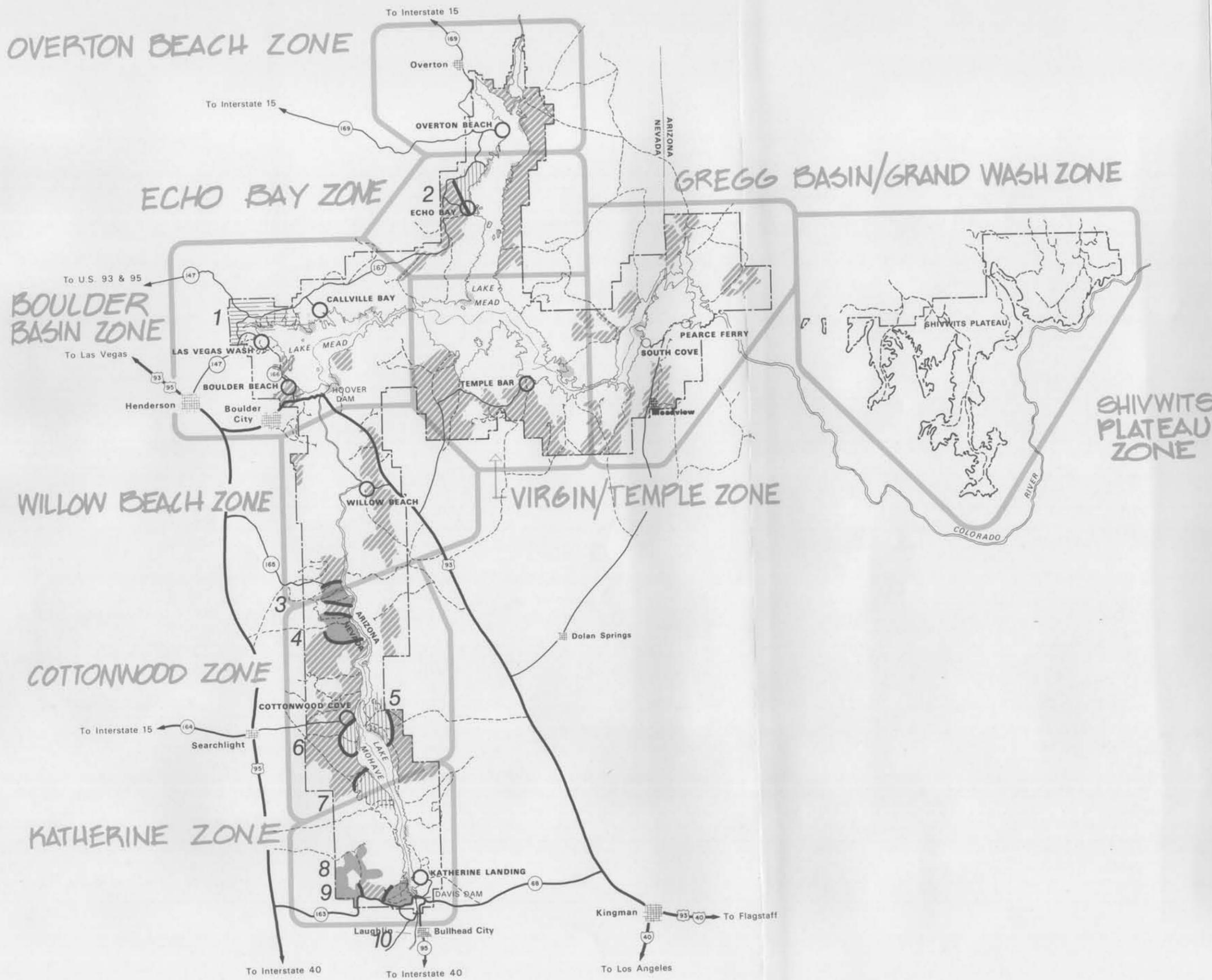
Enforcement of regulations would not be curtailed at Lake Mead NRA. However, in an attempt to assist the rangers in performing their duty and to facilitate visitors gaining overland access to the water, a new system of identifying approved roads has been established in the field and on a revised Approved Roads map. The Approved Roads map shows roads from start to finish, limited topography, and identifiable landmarks. These roads (shown on the Resource Damage map) are the only roads approved for visitor use within the NRA. The numbered road marking system identifies the correct road at all intersections so that visitors may get to the desired destination, thus reducing the potential for illegal cross-country travel. The road marking system is also used to clearly demarcate roads that are open to vehicles. All roads, routes, or trails that are not marked as open are closed to all vehicles. Using this marking system, vehicle users that see vehicle tracks across the desert

know they should not follow the tracks because they are not appropriately marked. Illegal and environmentally destructive vehicle use is also a focus of an improved public information and interpretation effort. Overall, by numbering and marking open routes, much existing confusion has been eliminated and only the intentional law violator is found in areas not open to vehicle use.

Table 8: Characteristics of Areas Damaged by Illegal Vehicle Use

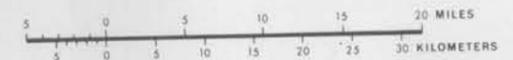
- 1) Moderately gullied bajada slopes covered by lithic soils and unconsolidated alluvium. Desert pavement and caliche present locally. Plant cover less than 5%.
- 2) Moderately gullied bajada slopes covered by lithic soils and unconsolidated alluvium. Desert pavement, lag gravels, and caliche are very common. Plant cover less than 5%.
- 3,4) Fine to moderately gullied bajada slopes covered by lithic soils and semiconsolidated residual and alluvial deposits cemented by gypsum and caliche and covered by desert pavement. Plant cover less than 5%.
- 5) Moderately to deeply gullied bajada slopes covered by lithic soils high in gypsum and by unconsolidated alluvium. Plant cover less than 5%.
- 6) Finely gullied to smooth bajada slopes covered by highly gypsiferous unconsolidated alluvial sediments and lithic soils. Plant cover less than 5%.
- 7) Bajada slopes cut by deep, widely spaced gullies and covered by highly alkaline lithic soils and semiconsolidated residual and alluvial sediments. Plant cover less than 5%.
- 8) Valleys and slopes in hilly to mountainous terrain. Colluvial and alluvial lithic soils are derived from Precambrian igneous and metamorphic rocks. Plant cover less than 10%.
- 9) Moderately gullied bajada slopes covered by lithic soils and unconsolidated alluvium derived from Precambrian igneous and metamorphic rocks. Plant cover less than 5%.
- 10) Moderately to deeply gullied bajada slopes covered by lithic soils and unconsolidated alluvium high in gypsum and calcite. Desert pavement caliche and lag gravel locally common. Plant cover less than 5%.

Additionally, the proposed action and alternative B propose improving roads to historically popular areas by providing roads that parallel the shore in one or both directions where physically possible. Although it



- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINT
- SEVERE - ABOUT 100 ACRES DAMAGED  
RATE = 12 ACRES PER YEAR
- HEAVY - ABOUT 30 ACRES DAMAGED  
RATE = 4 ACRES PER YEAR
- MEDIUM - ABOUT 15 ACRES DAMAGED  
RATE = 2 ACRES PER YEAR
- LIGHT - 5 OR LESS ACRES DAMAGED  
PRESENT USE RARE
- - - APPROVED BACKCOUNTRY ROADS
- ██ LAKESHORE SANITATION AND TRASH PROBLEM AREAS
- ▭ PLANNING ZONE

\* NUMBERS (1-10) REFER TO TABLE IN TEXT TITLED "CHARACTERISTICS OF AREAS DAMAGED BY ILLEGAL VEHICLE USE"



## RESOURCE DAMAGE

### LAKE MEAD NATIONAL RECREATION AREA

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



might not be desirable for the four-wheel-drive enthusiast to travel an improved road, it would reduce competition for beach space at the end of unimproved roads by those who only wish to get to the water the easiest way.

Mining and Minerals Management. Areas within the park where mineral leasing and other mineral activity would be considered are identified on the Proposed Management Zoning map. Because not every area of the park is suitable for mineral development, the plan provides the basis for the long-term allocation of land and water resources in the recreation area by establishing management zones that clearly identify areas where protection of natural, cultural, and recreational resources are the highest priority. The remaining areas are then placed in the special use zone where more intensive land uses such as mineral leasing can be considered.

Following finalization of the GMP, a minerals management plan (MMP) will be prepared, which details how mineral activity will be controlled within the resource utilization subzone. It will specify management objectives for lands remaining open for leasing consideration and additional surface protection stipulations needed to protect resource values within those areas. The MMP will cover such things as standard surface protection stipulations, which will be required on each lease and permit issued to protect particular resource values and/or visitor safety in the park. Stipulations may include provisions to ensure protection of the visual integrity of views from the lake and major park roads, provisions regarding access and facilities siting, road construction standards, and reclamation of the site following abandonment. Development of the MMP will include public involvement. Along with completion of the MMP, the excepted areas defined in 43 CFR 3109.2(d)(1) and 3566.2-2(a) will be revised to be consistent with the selected alternatives for the GMP and the corresponding Management Zoning map.

Three types of mineral rights within the recreation area are addressed below:

Mineral leases - Federal mineral leasing is authorized within the recreation area by the enabling legislation. Leases and permits are issued by the Bureau of Land Management subject to review and consent of the National Park Service. Regulations governing issuance of leases and permits and operations conducted on them are contained in 43 CFR 3100 for oil and gas and 3,500 for solid minerals other than coal and oil shale. The National Park Service has prepared a procedures manual which outlines the requirements of the mineral leasing regulations.

In the past 30 years 268 leases have been issued for oil and gas, copper, gold, silver, uranium, fluor spar, tungsten, and sodium. During the 1950s, many leases were issued for uranium, and later gold, silver, and oil and gas leases were sought. Currently eight leases covering 8,238 acres exist within the recreation area. These include two mineral leases covering 560 acres mostly in Nevada, and six oil and gas leases totaling 7,678 acres. The oil and gas leases

are clustered in three principal areas: on the west side of the Overton Arm south of Echo Bay, the Grand Wash Cliffs, and in scattered sections southeast of Temple Bar. The oil and gas leases were obtained through noncompetitive procedures and have historically been obtained for speculative purposes. At this time no proposal to drill or explore has been submitted for any of these leases. As of February 1984, there were 27 applications for prospecting permits on file that are awaiting NPS and BLM action. Most of these are located on the Shivwits Plateau. Uranium is the mineral of interest there, and this is the only area with potential for mineral development in the near future (see the minerals discussion in the "Affected Environment" section in volume II).

Lease applications are currently processed on a case-by-case basis by park personnel on those lands not excepted from leasing by the mineral leasing regulations (43 CFR 3109.2(d)(1) and 3566.2-2(a)). Leases are approved only if activities permitted under the lease "will not have significant adverse effect upon the resources or administration of the area." The dilemma of the mineral leasing system is that most of the recreation area is open to consideration of mineral leasing (78 percent) and almost half the area (45 percent) is also suitable or potentially suitable for wilderness designation. 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 Park Service anticipates that once the GMP and the MMP have been approved, the mineral leasing program will be reactivated.

Following completion of the GMP, the excepted areas would be revised through the rule-making process to make them consistent with the GMP management zones. Only the resource utilization subzone would remain open to mineral leasing consideration. To facilitate the processing of mineral lease and prospecting permit applications and to ensure equitable treatment of all applications, the National Park Service prepared "Procedures for Managing Federal Mineral Leasing and Operations," which were finalized in December 1984.

Under all the alternatives, the National Park Service would manage existing mineral leases according to the surrounding management zone until such time as the lessee proposed development of the minerals. Following expiration or termination of an existing lease in a management zone that would no longer be open to mineral leasing consideration, the area would not be considered for future leasing.

Mining Claims - Rights established under the 1872 mining law allows individuals to stake and file claims for certain minerals on federal lands. The recreation area was closed to further mineral entry (i.e., the right to stake new claims) under the 1872 law by the enabling legislation. However, valid rights were established before withdrawal of the recreation lands. Operations proposed on valid

existing mining claims are subject to NPS approval pursuant to regulations contained in 36 CFR 9A.

The regulations require NPS approval of a plan of operations before any activity can take place on the claim. The level of activity currently taking place on patented claims is relatively small, and new activity would continue to be evaluated on a case-by-case basis. Seven groups of patented claims in the recreation area consist of 941.65 acres, and one group of unpatented claims consists of 83 acres. Although the patented claims existed before the recreation area was established, few have shown any activity in mineral development. In fact, there was virtually no interest in mining these claims until 1984. Within the last 20 years, some of the claims have been developed for residential or commercial purposes.

None of the alternatives affect an owner's right to develop the mineral resources on any patented or valid unpatented mining claim. However, if the owner proposed development of the minerals, the National Park Service might wish to negotiate acquisition of these rights through purchase, exchange or donation as identified in the Land Protection Plan (October 1983), or to pursue other protection alternatives.

Nonfederal Subsurface Mineral Rights - Subsurface mineral rights exist because the federal government did not gain title to all the mineral rights when the recreation area was established. These rights are held by the states, private individuals, or corporations. Regulations governing operations on privately held subsurface oil and gas rights are contained in 36 CFR 9B. No regulations currently exist governing the extraction of nonfederal minerals other than oil and gas.

Nonfederal ownership of mineral rights exists on 57,654 acres in widely scattered sections throughout the recreation area. Most of these rights are owned by Santa Fe Pacific Railroad and the state of Arizona. Few of these mineral interests have been developed. The current NPS management policy for these lands is the elimination by acquisition of outstanding mineral ownership interests in all areas of the park not suitable for mineral development activity. In most cases, that means anywhere these rights exist outside the resource utilization and nonfederal lands subzones. The National Park Service would manage the surface of those lands as zoned until such time as the owners indicate a desire to exercise their rights to the minerals. The National Park Service may then wish to negotiate acquisition of the rights through purchase, exchange, or donation, or to pursue other protection alternatives.

### Cultural Resources Management

The National Park Service would provide for the identification, preservation, protection, and interpretation of all significant cultural

resources through adequate research and programming. All actions taken would be in full compliance with the requirements of appropriate cultural resource laws, such as the Antiquities Act, the Historic Sites Act, the National Historic Preservation Act, the Archeological Conservation Act, and the Archeological Resources Protection Act.

All proposals and activities affecting or relating to cultural resources would be developed and executed by professional specialists in history, archeology, anthropology, and historic architecture, in accordance with NPS "Management Policies" and NPS-28, "Cultural Resources Management Guidelines." No undertaking resulting in the alteration or loss of known cultural resources is proposed.

The cultural resource data base for Lake Mead is relatively comprehensive for historic resources. Additionally, the numerous archeological and anthropological studies that have been carried out over the past half century are discussed and evaluated in a recently published archeological overview (McClellan, Phillips and Belshaw 1980). An overview of Lake Mead's historic period has also been published (Belshaw 1980), and a List of Classified Structures survey was completed in 1976. Additional cultural resource work, including the assessment of sites for potential nomination to the National Register of Historic Places, has recently been completed.

The continued identification and protection of the NRA's cultural resources is one of the long-range objectives of this plan. Several strategies were identified to accomplish this objective.

In accordance with a cultural resources management program approved in February 1982, activities would be established by the park staff for the collection of information and data about cultural resources, and for the management and preservation of those resources. The program would be detailed, prioritized, scheduled, funded, and implemented through the annual cultural resource management program and updated as necessary to reflect changing preservation needs and management priorities.

The ongoing program of conducting complete archeological surveys for all developed areas would continue, thereby establishing a comprehensive listing of all cultural resources in allowing for more efficient planning and development of those areas. To date, complete archeological surveys have been conducted for Boulder Beach, Echo Bay, Temple Bar, and Cottonwood Cove.

A program would be initiated to conduct archeological surveys of 5 percent of all lands within the recreation area. This program, which would be spread over several years, would be designed to study and evaluate areas not covered by previous research, particularly backcountry and wilderness areas.

The historic resource study would be revised and updated as necessary to reflect new information gathered by continuing research. A historic base map would be prepared and maintained in an up-to-date status by the park staff with assistance from the Western Regional Office and DSC.

The List of Classified Structures (LCS) would be reevaluated and revised as necessary to either add or delete structures. Existing and potential LCS structures would be evaluated for adaptive and interpretive use.

Development proposals that relate to cultural resources would reflect a sensitivity to the preservation of the cultural scene through compatible and complementary design. All developments with potential for ground disturbance would be preceded by archeological clearances. Before proposals with potential for impacts on traditional sites were approved, local native Americans would be consulted. Projects would be designed to avoid or have minimal impacts on cultural resources.

Archeological Sites. The protection of archeological sites and districts would be based on historic preservation laws and NPS policies and standards. These would include permanently recording sites, monitoring selected sites to determine continuing natural and human impacts, test excavations of selected sites to evaluate them and to plan for further preservation actions, and data recovery at sites that could be affected by development, use, or natural destruction.

All data recovery, such as controlled surface collection and excavation, would be conducted according to current NPS professional standards. Data recovery would also be designed to obtain the most information with the least destruction of archeological resources. When excavation was made necessary by development, it would be programmed in advance of construction (not less than one fiscal year).

Surface collection is proposed to professionally record and preserve artifacts that are potentially subject to adverse impacts because of vandalism or proposed development actions. This surface collection would be conducted only by a professional archeologist, who meets existing professional and NPS standards.

Historic Structures. Historic structures and sites, such as native villages, historic cabins, or mining complexes, would not be reconstructed. Visitor understanding would be provided through other interpretive techniques.

When the preservation/restoration of historic structures was specified, the intent would be to preserve existing original work and to maintain it by compatible replacement or repair of deteriorated fabric. New work on such structures, when required for maintenance purposes, would be done in concert with their original character and only when such restoration could be satisfactorily documented. When restoration was not possible, the elements being replaced would be duplicated.

Certain structures might not merit preservation because of minimal significance, advanced deterioration, and excessive costs. These structures would be photographed, recorded, and marked as necessary, and allowed to deteriorate naturally, with their sites eventually reverting to a natural condition. Some removal of hazardous elements might be necessary for safety and to avoid an attractive nuisance, particularly

around abandoned mining sites. Park users would be alerted to the potential hazards associated with structures that have value as "discovery" sites. All work would conform with "Management Policies" and compliance requirements.

The archeological deposits of historic sites would be clearly identified. Any actions affecting them would be designed for minimal impact and would be preceded by professional data recovery.

Contemporary Native American Concerns. The National Park Service would ensure the preservation of resources associated with native Americans whose cultural memory, traditions, and lives are closely associated with the recreation area and its general vicinity.

The identification of areas of sacred and traditional importance to local native Americans would be continued by professional archeologists and anthropologists. As new information is obtained, it would be added to the confidential inventory of these sites. Measures would be taken to ensure that mutually acceptable methods of protection and preservation were adopted in conformance with NPS "Management Policies" and legislation.

The National Park Service would encourage active participation of local native American groups in developing methods of interpreting native American culture.

Planning, coordination, and management of issues of concern to local native Americans, such as special access and use permits, native American traditional activities, resources management, and research and interpretation of native American cultures, would be guided by NPS Special Directive 78-1.

Collections. A "Scope of Collections Statement" has been prepared to guide the park staff in the acquisition and management of museum objects. All park collections, including records, library and archival materials, and museum collections, would be managed in accordance with the statement and relevant NPS guidelines and policies.

### Lake Use Management

Carrying Capacities. The Lake Mead Carrying Capacity Study (USDI 1980) investigated boating use and capacity limits for Lakes Mead and Mohave. Boating capacity limits were computed by two methods--amount of usable water surface and amount of usable beach camping space. After an analysis of these two methods, the study concluded that the amount of usable beach camping space is lower than the amount of usable water surface in all zones of the lake. Because usable beach is the limiting factor, it restricts the capacity of the lakes. The study went on to calculate boating capacity limits based on the amount of usable beach space. Determining this capacity is not the final concern; rather, there is a need to estimate how much the land-based facilities that affect the

number of boats launching on the lakes could expand without exceeding the capacity of their respective zones. The facilities of concern are parking, launch ramps, marina slips, dry boat storage, buoyed boats, rental boats, and primitive access.

Parking is controlled only in those areas where there are enough law enforcement personnel to limit visitors to the designated parking areas; otherwise, people tend to park anywhere (even illegally) when the designated parking area becomes full. Sometimes visitors find the congestion, distances, and hassle so great that they leave to find another developed area that is not so crowded. Also, primitive access could have dramatic increases in use because there is little NPS control. Thus, the facilities that could be controlled and that affect the number of boats launching on the lakes would be launch ramps, marina slips, buoyed boats, dry boat storage, and rental boats. Of these facilities, the launch ramps contribute by far the greatest share of boats.

An analysis of boats launched from Wahweap marina at Lake Powell (Glen Canyon National Recreation Area) indicated that about 75 percent of the boats launched per day were from the developed launch ramps, with the remaining 25 percent launching from other facilities such as marina slips or primitive access points (USDI 1982). No such analysis has been done at Lake Mead NRA, but the trend is expected to be similar. A detailed study of launch rates for each marina on Lakes Mead and Mohave (similar to that done on Lake Powell) would be needed before any major expansions of the relevant facilities are made. Such detailed studies should consider expanding one or two of the relevant facilities by a great deal and not expanding others, while still not exceeding the capacity of the zone. Likewise, these studies should establish how much of a zone's use is contributed through primitive access points.

Day use boaters (those who boat for the day and return home that night or return their boat to a marina) affect the beach capacity differently than overnight boaters. These boaters only use beach space during the day, and some do not use any beach space except at the developed area. Thus, the proportion of such boaters and their effect on beach capacity must also be determined.

Until such detailed studies are completed, a more generalized approach would guide expansion proposals. The percentage by which existing peak boating use in a zone could increase before the capacity is reached has been calculated (see table 9). This percentage could be implied to also be the maximum percentage that the facilities (ones that affect how many boats get on the lake) could increase before the capacity is reached.

Until the detailed launch rate studies are completed for a marina and its zone, the expansion of any one of the relevant facilities would be limited to the proportion in the third column of table 9. This proportion has been used in the remainder of the table (except for the Temple/Virgin zone) to calculate the total allowable number of boats in marinas per zone. The development proposals in this document are all within the calculated figures.

Table 9: Boating Capacity

Zones	N	C	$P = \frac{C-N}{N}$	M	$IUC = P \times M$	IHS	E=IUC or IHS whichever is Less	T = M + E
Katherine	710	1,130	0.59	765	450	40	40	805
Cottonwood	625	1,500	1.41	300	420	235	235	535
Willow Beach	not computed	not computed	---	175	---	95	95	270
Boulder Basin	870	1,695	0.95	*LMM 400/1,370 *LVW 270	LMM 475/1,200 LVW 255	LMM 475/1,200 LVW 380	LMM 475/1,200 LVW 380	LMM 875/2,570 LVW 650
Echo Bay	425	761	0.79	*CAL 700	CAL 665	CAL 345	CAL 345	CAL 1045
Overton Beach	170	236	0.39	295	235	655	235	530
Virgin/Temple	550	1,960	2.56	100	40	50	40	140
Gregg/Grand Wash	290	1,170	3.03	30	**	1,200	980	950**
				0	0	NA	0	0

N--Number of boats on Memorial Day, 1978

C--Capacity listed as number of boats

$P = \frac{C-N}{N}$

M--Proportion by which use can increase before capacity is reached

M--Number of boats (slips, moorings, and rentals) in marinas, 1978

$IUC = P \times M$ --Maximum increase in marina boats beyond the 1978 level based on unused capacity

IHS--Maximum increase in marina boats beyond the 1978 level based on usable harbor space

E = IUC or IHS, whichever is less--Allowable total expansion of marina beyond 1978 level

T = M + E--Total allowable number of boats in marinas per zone

\*LMM - Lake Mead Marina, LVW - Las Vegas Wash Marina, and CAL - Callville Bay Marina

\*\*The marina at Temple Bar is the smallest on the lake, yet the zone it serves has the largest capacity. Thus the marina had virtually no effect on the observed use in 1978 and applying the same logic to this situation as to the other marinas would not be acceptable. For the other zones in 1978 there was on the average a 50% ratio between capacity and number of boats in marinas per zone (C/M). Assuming this is a reasonable ratio as past experience indicates in other zones, a reasonable E for this zone would be 950 [(.5 x c) - M].

These numbers are not a goal; they are the absolute maximum that can occur within the carrying capacity evaluation, rather than by demand and feasibility analyses. In fact, offering visitors a choice of use densities around the lakes would provide a much greater diversity of recreational opportunities, and it might not be desirable to build to the maximum in all zones for this reason. Any future detailed studies should examine this possibility.

The calculated figures are liberal estimates for maximum facility expansion, because use can increase relatively uncontrolled at primitive access points, at marina launch ramps (unless parking can be effectively controlled), and at any of the proposed improved access points. Therefore, if use from these uncontrolled facilities/locations increased by more than the acceptable percentage for that zone, the capacity could be exceeded if the other relevant marina facilities have increased by the acceptable percentage. Exceeding the capacity could have deleterious effects on visitor experience, shoreline aesthetics, water quality, and shoreline sanitation (USDI, NPS 1979).

An explanation of table 9 follows, using the Katherine zone figures as an example. The first two columns (N and C), the fourth column (M), and the sixth column (IHS) are taken directly from the carrying capacity study. Then to find out how much boating use can increase before peak weekends reach capacity (P), the difference between use on a peak weekend (N-710) and the capacity (C-1,130) is divided by the peak weekend use (N-710). Thus, the table indicates that if the seasonal pattern of use remained unchanged at Katherine, existing use can increase 59 percent before peak weekend use will reach capacity. This assumes that boating use from all access points (marina, launch ramps, primitive access roads, etc.) would increase by 59 percent. Obviously, use from each access point would not increase at the same pace, and that is one of the reasons the detailed studies are necessary. Until the studies are completed, the only guiding assumption (and a most liberal one) that can be made is that the marina increases be limited to a capacity increase of 59 percent (P-59%)

Thus, taking P-59% times the number of boats in the marina in 1978 (M-765) yields the maximum increase in marina boats based on the amount of unused capacity (IUC-450). This increase could be larger than usable harbor space would allow (IHS-40 from the carrying capacity study). Therefore, the smaller of IUC or IHS determines the amount by which marinas could expand (E-40). And if the number of existing slips in 1978 (M-765) is added to the number by which marinas can expand (E-40), the total allowable number of boats in a marina (T-805) results. This is based on an average size slip for Lake Mead National Recreation Area which was calculated by the Carrying Capacity Study.

Concession Boat/Float Trip Management. A concessioner offers raft float trips on Lake Mohave from below Hoover Dam to Willow Beach through Black Canyon. They cannot exceed 150 people per day, and human waste must be carried out of the canyon to Willow Beach. The raft trips can only stop at sites agreed to with the National Park Service. On a

quarterly basis, the National Park Service reviews the operation for safety and value to the public.

Commercial lake cruises on Lake Mead are limited to one concessioner, who provides a cruise in the Boulder Basin which lasts for approximately 1½ hours. A set schedule of tours on a daily basis, with the schedule and charges for the tour, must be approved by the National Park Service; however, the concessioner may book charter service for special tours above and beyond a scheduled cruise. The concessioner has four boats currently ready for use, varying in size from 35 passengers to 114 passengers.

Houseboat management is handled by the concessioners of each facility as they see fit. Concessioners in five developed areas (Katherine, Cottonwood Cove, Echo Bay, Callville Bay, and Temple Bar) are permitted to rent houseboats. The allowable number of houseboats at each developed area was established by the Carrying Capacity Study. On a quarterly basis the National Park Service reviews the operations for safety and service rendered to the public. Authority has been approved for all rates charged by the concessioner for his rental fleet. The National Park Service will monitor the houseboat operations on a five-year basis to determine the number of houseboats in relation to the Carrying Capacity Study and adjust accordingly.

No proposals are being made to change any of these concession operations because all are providing needed services at reasonable levels.

Flat-Wake Zoning. Although those visitors interviewed in the 1979 visitor survey have expressed a general satisfaction with their recreational experience at Lake Mead, some conflicts between skiers and fishermen and between nonboating visitors and boaters have been mentioned. The designation of certain coves as flat-wake zones is a method to reduce these conflicts and to promote safety. A half dozen coves and all harbors are currently zoned for flat wakes. In addition, the following coves are proposed for flat-wake zones on Lake Mead: Kingman Wash near Hoover Dam, and Cathedral Cove in the Echo Bay area. North and South Telephone coves near Katherine Landing are proposed for flat-wake zones on Lake Mohave. Other coves may be designated in the future if the need arises.

Shoreline Pollution. With increasing use of the recreation area, trash and human waste have become serious concerns in many of the remote coves and in the more developed areas. The areas shown on the Resource Damage map that have trash or sanitation problems cover approximately 50 acres. To alleviate this situation, toilets and trash receptacles would be provided at all coves proposed for improved road access. A boat crew on each lake would clean up the more remote areas, and efforts would be made to educate visitors about trash and sanitation through informational displays, public education, and community projects. Volunteer crews and incentive programs would be used whenever possible to augment NPS funds and personnel.

Table 10: Flat-Wake Zones

<u>Area</u>	<u>Acreage</u>	
	<u>Existing</u>	<u>Proposed</u>
Box Car Cove West	3	--
Sandy Cove	8	--
Boulder Beach Sailboat Area	14	--
Las Vegas Wash Back Bay	81	--
Gregg's Hideout	2	--
Gasoline Alley	1	--
Kingman Wash	--	3
Cathedral Cove	--	3
South Cove	--	--
Pearce Ferry	--	--
Stop Sign Cove	--	--
Little Stop Sign Cove	--	--
Ski Cove	--	--
North Telephone Cove	--	3
South Telephone Cove	--	2
Totals	<u>109</u>	<u>11</u>

Another problem is bacteriological pollution of reservoir water at some swim beaches and heavily used coves. To ensure water suitable for public use, a water quality monitoring program would include the following:

A scheduled water sampling program at all designated swim beaches on a biweekly basis under normal weather and visitor use conditions between May 15 and September 15. Water samples would be taken on a daily basis while visitor use capacity was met or exceeded, or if weather conditions that promote poor water quality continue for more than 48 hours. If problems developed at heavily used coves, such coves would also be added to the regular sampling system.

A scheduled water sampling program at selected heavy use coves every two weeks between May 15 and September 15, during heavy use weekends (Memorial Day, Fourth of July, Labor Day, etc.), and when weather conditions that promote poor water quality occur for more than 48 hours.

If a water sample indicated that state water quality standards for body contact are exceeded, a second sample would be obtained within 24 hours. If the second sample remains above state standards, the affected area would be closed to body contact activities until the water quality again meets standards.

Any water sample that exceeded state water quality standards would be brought to the attention of public health officials. An affected area would be closed, before a second water sample is taken, at the recommendation of the Nevada or Arizona Department of Health Services.

Because of the extreme high temperatures and low humidity that prevail during the summer months, water quality degradation due to bacteriological pollution would only be expected on a very infrequent basis. A program now in effect has installed land-based or floating restroom facilities at many heavy use coves. This program would also minimize the probability of bacteriological pollution.

Other options would be explored for reducing bacteriological pollution at areas where state health standards are exceeded. Aeration methods would be examined as would chemical treatment. These methods of pollution control would not be applied until adequately studied.

#### Land Protection and Boundary Revisions

In 1980, the National Park Service prepared a Land Acquisition Plan (USDI 1980) that set land acquisition priorities for Lake Mead. Concurrent with the present general management planning effort, a Land Protection Plan guiding park land protection actions was separately prepared, approved, and released to the public in July 1984. The plan was accompanied by an Environmental Assessment and finding of no significant impact (FONSI). It discussed specific alternatives and their impacts and then makes recommendations and sets priorities for acquiring or otherwise protecting nonfederal lands through fee or less-than-fee acquisition, exchanges, boundary revisions, cooperative agreements, local zoning, and other techniques. In general, acquisitions would be on an opportunity willing seller/buyer basis as long as incompatible uses do not develop. In some cases, deferring acquisition through assignment of a low priority might provide adequate protection if other regulations such as county zoning are considered effective. Accordingly, the following general policy statements have guided the specific recommendations of the Land Protection Plan.

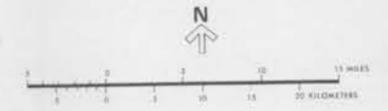
A variety of boundary revisions are formally proposed that would collectively delete a total of 3,216.25 acres from the authorized NRA boundaries. All deletions would involve lands that are not important for Lake Mead's primary resource and public use values. They lie along the current boundary and include small private parcels at Overton Beach, Las Vegas Wash, the western boundary at Cottonwood, and parcels south of Katherine Landing. Larger blocks, including both private and federal lands, are to be considered in the Hualapai Wash and Meadview areas. The Land Protection Plan evaluated options for these lands, including the possibility of deletion from the NRA.

State and Private Lands. Approximately 14,285 acres of land within the NRA boundary are owned in fee interest by the states of Nevada and Arizona and by various private interests. The privately owned parcels,



SYMBOL	OWNERSHIP	ADMINISTRATION	ACREAGE	CURRENT LAND USE	NOTES
[White box]	FEDERAL	NPS	1,463,357.06 *	Public Recreation	Some Developed Areas
[Diagonal hatching]	FEDERAL	NPS	12,795.00	Utility Corridor	Various Companies
[Horizontal hatching]	FEDERAL	B/R	5,029.00*	Power Generation	Permanent Bur. of Rec. Withdrawals (facilities)
[Vertical hatching]	FEDERAL	NPS	55,000.00	Undeveloped	Santa Fe RR (Subsurface Rights)
[Cross-hatching]	FEDERAL	NPS	—	Undeveloped	Bureau of Reclamation Withdrawals (future use)**
[Checkered pattern]	NONFEDERAL	STATE	2,654.71*	Undeveloped	State School Lands
[Solid black box]	NONFEDERAL	PRIVATE	11,435.23*	Undeveloped or Altered	Various Owners

\* These figures total the NRA's gross acreage of 1,482,476.00  
 \*\* Most withdrawn lands around Lake Mead and Lake Mohave are being released by the Bureau of Reclamation.



**LANDOWNERSHIP STATUS**  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
 ARIZONA - NEVADA  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE



which generally have resulted from patented mining claims, would be treated on a case-by-case basis. One of these parcels, a 935-acre tract of private land in the Las Vegas Wash area, has already been deleted from the NRA boundary. Most of these parcels are not posing critical problems, and their acquisition is considered of low priority except where inconsistent development or use is proposed. Some parcels might be accepted as donations. Arizona and Nevada state lands (which by law cannot be acquired by purchase) would be considered for acquisition by exchange or other negotiated settlements.

Santa Fe Pacific Mineral Rights. At one time the Santa Fe Pacific Railroad owned many sections of land in a checkerboard pattern, east of Lake Mohave, in the Hualapai Wash, and on the Shivwits Plateau. Although the federal government has since acquired the surface rights, Santa Fe Pacific has retained subsurface mineral rights and, in some cases, "railroad construction repurchase rights." Negotiations have been initiated that might lead to ultimate federal purchase of Santa Fe's residual rights or the possible exchange for rights on federal lands outside Lake Mead NRA. The National Park Service would continue such negotiations with the ultimate objective of acquiring clear fee title.

Hualapai Indian Reservation Lands. In the establishment act for the recreation area, some 224,420 acres of Hualapai Indian Reservation land was to potentially be included within NRA boundaries, only if approved by the tribal council. Such approval has never been given, and therefore these lands have never been included within the NRA.

Bureau of Reclamation Withdrawal Lands. Large portions of Lake Mead NRA are technically still under withdrawal rights of the Bureau of Reclamation for power generation purposes, although most such lands are under the operational management of the National Park Service. Bureau withdrawals consist of permanent "protection and security areas" in the area of Hoover and Davis dams (5,029 acres), all lands within 300 horizontal feet of maximum lake levels, and some 358,052 additional acres around Lakes Mead and Mohave, which were originally considered potentially necessary for future projects.

On February 14, 1984, the secretary of the interior revoked the public land order by which the lands on Shivwits Plateau and within Grand Canyon National Park had been withdrawn for the Bridge Canyon Dam project (renamed the Hualapai project). Various bureau studies over the past years have generally indicated that much of the withdrawn lands would not be suited to the pumped-storage power generation schemes for which the withdrawals were originally made. The bureau has recently begun the process of revoking withdrawal on most of its previously withdrawn lands north and south of Lake Mead and east and west of Lake Mohave. Certain lands would continue to be withdrawn south of Hoover Dam (a corridor for a river crossing) and between the Rifle Range pumped-storage site south of Boulder City and the Colorado River. The Park Service appreciates both of these steps and would respond to any requests that would facilitate the administrative changes.

In 1977 a three-year study by the Department of the Interior, Bureau of Reclamation, entitled "Reclamation Potentials within the Lake Mead National Recreation Area," was released. This study identified energy potentials within the recreation area, including pumped storage, Hoover Dam powerplant modifications, transmission corridors, and others.

In 1983 a special report entitled "Energy and Other Development Potentials within the Lake Mead National Recreation Area" was released by the Bureau of Reclamation which presented the findings of an appraisal-level investigation to identify and evaluate energy and other development potentials on lands in the recreation area. This study identified 34 pumped-storage sites during the investigation. Two sites -- Rifle Range (with both the Lake Mead and Lake Mohave alternatives) and Spring Canyon -- were selected as having the highest development potential. The other sites were found to be unsuitable.

Detailed project information and economic and environmental analyses are presented in the "Spring Canyon Pumped-Storage Project Special Report," May 1982. Data for the Rifle Range pumped-storage project are unpublished. The Spring Canyon project would be located in a dry wash known as Spring Canyon (see Proposed Action/Management Zoning map) on the Arizona side of Lake Mead about 10 miles east of Temple Bar. Project features include a 400-foot-high dam, a 1,821-acre reservoir, three dikes, an underground powerhouse, reversible pump generator units, a penstock-tailrace tunnel complex, an access road, a switchyard and substation facilities, transmission lines, and appurtenant facilities. Water from the Virgin Canyon on Lake Mead would be pumped through the two penstock-tailrace tunnels to the Spring Canyon Reservoir during periods of low power demand for later release through the turbines to generate power during peakload periods.

The major concerns of the National Park Service with such a major project include:

- changing the primitive character of this remote section of Lake Mead

- increased accessibility and resultant increased visitation to this area because of paving the road

- effect on the aquatic environment because of projected changes in lake waterflow, turbidity, and temperature

As a result of those concerns, the Park Service and Bureau of Reclamation are drafting a memorandum of understanding. As part of that memorandum, the Bureau of Reclamation will fund the Park Service to do a recreation evaluation of the project and its effects in this area of the NRA.

As part of the initial phase of the project, the Bureau of Reclamation will undertake a core drilling program to test for geological stability of the area. The National Park Service has approved this program, after

reviewing its effects on the recreation area in a separately prepared environmental assessment. As the additional studies for the Spring Canyon project proceed, additional assessments may be needed to cover road access or other activities that may affect NRA lands. If the project proves feasible, the Bureau of Reclamation will prepare an environmental impact statement on the project.

Special Activities on Nonfederal Lands. Certain small parcels of land in the Boulder Beach area are used for water treatment and pumping facilities and for a Nevada state-run fish hatchery. These activities are deemed compatible with NPS operations at present levels. The Overton Wildlife Management Area consists of 14,575 acres of the NRA that is managed by the Nevada Department of Wildlife on a long-term lease.

Easements, Utility Corridors, and Memorandums of Understanding. Various easements and utility corridors have been granted in the past. The National Park Service would generally oppose granting any further corridors; instead, additional use of existing corridors would be favored in the event there is a justified need for additional utility lines through the NRA. The U.S. Fish and Wildlife Service manages 47.81 acres at Willow Beach as a fish hatchery under a memorandum of understanding with the National Park Service and the Bureau of Reclamation.

Adjacent Federal Lands. The management zoning scheme would protect the natural and scenic values of the lands within the NRA boundaries. However, many scenic features lie partially or entirely outside the NRA on adjacent federal lands administered by the Bureau of Land Management. The most significant of these areas include

the unique dense stand of teddy bear cholla cactus that is west of the NRA boundary along the Cottonwood Cove access road

the views of unique and scenic geologic formations, including Bitter Spring Valley and Bowl of Fire along the Northshore Road between Callville Bay and Overton Beach; the best views along this very popular scenic touring route are north and west of the road on BLM lands

the River Mountains, which contain habitat important to desert bighorn sheep as lambing grounds; some of this habitat is outside NRA boundaries

the portion of the scenic Newberry Mountains that is outside NRA boundaries.

The National Park Service will work with the Bureau of Land Management to ensure protection of natural and scenic values on these adjacent federal lands.

## Information/Interpretation

For the purposes of determining the most effective means of communicating information/orientation to visitors and of interpreting Lake Mead's resources, it is useful to categorize visitors into three major types. The types of users, which require different approaches and have different needs, include summer water-oriented recreationists (with a few land-based visitors passing through the NRA), off-season visitors (usually older couples camping in RVs, fishing, and enjoying traditional interpretive/recreational activities), and local Las Vegas residents (largely water-oriented users during the summer, but water- and land-based recreation users during the off-season).

Information/Interpretation Objectives and Approaches. In priority order, the following information/interpretation objectives have been developed. The general approach to implementation is given under each objective, followed by a more complete definition of implementation techniques.

Encourage Visitor Safety and Resource Protection - Because of hazards associated with the recreation area's resources and its somewhat specialized clientele, safety information and resource protection require greater emphasis than at most NPS areas. The greatest need for communication is with water-oriented users during the summer. These visitors, after driving long, hot distances, often want to get in the water as quickly as possible and enjoy themselves, without any direction or authority. To effectively communicate with this user group, communication should occur while users are in transit to the national recreation area, after they are on the water, during the relaxed hours of their choosing, or as part of an outreach program offered year-round.

Advance arrival information would be provided by limited frequency and commercial radio. Topics would include weather, safety tips, crowding, services available, ORV and other regulations, and accident reports if relevant.

After arrival, contact with park personnel--both on and off the water--would be desirable. Park staff would meet visitors on the lakes or at isolated coves and answer questions and provide information/interpretation in an unstructured manner.

Waysides would be used for displaying safety and resource information. To be most effective for water safety, they would be located as closely to the water and unloading areas as possible. At Boulder Beach and Katherine Landing unloading ramps, a lighted message board would give changing information which would be tested to determine if it had greater ability in attracting boater's attention than the more conventional, wooden waysides.

Because publications are the most versatile method for reaching people at times of their own choosing, children's cartoon booklets and traditional literature on safety and resource protection would

likely be presented by rangers and interpreters during evening campsite hours. Outreach programs to school groups, community organizations, and local hobby/civic clubs have potential for long-term safety and resource appreciation/protection. Innovations such as asking boat dealers to distribute NRA safety packets to boat buyers should be tried. The goal is to reach people when they are receptive to this type of information and to convince them that safety and resource rules are for their benefit.

Provide Timely Information and Orientation - A major media rehabilitation program would be scheduled for 1985-95, which would answer many of the orientation/information needs. The visitor center and headquarters building would be rehabilitated, and the existing waysides in the campgrounds and in the marinas be redesigned, selectively relocated, and updated. Exhibits in a few ranger/contact stations would be redone, but because of their remoteness from the water, they do not have high priority. A limited frequency and commercial radio channel would be used for informational messages, and cooperation with the city or state in existing rest stops would be undertaken. Informational boards could be placed in nearby rest stops (such as the reststop outside Boulder City) where many NRA users would be able to get park information.

Again, moving park staff (on land and water) and publications would provide the best opportunity for communicating with visitors. An overall map of the NRA (useful to boat and auto visitors) is now available to visitors as an orientation tool.

Educate Visitors About the Recreation Area's Resources - Although Lake Mead NRA is first and foremost a recreational experience, an understanding of the area's resources can add an extra dimension to most visits.

Lake Mead National Recreation Area was carved primarily out of two desert environments: Mojave and Great Basin. As such, adaptations of the desert plants and animals to the arid environment is a significant aspect of the biological story. Geologically, the barren landscape provides outstanding examples of processes such as faulting, folding, and erosion. In addition, human history extends over 10,000 years, and each influx of people has tried to mesh or impose their needs on the land with varying degrees of success.

Interpretation of these resources would be accomplished with the recreation area's special circumstances in mind. An overview of the park's resources would be given in the visitor center. In the summer, interpretation would take the spontaneous form that complements the recreational use, using boats and personal contact. Where volume of use and features warrant, interpretive waysides tied to a hiking trail or at a single feature would be installed. These locations are best determined by the park staff, but potential wayside areas around Lake Mead include the railroad grade near the Alan Bible Visitor Center, Rogers Spring, and Redstone picnic area.

As a general rule, however, the recreation area lends itself to the use of publications and personal services for much of the interpretive effort. Publications can be bought or distributed at the visitors' convenience and in a manner acceptable to their other pursuits. They can be used repeatedly and geared to special interests. The Katherine zone gives mimeographed handouts to visitors about short hikes to areas of interest with related interpretive information. This approach, somewhat expanded, would work well. At a minimum, the following publications should be made available: an updated auto and boating tour or guide to the NRA, which would include both lakes and be available in a waterproof binder; a hiking guide to the NRA, which would illustrate short and long hikes to features of interest with relevant interpretive information; and an overall map of the NRA.

In terms of personal services, activity-oriented walks and demonstrations, roving interpreters on land and water, and information at the Alan Bible visitor center are currently emphasized. Amphitheater presentations at Boulder Beach are well attended but are not as effective in other areas. Consequently, other forms of personal service would have higher priority. Special events related to some event of cultural or historical significance should be organized and tried by the National Park Service. If this proved successful, other water-oriented special events could be initiated. Because the concession workforce is a major source of information for visitors, efforts would be made to train them or provide them with information about the recreation area.

Information/Interpretation Program Facilities. The following discussion describes the type of information/interpretation materials that would be used in facilities provided throughout the recreation area.

Alan Bible Visitor Center - After its scheduled rehabilitation is completed, this center would support the information/orientation and interpretive objectives. New exhibits would concentrate on all park resources. A sales and information area would be provided, and an adjacent garden would introduce visitors to the area's flora.

Contact/Ranger Stations - Each contact/ranger station would provide some general orientation through a map panel of the whole NRA. Several stations would provide sales publication displays and information desks. An exhibit that focuses on some nearby interpretive features would be added, thereby encouraging visitors to experience local interpretive features. These functions would remain in all stations, including those that would be relocated.

Marina Waysides - Waysides would be placed at all marinas and at a few selected coves where improved access (launch ramps) and other marina improvements would be made (under alternatives B and the proposed action). They would convey messages on safety and how environmental impacts could be minimized. A local map with such information as gas availability and flat-wake zoning would be

provided. There would be space to post local and changing information. A lighted message board (programmed) would be tested at a high-volume launch ramp. It would be programmed to show such information as weather, emergency messages, and safety tips.

Campground Waysides - These waysides would include a map panel with illustrations of local interest. The information panel would have pertinent safety cartoons (or messages), as well as necessary information on campground registration, interpretive programs, or local activities and messages.

Amphitheaters - These facilities would be in various developed areas (Katherine, Temple Bar, and Boulder Beach) and used for evening interpretive programs.

Interpretive Trails/Waysides - These waysides would be in areas of specific interpretive interest such as Redstone picnic area, Rogers Spring, and the railroad grade. Additional sites of interest would be identified by the park staff throughout the recreation area, and appropriate media (either waysides or publications) would be used to interpret them.

Roving Information/Interpretive Boats - Of top priority, boats would be obtained to visit undeveloped camping beaches and to provide easier access to reach water-oriented visitors. The roving naturalist patrol by boat would continue on Lake Mohave, and one would be implemented on Lake Mead. Roving interpretive personnel in the heavily visited areas at marinas are also necessary.

Limited Low-Watt Radio Transmitter - A radio program would be available in the NRA to convey topics such as weather, safety tips, regulations, crowding conditions, services available, and other topical news.

Outreach - The outreach program to school groups, community organizations, and local hobby/civic clubs has great potential for a long-term safety and resource appreciation/protection program. In addition, spot radio and TV announcements and newspaper articles could highlight safety messages, using accident statistics and the unforgiving nature of the desert as a focus.

Publications - Some of the publications offered would be the Lake Mead NRA park folder; necessary maps; a hiking guide; boat tour guides dealing with natural and cultural resources in the area; a park newsletter with safety cartoons; interpretive articles and program announcements; boating, water-skiing, and fishing information; and features on concessioner services.

Personal Services - Conducted programs such as walks, hikes, and demonstrations would be given. Table 11 summarizes the interpretation/information program facilities that would be provided at each site.

## Trailer Village and Vacation Cabin Site Policy

Lake Mead National Recreation Area has three areas around the lakes that are sites for privately owned vacation cabins. In addition, most of the developed areas around the lakes have concessioner-operated trailer villages for long- and short-term visitors.

Current trailer village policy allows for short- and long-term sites. Consistent with this policy, the existing number of long-term sites would remain or be converted to short-term sites (30-day occupancy or less). However, to meet an existing demand for RV sites, some concessioner trailer villages would be expanded or converted for the purpose of offering additional short-term sites. This change would be implemented gradually to assess the demand for and feasibility of additional RV sites at Lake Mead.

Cabin site occupancy is for personal and not commercial use. Department of the Interior regulations (43 CFR 21) prohibit granting new leases for new cabin site occupancy within Lake Mead. However, lessees may sell their improvements during the original period of lease. After an extension is granted, no transfer of lease may occur. Extensions of leases up to five years would continue to be granted until the need for public use of the cabin site areas dictates termination. The extensions would be staggered, based on the original lease term, to eventually bring all leases to a common expiration date (year) at each area. The determination of public need would be made two years in advance of the common expiration date.

The regulations also 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 shall 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.

## Road Improvements for Public Safety

Like resources management, the road safety and maintenance improvement proposals are not part of this GMP's proposals. Rather, they are from a separate planning process done in conjunction with the Federal Highway Administration. These proposals are summarized here to give the reader the full scope of all planning being done in the recreation area. Separate environmental impact analyses would be done for each of these road safety and maintenance projects when they reach the stage of alternative formulation.

Table 11: Information/Interpretation Program Facilities

Site	Visitor Centers	Contact Ranger Stations	Marina Waysides	Camp-ground Waysides	Amphi-theaters	Inter-pretive Trails and/or Waysides	Roving Contact Boats	Low Watt Radio
Lake Mohave or Mead								
Katherine		R	R	R	E	P	E, P, P	
Cottonwood		R	P	R		E		
Willow Beach		R	R	P		R, P		
Boulder Beach	R	R	R	R	E	E		
Las Vegas Wash		R	R	R				
Callville		P	P	R				
Echo Bay		R	R	R	P			
Overton Beach		P	P	P				
Temple Bar		R	R	R	E	R		
South Cove		P	P					
Pearce Ferry		P	P					
Coves with improved access			P					
Grapevine Canyon						E		
Redstone Picnic Area						P		
Rogers Spring						R		
Other specific sites determined by the recreation area						E, P		P

E - Existing  
R - Existing but to be rehabilitated or relocated  
P - Proposed

Paved roads within the recreation area, with few exceptions, would be improved. Improvements would include 4-foot paved shoulders, where appropriate, to alleviate deteriorating edges of pavement caused primarily by wide tracking boat trailers. The existing situation results in structural damage to the road, a constant maintenance problem, and a hazard for motorists who may drop a wheel in the ditch formed at the road edge. Other improvements could include better wash crossings, minor realignments at dangerous curves, use of guardrails in hazardous areas, and installation of reflective delineators for safer night driving.

Specific roads to be improved include the access roads to Willow Beach, Cottonwood Cove, and Katherine Landing. A realignment would be considered at Willow Beach to move the road out of a wash. This would reduce maintenance because of flood damage and increase visitor safety. Likewise, the road to Cottonwood Cove would be realigned where it crosses a wash and regular flash-flood damage occurs leaving the developed area isolated. The road to Katherine Landing would be widened with an extra lane (1 mile back from the launch ramp) to alleviate traffic jams during the heavy use season at this popular developed area.

Lakeshore Road, which runs between the Alan Bible visitor center and the NRA boundary near Henderson, Nevada (12 miles), is the most heavily used road in the NRA because it is the shortest and most scenic route between Las Vegas and Hoover Dam and provides access to the lake from two developed areas. The road is also one of the most dangerous in the section where it traverses rolling terrain between Las Vegas Wash and Lake Mead Marina (Boulder Beach). In this section there is very limited sight distance, virtually no shoulders or turnouts, and about a 7-mile no-passing zone. There are several alternatives being considered by the Federal Highway Administration and the National Park Service to improve this road, ranging from widening the existing alignment to building a new road on a new alignment. The design problem is compounded by a major waterline buried under the existing alignment. Work on the road would be done in phases, the first of which would be in the fiscal year (FY) 86 Federal Lands Highway Program (FLHP).

Table 12 presents existing road conditions, accident statistics for 1983, and proposed FHWA road improvements.

Northshore Road runs between Lakeshore Road and the north boundary of the recreation area above Overton Beach (48 miles). It is, perhaps, the most dangerous road in the national park system, at least from accident and fatality statistics. Most of this road was reconstructed around 1970 to the existing structural width but with gravel shoulders. Due to the pavement edge deterioration problem and safety hazard of the road, it would be widened, including 4-foot paved shoulders. There would be no additional disturbance in the section to Callville Bay because the existing base would accommodate the paved shoulders. From Callville Bay to Stewarts Point there would be some minor realignment of sharp curves, but the structural width is adequate to accommodate the paved shoulders. From Stewarts Point north, the road crosses many areas with unstable gypsum soils and is narrow and winding. Some reconstruction would be necessary in this section. Initial work on Northshore Road is in the FY 1985 FLHP schedule.

Table 12: Existing Conditions and Proposed FHWA Road Improvements

	<u>Existing Length/Width</u>	<u>Condition</u>	<u>Accidents in 1983</u>	<u>Improvements</u>	<u>Estimated Cost (millions)</u>
Katherine Access Road	4.01 - 24'	Deteriorating shoulders	16	Widen and pave 4' shoulders overlay road	\$ 2.0
Cottonwood Cove Access Road	5.96 - 24'	Deteriorating shoulders and road surface	10	Widen and pave 4' shoulders overlay road	\$ 2.5
Willow Beach Access Road	4.19 - 24'	Deteriorating shoulders and road surface	4	Widen and pave 4' shoulders overlay road	\$ 1.1
Lakeshore Rd.	11.69 - 24'	Poor site distance	28	Reconstruct	\$ 9.0
Northshore Rd.	47.61 - 24' - 32'	Deteriorating shoulders and road surface	53	Widen and Pave 4' shoulder overlay road	\$14.0
Callville Access Road	3.88 - 24'	Deteriorating shoulders and road surface	35	Widen and Pave 4' shoulders overlay road	\$ 1.5
Overton Access Road	2.92 - 24'	Deteriorating subbase - unstable soils	3	Reconstruct	\$ 7.0
Temple Bar Access Road	17.67 - 24'	Deteriorating shoulders and road surface	6	Widen and Pave 4' shoulders overlay road	\$ 1.5

The access road to Callville Bay is steep, narrow, and winding with many sheer drops into the wash the road parallels. It is the most dangerous access road in the recreation area. Guardrails would be installed in hazardous areas to improve safety in certain spots as part of FY 84 work on Northshore Road, but ultimately the road would be widened and realignment of hazardous curves would be considered. Work on the Callville Bay Road has not yet been programmed into a FY budget.

The access road to Temple Bar runs from US 93 northeast to the developed area. Only 14 miles of the road are within the NRA boundary, the rest of which is under the jurisdiction of Mohave County. The road crosses numerous washes, including Detrital Wash, which drains hundreds of square miles of Arizona, and the overall condition of the road surface is poor. The NPS portion of the road would be widened with paved shoulders, and realignments at bad curves and wash crossings would be considered. Work on this road has not yet been programmed for a FY budget. Of note on this road is the county ownership of the initial portion. It is also in poor condition but Mohave County does not have the funds available to match NPS improvements on this section. Cooperation with the state and county will be required when use warrants a consistently improved road.

The access road to Overton Beach crosses very unstable gypsum soils similar to those described on Northshore Road. Because of the existing condition of the road the National Park Service has reduced the speed limit from 50 mph to 35 mph for safety reasons, and the road requires frequent maintenance to remain passable. The Overton Beach access road would be reconstructed to provide a more stable base structure which would also accommodate widening with paved shoulders. The work has not yet been programmed.

#### Wetlands Park Cooperation and Lake at Las Vegas Development

The Las Vegas Wash Wetlands Park proposal runs from Las Vegas to an area which approaches the recreation area boundary near the development at Las Vegas Wash. It is administered by the Clark County Department of Parks and Recreation and has recently been in the planning stage. Within the recreation area, the county's proposal calls for a hiking/horse trail along Las Vegas Wash and a trailhead near the Las Vegas Wash developed area. The National Park Service wishes to cooperate fully with this proposal, which will become a part of the final plan.

A possible boundary revision and development of private lands between the NRA and Wetlands Park proposal may alter present plans. The Pacific Malibu Development Corporation has proposed a major development on private lands partially within and adjacent to the boundaries of the Lake Mead National Recreation Area. The National Park Service became aware of the project when the Corps of Engineers issued a public notice on a proposed earthfill dam in Las Vegas Wash. The project--"The Lake at Las Vegas"--is being planned as a major destination resort community of residential and commercial properties designed to provide the ultimate

in recreational and living facilities in the Las Vegas area. Development calls for a dam, 140 feet high and 4,000 feet long, which will impound a 324-acre lake that will be maintained with water from the Henderson municipal water system. The normal flows of effluent in Las Vegas Wash will be passed under the lake and dam through a 94-inch bypass pipeline. Planned improvements around the reservoir consist of six resort beach hotels (each with 2,500 rooms), seven world class championship golf courses, 5,000 residential units, and related recreational, commercial, and convention facilities. The overnight population is projected to be approximately 66,000, consisting of 36,500 tourists.

Because of the magnitude of the project, its probable effects on Lake Mead National Recreation Area, and its significant effects on the quality of the human environment, the recreation area has recommended to the Western Regional Office that the Corps of Engineers prepare an environmental impact statement on the project. Major concerns with the project are

- stability of the proposed dam and its threat, if collapse occurs, to downstream visitor use

- the view from within Lake Mead NRA

- the tremendous potential for additional visitors for which proper facilities could not be provided because of budget restrictions

- the question of whether water stagnation and siltation could occur in a nonmoving body of water

### Plan Implementation

This General Management Plan is the first one to be completed for Lake Mead NRA since establishment of the area some 50 years ago. It is anticipated that the actions proposed in the plan will take at least 25 years to implement. The plan is based on an anticipated increase in visitation from 6.5 million to 11 million over the 25-year period. Because it is a long-term plan, individual actions proposed have been divided into three priorities to show the order in which the actions would be funded and implemented.

Priorities. First priority would be any action required for public health, safety, resource protection, and actions needed to correct existing facility or visitor use problems, such as crowding, congestion, trash, and conflicting uses. Examples of such actions include water treatment and sewer improvements, control of resource damage from illegal ORV use, improving traffic safety and circulation, separating uses at congested areas such as beaches and launch ramps, and rehabilitating outmoded facilities to meet current needs. These projects would only be programmed when existing developed areas are near capacity and visitation increases demand development. The National Park Service will need about five years to complete all of the first priority actions, and NPS costs for these actions would be \$6,237,500.

Second priority would be to meet the needs of increasing visitation at existing developed areas. Examples include expansion of motels, marinas, and maintenance areas. The National Park Service will need about eight years to complete all second priority actions, and NPS costs for these actions would be \$11,000,000.

Third priority would be to meet the needs of increasing visitation by developing new areas. Such low priorities include the development of Boxcar Cove and Fire Mountain. The National Park Service will need about 12 years to complete all third priority actions, and NPS costs for these actions would be \$17,525,000.

Table 13 summarizes the NPS and concessioner development costs by zone and priority number. Some items listed as concession costs would be negotiated at a later date, but the intent is to have them funded by concessioners. Examples of such items include utility systems, parking improvements and expansion, and campground improvements.

Phasing. By applying the priorities as described, the plan and its costs would be phased over a 25-year period or longer. A new plan would be developed only when the needs and problems of the recreation area changed dramatically enough to warrant the investment in a new plan. Total costs for all three priorities are \$34,762,500 for the NPS and \$35,269,500 for concessioners. While this total cost is high, it should be emphasized again that the plan would be phased over about 25 years. If the costs were averaged over this period, it would amount to an average annual expenditure of \$1,390,500 for the NPS and \$1,410,780 for concessioners. If this annual NPS expenditure is averaged over the 6.5 million visitors who currently use the area, the expenditure amounts to 21 cents per visitor per year initially and 13 cents per visitor per year as visitation grows to the 11 million level projected in 25 years.

Finally, as with any long-range plan, some actions anticipated in 1985 may never be needed. The National Park Service has no intention of building any facility until use warrants the expenditure of funds. This is especially true for the proposed developed areas.

Flood Mitigation. Flood mitigation costs are summarized in table 14. These costs have not been included in the development costs summarized in table 13 because the National Park Service is required to take these flood mitigation actions under Executive Order 11988. These funds would be expended even if a plan was not approved.

The costs summarized in table 14 are broken down into structural and nonstructural actions. Whenever possible all low-cost nonstructural items would be implemented before the more expensive structural measures.

Minimum Requirements. The minimum requirements for the safe and effective operation of the recreation area would include actions in the first and second priorities. These actions would be completed by the NPS in 12 years at the average annual funding level of \$1,390,500 and would represent a balanced management program that addresses needs for public

Table 13: Proposed NPS and Concessioner Development Costs by Priority

Zone	Priority 1		Priority 2		Priority 3		Total	
	NPS	Concession	NPS	Concession	NPS	Concession	NPS	Concession
Katherine	\$ 183,500	\$ 262,500	\$ 1,475,000	\$ 3,310,000	\$ 6,617,000	\$ 800,000	\$ 8,275,500	\$ 4,372,500
Cottonwood	242,500	100,000	1,137,000	2,937,500	9,065,500	3,794,500	10,445,000	6,832,000
Willow Beach	125,000	500,000	17,000	970,000	0	0	142,000	1,470,000
Boulder Basin	4,400,000	1,265,000	4,001,500	7,537,500	1,692,500	3,119,500	10,094,000	11,922,000
Echo Bay	532,500	792,500	1,489,000	2,283,000	0	0	2,021,500	3,075,500
Overton Beach	320,000	30,000	706,000	740,000	0	0	1,026,000	770,000
Virgin/Temple	295,000	270,000	902,500	6,557,500	150,000	0	1,347,500	6,827,500
Gregg Basin/Grand Wash	12,000	0	1,066,000	0	0	0	1,078,000	0
Shivwits Plateau	127,000	0	206,000	0	0	0	333,000	0
Totals	\$6,237,500	\$3,220,000	\$11,000,000	\$24,335,500	\$17,525,000	\$7,714,000	\$34,762,500	\$35,269,500

Table 14: Proposed Flood Mitigation Cost Summary

Zone	Structural		Total
	Nonstructural	Structural	
Katherine	\$ 265,000	\$2,047,000	\$2,312,000
Cottonwood	490,000	2,327,000	2,817,000
Willow Beach	270,000	1,898,000	2,168,000
Boulder Basin	220,000	1,837,000	2,057,000
Echo Bay	0*	0	0
Overton Beach	125,000	0	125,000
Virgin/Temple	65,000	1,615,000	1,680,000
Totals	\$1,435,000	\$9,915,000	\$11,159,000

health and safety, resource protection, correction of existing facility and visitor use problems, and accommodation of increasing visitation at existing developed areas. The NPS costs for accomplishing the minimum requirements would be \$17,237,500.

## NO-ACTION ALTERNATIVE

### Visitor Use and Development

Existing management strategies would continue; this alternative suggests that the recreation area has reached an optimum level and distribution of use, where large intensive activity sites are complemented by sweeping open spaces and extensive shorelines that invite exploration by boat or on primitive roads.

Planning would be piecemeal. When resource damage or visitor conflicts occurred, they would be dealt with on a case-by-case basis.

Facilities would remain basically as they are, but minor improvements would be accomplished through routine maintenance when money and manpower became available.

The assumption under the no-action alternative is that only minor modifications are needed to solve the recreation area's problems. The following visitor use and development actions would occur under each zone in the recreation area. Greater details related to each zone are located in the "Alternative Development Concept Actions" section.

Katherine Zone. Katherine Landing would provide visitors with the major access point for boating and beach camping on the southern end of Lake Mohave; visitors would be provided a full range of services for day and overnight use at the developed area.

Cottonwood Zone. A wide variety of visitors would be accommodated at Cottonwood Cove; most visitors use Cottonwood simply as access to the central portion of Lake Mohave where they beach camp for several days, boat, water ski, or fish.

Willow Beach Zone. The area would provide convenient day use access to the upper portion of Lake Mohave; overnight accommodations would be limited.

Boulder Basin Zone. Visitors would be provided a full range of services and facilities, primarily for day use lake access, which would continue to be provided from the three existing developed areas.

Echo Bay Zone. Visitors would be provided a full range of services and facilities for lake access, overnight use, and houseboat staging.

OVERTON BEACH ZONE

ECHO BAY ZONE

BOULDER BASIN ZONE

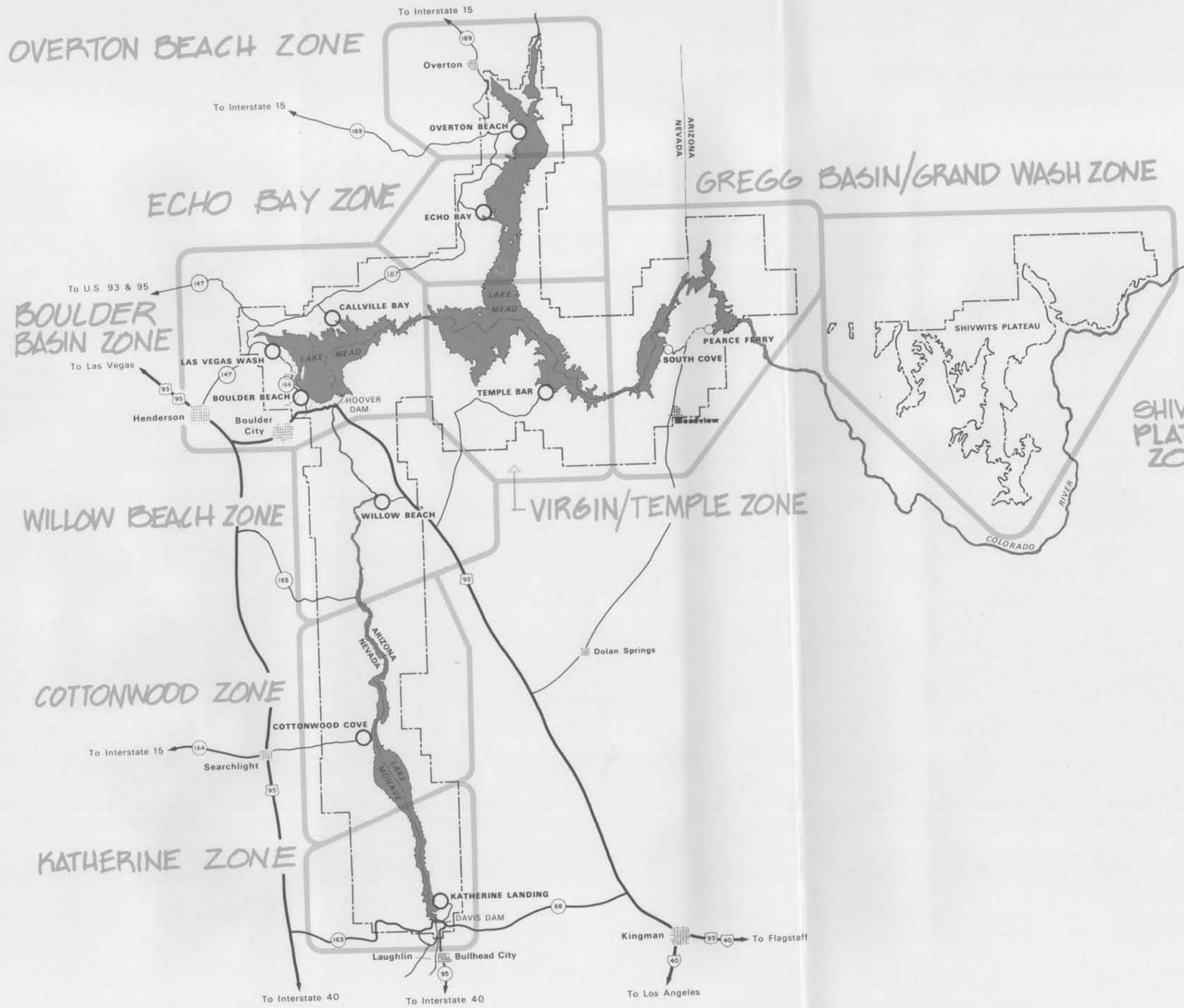
WILLOW BEACH ZONE

COTTONWOOD ZONE

KATHERINE ZONE

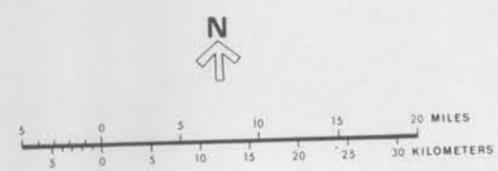
GREGG BASIN/GRAND WASH ZONE

SHIWITS PLATEAU ZONE



EXISTING CONDITIONS WILL PREDOMINATE. THIS ALTERNATIVE SUGGESTS THAT LAKE MEAD HAS REACHED AN OPTIMUM LEVEL AND DISTRIBUTION OF USE, WHERE LARGE INTENSIVE ACTIVITY SITES ARE COMPLIMENTED BY SWEEPING OPEN SPACES AND EXTENSIVE SHORELINES THAT INVITE EXPLORATION BY BOAT AND OVER PRIMITIVE ROADS.

- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINT
- PLANNING ZONE
- - - APPROVED BACKCOUNTRY ROADS



NO-ACTION ALTERNATIVE

LAKE MEAD  
NATIONAL RECREATION AREA  
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Overton Zone. Visitors seeking a less crowded and more rustic developed area with fewer services would be attracted to Overton Beach; primitive camping and support services along with access to the northernmost portion of Lake Mead would remain primary attractions.

Virgin/Temple Zone. All types of visitors would be accommodated, but the adventuresome boater and fisherman would be the most accommodated because there would be a fuel stop on the east end of the lake, houseboat rentals, and other services to help visitors wanting to make an expedition toward Grand Canyon and into the most remote parts of Lake Mead.

Gregg Basin/Grand Wash Zone. Visitors that desire a primitive experience with limited access and no services would be accommodated.

Shiwits Plateau Zone. The remote and nonwater-related experiences would continue to be primitive.

### Flood Mitigation

Flood mitigation under 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. Property in the flash-flood hazard zone would remain susceptible to flood damage, and people's lives would depend on the success of these nonstructural measures. Specific actions can be found in the "Alternative Development Concept Actions" section.

### Management Zoning

Under the no-action alternative the recreation area would be managed according to the No-Action Management Zoning map (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 (excepted from) to 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 from federal regulations, whereas the zones are more conceptual and reflect general management intent.

Accordingly, mineral leasing can currently be considered on a case-by-case basis in portions of most of the zones and subzones. Because of this situation, the no-action alternative varies from the definitions in table 4. Otherwise that table's definitions, examples, and strategies are applicable to the no-action alternative. Acreages and percentages of each zone are presented in table 5 for easy comparison among alternatives.

The Management Zoning map for the no-action alternative was developed by updating, correcting, and simplifying the information from the Land Management and Use map. This zoning map also allows comparison among alternatives by using the same categories as the other alternatives in this GMP.

Under the no-action alternative, existing developments and approved roads are included in the development zone. Historic and archeological sites are in the historic archeological zone. This zone intentionally follows section lines and is larger than the cultural resource sites so that the irreplaceable cultural resources are protected by not precisely revealing their location.

The special use zone includes the following subzones that are the same for all alternatives - reservoirs, Bureau of Reclamation project lands, nonfederal lands, and utility corridors. This zone does not include any resource utilization subzone, but mineral leasing and development are considered on a case-by-case basis in most other zones/subzones.

Most of the recreation area is in the natural zone under the no-action alternative. It contains three subzones - environmental protection, outstanding natural feature, and natural environment.

Significant natural resources are in the environmental protection or outstanding natural feature subzones. Because more resource data has become available during the GMP planning process to more accurately define the significant natural resources, many of those resources identified in the "Affected Environment" section are not in the environmental protection or outstanding natural feature subzones under this alternative.

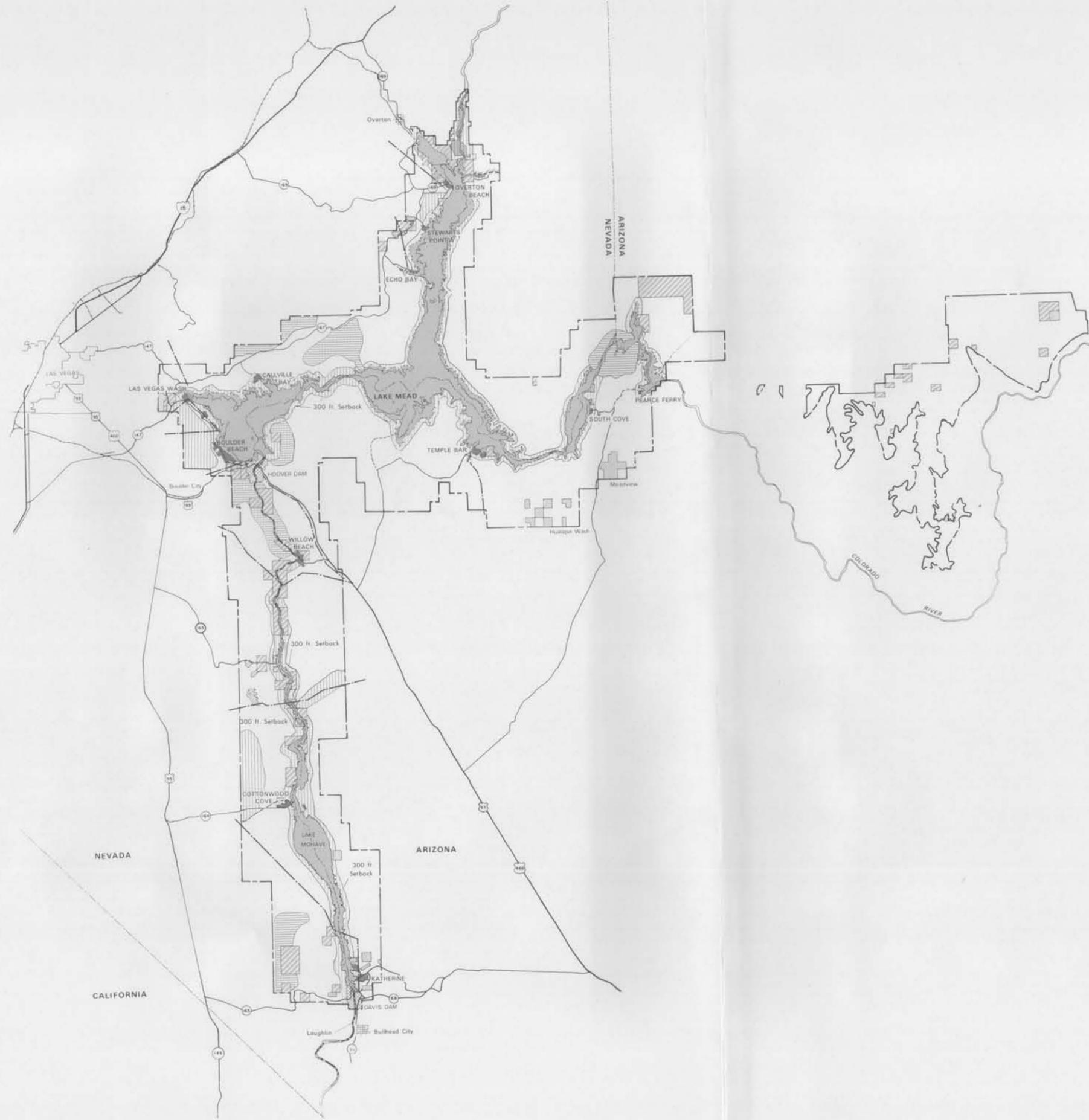
The natural environment subzone includes all lands in the recreation area not included in one of the previous zones or subzones. Most lands possessing wilderness values and recently identified significant natural resources would be in the natural environment subzone.

For mineral leasing the 1966 Excepted Areas map (NRA-LM 2291-A) would remain in effect. The only areas of the NRA where leasing is categorically excluded (i.e., excepted) are those areas shown on the 1966 Excepted Areas map (see table 15). These areas are

- 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

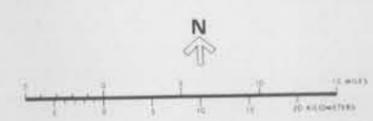
- lands within the smallest legal subdivision of the public land surveys containing a spring or water hole, or within 1/4 mile thereof on unsurveyed public land

- lands within 300 feet of Lake Mead, Lake Mohave, or the Colorado River, measured horizontally from the shoreline at maximum water surface elevation and land within the area of supervision of the Bureau of Reclamation around Hoover and Davis dams



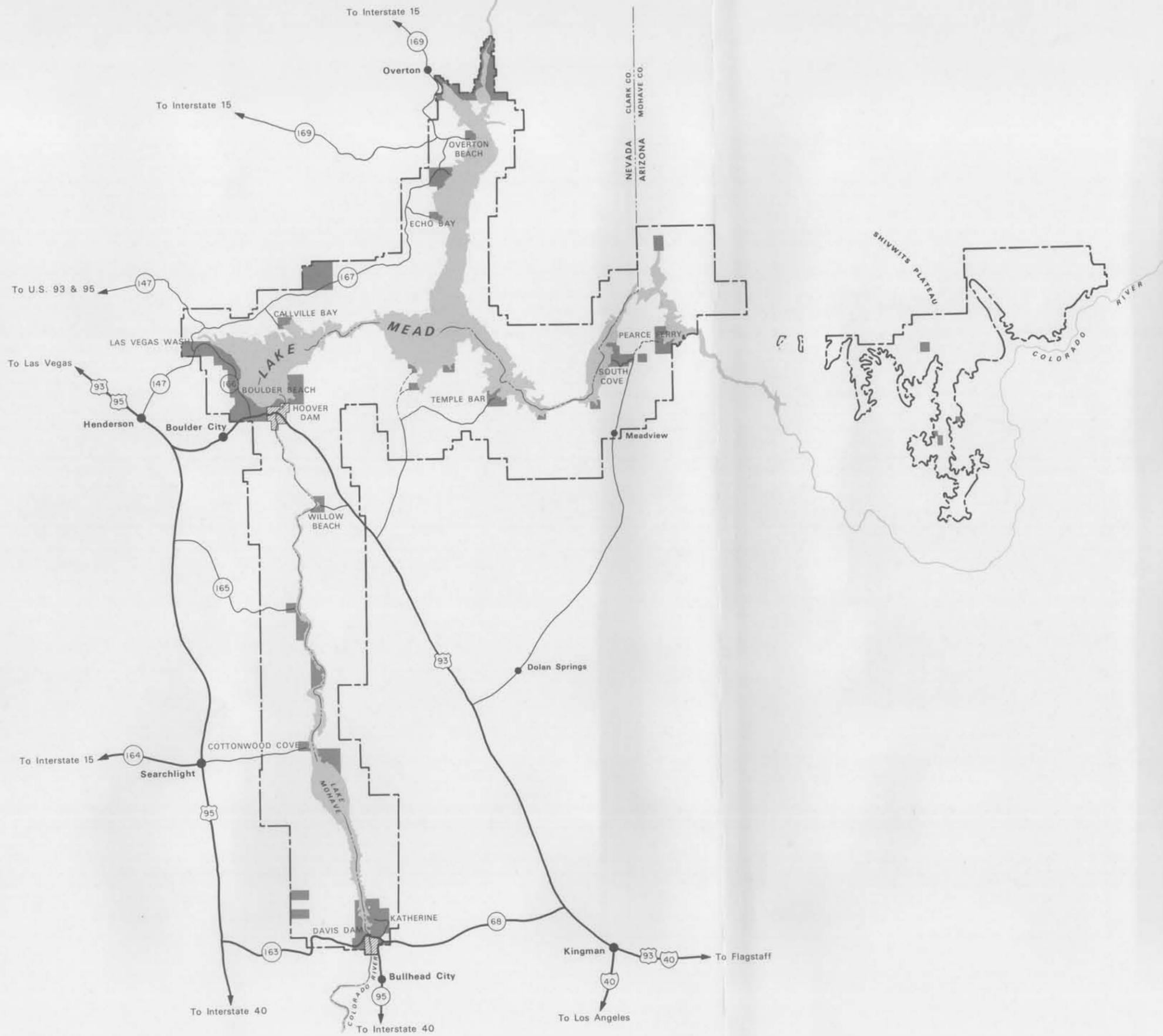
ACREAGE	NATURAL ZONE
71,735	ENVIRONMENTAL PROTECTION
66,590	OUTSTANDING NATURAL FEATURE SUBZONE
1,062,125	NATURAL ENVIRONMENT SUBZONE
51,280	HISTORIC/ARCHEOLOGICAL ZONE
<b>DEVELOPMENT ZONE</b>	
7,330	DEVELOPMENT SUBZONE ACCESS SUBZONE (Not shown, but roads shown on the alternative maps and Approved Roads map.)
<b>SPECIAL USE ZONE</b>	
191,500	RESERVOIR SUBZONE
5,030	BUREAU OF RECLAMATION PROJECT LANDS SUBZONE
14,090	NONFEDERAL LANDS SUBZONE
12,795	UTILITY CORRIDOR SUBZONE

\* Areas closed to mineral leasing are shown on the mineral leasing excepted areas (July 1966) map



**NO-ACTION ALTERNATIVE  
MANAGEMENT ZONING**  
(PROPOSED LAND USE)  
**LAKE MEAD  
NATIONAL RECREATION AREA**  
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NATIONAL PARK SERVICE





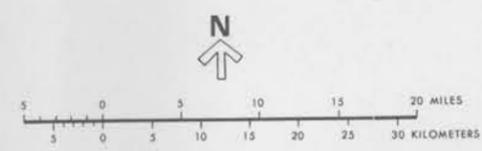
The following areas shall not be open to mineral leasing under the provisions of 43 CFR 3100 for oil and gas, and 43 CFR 3500 for other minerals:

- a) All lands within 200 feet of the center line of any public road, or within 200 feet of any public utility including, but not limited to electric transmission lines, pipelines and railroads.
- b) All lands within the smallest legal subdivision of the public land surveys containing a spring or water hole, or within one-quarter of a mile thereof on unsurveyed public land.
- c) All the waters of Lakes Mead and Mohave and all lands within 100 feet of those lakes measured horizontally from the shoreline at maximum water surface elevations.
- d) All lands within the area of supervision of the Water and Power Resources Service (Bureau of Reclamation) around Hoover and Davis Dams and all land within any developed and/or concentrated public use area or other area of outstanding recreational significance as designated by the Superintendent on the map (NRA-L.M.2291A, dated July 1966) of Lake Mead National Recreation Area which is available for inspection in the Office of the Superintendent.

Other areas of the NRA are open to consideration of mineral lease applications on a case-by-case basis, subject to valid prior existing rights. Resource values in these areas are considered on each application and the lease application is either denied, or approved with protective stipulations.

- Lands retained by Bureau of Reclamation for primary purpose of project
- Lake Mead National Recreation Area - existing and proposed development sites and areas of concentrated visitor use

TOTAL ACREAGE OF EXCEPTED AREAS = 319,925



**EXCEPTED AREAS**  
1966  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
ARIZONA - NEVADA  
UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



lands within any developed and/or concentrated public use area or other area of outstanding recreational significance as designated by the superintendent

Table 15: 1966 Excepted Areas

<u>Area Excepted</u>	<u>Acres</u>
Lake surfaces at high water	191,500
300-foot setback from lakes	12,365
Areas of outstanding recreational significance, developed areas, and BOR supervised areas	76,140
Springs (43 springs with ¼-mile setback=160 ac. ea.)	6,880
Roads (572 miles x 400-foot corridor)	28,385
Utilities (96 miles x 400-foot corridor)	<u>4,655</u>
Total	319,925

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 (78%) are open to consideration for mineral leasing, and of this acreage 69,177 acres remain available for potential mineral development on patented/unpatented mining claims and nonfederal mineral rights. Lands containing nonfederal mineral rights might occur in any of the management zones. When this occurs, the National Park Service would manage the surface of those lands according to the surrounding zoning category, subject to the exercise of the nonfederal right. Leases currently exist within two management zones--natural zone and historic/archeological zone.

#### Other Management Actions

Other management actions under the alternative would be the same as those described under the proposed action, including natural and cultural resources management, lake use management, information/interpretation, trailer village and cabin site policy, road improvements for public safety, and wetland park cooperation.

## ALTERNATIVE A

### Visitor Use and Development

Activities and experiences associated with lakeshore sites accessible by boat or on primitive roads would be maintained by directing expanded use to existing developed areas. This would result in a clear choice for those who seek an active social experience at developed areas and for others who prefer a more primitive experience at developed areas or along the shoreline. The existing developed areas would be expanded and improved to withstand the large numbers of visitors while minimizing impacts on the environment.

It is assumed that existing development is adequately located to serve visitors; however, it could be expanded to provide for increasing use. The flood hazard could be mitigated against the probable maximum flood with major structures like channels and levees.

Following are specific actions proposed for each zone. Greater details related to each zone are presented in the "Alternative Development Concept Actions" section.

Katherine Zone. The developed area would be expanded for overnight and day use with some activities relocated to adjacent coves. Boat access would be provided in two locations in the immediate vicinity. Existing vacation cabin sites would be removed and the flood-free area would be used for expansion of public recreation facilities.

Cottonwood Zone. Cottonwood Cove would continue to accommodate a wide variety of visitors as described in the previous alternative; however, facilities would be improved, expanded, or relocated to better accommodate visitors and to provide safety from flood hazard.

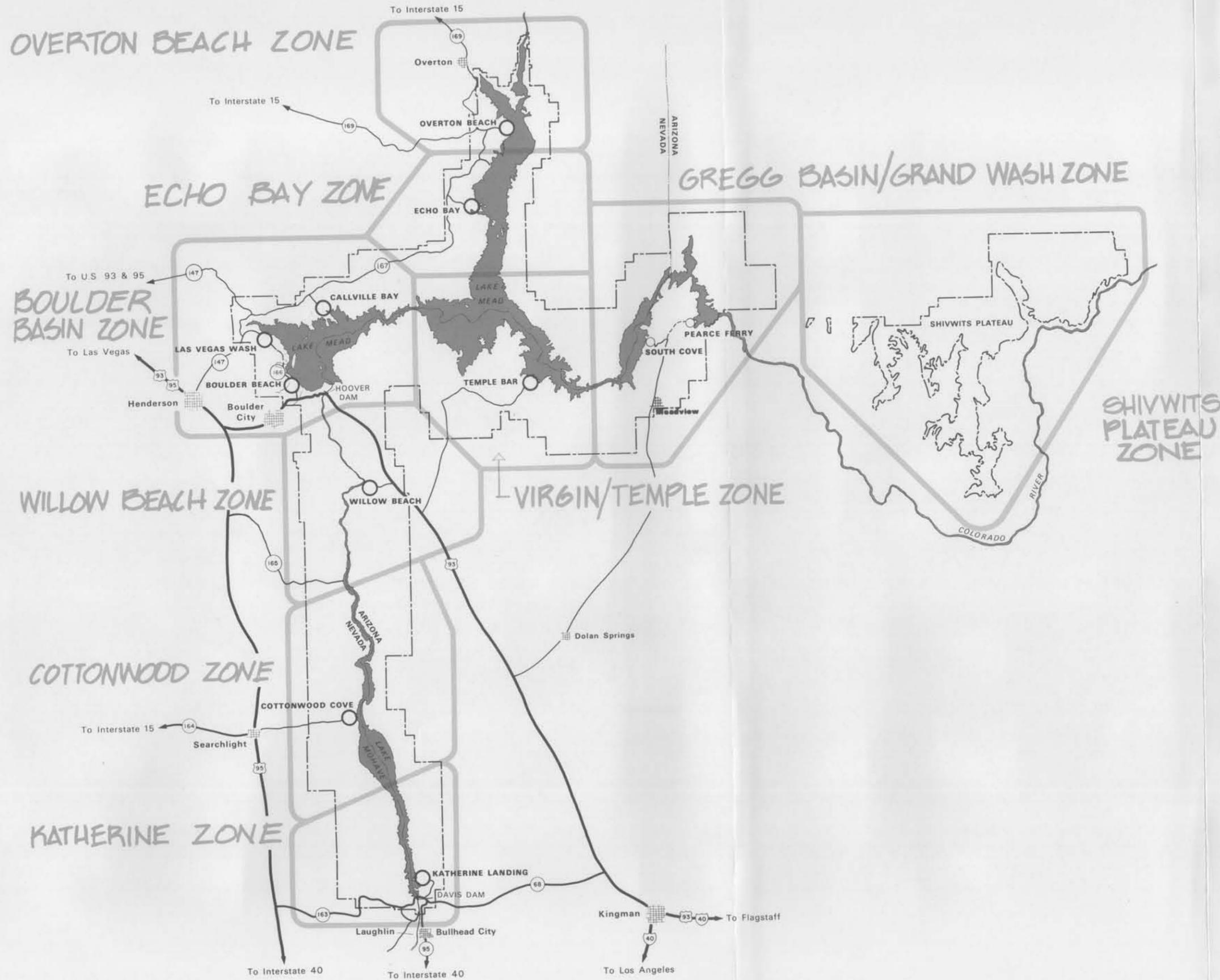
Willow Beach Zone. Visitors would continue to be provided convenient access to Northern Lake Mohave, and more overnight accommodations would be provided.

Boulder Basin Zone. Major emphasis would not change; developed areas would be expanded to accommodate more use and to better provide for overnight use.

Echo Bay Zone. Major emphasis would not change; developed area facilities would be expanded to accommodate more use.

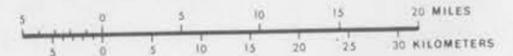
Overton Beach Zone. Major emphasis would not change; more overnight visitors would be accommodated through the development of a motel.

Virgin/Temple Zone. Day and overnight visitors would be accommodated through the improvement of facilities at Temple Bar, which would provide a complete range of visitor services. Temple Bar would remain the staging area for adventuresome visitors wishing to explore the most remote regions of Lake Mead. Existing vacation cabin sites would be



THIS ALTERNATIVE IS DESIGNED TO PRESERVE AND MAINTAIN ACTIVITIES AND EXPERIENCES ASSOCIATED WITH LAKESHORE SITES ACCESSIBLE BY BOAT OR PRIMITIVE ROADS BY DIRECTING EXPANDED USE TO EXISTING DEVELOPED AREAS. THIS WILL RESULT IN A CLEAR CHOICE FOR THOSE WHO SEEK AN ACTIVE SOCIAL EXPERIENCE AT THE DEVELOPED AREAS, AND OTHERS WHO PREFER A MORE PRIMITIVE EXPERIENCE ALONG THE SHORELINE. THE EXISTING DEVELOPED AREAS WILL BE EXPANDED AND IMPROVED TO WITHSTAND LARGE NUMBERS OF VISITORS WHILE MINIMIZING IMPACTS ON THE ENVIRONMENT.

- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINTS
- PLANNING ZONE



**ALTERNATIVE A**  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
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removed, and the flood-free area would be used for expansion of public recreation facilities.

Gregg Basin/Grand Wash Zone. Major emphasis would not change.

Shivwits Plateau Zone. Major emphasis would not change.

### Flood Mitigation

Under alternative A all flash floods up to the probable maximum level would be mitigated with channels, levees, and other structures, or by relocating facilities out of the floodplain.

### Management Zoning

Under alternative A the management zoning (see Alternative A Management Zoning map) includes existing developments and approved roads in the development zone. This zone is unchanged from existing conditions under the no-action alternative. Likewise, the historic/archeological zone is the same size for this alternative as existing conditions (for acreages refer to table 5), but mineral leasing would not be allowed in this zone under this alternative. The zoning categories explained in table 4 are applicable for alternatives A, B, and the proposed action; the no-action alternative varies from the definitions.

Because the objective of alternative A is maximum protection of natural resources, only the minimum amount of land area would be used to accommodate increasing visitor use. To accomplish this objective existing developed areas would be expanded to provide for larger numbers of visitors.

The only difference between this alternative and the proposed action is that the resource utilization subzone of the special use zone is smaller. This is due to the fact that all areas meeting the Wilderness Act criteria were excluded from mineral leasing. All areas not in one of the three previously mentioned zones, such as those areas possessing wilderness values, would be in the natural zone, which emphasizes preservation and protection of natural resources. This situation results in the largest natural zone of any alternative.

Lands containing nonfederal mineral rights might occur in any of the management zones. When this occurs, the National Park Service would manage the surface of those lands according to the surrounding zoning category, subject to the exercise of the nonfederal right.

### Other Management Actions

Other management actions under alternative A would be the same as those described under the proposed action, including natural and cultural

resources management, lake use management, information/interpretation, trailer village and cabin site policy road improvements for public safety, and wetland park cooperation.

## ALTERNATIVE B

### Visitor Use and Development

A broader range of choices and experiences would be offered by developing new areas and upgrading selected primitive roads leading to less developed shoreline sites. Crowding and congestion at the more heavily used existing areas would be reduced by spreading use evenly around the lakes.

Use of new developed areas and improved access points would likely relieve congestion in existing developed areas. It would be feasible to leave existing developed areas at status quo, and the probable maximum flood hazard could be mitigated by various means (structures, relocations, and area closures) and avoided at improved access points and new developed areas.

Following are specific actions proposed for each zone. Greater details are presented in the "Alternative Development Concept Actions" section.

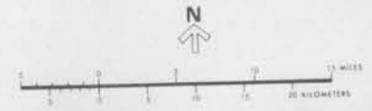
Katherine Zone. Overnight visitors would be accommodated at Katherine Landing, and the day users would be directed to adjacent coves for swimming and picnicking. Eight vacation cabin sites would be removed, and that flood-free area would be used for expansion of public recreation facilities. Overcrowding, now experienced primarily on holiday weekends in the south end of the zone around Katherine Landing, would be alleviated by providing an additional launch ramp in the cabin site area and a seasonal, floating gas/supply facility in a cove 6 to 8 miles to the north. This arrangement would draw visitors from the south and keep them in the currently underutilized north end of the zone by providing required commodities now available only at Katherine Landing. Conditions that would trigger implementation of this proposal would be facilities at Katherine Landing, reaching 85 to 90 percent capacity for 45 days or more during the heavy use season for two to four years consecutively.

Cottonwood Zone. Day visitors desiring to use the central portion of Lake Mohave would be directed to Cottonwood Cove where a launch ramp and a few other day use facilities would be provided. Due to the great flood hazard and high costs to structurally mitigate, the concession would be purchased by the National Park Service and closed. Both day and overnight visitors would be accommodated at a new development at Fire Mountain, which would have boat access and a wide variety of services. Cottonwood East and Six-Mile Cove would function as two additional boating access points. These major changes would be implemented early in the life of the plan, since they are being done for flood mitigation.



ACREAGE	NATURAL ZONE
317,930	ENVIRONMENTAL PROTECTION SUBZONE
51,580	OUTSTANDING NATURAL FEATURE SUBZONE
779,390	NATURAL ENVIRONMENT SUBZONE
51,280	HISTORIC/ARCHEOLOGICAL ZONE
<b>DEVELOPMENT ZONE</b>	
7,330	DEVELOPMENT SUBZONE
	ACCESS SUBZONE (Not shown, but roads shown on the alternative maps and Approved Roads map.)
<b>SPECIAL USE ZONE</b>	
51,550	RESOURCE UTILIZATION SUBZONE *
191,500	RESERVOIR SUBZONE
5,030	BUREAU OF RECLAMATION PROJECT LANDS SUBZONE
14,090	NONFEDERAL LANDS SUBZONE
12,795	UTILITY CORRIDOR SUBZONE

\* Mineral leasing is only permitted in the resource utilization subzone



**ALTERNATIVE A  
MANAGEMENT ZONING**  
(PROPOSED LAND USE)  
**LAKE MEAD  
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OVERTON BEACH ZONE

ECHO BAY ZONE

GREGG BASIN/GRAND WASH ZONE

BOULDER BASIN ZONE

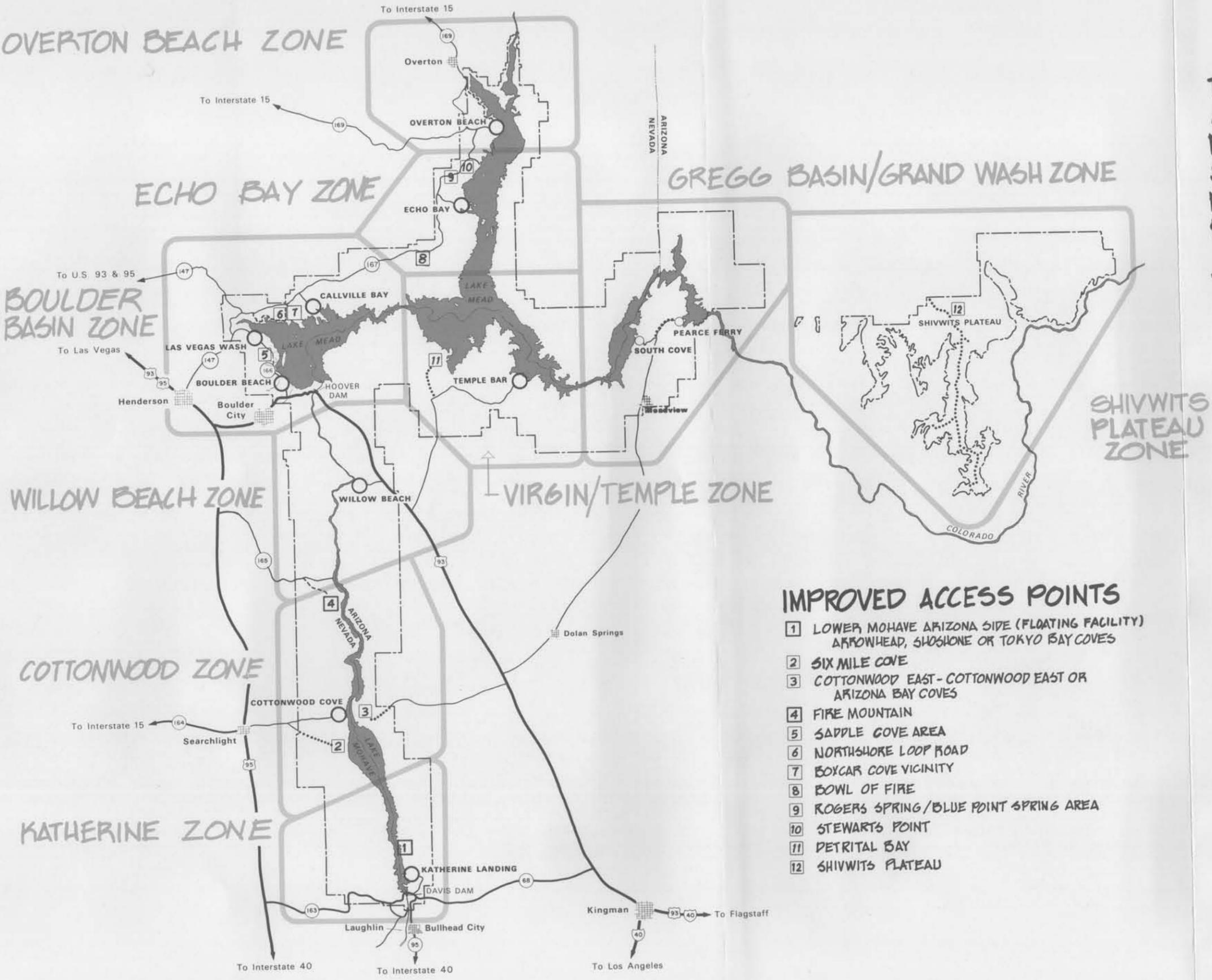
WILLOW BEACH ZONE

VIRGIN/TEMPLE ZONE

SHIVWITS PLATEAU ZONE

COTTONWOOD ZONE

KATHERINE ZONE

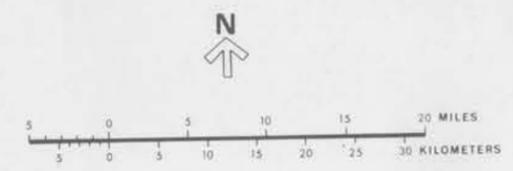


THIS ALTERNATIVE IS MEANT TO OFFER A BROADER RANGE OF CHOICES AND EXPERIENCES BY DEVELOPING NEW SITES AND UPGRADING SELECTED PRIMITIVE ROADS LEADING TO LESS DEVELOPED SHORELINE SITES. CROWDING AND CONGESTION AT THE MORE HEAVILY USED EXISTING AREAS WILL BE REDUCED BY OPENING THESE NEW OR UPGRADED SITES

- PROPOSED ROAD
- ..... IMPROVE EXISTING ROAD
- MAJOR DEVELOPED AREA
- EXISTING IMPROVED ACCESS POINTS
- PLANNING ZONE
- PROPOSED MAJOR DEVELOPED AREA
- PROPOSED IMPROVED ACCESS POINT

IMPROVED ACCESS POINTS

- 1 LOWER MOHAVE ARIZONA SIDE (FLOATING FACILITY) ARROWHEAD, SHOSHONE OR TOKYO BAY COVES
- 2 SIX MILE COVE
- 3 COTTONWOOD EAST - COTTONWOOD EAST OR ARIZONA BAY COVES
- 4 FIRE MOUNTAIN
- 5 SADDLE COVE AREA
- 6 NORTHSORE LOOP ROAD
- 7 BOXCAR COVE VICINITY
- 8 BOWL OF FIRE
- 9 ROGERS SPRING/BLUE POINT SPRING AREA
- 10 STEWARTS POINT
- 11 PETRITAL BAY
- 12 SHIVWITS PLATEAU



**ALTERNATIVE B**  
 LAKE MEAD  
 NATIONAL RECREATION AREA  
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Willow Beach Zone. Day visitors who require access to the northern portion of Lake Mohave would be directed to Willow Beach, where a launch ramp and a few other day use facilities would be provided. Due to the great flood hazard and high costs to structurally mitigate, the concession would be purchased by the National Park Service and closed.

Boulder Basin Zone. Major emphasis would not change; improved access points would accommodate more use.

Echo Bay Zone. Major emphasis would not change; Stewarts Point access and launch ramp would be improved.

Overton Beach Zone. The new gravel road between Overton and Overton Beach would open many new access opportunities along that section of Lake Mead shoreline. Visitors seeking a less crowded and more rustic developed area with fewer services would be attracted to Overton Beach; primitive camping and support services along with access to the northernmost portion of Lake Mead would be primary attractions.

Virgin/Temple Zone. Major emphasis would not change at Temple Bar. An additional improved access point would also be provided at Detrital Bay to help spread use more evenly throughout the zone.

Gregg Basin/Grand Wash Zone. Visitors who need limited services (e.g., fuel) would be accommodated at Pearce Ferry and South Cove, and the increased use would change the character of the zone.

Shivwits Plateau Zone. The primitive experience of the Shivwits Plateau would be slightly changed by the improvement of roads and the addition of a primitive campground.

### Flood Mitigation

Alternative B would mitigate the flood hazard by closing Willow Beach and Cottonwood Cove as developed areas and using them for day use access; mitigating most other probable maximum flood hazards with channels, levees, and other structures; and by relocating some facilities.

### Management Zoning

Under Alternative B, the management zoning (see Alternative B Management Zoning map) includes existing and proposed developments and roads in the development zone. The area of this zone is larger under this alternative than in any of the other alternatives, except the proposed action, because of the new proposed development and improved access points (see table 5). The historic/archeological zone is the same for this alternative as it is for alternatives. The zoning categories explained in table 4 are applicable for alternatives A, B, and the proposed action; the no-action alternative varies from the definitions.

Alternative B emphasizes maximum use of the resources of the NRA and a broader range of choices and experiences for visitors. This would be accomplished by developing new areas and improved access points and upgrading selected primitive roads leading to less developed shoreline sites. Since maximum use of resources was the objective of this alternative, the management zoning criteria had to be more liberally interpreted. To allow more resource use and to also preserve scenic vistas around the lake, this alternative would protect a 1.5-mile-wide corridor of land back from the shoreline of both lakes. This is the only difference from the proposed action, which seeks to preserve scenic vistas through protection of entire natural features. Accordingly, this alternative has the largest special use zone and resource utilization subzone of all the alternatives. Many areas possessing wilderness values would be in the resource utilization subzone and subject to mineral leasing. Areas containing significant natural resource values would be in the natural zone. Many of these areas also possess wilderness values.

Lands containing nonfederal mineral rights might occur in any of the management zones. When this occurs, the National Park Service would manage the surface of those lands according to the surrounding zoning category, subject to the exercise of nonfederal rights.

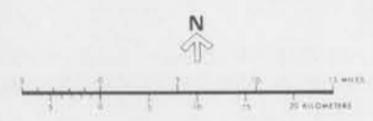
#### Other Management Actions

Other management actions for alternative B would be the same as those described under the proposed action, including natural and cultural resource management, lake use management, information/interpretation, trailer village and cabin site policy, road improvements for public safety, and wetland park cooperation.



ACREAGE	NATURAL ZONE
317,930	* ENVIRONMENT PROTECTION SUBZONE
51,580	OUTSTANDING NATURAL FEATURE SUBZONE
508,940	NATURAL ENVIRONMENT SUBZONE
51,280	HISTORIC/ARCHEOLOGICAL ZONE
<b>DEVELOPMENT ZONE</b>	
8,780	DEVELOPMENT SUBZONE ACCESS SUBZONE (Not shown, but roads shown on the alternative maps and Approved Roads map.)
<b>SPECIAL USE ZONE</b>	
191,500	RESERVOIR SUBZONE
5,030	BUREAU OF RECLAMATION PROJECT LANDS SUBZONE
14,090	NONFEDERAL LANDS SUBZONE
320,550	RESOURCE UTILIZATION SUBZONE *
12,795	UTILITY CORRIDOR SUBZONE

\* Mineral leasing is only permitted in the resource utilization subzone



**ALTERNATIVE B  
MANAGEMENT ZONING**  
(PROPOSED LAND USE)  
**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA  
UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



## ALTERNATIVE DEVELOPMENT CONCEPT ACTIONS

In the preceding part of the "Alternatives, Including the Proposed Action" section, the parkwide management direction for each planning zone was given for each alternative. This part contains a series of alternative development concept actions that detail actions necessary to resolve specific problems within each zone. These actions are proposed to correct problems in existing developed areas, expand these areas where necessary, improve existing access points, and to add new developed areas where needed.

The development concept planning for each zone includes a narrative description of the zone, proposed development, and flood mitigation actions for the proposed action and the alternatives. An Actions chart compares the specific actions and costs that would occur under the proposed action and each alternative. A set of DCP graphics follows each zone description.

All alternatives except the no-action alternative establish maximum levels of development that can accommodate increasing use in the foreseeable future, while not exceeding reasonable capacity limits. This strategy can be applied in different ways, and the "Parkwide Alternative Actions" section explains the rationale behind each alternative.

The maximum levels of development identified are not goals; they are the absolute maximum that can occur. Any expansion of facilities proposed by the concessioner must be within the limits set by the GMP. These proposals will be evaluated to determine if there is adequate visitor demand and if it is economically feasible at the time. Approval of expansion will be granted only after the criteria have been met.

In certain cases, where facilities of concern to the carrying capacities of the lakes are involved, such as parking, launch ramps, marina slips, dry boat storage, buoyed boats, rental boats, and primitive access, more detailed studies will be required before expansion is allowed. These detailed studies are discussed in the "Carrying Capacities" section.

The maximum expansion levels should satisfy visitor demand well beyond the year 2000. Problems will arise because demand is uneven around the recreation area. The areas that are in the greatest demand in the near future should be developed to their identified maximums first. Once this happens, the National Park Service will develop a strategy to encourage visitors to use developed areas that are not as crowded.

Relocation of facilities, unless noted otherwise, means that facilities would be relocated within the developed area or immediate vicinity. (See appendix E for a definition of other planning terms.) Cost estimates presented in the Actions charts, which follow each of the subsequent development zone analyses, are in 1983 dollars.

Several important issues are common to all developed areas. Flood hazard mitigation, general circulation, and fluctuating lake water levels influence the visitor experience. Flood protection is considered paramount because of safety, and it is the first element addressed related to location or relocation of facilities. General circulation problems are remarkably similar in all areas. The unfamiliar visitor often ends up on the launch ramp by way of the current road system, usually in the midst of several vehicles launching boats. To reduce such confusion and traffic hazards, most of the plans for the developed areas suggest alternative circulation routes to allow easy launch access for repeat visitors, with still easier routes to marina parking lots for first-time visitors. Circulation patterns in all developed areas will be studied in greater detail in transportation studies for each area. First priority for such a study is the Katherine Landing developed area. With regard to permanent facilities and parking, lake levels at Lake Mead can fluctuate dramatically. High-water parking, critical in 1983, might not be necessary in five years; therefore, parking areas would be sited but would not be paved. No permanent facilities that can be damaged by reservoir flooding would be below the high-water elevation of 1,230 feet on Lake Mead, which is several feet higher than the water level would be expected to reach.



katherine zone

## KATHERINE ZONE

### Proposed Action

Katherine Landing. The road to Katherine Landing winds down to Lake Mohave through open desert and affords expansive views of the lake and the picturesque hills beyond. This resort is one of the most popular and highly used areas in the recreation area, drawing crowds from both southern California and Arizona metropolitan areas. The resort's appeal would increase with time and therefore the current pressing problems of crowding, inadequate launch facilities, and limited parking and beach space would become more severe. The proposed action would provide solutions to improve the current visitor experience and to ensure a better experience for future visitors.

Congestion on land and in the water is apparent in the southern end of Katherine zone, especially during the summer. Capacity within the entire zone has not yet been reached, but capacity in the vicinity of Katherine Landing development and harbor is pushing the limits of tolerance. Over the 1979 to 1982 period, visitation to this area has shown an increasing trend of 6 percent yearly. Overnight lodging stays during the same time increased 3 percent yearly. Because the capacity of Katherine Landing is already often at its limit during the summer, additional parking areas are not suggested because they would increase the existing congestion problems on the lake nearby. However, redesign of existing parking areas and overall circulation would be reviewed in a transportation study to improve and facilitate the visitor experience.

Additional features of the proposed action would include improved information facilities next to the water and before entering the resort. A new swim area is proposed north of the developed area along a beautiful sandy stretch of beach where there is better mixing of water than in the present swim area. Restrooms, parking, and picnicking would be conveniently located to serve this swim area. These changes would help prevent pollution of the water beyond acceptable standards. Pending the results of a transportation study, additional RV sites, a redesigned parking area, or other future use would be located in the existing swim beach/picnic area, and the motel would be expanded. Expansion of existing or development of new concession facilities would be analyzed by an economic feasibility study before approval. Only those proposed actions that are feasible would be approved.

Flood hazard would be alleviated through channeling 100-year floodflow and relocating some facilities. (See floodplains and wetlands in the "Affected Environment" section of volume II for a discussion of the design studies that have been completed to arrive at these flood mitigation proposals.) For floods larger than the 100-year level, a warning system and evacuation plan would be implemented. North and South Telephone coves would be closed to public use because of the severe flood hazard. People displaced from these coves would probably use improved access points within the zone for a similar experience.

The existing earth, flood-diversion dike above the entrance road that diverts flood waters from Katherine Wash to South Telephone Cove Wash would be reconstructed using concrete/gabion lining. A concrete/gabion-lined diversion dike/channel would be placed immediately above the campground, extending from South Katherine Wash across the access road to the north wall of Katherine Wash. This action would require a bridge on the access road to cross the dike. All flow would be diverted to South Katherine Wash and would flow down the gravel wash to the vicinity of the NPS and concession housing area where the concrete-lined channel would begin. The concrete-lined channel would continue from this point down to the present alignment of South Katherine Wash to the lake. A concrete-lined diversion dike would be placed in the concession housing maintenance area with a dip section in the road for flood protection in that area. The NPS maintenance area would be relocated and a warning system package installed. Sizes and costs of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Concrete/gabion-lined diversion dike	4400' x 40'	\$ 880,000
	Concrete/gabion-lined diversion dike	1550' x 22'	285,000
	Access road bridge	24' x 20'	68,000
	Concrete-lined channel	2437' x 40'	647,000
	Concrete-lined diversion dike/dip crossing	659' x 23'	167,000
Nonstructural:	Warning system package		95,000
	Relocate NPS maintenance area	2 acres	<u>170,000</u>
	Total		\$2,312,000

Lower Mohave Arizona Side--Improved Access. To attract people to the less crowded regions of the zone, a new improved access point with gas and grocery facilities would be provided 5 to 10 miles north of the development. An additional launch ramp would be located here, with parking easily accessible to the ramp. Likely locations for the new improved access point include Shoshone, Tokyo, and Arrowhead coves.

No-Action Alternative

Katherine Landing would provide visitors with the major access point for boating and beach camping on the southern end of Lake Mohave; visitors would be provided a full range of services for day and overnight use at the developed area.

To mitigate flash floods, the short-term trailers would be removed from the north Katherine Wash area and the area regraded. The existing diversion canal above the access road would be regraded to divert flood

flow into Telephone Cove. A warning system package would be installed. Sizes and costs of these items are as follows:

<u>Item</u>	<u>Cost</u>
Regrade diversion canal	\$ 128,000
Warning system package	<u>95,000</u>
Total	\$ 223,000

#### Alternative A

The developed area would be expanded for overnight and day use with some activities relocated to adjacent coves. Boat access would be provided in two locations in the immediate vicinity.

To mitigate flash-flood hazards, a diversion canal lined with gabions would be placed above the access road to divert flows into Telephone Cove. A spillway would be provided at the existing detention dam site at the borrow pit (1/4 mile above campground) so that the borrow pit could be used as a stilling basin. In South Katherine Wash a diversion dike would be placed immediately above the campground to divert flows through a concrete-lined channel beginning immediately above the campground to the lake. This channel would protect all visitor developments in the South Katherine Wash, including NPS maintenance and NPS and concession housing. In the North Katherine Wash a dike would be placed in the cabin site road so that flood flows would enter a concrete-lined channel. This channel would continue through the long- and short-term trailer sites and afford them protection. Below the trailer sites the channel would be unlined to the lake. In the boat storage area an earth ditch would convey flood flows to the lake. Costs and sizes of these items (all structural mitigation) would be as follows:

<u>Item</u>	<u>Size</u>	<u>Cost</u>
Gabion-lined diversion canal	4500' x 50'	\$ 568,000
Spillway at borrow pit	250' x 6'	188,700
Campground diversion dike	500' x 40'	71,000
Concrete channel, S. Katherine Wash	3750' x 75'	1,797,800
Concrete channel, N. Katherine Wash	1830' x 40'	588,000
Boat storage ditch	690' x 150'	<u>63,500</u>
Total		\$3,277,000

#### Alternative B

Overnight visitors would be accommodated at Katherine Landing, and the day users would be directed to adjacent coves for swimming and picnicking. Overcrowding, primarily on holiday weekends, in the south

end of the zone around Katherine Landing would be alleviated by providing an additional launch ramp in the cabin site area and a seasonal, floating gas/supply facility in a cove 5 to 10 miles to the north (at Lower Mohave, Arizona side). This arrangement would draw visitors from the south and keep them in the currently underutilized north end of the zone by providing required commodities now available only at Katherine Landing. Conditions which would trigger implementation of this proposal would be facilities at Katherine Landing, reaching 85 to 90 percent capacity for 45 days or more during the heavy use season for two to four years consecutively.

To mitigate flash-flood hazards, an unlined diversion canal would be placed above the access road to divert flood flows into Telephone Cove. As in alternative A a spillway would be placed at the existing detention dam site so that the borrow pit could be used as a stilling basin. In South Katherine Wash a diversion dike would be placed immediately above the campground to divert flows through the NPS maintenance area which would be relocated and replaced with a dike to divert flows through a concrete-lined channel to the lake. This channel would protect all developments in the South Katherine Wash, including NPS and concession housing. In the North Katherine Wash 15 long-term and all 33 short-term trailer sites would be relocated out of the floodplain. In the boat storage area an earth dike would convey flood flows to the lake. Costs and sizes of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Unlined diversion canal	4500' x 60'	\$ 128,000
	Spillway at borrow pit	250' x 6'	188,700
	Campground/maintenance diversion dikes	700' x 50'	117,000
	Concrete channel, S. Katherine Wash	3750' x 75'	1,069,800
	Boat storage ditch	690' x 150'	63,500
	Nonstructural:	Relocate NPS maintenance area	
Relocate 15 permanent trailers			124,400
Relocate 33 short-term trailers			118,600
Warning system package			<u>95,000</u>
	Total		\$2,075,000

A C T I O N S

	No-Action	Alternative A	Alternative B	Proposed Action
<b>KATHERINE ZONE</b>				
<u>Katherine Landing Flood Mitigation</u>				
	Nonstructural measures: improve diversion canal above area, provide warning system \$223,000*	PMF structural measures: gabion-lined diversion canal above development, concrete-lined channel in South Katherine Wash, concrete-lined channel in North Katherine Wash \$3,277,000*	Combination of structural and nonstructural measures: earth diversion canal above development, concrete-lined channel in a portion of South Katherine Wash; relocate short-term trailers, provide warning system \$1,662,000*	Combination of 100-yr. structural and nonstructural measures: earth/concrete/gabion-lined, diversion canal above development concrete-lined channel in South Katherine diversion dike North Katherine Wash, provide warning systems for floods above 100 yr. \$2,143,000*
Access	Paved 2-lane road, 3 mi.	Widen 3-mi. entrance road to 4 lanes \$1,500,000	Same as no action	Widen entrance to 4 lanes where needed (1 mi.); maintain two paved lanes in developed area (.4 mi.) \$1,100,000 - 2**
Parking	1,400 spaces (paved and unpaved)	Pave and stripe existing parking; expand by 1/3 \$275,000	Same as no action	Pave and stripe existing gravel lot \$200,000 - 2
Launch Ramp	8 lanes	Resurface and extend existing ramp; \$40,000	Same as no action	Resurface and extend existing ramp \$40,000 - 1
Courtesy Dock	8-boat capacity	Expand by 1/2 \$25,000	Same as alternative A \$25,000	Same as alternative A \$25,000 - 1
Swim Beach	Designated (2.75 acres)	Relocate out of harbor area (4 acres); add restrooms \$100,000	Same as alternative A \$100,000	Same as alternative A \$100,000 - 1
Ranger Station	Inadequate size (400 sq.ft.)	Relocate and expand to 1,000 sq.ft. \$70,000	Same as no action	Same as alternative A \$70,000 - 1
Interpretation/Information	Marina wayside, campground wayside (10'w x 7'h), 250-seat amphitheater	Rehabilitate all facilities except amphitheater, \$5,000	Same as alternative A, plus small highway information board at junction of access road and State Highway 68 \$8,000	Same as alternative B, plus small information wayside sign (10'w x 7'h) at cabin site junction \$11,000 - 1
NPS Boat Dock	3-boat capacity	Relocate and expand by 2 slips \$10,000	Same as no action	Same as alternative A \$10,000 - 1
NPS Maintenance	Inadequate size--two 800-sq. ft. buildings, 1.5 acre unpaved storage, and 800-ft. fence	Expand in same location--provide new 1,500 sq.ft. building, 2 acres unpaved storage; and 1,400-ft. fence \$125,000	Relocate existing buildings and grade 2 acres unpaved area \$170,000*	Same as alternative B, long term (\$170,000*) Same as alternative A, short term \$125,000 - 2

**KATHERINE ZONE/Katherine Landing**

A C T I O N S

KATHERINE_ZONE (cont.)		No-Action	Alternative A	Alternative B	Proposed Action
NPS Housing	8 units--6 (1,200 sq.ft.) permanent single family, 1 (1,600 sq.ft.) duplex	Construct new 3,000 sq. ft. fourplex in same area for seasonal housing \$150,000	Same as no action	Same as no action	Same as alternative A \$150,000 - 2
Picnic Area	Ten sites	Same as no action	Same as no action	Same as no action	Relocate existing sites with swim beach; convert existing area to RV sites, parking, or other future use
Campground	173 sites	Same as no action; add new 250-site campground at cabin site areas	Same as no action	Same as no action	Same as no action
Cabin Sites	39 cabins	Remove all cabins and replace with public facilities, including: 40-table picnic area, 25-site RV trailer park, 24-unit motel, 100-seat restaurant, 4-lane launch ramp, and 300 parking spaces \$1,665,000	Remove 8 cabins and replace with public facilities, including: 20-table picnic area, 4-lane launch ramp, and 325-vehicle parking area \$554,000	Remove 8 cabins and replace with public facilities, including: 20-table picnic area, 4-lane launch ramp, and 325-vehicle parking area \$554,000	Same as no action
Trailer Village	104 long-term and 39 short-term sites	Retain long and short term sites	Relocate 15 long- and all 39 short-term sites out of floodplain \$243,000*	Relocate 15 long- and all 39 short-term sites out of floodplain \$243,000*	Possibly add 40-site RV park in old amphitheater area, retain short-term and long-term sites \$125,000 - 2
Motel	52 units	Double size--add pool \$1,600,000	Same as no action	Same as no action	Same as alternative A \$1,600,000 - 2
Restaurant	117 seat capacity	Double size \$300,000	Same as no action	Same as no action	Same as alternative A \$300,000 - 2
Store	Adequate size (3,600 sq.ft.)	Double size \$150,000	Same as no action	Same as no action	Same as alternative A \$150,000 - 2
Marina	764 slips, no moorings	Carrying capacity expansion limit, 805 slips \$125,000	Same as no action	Same as no action	Same as alternative A \$125,000 - 2
Rental Boats	75 houseboats, 41 ski/patio/fishing boats	Same as no action	Same as no action	Same as no action	Same as no action
Dry Boat Storage	210 spaces	Double size same area \$10,000	Same as no action	Same as no action	Same as alternative A \$10,000 - 2
Concession Maintenance	Adequate size for present needs--6,000 sq.ft. building, 28,600 sq.ft. unpaved storage	Same as no action	Same as no action	Same as no action	Expand in existing area; combine with NPS if more space is needed \$250,000 - 1
Concession Housing	14 (800 sq.ft.) trailer units	Replace with permanent structures and add screen from view--five 1,200 sq.ft. homes and 5,000 sq.ft. dorm \$900,000	Same as no action	Same as no action	Same as alternative A \$900,000 - 2

KATHERINE\_ZONE/Katherine Landing

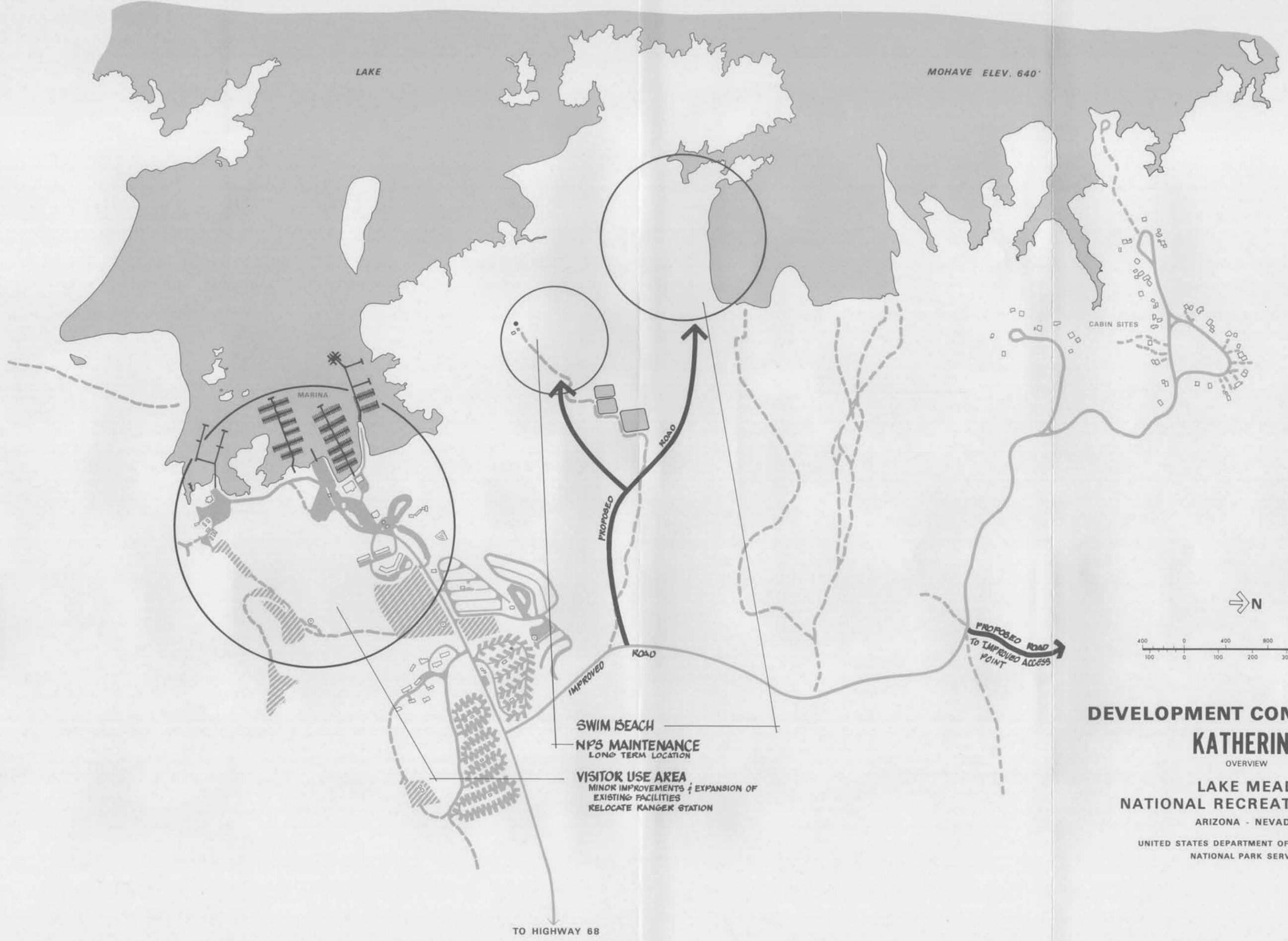
A C T I O N S

KATHERINE ZONE (cont.)	No-Action	Alternative A	Alternative B	Proposed Action
Gas Station	2 pumps	Same as no action	Same as no action	Same as no action
Gas Dock	14-boat capacity	Same as no action	Same as no action	Same as no action
<u>Improved Access:</u>				
<u>Lower Mohave, Arizona Side</u>				
Access	4-wheel-drive road (7 mi.)	Same as no action	1,000 sq. ft. floating store and 2-pump (400 sq. ft.) gas dock with water access only \$4,000,000	Construct 7 miles of paved road \$6,000,000 - 3
Parking	None	Same as no action		Paved, 200 spaces \$250,000 - 3
Launch Ramp	None	Same as no action		Paved 2 lanes \$15,000 - 3
Courtesy Dock	None	Same as no action		4 to 6 boat capacity \$30,000 - 3
Store	None	Same as no action		2,000 sq. ft. store \$150,000 - 3
Gas Dock	None	Same as no action		4-boat capacity \$50,000 - 3
Intepretation/Information	None	Same as no action	Same as alternative B \$2,000	Marina wayside sign \$2,000 - 3
Utilities (Water, Power, Sewer)	None	Same as no action	Water and sewage by boat; small generator \$36,000	Provide utilities \$920,000 - 3
<u>NPS: Flood Mitigation</u>				
Structural	\$ 0	\$ 3,277,000	\$ 1,567,000	\$ 2,047,000
Nonstructural/Relocation	223,000	0	508,000	265,000
Subtotal	223,000	3,277,000	2,075,000	2,312,000
<u>Other NPS Development</u>				
Existing Areas	0	3,905,000	627,000	1,658,500
New Areas	0	0	38,000	6,617,000
Subtotal	0	3,905,000	665,000	8,275,500
Total	223,000	7,182,000	2,740,000	10,587,500
<u>CONCESSION: Development Costs</u>				
Existing Areas	0	3,085,000	0	3,572,500
New Areas	0	0	4,000,000	800,000
Total	0	3,085,000	4,000,000	4,372,500
<b>GRAND TOTAL - Katherine Zone</b>	<b>\$223,000</b>	<b>\$10,267,000</b>	<b>\$ 6,740,000</b>	<b>\$14,960,000</b>

\* Costs related to flood mitigation.

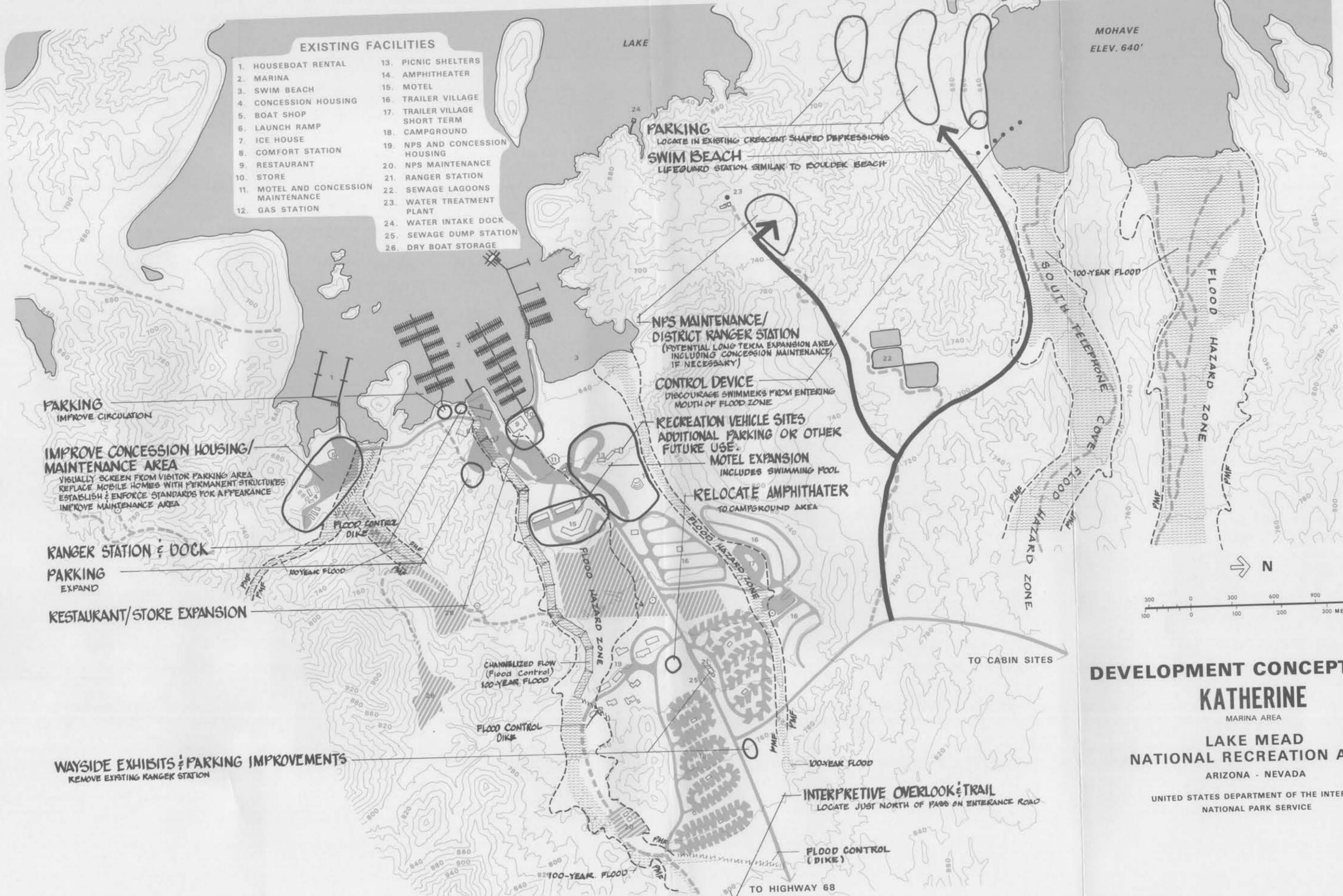
\*\*The plan implementation section defines three priorities, indicated here as 1, 2, or 3.

**KATHERINE ZONE/Improved Access**



**DEVELOPMENT CONCEPT PLAN**  
**KATHERINE**  
 OVERVIEW  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
 ARIZONA - NEVADA  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE





MOHAVE  
ELEV. 640'

**EXISTING FACILITIES**

- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1. HOUSEBOAT RENTAL                  | 13. PICNIC SHELTERS            |
| 2. MARINA                            | 14. AMPHITHEATER               |
| 3. SWIM BEACH                        | 15. MOTEL                      |
| 4. CONCESSION HOUSING                | 16. TRAILER VILLAGE            |
| 5. BOAT SHOP                         | 17. TRAILER VILLAGE SHORT TERM |
| 6. LAUNCH RAMP                       | 18. CAMPGROUND                 |
| 7. ICE HOUSE                         | 19. NPS AND CONCESSION HOUSING |
| 8. COMFORT STATION                   | 20. NPS MAINTENANCE            |
| 9. RESTAURANT                        | 21. RANGER STATION             |
| 10. STORE                            | 22. SEWAGE LAGOONS             |
| 11. MOTEL AND CONCESSION MAINTENANCE | 23. WATER TREATMENT PLANT      |
| 12. GAS STATION                      | 24. WATER INTAKE DOCK          |
|                                      | 25. SEWAGE DUMP STATION        |
|                                      | 26. DRY BOAT STORAGE           |

**PARKING**  
LOCATE IN EXISTING CRESCENT SHAPED DEPRESSIONS

**SWIM BEACH**  
LIFEGUARD STATION SIMILAR TO BOULDER BEACH

**NPS MAINTENANCE/DISTRICT RANGER STATION**  
(POTENTIAL LONG TERM EXPANSION AREA INCLUDING CONCESSION MAINTENANCE IF NECESSARY)

**CONTROL DEVICE**  
DISCOURAGE SWIMMERS FROM ENTERING MOUTH OF FLOOD ZONE

**RECREATION VEHICLE SITES**  
ADDITIONAL PARKING OR OTHER FUTURE USE.

**MOTEL EXPANSION**  
INCLUDES SWIMMING POOL

**RELOCATE AMPHITHEATER**  
TO CAMPGROUND AREA

**PARKING**  
IMPROVE CIRCULATION

**IMPROVE CONCESSION HOUSING/MAINTENANCE AREA**  
VISUALLY SCREEN FROM VISITOR PARKING AREA  
REPLACE MOBILE HOMES WITH PERMANENT STRUCTURES  
ESTABLISH & ENFORCE STANDARDS FOR APPEARANCE  
IMPROVE MAINTENANCE AREA

**RANGER STATION & DOCK**

**PARKING**  
EXPAND

**RESTAURANT/STORE EXPANSION**

**WAYSIDE EXHIBITS & PARKING IMPROVEMENTS**  
REMOVE EXISTING RANGER STATION

**DEVELOPMENT CONCEPT PLAN**

**KATHERINE**

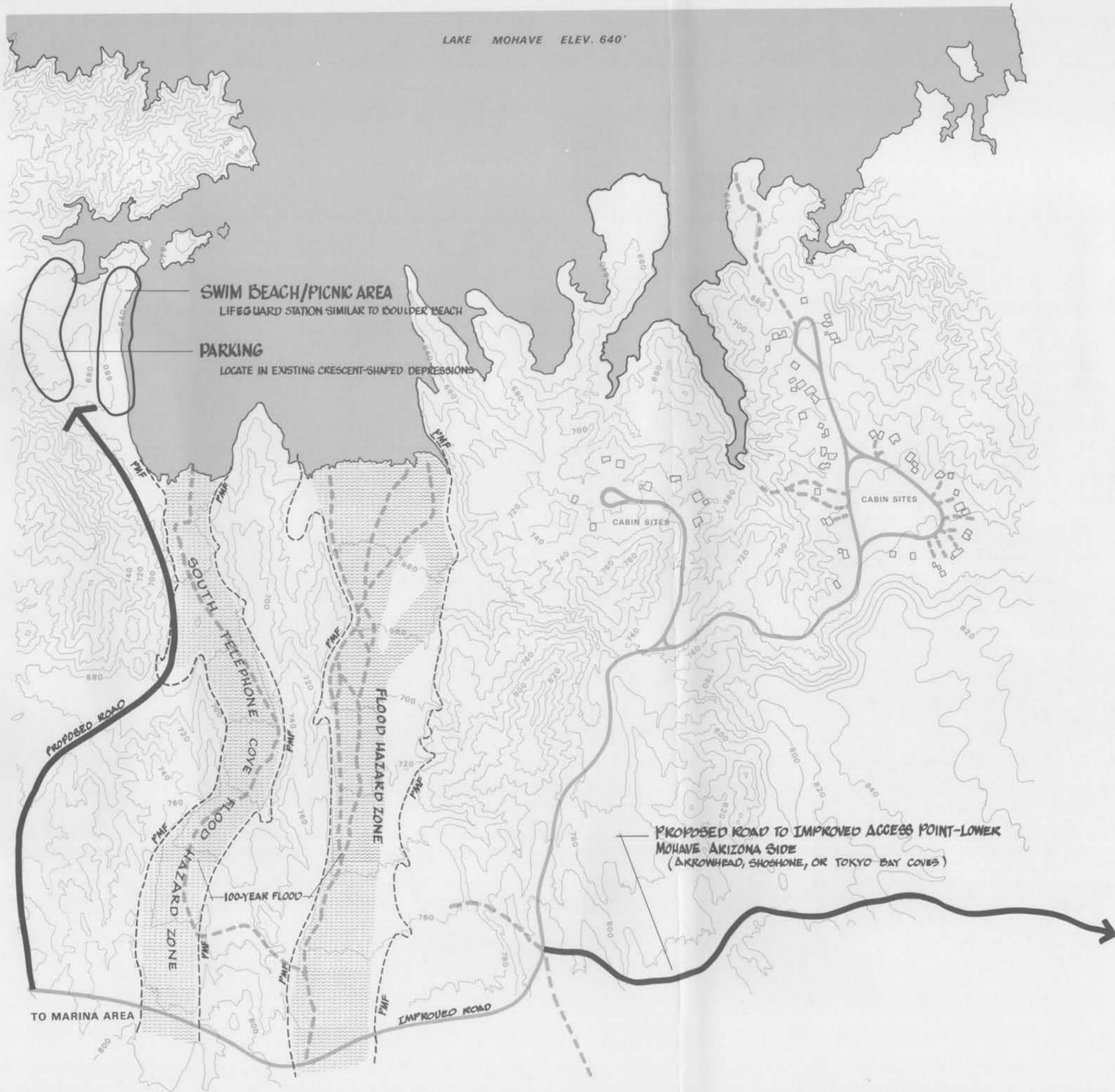
MARINA AREA

**LAKE MEAD  
NATIONAL RECREATION AREA**

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





**DEVELOPMENT CONCEPT PLAN**

**KATHERINE**

CABIN SITE AREA

**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





cottonwood cove zone

## COTTONWOOD ZONE

### Proposed Action

Cottonwood Cove. This area, located on the largest basin in Lake Mohave, attracts visitors from all parts of the country and has a high percentage of repeat visitation. Total visitation, however, has shown a decreasing trend of 14 percent per year over the 1979 to 1982 period. From 1979 to 1982 overnight stays showed an increasing trend of 20 percent per year. Good fishing beckons many during the cooler months of the year, while the large basin and accessible coves offer good water-skiing and hot-boating throughout the summer. The development consists of tile-roofed buildings and a tree-covered campground, both within easy walking distance to the lakeshore.

Circulation and parking would be redesigned to improve ease of access and capacity. Additional visitor parking would be provided in the long term at the NPS housing area after it has been relocated. The plan would allow for a maximum of doubling concession lodging and support services depending on the conclusion of an economic feasibility study. New features would include a picnic area and sandy swim beach in the next cove south of the resort. The new location for the swim beach has much better water mixing characteristics than the present swim beach location. Shade shelters and picnic tables adjacent to the water and on the bluff would create a pleasant environment to spend a day. Restrooms would also be conveniently provided to serve the new swim beach. These changes would help prevent waters being polluted beyond acceptable state standards. Because two airstrips already exist in this area in Searchlight, Nevada, and Cottonwood East, Arizona, an additional airstrip would not be considered at Cottonwood Cove, unless it became necessary to close the Cottonwood East airstrip.

Flood hazard at Cottonwood Cove would be alleviated by channeling 100-year flood flow and relocating some facilities. A concrete gabion-lined diversion dike would be placed approximately 600 feet above the main campground to divert flows north across the access road. As at Katherine Landing, a bridge would be required to cross the road. Another concrete/gabion-lined diversion dike would be placed behind and around the NPS housing/maintenance area to protect the area and the concession dry boat storage. Flows from both dikes would be directed into a concrete-lined channel which would continue from the confluence of the dikes on the north side of the access road to the lake. Two dip crossings of this channel would be required, one at the NPS housing/maintenance area and one at the concession dry boat storage area. An additional bridge would be required to cross the channel at the lower parking area. To protect the north campground, a concrete/gabion-lined diversion dike and concrete-lined channel would be required. In the long term, the NPS housing and maintenance areas would be relocated to a high bluff south of the entrance road where concession housing is also proposed. The warning system package is already in place at this area. Sizes and costs of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Concrete/gabion-lined diversion dike (main campground)	850' x 55'	\$ 151,000
	Concrete/gabion-lined diversion dike (NPS residences)	650' x 55'	124,000
	Diversion dike bridge	30' x 24'	\$ 95,000
	Concrete-lined channel (access road)	4364' x 60'	1,642,000
	2 channel dip crossings		86,000
	1 channel bridge	30' x 24'	95,000
	Concrete/gabion-lined diversion dike (North Campground)	200' x 55'	40,000
	Concrete-lined channel (North Campground)	1547' x 26'	90,000
	Nonstructural:	Relocate NPS housing maintenance (long term)	<u>5A</u>
	Total		\$2,817,000

Fire Mountain--Major New Developed Area. A major new developed area uplake at Fire Mountain would be developed if increased visitation warranted it and if an economic feasibility study indicated that new concession facilities were warranted. Development at Fire Mountain would be considered when facilities at Cottonwood Cove were at 85 to 90 percent capacity for at least 45 days of the heavy use season for two to four years consecutively. However, if the zone is experiencing carrying capacity problems, Fire Mountain would remain an improved access point, and additional use would be discouraged in less crowded zones.

Fire Mountain was studied extensively as a replacement for Eldorado Canyon after the disastrous 1974 flood. This development site occupies a high knoll on the Nevada side of the lake next to the water and has no flood hazard. It is situated in the transition zone between the Colorado River and Lake Mohave. Hence, it offers two distinctive recreational opportunities--fishing upstream and general boating downlake. Facilities provided would be comparable to those offered at other developed areas.

Six-Mile Cove and Cottonwood East--Improved Access. Two access points at Six-Mile Cove and Cottonwood East would be improved. These access points currently receive moderate use despite their unimproved condition. They would be improved to consist of a two-lane gravel access road, small parking area, paved launch ramp, restrooms, and level areas to facilitate RV and tent camping.

#### No-Action Alternative

A wide variety of visitors would be accommodated at Cottonwood Cove; most visitors use this site simply as access to the central portion of Lake

Mohave where they beach camp for several days, boat, water ski, or fish.

Existing drainage canals and warning system package would be maintained.

Alternative A

Cottonwood Cove would continue to accommodate a wide variety of visitors as described in the previous alternative; however, facilities would be improved, expanded, or relocated to better accommodate visitors and to provide safety from flood hazard.

The NPS housing and maintenance areas would be relocated. The wash above the boat storage area would be graded to prevent flood flows from entering the boat storage area. A dike would be placed below the NPS housing areas which would divert flows through a concrete-lined channel (#1) adjacent to the access road to the lake. Flood flows in the main wash would enter a concrete-lined channel (#2) above the campground. This channel would carry flows around the campground into channel #1 immediately below the boat storage area access road. The combined channel (#3) would then carry flows to a much wider channel (#4) across the lower parking areas to the lake. A box culvert would need to be placed under the boat storage access road and under the main access road so that channels could flow under these roads. Flood flows would also be carried in a concrete-lined channel (#5) around the north campground to the lake. Costs and sizes of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Grade Wash	650' x 50'	\$ 40,000
	NPS housing area dike	600' x 20'	59,000
	Concrete-lined channel (#1)	800' x 60'	869,000
	Concrete-lined channel (#2)	2700' x 25'	1,566,000
	Concrete-lined channel (#3)	2200' x 60'	2,140,000
	Concrete-lined channel (#4)	700' x 200'	900,000
	Concrete-lined channel (#5)	1600' x 40'	496,000
	2 box culverts	2(25' x 60')	240,000
Nonstructural:	Relocate NPS housing/ maintenance	5 acres	<u>490,000</u>
	Total		\$6,800,000

Alternative B

Day visitors desiring to use the central portion of Lake Mohave would be directed to Cottonwood Cove where a launch ramp and a few other day use facilities would be provided. Due to the great flood hazard and high

costs to structurally mitigate, the concession would be purchased by the National Park Service and closed. Both day and overnight visitors would be accommodated at a new development at Fire Mountain, which would have boat access and a wide variety of services. Cottonwood East and Six-Mile Cove would function as two additional boating access points. These major changes would be implemented early in the life of the plan because they are being done for flood mitigation.

Under this alternative the National Park Service would buy out the concession operation and operate the area as a day use access point to Lake Mohave. Costs for flood mitigation would be \$2,750,000.

A C T I O N S

COTTONWOOD_ZONE		No-Action	Alternative A	Alternative B	Proposed Action
Flood Mitigation	Nonstructural measures: maintain existing drainage channels and warning system	PMF Structural measures: channel flood flows in concrete channels through the developed area; nonstructural measures: relocate NPS housing, maintenance \$6,310,000*	Nonstructural measures: relocate structures out of floodplains; NPS buy out concrete-lined channels through developed area; relocate NPS housing and maintenance; provide warning system for floods above 100 yr. \$2,327,000*	Same as alternative A	Same as alternative A
Access	Paved 2-lane roads, 5 mi.	Same as no-action	Same as alternative A	Same as alternative A	Same as alternative A
Circulation	Paved 2-lane roads, 2.6 mi.	Improve circulation within development \$150,000	Same as no action	Same as alternative A	Same as alternative A \$150,000 - 1**
Parking	728 spaces (paved and unpaved)	Pave and stripe existing parking; expand by 1/3 \$750,000	Same as no action	Same as alternative A	Same as alternative A \$750,000 - 2
Launch Ramp	6 paved lanes	Define ready lanes and launch lanes, add permanent (400 sq.ft.) restroom \$60,000	Same as no action	Same as alternative A	Same as alternative A \$60,000 - 1
Courtesy Dock	Inadequate, 3-boat capacity	Provide new courtesy dock and expand to 4-boat capacity \$25,000	Same as no action	Same as alternative A	Same as alternative A \$25,000 - 1
Swim Beach	Unprotected north of launch ramp-- .5 acre	Relocate to cove south of present location; add restrooms--1 acre \$62,000	Same as no action	Same as alternative A	Same as alternative A \$62,000 - 2
Ranger Station	Inappropriate location 1,800 sq.ft.	Relocate to launch ramp area \$70,000	None required	Same as alternative A	Same as alternative A \$70,000 - 1
Interpretation/Information	Contact/ranger station, marina wayside (10'x7'), campground wayside (10'x7')	Rehabilitate all waysides \$10,000	Marina wayside sign (10'x7') \$2,000	Same as alternative A	Same as alternative A \$10,000 - 1
NPS Boat Dock	Rented (2 slips)	Construct 4 slips in vicinity of new ranger station \$10,000	None	Same as alternative A	Same as alternative A \$10,000 - 1
NPS Maintenance	Paved (20,000 sq.ft.) and fenced (600') maintenance yard, 3,000 sq.ft. building	Relocate-\$190,000* and expand-\$60,000; 3,000 sq. ft. building, 20,000 sq. ft. paved area, 800' fence	None	Same as alternative A	Same as alternative A Relocate \$190,000* Expand \$60,000 - 2
NPS Housing	3 (1,200 sq.ft.) permanent residences, 7 (800 sq.ft.) trailer units	Relocate existing housing-\$300,000* Construct 5 new 1,200 sq. ft. houses and 5,000 sq. ft. dorm--\$600,000	None	Same as alternative A	Same as alternative A Relocate \$300,000* Expand \$600,000 - 2
Picnic Area	1 shade structure with 4 tables	Same as no action	Add 3 new shade structures with 30 tables and grills \$30,000	Same facilities as alternative B but relocate with swim beach \$30,000 - 2	Same facilities as alternative B but relocate with swim beach \$30,000 - 2

COTTONWOOD\_ZONE

A C T I O N S

COTTONWOOD ZONE (cont.)		No-Action	Alternative A	Alternative B	Proposed Action
Campground	149 sites-concession operated	Expand by 2/3 \$90,000	None	None	Same as no action
Trailer Village	223 long-term and 75 short-term sites	Same as no action	None	None	Same as no action
Motel	24 units	Double size \$700,000	None	None	Same as alternative A \$700,000 - 2
Restaurant	35 seats	Relocate and double size \$450,000	None	None	Double size \$450,000 - 2
Store	Inadequate size (1,200 sq. ft.)	Double size \$150,000	None	None	Same as alternative A \$150,000 - 2
Marina	237 slips, no moorings	Carrying capacity expansion limit: 535 slips \$90,000	None	None	Same as alternative A \$90,000 - 2
Rental Boats	10 houseboats, 31 ski/patio/fishing	Expand houseboat fleet to carrying capacity limit of 25	None	None	Same as alternative A
Dry Boat Storage	350 spaces	Expand by 1/3 in existing location \$10,000	None	None	Same as alternative A \$10,000 - 2
Concession Maintenance	Adequate--4,400 sq. ft. building, 35,600 sq. ft. paved storage	Expand building by 2,500 sq. ft. in same area \$250,000	None	None	Same as alternative A \$250,000 - 2
Concession Housing	6 trailer units	Expand and relocate--5 1,200 sq. ft. homes and 5,000 sq. ft. dorm \$600,000	None	None	Same as alternative A (\$600,000) - 2, plus 12 1,000 sq. ft. mobile homes \$300,000 - 2
Gas Station	2 pumps	Relocate to reduce congestion--2 pumps \$100,000 - 1	None	None	Same as alternative A \$100,000 - 1
Gas Dock	4-boat capacity	Double size and consider relocation \$50,000	None	None	Same as no action
Airstrip	Dirt strip on east side Lake Mohave (2,600' length x 75' width)	Same as no action	Same as no action	Same as no action	Same as no action
Improved Access (Access, unpaved parking, pave launch ramp, primitive campground, restrooms)	10 miles of single-lane primitive road to Six-Mile Cove and 10 miles improved gravel road to Cottonwood East; no parking, no campsites, no ramp	Same as no action	Provide at Six Mile Cove and Cottonwood East: widen 10-mile road to Six-Mile Cove to 2 lane--12 acres; each area would have 3 acres of gravel parking, 2-lane launch ramp, 2 acres primitive camping, and two 12 sq. ft. toilets \$1,433,000	Same as alternative B \$1,433,000 - 3	Same as alternative B \$1,433,000 - 3

COTTONWOOD ZONE

A C T I O N S

COTTONWOOD ZONE (cont.)		No-Action	Alternative A	Alternative B	Proposed Action
<u>Major New Development Area</u>					
<u>Fire Mountain</u>					
Access	4-wheel-drive road (5.4 mi.)	Same as no action	Same as no action	2 lanes, 5.4 mi. paved \$6,000,000	Same as alternative B \$6,000,000 - 3
Parking	None	Same as no action	Same as no action	200 spaces \$225,000	Same as alternative B \$225,000 - 3
Launch Ramp	None	Same as no action	Same as no action	6 paved lanes \$35,000	Same as alternative B \$35,000 - 3
Campground	None	Same as no action	Same as no action	100 sites \$135,000	Same as alternative B \$135,000 - 3
Trailer Village	None	Same as no action	Same as no action	50 RV sites \$250,000	Same as alternative B \$250,000 - 3
Motel	None	Same as no action	Same as no action	25 units \$700,000	Same as alternative B \$700,000 - 3
Restaurant	None	Same as no action	Same as no action	Full-service, 50 seat \$100,000	Same as alternative B \$100,000 - 3
Store	None	Same as no action	Same as no action	Full-service, 2,000 sq. ft. \$225,000	Full-service 3,000 sq. ft. \$300,000 - 3
Concession Housing/Maintenance	None	Same as no action	Same as no action	4 units each 1,200 sq. ft. \$400,000	Same as alternative B \$400,000 - 3
NPS Housing/Maintenance	None	Same as no action	Same as no action	4 units each 1,200 sq. ft. \$400,000	Same as alternative B \$300,000 - 3
Interpretation/Information	None	Same as no action	Same as no action	1,000 sq. ft. contact/ranger station, marina wayside sign, campground wayside sign \$75,000	Same as alternative B \$75,000 - 3
Marina	None	Same as no action	Same as no action	200 slips \$600,000	Same as alternative B \$600,000 - 3
Dry Boat Storage	None	Same as no action	Same as no action	120 spaces \$67,000	Same as alternative B \$67,000 - 3
Restrooms	None	Same as no action	Same as no action	Provide full service--4,000 sq. ft. \$60,000	Same as alternative B \$60,000 - 3
Utilities	None	Same as no action	Same as no action	Provide water system, sewage lagoons, power, telephone/radio \$2,100,000	Same as alternative B \$2,100,000 - 3
Gas Station	None	Same as no action	Same as no action	Provide 2 pumps \$30,000	Same as alternative B \$30,000 - 3
Gas Dock	None	Same as no action	Same as no action	Provide 2 pumps \$50,000	Same as alternative B \$50,000 - 3

COTTONWOOD ZONE/Fire Mountain

COTTONWOOD ZONE

COTTONWOOD ZONE (cont.)	No-Action	Alternative A	Alternative B	Proposed Action
<u>NPS: Flood Mitigation</u>				
Structural	0	\$ 6,310,000	0	\$ 2,327,000
Nonstructural/Relocation	0	490,000	2,750,000	490,000
Subtotal	0	6,800,000	2,750,000	2,817,000
<u>Other NPS Development</u>				
Existing Areas	0	1,827,000	32,000	1,379,500
New Areas/Improved Access	0	0	10,463,000	9,065,500
Subtotal	0	1,827,000	10,495,000	10,445,000
Total	0	8,627,000	13,245,000	13,262,000
<u>CONCESSION: Development Costs</u>				
Existing Areas	0	2,400,000	0	3,037,500
New Areas/Improved Access	0	0	2,422,000	3,794,500
Total Concession Development	0	2,400,000	2,422,000	6,832,000
GRAND TOTAL - Cottonwood Zone	0	\$11,027,000	\$15,667,000	\$20,094,000

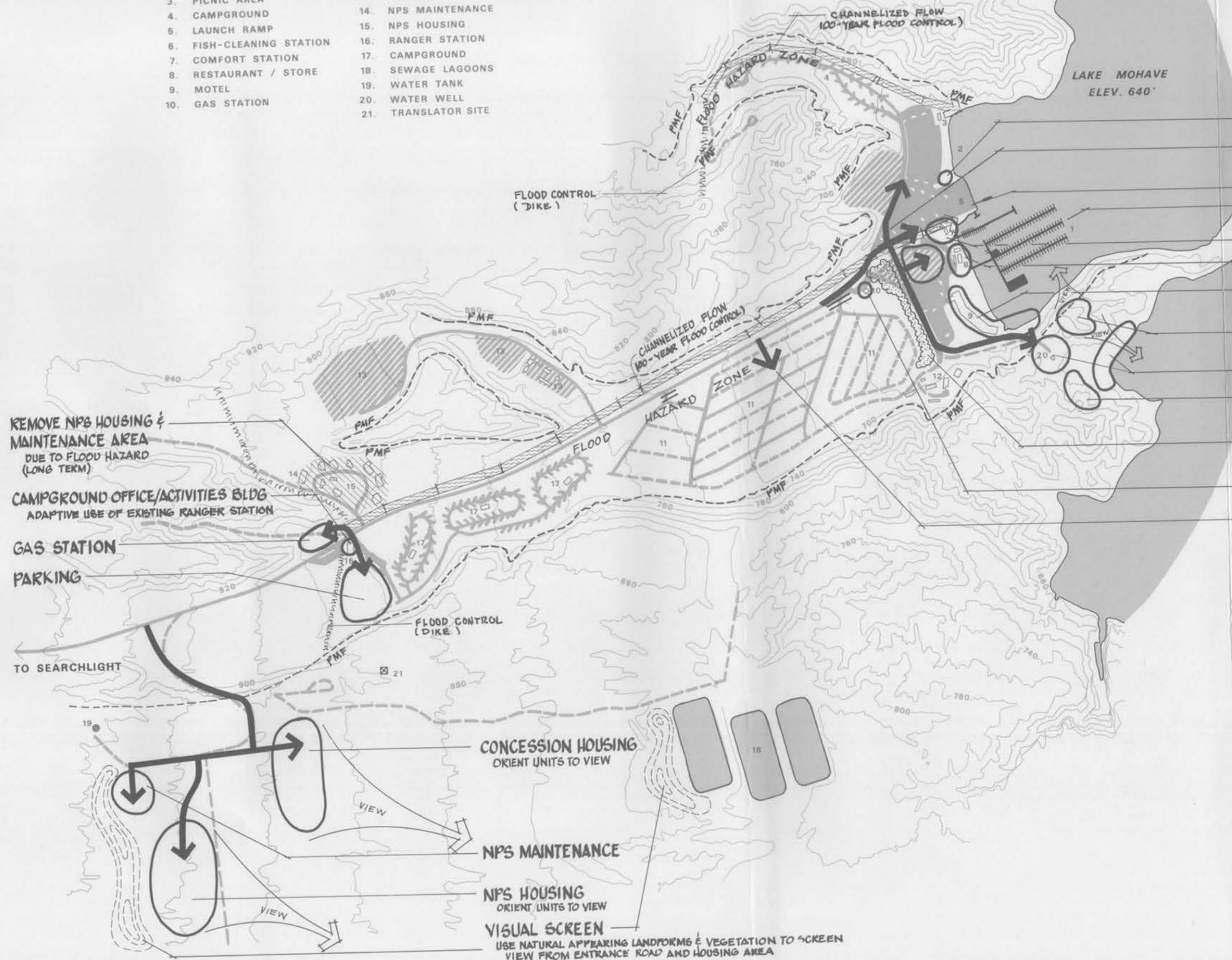
\* Costs related to flood mitigation.

\*\*The plan implementation section defines three priorities, indicated here as 1, 2, or 3.

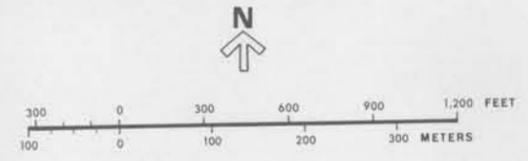


**EXISTING FACILITIES**

- |                          |   |
|--------------------------|---|
| 1. MARINA                | 11. TRAILER VILLAGE                           |
| 2. SWIM BEACH            | 12. CONCESSION HOUSING                        |
| 3. PICNIC AREA           | 13. DRY BOAT STORAGE / CONCESSION MAINTENANCE |
| 4. CAMPGROUND            | 14. NPS MAINTENANCE                           |
| 5. LAUNCH RAMP           | 15. NPS HOUSING                               |
| 6. FISH-CLEANING STATION | 16. RANGER STATION                            |
| 7. COMFORT STATION       | 17. CAMPGROUND                                |
| 8. RESTAURANT / STORE    | 18. SEWAGE LAGOONS                            |
| 9. MOTEL                 | 19. WATER TANK                                |
| 10. GAS STATION          | 20. WATER WELL                                |
|                          | 21. TRANSLATOR SITE                           |



- FISH CLEANING STATION
- ROAD & PARKING IMPROVEMENTS  
SIMPLIFY CIRCULATION & MINIMIZE NUMBER OF INTERSECTIONS
- EXTEND COURTESY DOCK  
MARINA  
EXPAND TO 585 SLIPS
- RANGER STATION/COMFORT STATION
- RESTAURANT/STORE
- MOTEL EXPANSION  
ADD SECOND STORY
- PICNICKING  
SCATTERED TABLE & SHELTERS
- SWIM BEACH / PARKING
- PICNICKING  
SCATTERED TABLE & SHELTERS
- VISUAL SCREEN  
VISUALLY SEPARATE TRAILER VILLAGE FROM VISITOR USE AREA
- REMOVE GAS STATION
- NEW ENTRANCE  
PROVIDE NEW ENTRANCE TO TRAILER VILLAGE AND REMOVE ENTRANCE NEAR GAS STATION FOR ACCESS TO RV SITES ONLY

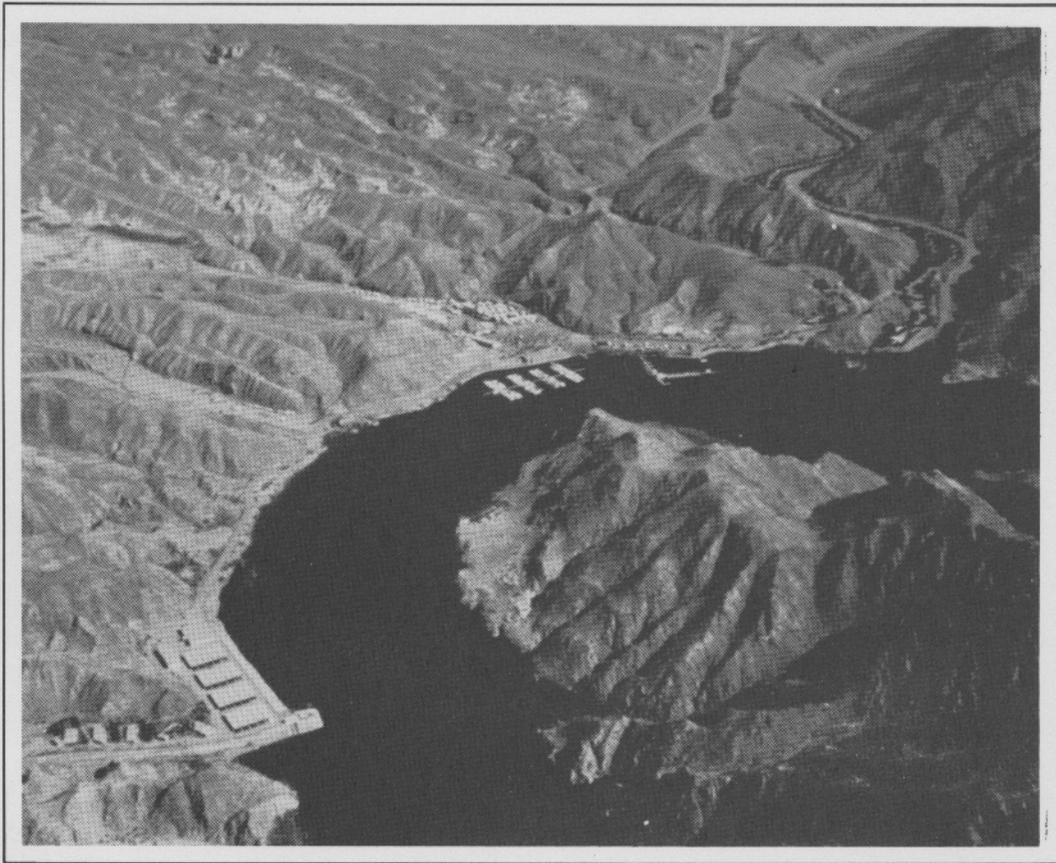


**DEVELOPMENT CONCEPT PLAN  
COTTONWOOD COVE**

LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





willow beach zone

## WILLOW BEACH ZONE

### Proposed Action

The quiet character of this small developed area is unlike any other in the recreation area. The drive into the resort begins in open desert and winds downward through a small canyon to the lake's edge. The area, nestled in the bottom of a narrow river canyon, reflects an intimate and tranquil ambiance. Willow Beach is primarily a fishing resort, with the flavor and charm that goes along with such a sport. Water temperature remains a constant 55° Fahrenheit year-round. Hot springs and pools tucked within the Black Canyon, north of Willow Beach, provide diversions for those eager to boat in the picturesque river canyon. This resort provides excellent fishing and a special visitor experience that cannot be matched elsewhere around the lakes. Visitation to this area has shown a decreasing trend of 11 percent per year since 1979, probably as a result of the campground closure. Correspondingly, concessioner overnight use has shown a decreasing trend of 15 percent per year.

Although overnight use is down, the plan proposes motel expansion in the event that demand grows and more units are required. An economic feasibility analysis would be conducted before such concession expansion to ensure it is warranted. All other concessioner services would remain at their current level.

Another feature of the plan would be to incorporate an area for raft takeouts. Raft trips, which began in March 1983, have opened new opportunities to explore the magnificent canyons that edge the river. Cooperative ventures with the U.S. Fish and Wildlife Service for housing and maintenance are under discussion.

To further enhance the visitor experience, safety and circulation would be improved. Of primary importance is the flood hazard in the four washes that empty through the Willow Beach area. The ranger station, trailer village, NPS/concessioner housing and maintenance areas, and campgrounds would be relocated to safe places, and parking would be redesigned and relocated. If feasible, protection would be provided for the remaining structures.

A riprapped dike would be constructed to protect the sewage lagoons, and a 6-foot-high concrete flood wall would be constructed to protect the restaurant/store and parking area. An additional wall is being studied to protect the NPS ranger station/residential area. If the study concludes that the NPS facilities cannot be safely protected, they will be relocated. A warning system and evacuation plan have already been installed. Sizes and costs of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Riprapped dike (sewage lagoons)	550' x 20'	\$ 43,000
	Concrete wall (restaurant/motel)	626' x 6'	215,000
	Remove curbs/repave	.75 acre	55,000
Nonstructural:	Relocate ranger station	1,200 sq. ft.	70,000
	Relocate NPS maintenance	1,500 sq. ft.	150,000
	Relocate NPS housing	4,800 sq. ft.	685,000
	Relocate trailer village	3 acres	600,000
	Relocate concession maintenance	1,200 sq. ft.	250,000
	Relocate concession housing	<u>12,000 sq. ft.</u>	<u>100,000</u>
	Total		\$2,168,000

### No-Action Alternative

The area would provide convenient day use access to the upper portion of Lake Mohave; overnight accommodations would be limited.

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

### Alternative A

Visitors would continue to be provided convenient access to northern Lake Mohave, and more overnight accommodations would be provided.

Flood mitigation measures would include a riprapped dike to protect the sewage lagoons from the 100-year flood and a 6-foot-high wall to protect the motel and a portion of the parking area from the probable maximum flood. The following facilities would be relocated: launch ramp, restaurant, store, campground (1/3 to 1/4 former capacity), ranger station, NPS housing/maintenance area, trailer village and concession housing/maintenance area. Costs and sizes of these items would be as follows:

	<u>Item</u>	<u>Size</u>	<u>Cost</u>
Structural:	Riprapped dike (100-year flood)		
	sewage lagoons	550' x 20'	\$ 43,000
	Concrete wall (motel/parking)	460' x 6'	165,000
	Repair paving	0.25 acre	7,000
Nonstructural:	Relocate restaurant		300,000
	Relocate store		100,000
	Relocate gas station		100,000
	Relocate launch ramp	8 lanes	50,000
	Relocate ranger station	1,200 sq. ft.	70,000
	Relocate NPS maintenance	1,500 sq. ft.	150,000
	Relocate NPS housing	4,800 sq. ft.	685,000
	Relocate trailer village	3 acres	600,000
	Relocate concession maintenance	1,200 sq. ft.	250,000
	Relocate concession housing	<u>12,000 sq. ft.</u>	<u>100,000</u>
	Total		\$2,620,000

### Alternative B

Day visitors who require access to the northern portion of Lake Mohave would be directed to Willow Beach, where a launch ramp and a few other day use facilities would be provided.

Due to the great flood hazard and high costs for structural mitigation, the concession operation would be purchased by the National Park Service. The area would serve as a day access point with some facilities relocated but retained at reduced capacities. Such facilities include parking, ranger station, NPS housing and maintenance, restaurant/store, and concession housing and maintenance area. Cost of these nonstructural items would be as follows:

<u>Item</u>	<u>Cost</u>
NPS buyout of concession	\$1,075,000
Close parking in floodplain	1,000
Relocate ranger station	70,000
Relocate NPS maintenance	150,000
Relocate NPS housing	685,000
Relocate restaurant/store	400,000
Relocate concession housing/maintenance	350,000
Protect sewage lagoons	<u>43,000</u>
Total	\$2,774,000

A C T I O N S

WILLOW BEACH ZONE		No-Action	Alternative A	Alternative B	Proposed Action
Flood Mitigation	Nonstructural measures: maintain warning system; information/orientation plan; closure of some facilities	Nonstructural/structural measures: provide structural protection for motel, relocate restaurant/store, relocate other facilities at reduced capacity \$172,000*	Nonstructural measures: remove overnight facilities, relocate others at reduced capacity and NPS buy out of concessioner \$1,075,000*	Nonstructural/structural measures: provide structural protection for motel/restaurant/store, relocate other facilities at reduced capacities \$270,000*	
Access	Paved 2-lane road, 4 mi.	Same as no action	Same as no action	Same as no action	
Parking	164 spaces paved	Redesign to increase capacity; close spaces in floodplain, redesign remaining and open new area-- 225 spaces \$200,000	Close spaces in floodplain-- 110 spaces \$1,000*	Same as alternative A \$200,000 - 1**	
Launch Ramp	8 lanes	Relocate--8 lanes \$50,000*	Same as no action	Same as no action	
Courtesy Dock	2 boats	Same as no action	Same as no action	Same as no action	
Swim Beach	None	None	None	Designate in picnic area	
Ranger Station	Inadequate location 1,000 sq.ft.	Relocate and expand to 1,200 sq.ft. \$70,000*	Same as alternative A \$70,000*	Same as alternative A \$70,000*	
Interpretation/Information	Contact at ranger station (10'x7') and marina wayside sign	Rehabilitate both \$25,000	Same as alternative A \$25,000	Same as alternative A \$25,000 - 2	
NPS Boat Dock	None	Provide 2-boat capacity \$10,000	Same as alternative A \$10,000	Same as alternative A \$10,000 - 2	
NPS Maintenance	Adequate but in flood zone, 1,500 sq.ft. building and storage, 7,200 sq.ft. paved area, etc.	Relocate 1,500 sq.ft. building to Fish and Wildlife Service area \$150,000*	Same as alternative A \$150,000*	Same as alternative A \$150,000*	
NPS Housing	Closed (four 1,200 sq.ft. houses)	Relocate four 1,200 sq.ft. houses to Fish and Wildlife Service area \$685,000*	Same as alternative A \$685,000*	Same as alternative A \$685,000*	
Picnic Area	15 sites	Add 5 sites \$7,000	Same as no action	Same as alternative A \$7,000 - 2	
Campground	Closed (formerly 150 sites)	Relocate at 1/4 to 1/3 former capacity \$300,000	None	Relocate as 50 RV sites with full hook-ups \$350,000 - 1	
Trailer Village	60 long-term and 18 short-term sites	Relocate 68 sites out of floodplain; retain 10 sites on bench \$600,000*	None	Same as alternative A \$600,000*	
Motel	24 units	Same as no action	None	Double size \$700,000 - 2	

WILLOW BEACH ZONE

WILLOW BEACH ZONE

ACTIONS

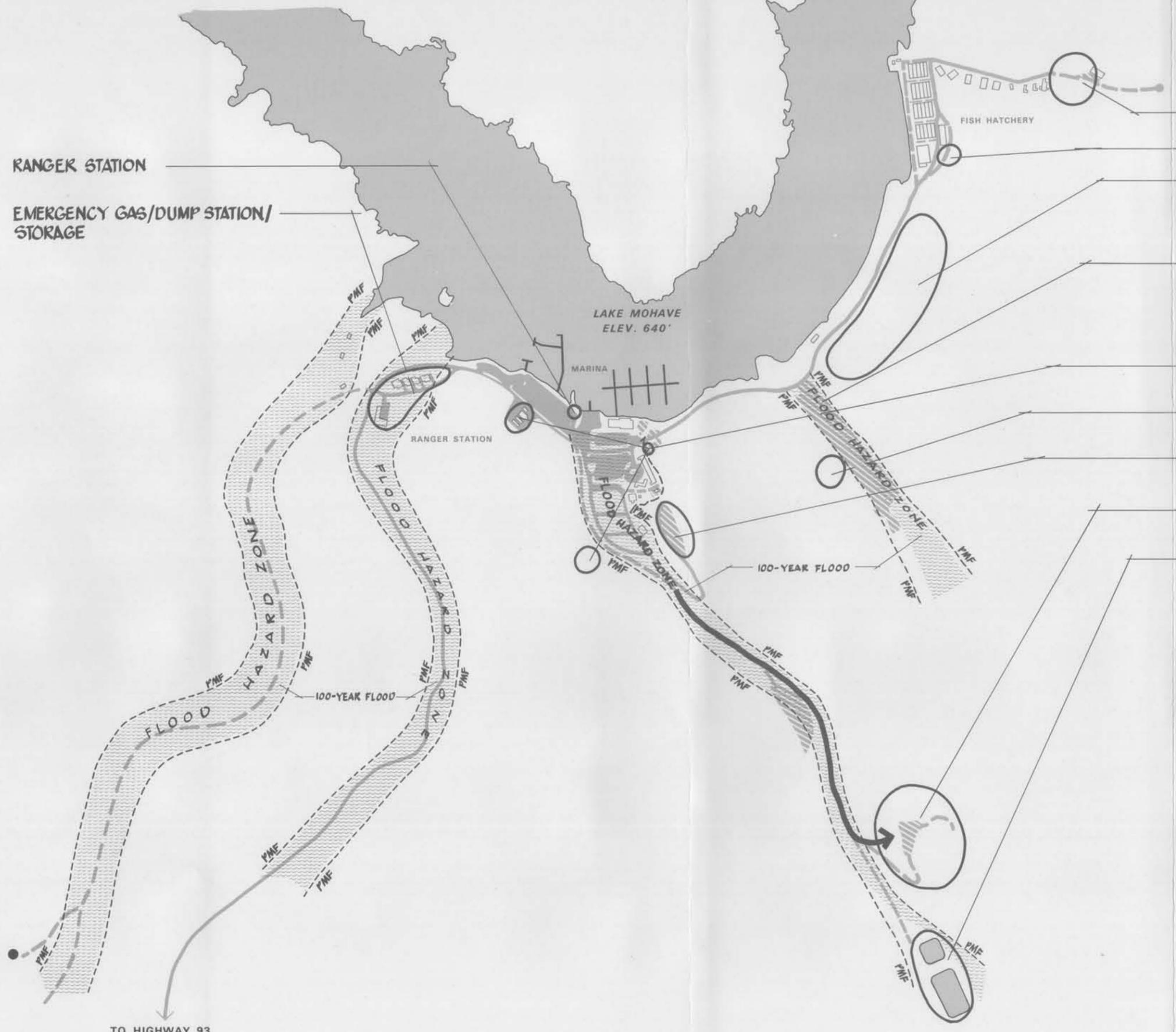
WILLOW BEACH ZONE (cont.)	No-Action Alternative	Alternative A	Alternative B	Proposed Action
Restaurant	100 seats (4,900 sq. ft.)	Relocate (4,900 sq. ft.) \$300,000*	Same as alternative A \$300,000*	Same as no action
Store	Adequate size (sq. ft. combined with restaurant)	Relocate \$100,000*	Relocate and expand \$100,000*	Same as no action
Marina	182 slips; 16 moorings	Carrying capacity expansion limit, 270 slips \$270,000	Same as no action	Same as alternative A \$270,000 - 2
Rental Boats	40 ski/patio/fishing	Same as no action	Same as no action	Same as no action
Dry Boat Storage	120 spaces	Same as no action	Same as no action	Same as no action
Concession Maintenance	Inadequate location, 1,200 sq. ft. building, 2,400 sq. ft. paved area	Relocate 1,200 sq. ft. building \$250,000*	Same as alternative A \$250,000*	Same as alternative A \$250,000*
Concession Housing (trailer village)	10 1,200 sq. ft. trailer units	Relocate 10 (1,200 sq. ft.) trailers \$100,000*	Same as alternative A \$100,000*	Same as alternative A \$100,000*
Gas Station	1 pump	Relocate existing gas station \$100,000*	None	Provide small emergency service only--1 pump \$50,000 - 1
Gas Dock	4 boat capacity	Same as no action	Same as no action	Same as no action
Sewage Lagoons	In flood zone 2 lagoons (.75 acre)	Provide 100-year flood protection (relocate if necessary) \$43,000*	Same as alternative A \$43,000*	Same as alternative A \$43,000*
<b>NPS: Flood Mitigation</b>				
Structural	\$ 0	\$ 172,000	\$ 0	\$ 270,000
Nonstructural/Relocation	0	2,448,000	2,774,000	1,898,000
Subtotal	0	2,620,000	2,774,000	2,168,000
<b>Other NPS Development</b>				
Existing Areas	0	242,000	35,000	142,000
New Areas	0	0	0	0
Subtotal	0	242,000	35,000	142,000
Total	0	3,162,000	2,809,000	2,310,000
<b>CONCESSION: Development Costs</b>				
Existing Areas	0	570,000	0	1,470,000
New Areas	0	0	0	0
Total	0	570,000	0	1,470,000
<b>GRAND TOTAL - Willow Beach Zone</b>	<b>\$ 0</b>	<b>\$ 3,432,000</b>	<b>\$ 2,809,000</b>	<b>\$ 3,780,000</b>

\* Costs related to flood mitigation.

\*\*The plan implementation section defines three priorities, indicated here as 1, 2, or 3.

RANGER STATION

EMERGENCY GAS/DUMP STATION/  
STORAGE



NPS HOUSING

NPS MAINTENANCE

CAMPGROUND/RECREATION VEHICLE SITES

DRY BOAT STORAGE

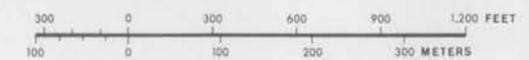
PARKING

CONCESSION MAINTENANCE

TRAILER VILLAGE

TRAILER VILLAGE & CONCESSION  
HOUSING

PROTECT SEWAGE LAGOONS



**DEVELOPMENT CONCEPT PLAN  
WILLOW BEACH**

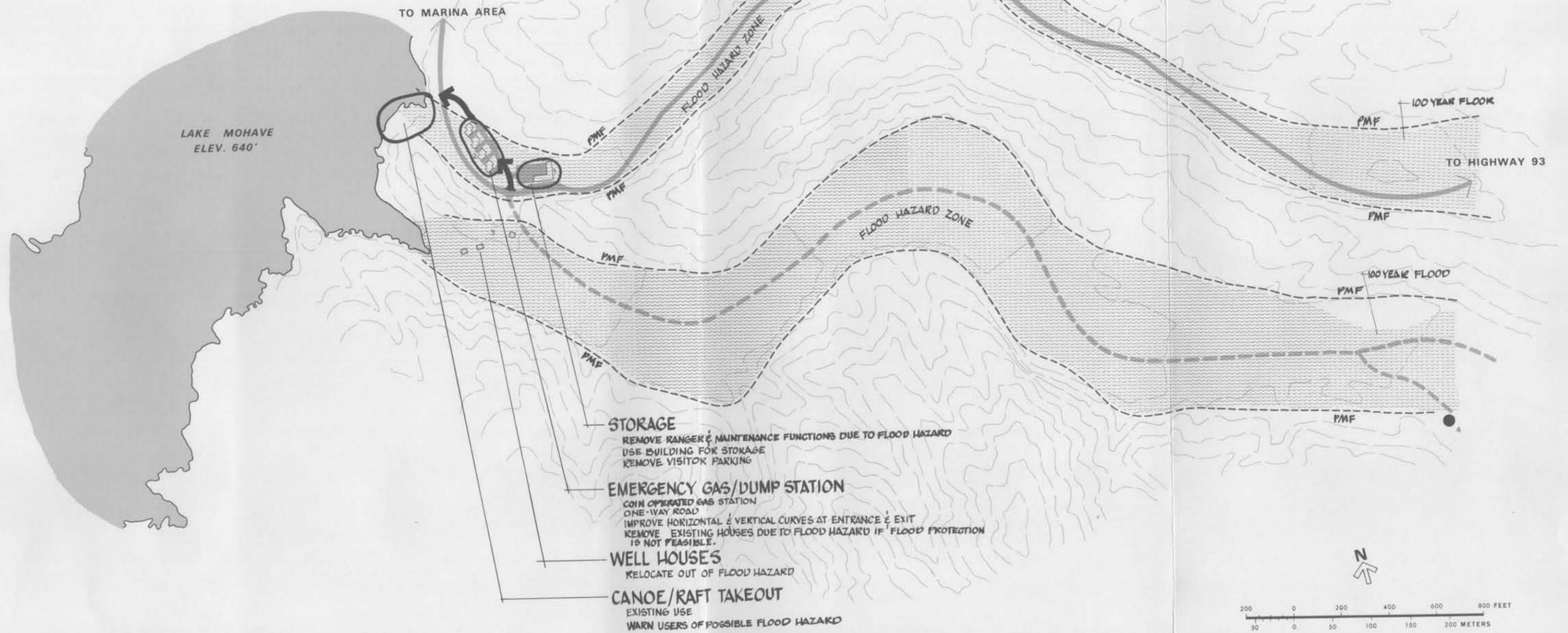
OVERVIEW

**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

TO HIGHWAY 93





LAKE MOHAVE  
ELEV. 640'

TO MARINA AREA

- STORAGE**  
REMOVE RANGER & MAINTENANCE FUNCTIONS DUE TO FLOOD HAZARD  
USE BUILDING FOR STORAGE  
REMOVE VISITOR PARKING
- EMERGENCY GAS/DUMP STATION**  
COIN OPERATED GAS STATION  
ONE-WAY ROAD  
IMPROVE HORIZONTAL & VERTICAL CURVES AT ENTRANCE & EXIT  
REMOVE EXISTING HOUSES DUE TO FLOOD HAZARD IF FLOOD PROTECTION IS NOT FEASIBLE.
- WELL HOUSES**  
RELOCATE OUT OF FLOOD HAZARD
- CANOE/RAFT TAKEOUT**  
EXISTING USE  
WARN USERS OF POSSIBLE FLOOD HAZARD

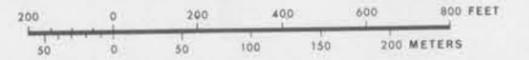
FLOOD HAZARD ZONE

FLOOD HAZARD ZONE

100 YEAR FLOOD

TO HIGHWAY 93

100 YEAR FLOOD



- EXISTING FACILITIES**
1. RANGER STATION / MAINTENANCE BUILDING
  2. NPS HOUSING ( CLOSED )
  3. WATER WELL BUILDINGS
  4. WATER TANK

**DEVELOPMENT CONCEPT PLAN**  
**WILLOW BEACH**  
RANGER STATION, RESIDENTIAL AREA

**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



**SEWAGE LAGOONS**  
 MITIGATE TO 100-YEAR FLOOD  
 RELOCATE FARTHER UP WASH IF NECESSARY

**CONCESSION TRAILER VILLAGE**  
 PERMANENT TRAILERS (ORIENTED TO VIEW) AND  
 TRANSIENT SITES (50-60 UNITS TOTAL)  
 BUILD ON OLD SEWAGE LAGOON WHICH HAS BEEN  
 FILLED. SOIL TESTS, EXCAVATION, AND ENGINEERED  
 FILL REQUIRED. SOME CUT IN UNDISTURBED AREAS  
 REQUIRED.  
 PROVIDE CONCESSION HOUSING IN A SEPARATE AREA OF  
 THE VILLAGE

**CAMPGROUND/RECREATION VEHICLE SITES**  
 SEE FISH HATCHERY SHEET

**CONCESSION MAINTENANCE**

**CONCESSION TRAILER VILLAGE**  
 ALLOW EXISTING TRAILERS  
 TO REMAIN

**FLOOD ZONE**  
 REMOVE EXISTING TRAILER VILLAGE, PARKING &  
 UNUSED ROADS

**PARKING**  
 PAVE & STRIPE  
 MAXIMIZE DOUBLE SPACES

**RANGER STATION/COMFORT STATION**  
 LOCATE TWO-STORY STRUCTURE ON SLOPE

**PARKING**  
 PAVE & STRIPE  
 MAXIMUM DOUBLE SPACES  
 REMOVE EXISTING GAS STATION & TRAILERS

TO FISH HATCHERY

100-YEAR FLOOD

FLOOD HAZARD ZONE

FLOOD HAZARD ZONE

100-YEAR FLOOD

**PICNICKING**  
 LOCATE TABLES ON ROCKY  
 POINT (GRADED PADS)

ELEV. 640'  
 LAKE MOHAVE

**PARKING**  
 PAVE & STRIPE  
 MAXIMIZE DOUBLE SPACES  
 SITE FOR RESTAURANT IF FLOOD  
 PROTECTION BY WALL IS  
 INFEASIBLE

**MARINA**  
 EXPAND TO 270 SLIPS

**RESTAURANT/MOTEL COMPLEX**  
 REMAIN IN PLACE IF FLOOD  
 PROTECTION BY WALL IS FEASIBLE

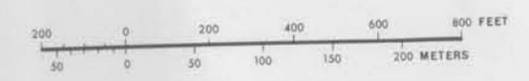
**COURTESY DOCK**  
 EXPAND EXISTING DOCK BY 80 FEET

**PARKING**  
 REDESIGN TO INCREASE  
 DOUBLE SPACES

TO RANGER STATION

**EXISTING FACILITIES**

1. MARINA
2. BOAT RENTAL
3. LAUNCH RAMP
4. CONCESSION MAINTENANCE / GAS STATION
5. STORE / RESTAURANT
6. MOTEL
7. TRAILER VILLAGE
8. DRY BOAT STORAGE
9. PICNICKING
10. SEWAGE LAGOONS



**DEVELOPMENT CONCEPT PLAN**

**WILLOW BEACH**

MARINA, MOTEL, TRAILER VILLAGE AREA

**LAKE MEAD  
 NATIONAL RECREATION AREA**

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE



**EXISTING FACILITIES**

1. PICNICKING
2. U.S. FISH AND WILDLIFE SERVICE FISH HATCHERY
3. U.S. FISH AND WILDLIFE SERVICE MAINTENANCE
4. U.S. FISH AND WILDLIFE SERVICE HOUSING
5. U.S. FISH AND WILDLIFE SERVICE MAINTENANCE/STORAGE

**CHANNELIZATION & LEVEE**  
MAY BE REQUIRED

**NPS HOUSING**  
NEGOTIATIONS WITH U.S. FISH & WILDLIFE SERVICE INITIATED

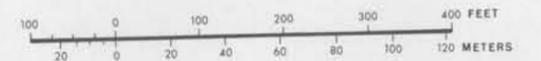
**NPS MAINTENANCE**  
NEGOTIATIONS WITH U.S. FISH & WILDLIFE SERVICE INITIATED

**CAMPGROUND/RECREATION VEHICLE SITES**  
ACTUAL SIZE PHASE DETERMINED, BASED ON TOPOGRAPHIC & GEOLOGIC SURVEYS. MAY BE LOCATED IN 3 EXISTING KAVINES OR MAY INCLUDE REMOVAL OF ROCK RIDGES BETWEEN RAVINES. FULL HOOKUPS PROVIDED.

**PARALLEL PARKING**

LAKE MOHAVE ELEV. 640

TO MARINA AREA



**DEVELOPMENT CONCEPT PLAN  
WILLOW BEACH**

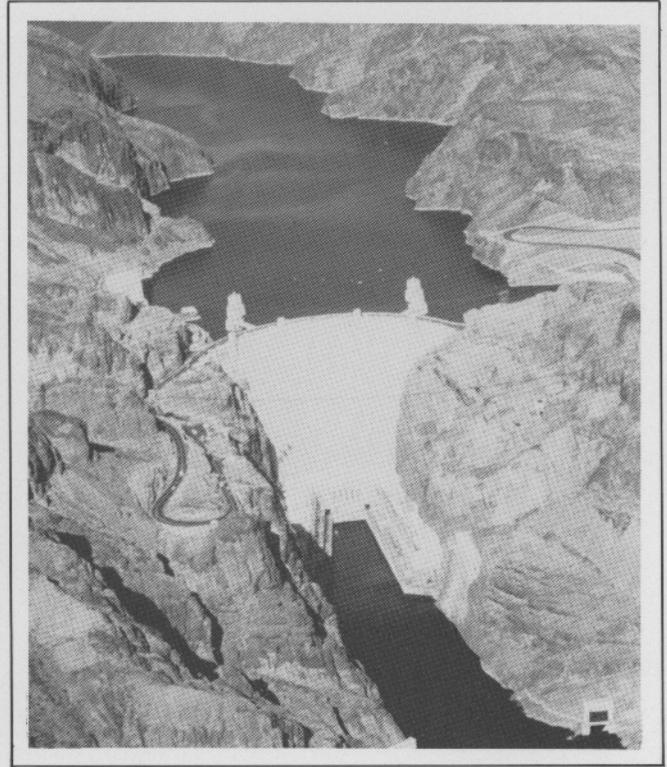
FISH HATCHERY AREA

**LAKE MEAD  
NATIONAL RECREATION AREA**

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





boulder basin zone

## BOULDER BASIN ZONE

### Proposed Action

Several developed areas are included in Boulder Basin. The Boulder Beach developments include Hemenway Harbor, Central Core of Boulder Beach, and Lake Mead marina. The other developed areas include Las Vegas Wash and Callville Bay. All developed areas are relatively close to Las Vegas and offer full services to visitors. The zone showed a decreasing trend in visitation of 6 percent per year from 1979 to 1982. Increasing overnight use of concessioner facilities for the zone showed an upward trend of 4 percent per year.

For the most part, the plan would provide for expansion of the concessioner facilities when demand warranted such expansion. If economically viable, a motel might be added to the development at Callville Bay. The plan would also include a potential new development area at Boxcar Cove; if economically feasible, concession development could be added.

Boulder Beach. The setting of Boulder Beach within the desert landscape is picturesque. The colorful Paintpots area of Fortification Hill provides a magnificent backdrop to the lake's blue expanse and focuses views across the lake. Boulder Beach is one of the most popular day areas in the national recreation area because of its proximity to Las Vegas and would provide a lasting impression to those who used it.

Boulder Beach is on a broad alluvial fan and is not subject to the dangerous flash-flood concentrations that can occur in canyons and other drainages. However, a significant hazard still exists.

New flood-control dikes (concrete faced) would be designed and constructed for up to the 100-yr. flood for Lake Mead marina, NPS housing and maintenance area, Lake Mead Lodge area, Boulder Beach campground and trailer village, and Hemenway Harbor launch ramp and parking. Hemenway Harbor campground would be closed from May through October when the flash-flood threat is greatest, except on peak use weekends when it would be used as an overflow campground. A warning system would be added. Sizes and cost of these items would be as follows:

<u>Item</u>	<u>Size</u>	<u>Cost</u>
Marina dike and road crossing	2,000' x 25'	\$ 300,000
NPS area dike	2,200' x 30'	352,000
Lodge area dike	2,000' x 30'	320,000
Campground/trailers dike and road crossing	4,600' x 35'	805,000
Hemenway Harbor ramp area dike	1,200' x 25'	60,000
Warning system package		65,000
Total		<u>\$1,902,000</u>

Within Boulder Beach are three developed areas. Development actions for these areas are as follows:

Hemenway Harbor - Fishermen, campers, boaters, skiers, and sailors enjoy the popular Hemenway Harbor area. Parking and further delineation of use areas are the primary proposed actions that would improve the visitor experience. A parking area would be designated for fishing access at the extreme south end where fishing is good. A sailboat launch area would be formalized to accommodate the popular use of Hobiecats and other sailing craft just north of the launch ramp.

Portions of the unfinished campground would be completed, with additional provisions for group sites and group activity areas in the long term. In the short term, this area would be used for high-water parking, and a new access to the special events beach would be provided around the area. A bicycle/pedestrian path would be proposed as a means to link the entire area (Hemenway Harbor to Lake Mead marina). Shade shelters with picnic tables and comfort stations would be located along this path to provide a pleasant place to rest, enjoy lunch, or to observe the myriad of activities that occur along the beach.

Central Core of Boulder Beach - As the nucleus of day activities in the Boulder Beach zone, the store, campground, and beach areas are highly used throughout the summer. Circulation and high-water parking are the major issues that the plan addresses. Improved restrooms would be provided at the beach to help alleviate the possibility of state pollution standards being exceeded.

Lakeshore Road would be realigned and widened by the Federal Highway Administration, as would the intersections that extend the entire stretch of Boulder Beach. Simpler circulation would be proposed, with fewer intersections and more centralized high-water parking. The campground would be redesigned to allow easier site delineation and access by recreation vehicles. The motel would be expanded, with a separate access for motel clientele.

A new ranger station site, centrally located to the Boulder Beach area on the west side of the highway, would provide an opportunity for faster response to emergencies and would be more visible in the area.

Lake Mead Marina - This marina is convenient to local populations and especially convenient for those traveling NV 166 (Lakeshore Drive), who want to stop for a quick look at the lake and the dam by means of charter boats. People who maintain boats at the marina use the Boulder Beach area as an access point to other portions of the basin, while visitors to the area tend to stay within the immediate vicinity. Visitors to Lake Mead marina come from more points of origin than do visitors to any other developed area within the recreation area. During the peak summer season, pleasure

boaters and skiers abound, while in the fall, winter, and spring months, fishermen enjoy the area.

To improve and enhance the visitor experience, access and parking would be the major elements addressed. An area set aside for high-water parking would be south and west of the marina, with redesign of the existing parking facilities. Dry boat storage and boat maintenance, which are critical to the marina operation, have been expanded northwest of the former dry boat storage area. Opportunity for boat sales has been provided within the expanded dry boat storage area.

Las Vegas Wash. Within 25 miles from Las Vegas, this development is a popular attraction for both tourists and local visitors from the Las Vegas area. The launch ramp is busy year-round, but especially during the summer. Skiers, hot-boaters, and fishermen make up the majority of users.

Currently, circulation (including access to and use of the launch ramp) and limited high-water parking are the most pressing issues at Las Vegas Wash. The plan would improve the circulation pattern and increase parking (paved and striped). Circulation would be more clearly delineated, so that people launching boats would have easy access to the launch ramp, while other visitors could be safely guided to less congested parking areas. Future expansion might include a recreation vehicle campground on a spectacular bluff south and east of the main development. The trailhead and parking associated with the Wetlands Park Trail would be compatible with the Clark County Wetlands Park.

Dry boat storage has recently been relocated out of the flood-hazard zone. Although the launch ramp is in the flood-hazard zone, it is the only feasible location. A warning system package would be placed on the ramp to advise incoming boaters to leave in the event of a flood. The concession maintenance area would be relocated. Sizes and costs of these items would be as follows:

<u>Item</u>	<u>Size</u>	<u>Cost</u>
Warning system package		\$ 65,000
Relocate concession maintenance	3,200 sq. ft.	90,000
		<u>\$ 155,000</u>

Callville Bay. As one of the closest developed areas to Las Vegas, Callville Bay attracts a large number of local visitors throughout the year. Its marina is filled with a great variety of private watercraft, including day cruisers, ski boats, private houseboats, and fishing boats. The development has no flood hazard, but it has constraints from the hilly topography. The development takes advantage of the low bluffs, where views to the lake are dramatic.

Proposals for this area would include improved circulation and parking. The access road to Callville Bay is very narrow, winding, and steep, with little or no shoulder space, and would require redesign. Present internal circulation is more confusing than at any other developed area. A new road alignment, in conjunction with formalized (paved and striped) parking areas, would allow for increased and more efficient use of valuable space. Traffic flow would be improved, providing first-time visitors easy access to the motel/restaurant/store complex. Repeat visitors, especially those using the launch ramp, would have easy, safe access to support facilities from the parking area. Because of the road design, visitors could drive to the store and would not have to cross major roads in most cases. New features would include the conversion of an underused campground to RV sites with full hookups and designation of a prominent knoll for a motel/restaurant/store complex.

Boxcar Cove Vicinity--Major New Developed Area. Boxcar Cove development would be considered only after Las Vegas Wash and Callville Bay have been developed to the maximum levels identified in the plan and their facilities were being used at 85 to 90 percent or greater capacity for two to four years consecutively. The development would also have to be justifiable according to an economic feasibility study. If the Boulder Basin zone was experiencing carrying capacity problems, the new Boxcar Cove development would not be implemented. If the development was provided, it would be out of the flash-flood hazard area. Facilities would be provided that were similar to those at developed areas, and access would be provided by the Northshore Road.

Northshore Area and Saddle Cove - Improved Access Points. As popularity of the recreation area increased in the future, pressure for land access to the shoreline would escalate, particularly in the Boulder Beach area. Currently, illegal vehicle use causes numerous tire tracks that crisscross the desert, terminating at the lake's edge. There will always be off-road use that cannot be controlled by the National Park Service; however, the majority of off-road use is destined for the lakeshore and for less-crowded area to picnic and play. To inhibit illegal ORV use and improve land access to the shoreline, the plan would formalize access to a greater length of shoreline by improving existing gravel roads and adding new spur roads to several coves.

Saddle Cove near Boulder Beach marina would also be an improved access point.

#### No-Action Alternative

Visitors would be provided a full range of services and facilities, primarily for day use lake access, which would continue to be provided from the three existing developed areas.

Flood mitigation actions for the Boulder Beach and Las Vegas Wash developed areas would include maintaining existing diversion dikes and channels and installing a warning system package at a cost of \$65,000.

At Las Vegas Wash flood mitigation actions would consist of installation of a warning system package at a cost of \$65,000.

#### Alternative A

Major emphasis would not change; developed areas would accommodate more use. Flood mitigation actions would be the same as the proposed action, except that structures would protect to the PMF flood level and the launch ramp at Las Vegas Wash would be relocated. The cost for this relocation would be \$30,000. The flood mitigation actions for Las Vegas Wash would then total \$185,000.

#### Alternative B

Major emphasis would not change; improved access points would accommodate more use. Flood mitigation actions would be the same as for alternative A.

A C T I O N S

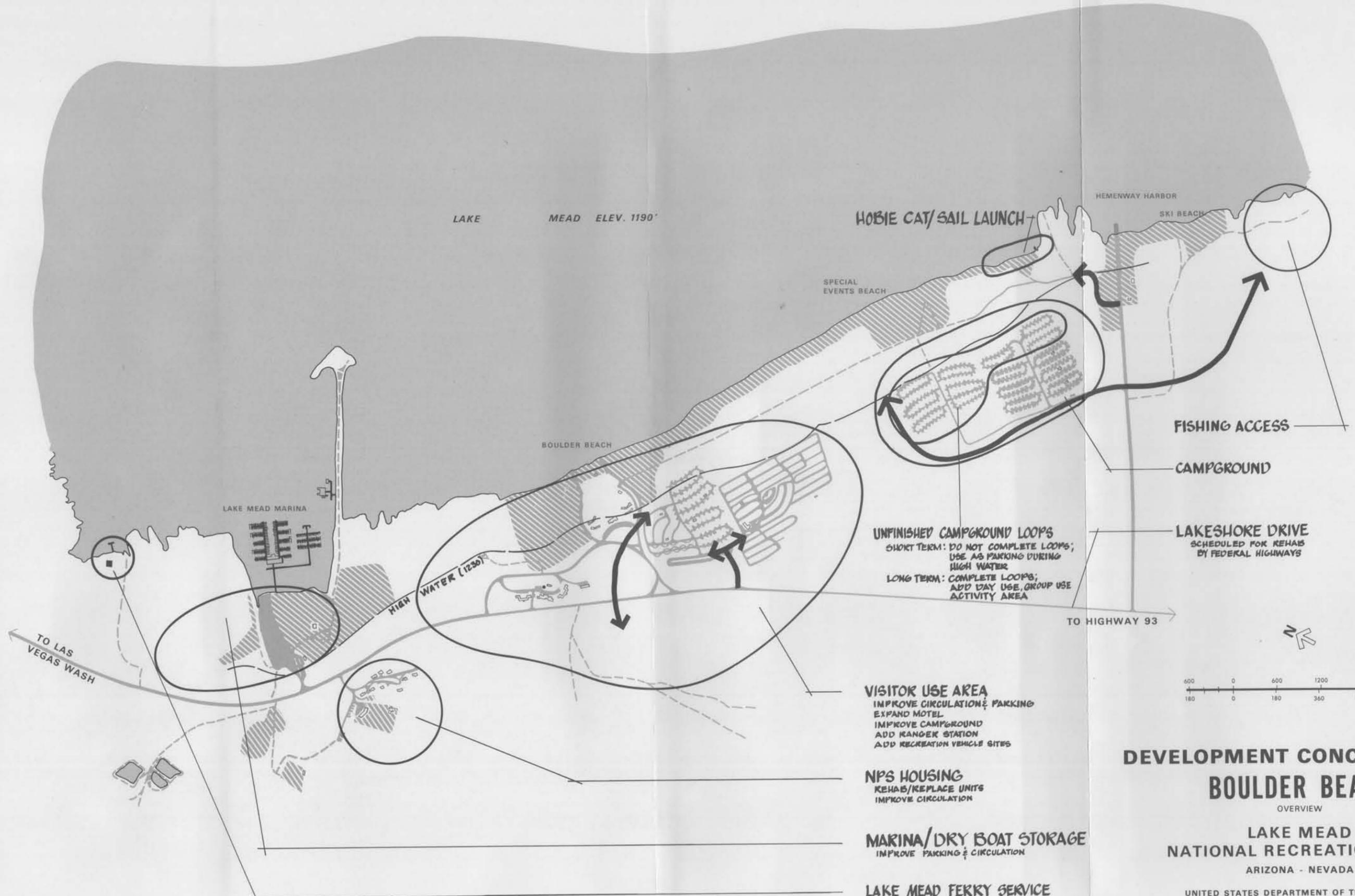
BOULDER BASIN ZONE		No-Action	Alternative A	Alternative B	Proposed Action
<u>Boulder Beach and Lake Mead Marina</u>					
Flood Mitigation	Nonstructural measures: maintain small diversion dikes, channels; add warning system package \$65,000*	Construct dikes and channels to protect to level of PMF; add warning system \$2,481,000*	Same as alternative A \$2,481,000*	Construct dikes to protect against 100-yr. floods; add warning system \$1,902,000*	
Access	Paved 2-lane roads, 12 mi.	Improve circulation of roads; add pedestrian trail system \$575,000	Same as alternative A \$575,000	Same as alternative A \$575,000 - 2**	
Parking	12,250 (paved and unpaved)	Expand \$440,000	Same as no action	Same as alternative A \$440,000 - 2	
Launch Ramps	At Hemenway Harbor and Lake Mead marina - 8 lanes	Same as no action	Same as no action	Hemenway Harbor: designate Hobiecat area; otherwise same as no action \$50,000 - 2	
Courtesy Docks	Hemenway Harbor: adequate; Lake Mead marina: none	Same as no action	Same as no action	Hemenway Harbor: same as no action; Lake Mead marina: add dock \$25,000 - 2	
Swim Beach	Designated (10 acres)	Add lifeguard station, play area, restrooms \$102,000	Same as alternative A \$102,000	Same as alternative A \$102,000 - 2	
Ranger Station	Inadequate location 1,000 sq.ft. building	Relocate and expand \$77,000	Same as no action	Same as alternative A \$77,000 - 2	
Interpretation/Information	Alan Bible visitor center (10,000 sq.ft.), marina wayside size (10'x7'), campground wayside sign (15'x7'), and amphitheater (250 seats)	Rehabilitate all except amphitheater \$120,000	Same as no action	Same as alternative A \$120,000 - 1	
NPS Boat Dock	Adequate--7 slips	Same as no action	Same as no action	Same as no action	
NPS Maintenance	Adequate--4,800 sq.ft. building, 15,000 sq.ft. paved area, 2 acres of unpaved storage	Same as no action	Same as no action	Improve roads and intersections into maintenance area \$100,000 - 2	
NPS Housing	16 permanent units--seven 1,225-sq.ft. houses; three 1,600-sq.ft. houses; one 1,400-sq.ft. trailer; one 720-sq.ft. trailer; three unoccupied trailer sites	Same as no action	Same as no action	Rehabilitate \$1,000,000 - 2	
Picnic Area	56 sites	Double size, open up views to water; add sites on trail system \$50,000	Same as no action	Same as alternative A \$50,000 - 2	

BOULDER BASIN ZONE/Boulder Beach and Lake Mead Marina

A C T I O N S

BOULDER BASIN ZONE	No-Action	Alternative A	Alternative B	Proposed Action
<u>Boulder Beach and Lake Mead Marina</u>				
Campground	338 sites	Complete Hemenway Harbor campground for group camping and activities--10 group sites, 2,500 sq. ft. rest-rooms, landscape 12 acres. \$400,000	Same as alternative A \$400,000	Same as alternative A (\$400,000) and redesign sites at Boulder Beach (\$50,000) \$450,000 - 1
Trailer Village	215 long-term and 75 short-term sites	Add 75 short-term sites in existing location \$150,000	Same as alternative A \$150,000	Same as alternative A \$150,000 - 2
Motel	44 units	Double size \$1,000,000	Same as no action	Same as alternative A \$1,000,000 - 2
Restaurant (Marina)	314 seats	Same as no action	Same as no action	Same as no action
Store (Beach)	Inadequate size--5,500 sq. ft.	Double size \$300,000	Same as no action	Expand by one-half \$150,000 - 1
Marina	400 slips, no moorings	Carrying capacity---expansion limit: 875 \$1,500,000	Same as alternative A \$1,500,000	Same as alternative A \$1,500,000 - 2
Rental Boats	35 ski/patio/fishing boats, 4 tour boats	Double size (ski/patio/fishing)	Same as no action	Same as alternative A
Dry Boat Storage	100 spaces (3.5 acres)	Expand to 9.5 acres \$110,000	Same as alternative A \$110,000	Same as alternative A \$110,000 - 2
Concession Maintenance	Inadequate--2,700 sq. ft. building	Expand with dry boat storage, add 25,000 sq. ft. paved area \$250,000	Same as alternative A \$250,000	Same as alternative A \$250,000 - 1
Concession Housing	None	Same as no action	Same as no action	Same as no action
Gas Station	None	Same as no action	Same as no action	Same as no action
Gas Dock	6-boat capacity	Same as no action	Same as no action	Same as no action
<u>NPS: Flood Mitigation</u>				
Structural	\$ 0	\$2,416,000	\$2,416,000	\$1,837,000
Nonstructural	65,000	65,000	65,000	65,000
Subtotal	65,000	2,481,000	2,481,000	1,902,000
<u>Other NPS Development</u>				
Existing Areas	0	1,814,000	1,814,000	2,696,500
Subtotal	0	4,295,000	3,608,000	4,598,500
Total	65,000	3,200,000	1,900,000	3,392,500
<u>CONCESSION: (Existing Areas)</u>				
Subtotal	0	3,200,000	1,900,000	3,392,500
<u>GRAND TOTAL - Boulder Beach/Lake Mead Marina</u>				
	\$65,000	\$7,495,000	\$5,508,000	\$7,991,000

**BOULDER BASIN ZONE/Boulder Beach and Lake Mead Marina**



LAKE MEAD ELEV. 1190'

HOBBIE CAT/SAIL LAUNCH

HEMENWAY HARBOR

SKI BEACH

SPECIAL EVENTS BEACH

BOULDER BEACH

LAKE MEAD MARINA

HIGH WATER (1250)

FISHING ACCESS

CAMPGROUND

LAKESHORE DRIVE  
SCHEDULED FOR REHAB  
BY FEDERAL HIGHWAYS

UNFINISHED CAMPGROUND LOOPS  
SHORT TERM: DO NOT COMPLETE LOOPS;  
USE AS PARKING DURING HIGH WATER  
LONG TERM: COMPLETE LOOPS;  
ADD DAY USE, GROUP USE  
ACTIVITY AREA

TO HIGHWAY 93

TO LAS VEGAS WASH

600 0 600 1200 1800 2400 FEET  
180 0 180 360 540 720 METERS

**VISITOR USE AREA**  
IMPROVE CIRCULATION & PARKING  
EXPAND MOTEL  
IMPROVE CAMPGROUND  
ADD RANGER STATION  
ADD RECREATION VEHICLE SITES

**NPS HOUSING**  
REHAB/REPLACE UNITS  
IMPROVE CIRCULATION

**MARINA/ DRY BOAT STORAGE**  
IMPROVE PARKING & CIRCULATION

**LAKE MEAD FERRY SERVICE**  
TICKET SALES  
MAINTENANCE  
REST ROOMS

**DEVELOPMENT CONCEPT PLAN**  
**BOULDER BEACH**  
OVERVIEW

LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA

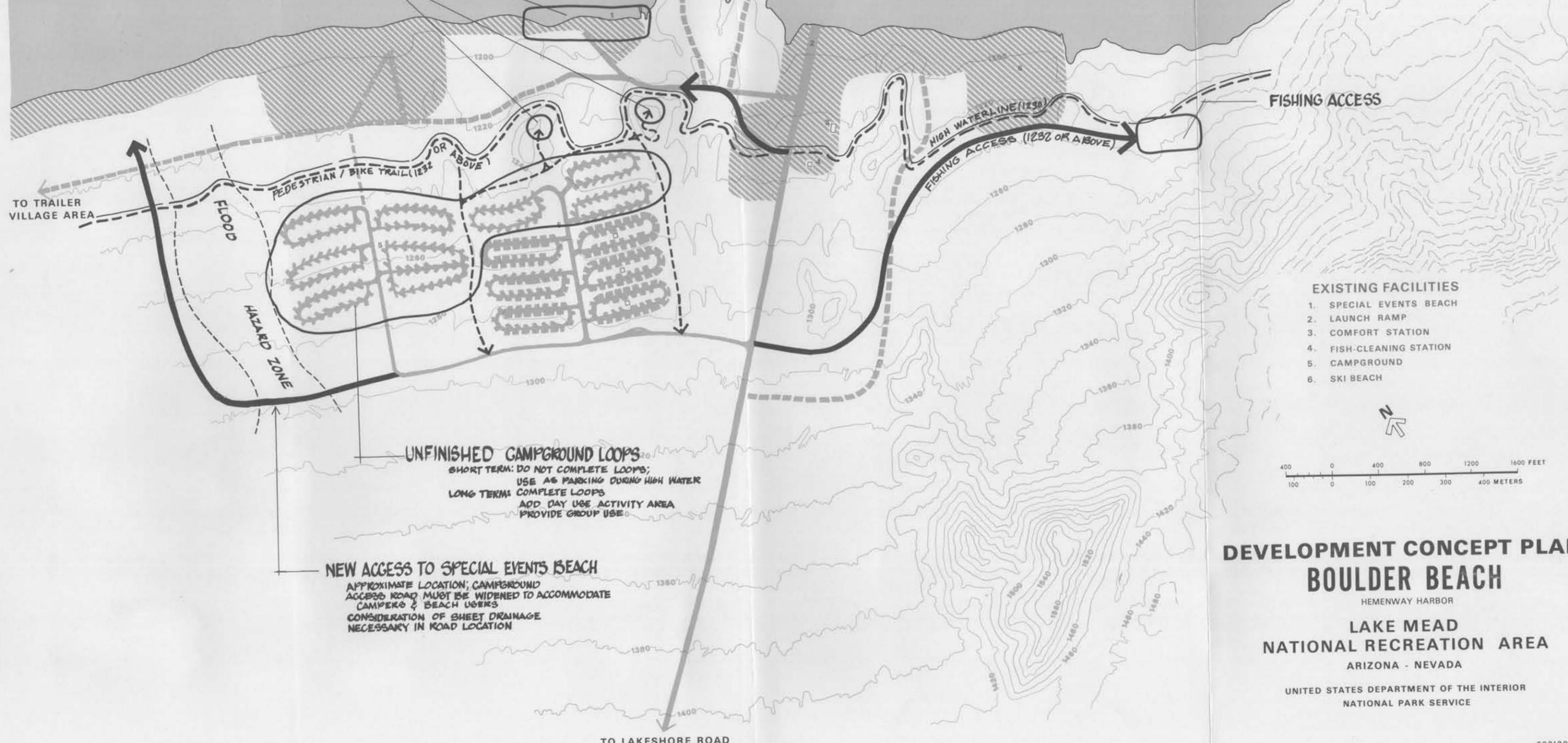
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**HOBIE CAT/SAIL LAUNCH**

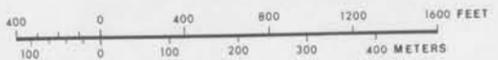
**INTERPRETIVE VIEWPOINTS**  
SHADE SHELTERS & WAYSIDE EXHIBITS ON TOP OF KNOLLS

LAKE MEAD ELEV. 1190'



FISHING ACCESS

- EXISTING FACILITIES**
1. SPECIAL EVENTS BEACH
  2. LAUNCH RAMP
  3. COMFORT STATION
  4. FISH-CLEANING STATION
  5. CAMPGROUND
  6. SKI BEACH



**UNFINISHED CAMPGROUND LOOPS**  
SHORT TERM: DO NOT COMPLETE LOOPS;  
USE AS PARKING DURING HIGH WATER  
LONG TERM: COMPLETE LOOPS  
ADD DAY USE ACTIVITY AREA  
PROVIDE GROUP USE

**NEW ACCESS TO SPECIAL EVENTS BEACH**  
APPROXIMATE LOCATION; CAMPGROUND  
ACCESS ROAD MUST BE WIDENED TO ACCOMMODATE  
CAMPER & BEACH USERS  
CONSIDERATION OF SHEET DRAINAGE  
NECESSARY IN ROAD LOCATION

**DEVELOPMENT CONCEPT PLAN**  
**BOULDER BEACH**

HEMENWAY HARBOR  
**LAKE MEAD**  
**NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



LAKE MEAD ELEV. 1190'

**PICNICKING**  
SHADE STRUCTURES

**RANGER STATION**  
REPLACE TRAILER WITH PERMANENT STRUCTURE WITH GOOD OUTWARD VISIBILITY

**DAY USE ACTIVITY AREA**  
VOLLEYBALL, SOFTBALL, HORSESHOES, ETC.  
PORTABLE COMFORT STATIONS-FOLLOW WATERLINE

**ROAD & PARKING IMPROVEMENTS**  
OBLITERATE EXISTING ENTRANCE ROAD & DEVELOP NEW ENTRANCE  
DECREASE NUMBER OF INTERSECTIONS  
PAVE & STRIPE PARKING- IMPROVE CIRCULATION  
CONVERT ROAD BETWEEN MOTEL & STORE TO TRAIL

**MOTEL EXPANSION**  
DEFINE SINGLE ENTRANCE  
OBLITERATE NORTH ENTRANCE  
SCREEN REAR OF EXISTING UNITS FROM LAKESHORE ROAD  
ORIENT NEW UNITS TOWARDS VIEW

**CAMPGROUND**  
REDEFINE SITES  
RETAIN EXISTING VEGETATION  
IMPROVE ENTRANCE ROAD INTERSECTION & SIGNS

**RANGER STATION**  
LOCATE NEAR LARGE ROCK OUTCROPS  
DEVELOP INTERPRETIVE TRAILS & PICNICKING

TO HEMENWAY HARBOR

TO LAKE MEAD MARINA

TO HEMENWAY HARBOR

RECREATION VEHICLE EXPANSION

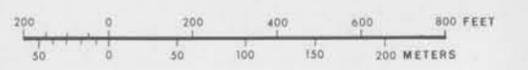
BIKE

PATH

HIGH WATERLINE

(1230)  
(1232 OR ABOVE)

PEDESTRIAN



**EXISTING FACILITIES**

- 1. SWIM BEACH
- 2. RANGER STATION
- 3. STORE
- 4. PICNICKING
- 5. CAMPGROUND
- 6. TRAILER VILLAGE
- 7. MOTEL
- 8. AMPHITHEATER

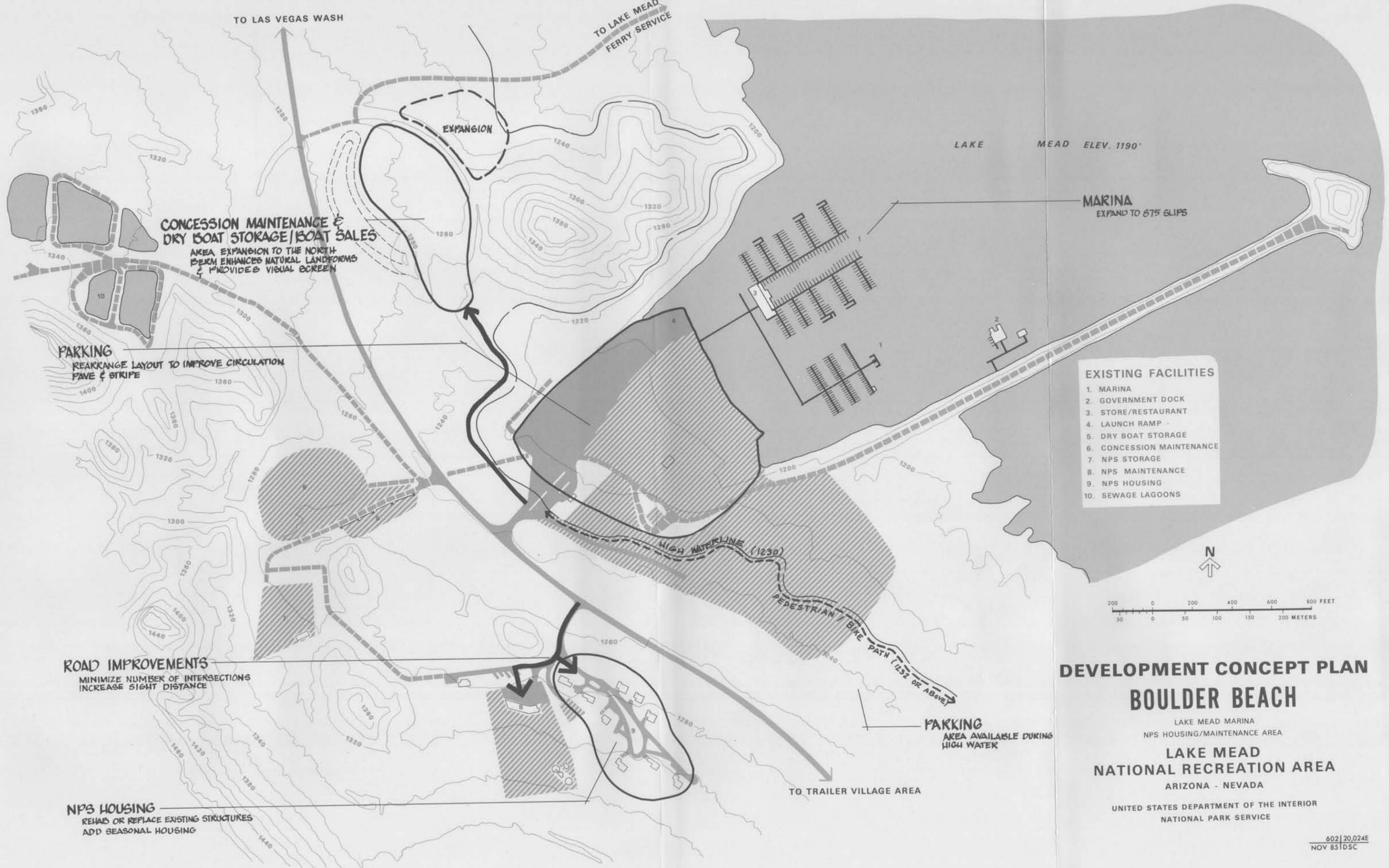
**DEVELOPMENT CONCEPT PLAN  
BOULDER BEACH**

BOULDER BEACH, TRAILER VILLAGE, CAMPGROUND, STORE, MOTEL

**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





**DEVELOPMENT CONCEPT PLAN  
BOULDER BEACH**

LAKE MEAD MARINA  
NPS HOUSING/MAINTENANCE AREA  
**LAKE MEAD  
NATIONAL RECREATION AREA**  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



A C T I O N S

BOULDER BASIN ZONE	No-Action	Alternative A	Alternative B	Proposed Action
<u>Las Vegas Wash</u>				
Flood Mitigation	Nonstructural measures: relocate dry boat storage/maintenance; provide launch ramp warning system \$65,000*	Same as no action but relocate launch ramp \$65,000	Same as no action \$65,000*	Same as no action \$65,000*
Access	Paved 2-lane 1,500' road	Improve circulation within development \$125,000	Same as no action	Same as alternative A \$125,000 - 1**
Parking	750 (paved and unpaved)	Triple size \$1,180,000	Same as no action	Same as alternative A \$1,180,000 - 2
Launch Ramp	5 lanes	Relocate--5 lanes \$30,000*	Same as no action	Same as no action
Courtesy Dock	5-boat capacity	Double size \$30,000	Same as no action	Same as alternative A \$30,000 - 1
Swim Beach	None	Same as no action	Same as no action	Same as no action
Ranger Station	Adequate location--3,000 sq. ft.	Same as no action	Same as no action	Same as no action
Interpretation/Information	Contact at ranger station, marina wayside (10'x7'), campground wayside (12'x7')	Rehabilitate all facilities \$10,000	Same as alternative A \$10,000	Same as alternative A \$10,000 - 1
NPS Boat Dock	None	Provide 4 slips \$10,000	Same as alternative A \$10,000	Same as alternative A \$10,000 - 1
NPS Maintenance	Adequate--1,500 sq. ft. building, 3,500 sq. ft. paved area, and 1.84-acre unpaved storage	Same as no action	Same as no action	Same as no action
NPS Housing	4 units, three 2,000 sq. ft. houses, one 1,440 sq. ft. house	Same as no action	Same as no action	Same as no action
Picnic Area	16 sites	Relocate and expand by 10 sites \$10,000	Same as no action	Same as alternative A \$10,000 - 2
Campground	89 sites	Expand by 25 sites \$25,000	Same as no action	Same as alternative A \$25,000 - 2
Trailer Village	None	Add 80 RV sites \$400,000	Same as no action	Same as alternative A \$400,000 - 2
Motel	None	Build 50 rooms \$975,000	Same as no action	Same as no action

BOULDER BASIN ZONE/Las Vegas Wash

A C T I O N S

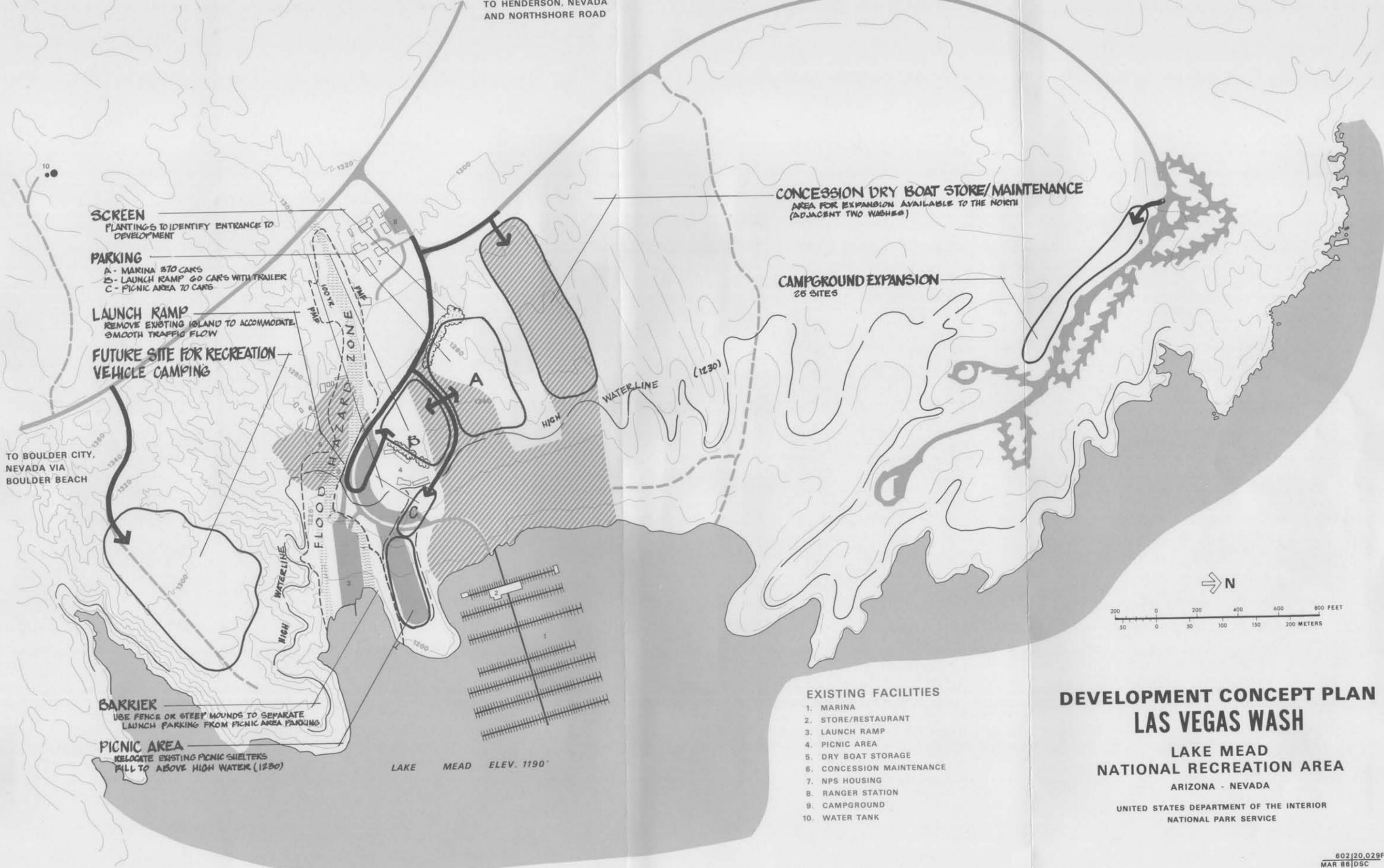
BOULDER BASIN ZONE		No-Action	Alternative A	Alternative B	Proposed Action
<u>Las Vegas Wash</u>					
Restaurant	36 seats	Expand by 1/2 and consider relocation on shore \$300,000	Same as alternative A \$300,000	Same as alternative A \$150,000 - 2	Same as alternative A, but retain as floating \$150,000 - 2
Store	Inadequate size--3,300 sq.ft.	Relocate to land adjacent to marina	Same as no action	Same as alternative A, but retain as floating	Same as alternative A, but retain as floating
Marina	595 slips, 3 moorings	Carrying capacity expansion limit, 630 slips \$110,000	Same as no action	Same as alternative A \$110,000 - 2	Same as alternative A \$110,000 - 2
Rental Boats	35 ski/patio/fishing	Expand to 70 boats (ski/patio/fishing) \$25,000	Same as no action	Same as alternative A \$25,000 - 2	Same as alternative A \$25,000 - 2
Dry Boat Storage	200 spaces	Same as no action	Same as no action	Same as no action	Same as no action
Concession Maintenance	Adequate--3,200-sq.ft. building, 0 paved area	Relocate with dry boat storage \$90,000*	Same as alternative A \$90,000*	Same as alternative A \$90,000*	Same as alternative A \$90,000*
Concession Housing	None	Provide in NPS housing area; four 1,200-sq.ft. houses and 5,000-sq.ft. dorm \$800,000	Same as no action	Same as alternative A \$800,000 - 1	Same as alternative A \$800,000 - 1
Gas Station	None	Same as no action	Same as no action	Same as no action	Same as no action
Gas Dock	Inadequate--3 pumps	Expand and renovate--4 pumps \$20,000	Same as no action	Same as alternative A \$20,000 - 1	Same as alternative A \$20,000 - 1
Improved Access: <u>Wetlands Trail</u>	None	None	None	Trailhead (2 acres), trail (1 mile) \$60,000 - 3	Trailhead (2 acres), trail (1 mile) \$60,000 - 3
NPS: Flood Mitigation (Nonstructural)		\$ 185,000	\$ 155,000	\$ 155,000	\$ 155,000
Other NPS Development					
Existing Areas		0	20,000	760,000	760,000
New Areas		0	0	60,000	60,000
Total		65,000	175,000	975,000	975,000
CONCESSION: (Existing Areas)		0	320,000	2,135,000	2,135,000
GRAND TOTAL - Las Vegas Wash		\$ 65,000	\$ 4,205,000	\$ 495,000	\$ 3,110,000

\* Actions related to flood mitigation

\*\*The plan implementation section defines three priorities indicated here as 1, 2, and 3

BOULDER BASIN ZONE/Las Vegas Wash

TO HENDERSON, NEVADA  
AND NORTHSORE ROAD



**SCREEN**

PLANTINGS TO IDENTIFY ENTRANCE TO DEVELOPMENT

**PARKING**

A - MARINA 370 CARS  
B - LAUNCH RAMP 60 CARS WITH TRAILER  
C - PICNIC AREA 70 CARS

**LAUNCH RAMP**

REMOVE EXISTING ISLAND TO ACCOMMODATE SMOOTH TRAFFIC FLOW

**FUTURE SITE FOR RECREATION VEHICLE CAMPING**

TO BOULDER CITY, NEVADA VIA BOULDER BEACH

**BARRIER**

USE FENCE OR STEEP MOUNDS TO SEPARATE LAUNCH PARKING FROM PICNIC AREA PARKING

**PICNIC AREA**

RELOCATE EXISTING PICNIC SHELTERS FILL TO ABOVE HIGH WATER (1250)

LAKE MEAD ELEV. 1190'

**CONCESSION DRY BOAT STORE/MAINTENANCE**

AREA FOR EXPANSION AVAILABLE TO THE NORTH (ADJACENT TWO WASHES)

**CAMPGROUND EXPANSION**

25 SITES

**EXISTING FACILITIES**

1. MARINA
2. STORE/RESTAURANT
3. LAUNCH RAMP
4. PICNIC AREA
5. DRY BOAT STORAGE
6. CONCESSION MAINTENANCE
7. NPS HOUSING
8. RANGER STATION
9. CAMPGROUND
10. WATER TANK

**DEVELOPMENT CONCEPT PLAN  
LAS VEGAS WASH**

**LAKE MEAD  
NATIONAL RECREATION AREA**

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



A C T I O N S

BOULDER BASIN ZONE		Alternative A	Alternative B	Proposed Action
<u>Callville Bay</u>				
Flood Mitigation	No flood hazard	Same as no action	Same as no action	Same as no action
Access	Paved 2-lane entrance road, 4 mi	Improve circulation within development \$300,000 - 2	Same as no action	Same as alternative A \$300,000 - 2
Parking	1,701 spaces (paved and unpaved)	Expand by 300 spaces \$450,000	Same as no action	Same as alternative A \$450,000 - 2
Launch Ramp	13 lanes	Improve circulation	Same as no action	Same as alternative A
Courtesy Dock	4-boat capacity	Expand to 8 slips \$25,000	Same as no action	Same as alternative A \$25,000 - 1
Swim Beach	None	Same as no action	Same as no action	Same as no action
Ranger Station	Inadequate size--400 sq.ft. trailer	Build permanent facility with restrooms; 1,000 sq.ft. \$70,000	Same as no action	Same as alternative A \$70,000 - 1
Interpretation/Information	Contact at ranger station, marina wayside (10'x7'), campground wayside (12'x7')	Rehabilitate all \$5,000	Same as alternative A \$5,000	Same as alternative A \$5,000 - 1
NPS Boat Dock	None	Provide 4 slips \$10,000	Same as no action	Same as alternative A \$10,000 - 1
NPS Maintenance	Inadequate--500 sq.ft. trailer, 0 paved, 1,500 sq.ft. unpaved storage	Expand maintenance 1,500 sq.ft. building \$100,000	Same as no action	Same as alternative A \$100,000 - 2
NPS Housing	5 (800 sq.ft.) trailer units	Expand in same location; five 1,200-sq.ft. houses and 3,000-sq.ft. fourplex \$650,000	Same as no action	Same as alternative A \$650,000 - 2
Picnic Area	6 sites	Same-as no action	Same as no action	Same as no action
Campground	80 sites - concession operated	Same as no action	Same as no action	Convert one loop to full hookup RV sites with 30 sites \$40,000 - 2
Trailer Village	94 long-term and 6 short-term sites	Same as no action	Same as no action	Same as no action
Motel	None	Add 100-room motel \$750,000	Same as no action	Same as alternative A \$750,000 - 2

BOULDER BASIN ZONE/Callville Bay

**BOULDER BASIN ZONE/Callville Bay**

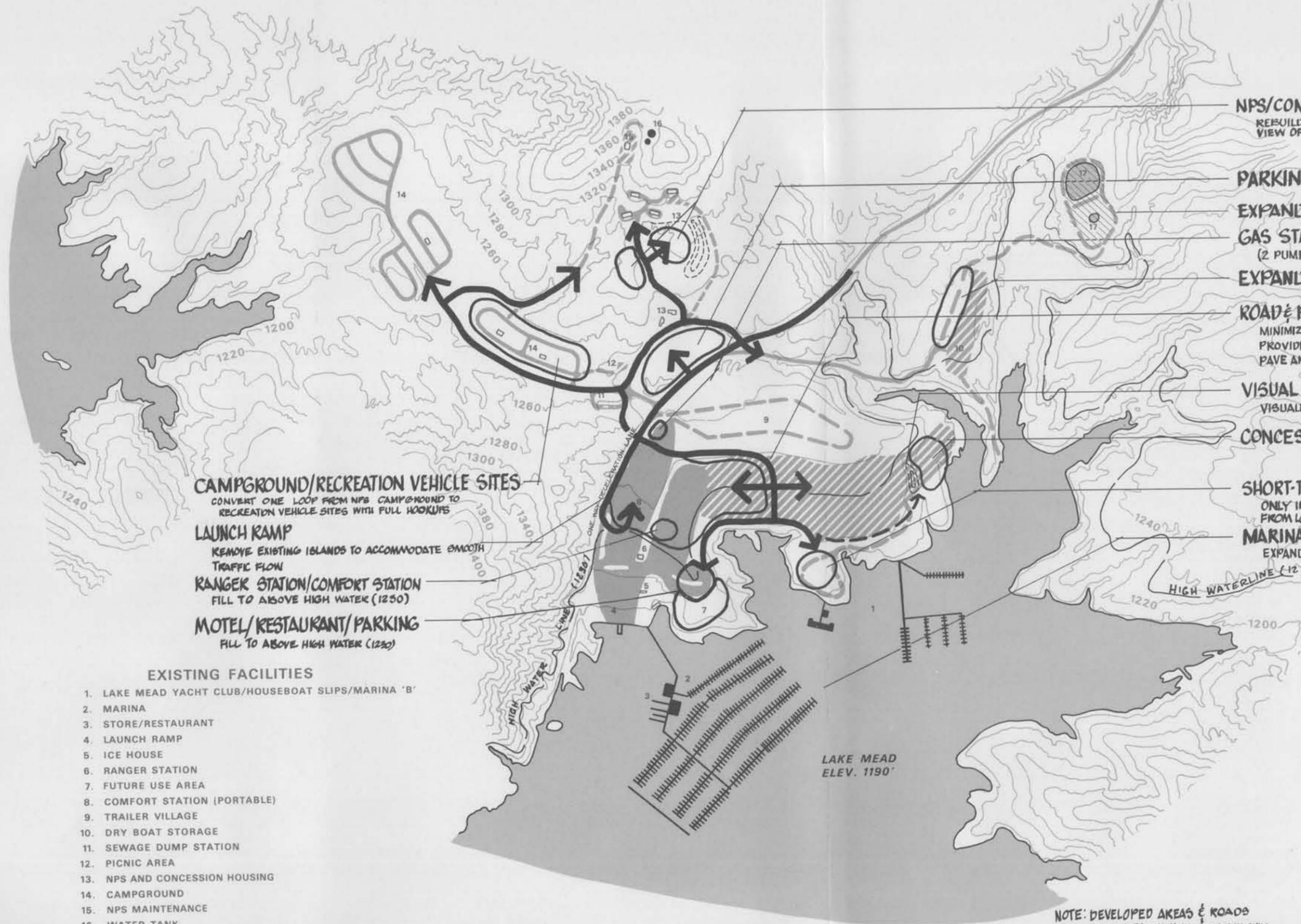
**A C T I O N S**

BOULDER BASIN ZONE Callville Bay	No-Action Alternative	Alternative A	Alternative B	Proposed Action
Restaurant	36 seats	Relocate to land and expand to 60 seats; leave snack facility on water \$300,000	Same as no action	Same as alternative A \$300,000 - 2
Store	Floating--500 sq.ft. trailer	Expand on land--1,000 sq.ft. \$150,000	Same as no action	Same as alternative A \$150,000 - 2
Marina	300 slips, no moorings	Carrying capacity expansion limit, 1,045 slips \$875,000	Same as no action	Same as alternative A \$875,000 - 2
Dry Boat Storage	111 spaces	Expand by 1/2 in existing location \$5,000	Same as no action	Same as alternative A \$5,000 - 2
Rental Boats	15 houseboats, 33 ski/patio/fishing boats	Same as no action	Same as no action	Same as no action
Concession Maintenance	Inadequate--150 sq.ft. building, 0 sq.ft. paved area, .7 acre unpaved storage	Build 1,500 sq.ft. new facility, add 20,000 sq.ft. paved area \$250,000	Same as no action	Same as alternative A \$250,000 - 2
Concession Housing	3 trailer units	Relocate to NPS housing area and expand; five 1,200-sq.ft. houses and 3,000-sq.ft. fourplex \$650,000	Same as no action	Same as alternative A \$650,000 - 2
Gas Station	None	Provide 2 pumps \$30,000	Same as alternative A \$30,000	Same as alternative A \$30,000 - 1
Gas Dock	6-boat capacity	Same as no action	Same as no action	Same as no action
Sewage Lagoons	Inadequate--2 lagoons (.8 acre)	Expand, add one new lagoon (1.2 acres) \$360,000	Same as alternative A \$360,000	Same as alternative A \$360,000 - 1
NPS: Flood Mitigation		\$	\$	\$
Other NPS Development (Existing Areas)		0	365,000	1,745,000
Total		0	365,000	1,745,000
CONCESSION: (Existing Areas)		0	30,000	3,275,000
GRAND TOTAL - Callville Bay		\$ 0	\$ 4,980,000	\$ 5,020,000

\* Actions related to flood mitigation

\*\*The plan implementation section defines three priorities indicated here as 1, 2, and 3

TO NORTHSORE ROAD



- NPS/CONCESSION HOUSING**  
REBUILD BERM ON NORTH SIDE TO SCREEN AREA FROM VIEW OF ENTRANCE ROAD
- PARKING**
- EXPAND SEWAGE LAGOONS**
- GAS STATION/EMERGENCY GAS**  
(2 PUMPS)
- EXPAND DRY BOAT STORAGE**
- ROAD & PARKING IMPROVEMENTS**  
MINIMIZE NUMBER OF INTERSECTIONS  
PROVIDE CLEAR DELINEATION BETWEEN ROAD & PARKING  
PAVE AND STRIPE
- VISUAL SCREEN**  
VISUALLY SEPARATE MAINTENANCE AREA FROM PARKING
- CONCESSION MAINTENANCE**
- SHORT-TERM PARKING/DROP OFF**  
ONLY IN LOW WATER; DURING HIGH WATER DROPOFF IS FROM LOWER DECK OF PARKING
- MARINA**  
EXPAND TO 1045 SLIPS  
HIGH WATERLINE (1230)

- CAMPGROUND/RECREATION VEHICLE SITES**  
CONVERT ONE LOOP FROM NPS CAMPGROUND TO RECREATION VEHICLE SITES WITH FULL HOOKUPS
- LAUNCH RAMP**  
REMOVE EXISTING ISLANDS TO ACCOMMODATE SMOOTH TRAFFIC FLOW
- RANGER STATION/COMFORT STATION**  
FILL TO ABOVE HIGH WATER (1250)
- MOTEL/RESTAURANT/PARKING**  
FILL TO ABOVE HIGH WATER (1230)

**EXISTING FACILITIES**

1. LAKE MEAD YACHT CLUB/HOUSEBOAT SLIPS/MARINA 'B'
2. MARINA
3. STORE/RESTAURANT
4. LAUNCH RAMP
5. ICE HOUSE
6. RANGER STATION
7. FUTURE USE AREA
8. COMFORT STATION (PORTABLE)
9. TRAILER VILLAGE
10. DRY BOAT STORAGE
11. SEWAGE DUMP STATION
12. PICNIC AREA
13. NPS AND CONCESSION HOUSING
14. CAMPGROUND
15. NPS MAINTENANCE
16. WATER TANK
17. SEWAGE LAGOONS

LAKE MEAD  
ELEV. 1190'

NOTE: DEVELOPED AREAS & ROADS  
BELOW THE HIGH WATERLINE WILL  
REQUIRE FILL TO BRING ELEVATIONS  
TO A SAFE LEVEL

# DEVELOPMENT CONCEPT PLAN CALLVILLE BAY

LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE



A C T I O N S

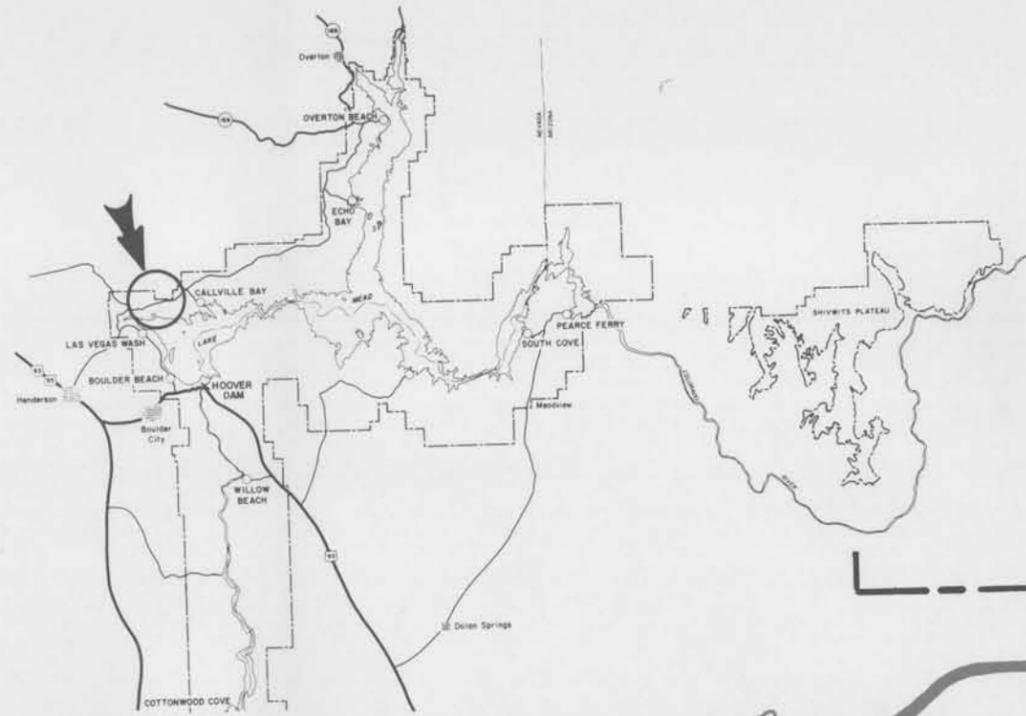
BOULDER BASIN_ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<u>Boxcar Cove Vicinity (Major New Development Area)</u>				
Access	Gravel roads--8 mi.	Same as no action	Same as no action	2 lanes, paved (from existing gravel roads) \$200,000 - 3
Parking	None	Same as no action	Same as no action	200 spaces \$225,000 - 3
Launch Ramp	None	Same as no action	Same as no action	Paved, 6 lanes \$35,000 - 3
Campground	None	Same as no action	Same as no action	100 sites \$135,000 - 3
Trailer Village	None	Same as no action	Same as no action	50 RV sites \$250,000 - 3
Motel	None	Same as no action	Same as no action	35 units \$700,000 - 3
Restaurant	None	Same as no action	Same as no action	Full service, 50 seats \$100,000 - 3
Store	None	Same as no action	Same as no action	Full service, 3,000 sq.ft. \$225,000 - 3
Concession Housing/ Maintenance	None	Same as no action	Same as no action	Provide 4 units, 1,200 sq.ft. each \$400,000 - 3
NPS Maintenance	None	Same as no action	Same as no action	Provide 1,500 sq.ft., 2 acres unpaved storage \$100,000 - 3
Interpretation/Information	None	Same as no action	Same as no action	1,000 sq.ft. contact/ranger station, marina wayside, campground wayside \$75,000 - 3
Dry Boat Storage	None	Same as no action	Same as no action	120 spaces \$67,000 - 3
Restrooms	None	Same as no action	Same as no action	Provide full service, 500 sq.ft. \$60,000 - 3
Gas Station	None	Same as no action	Same as no action	Provide 2 pumps \$30,000 - 3
Gas Dock	None	Same as no action	Same as no action	Provide 2 pumps \$50,000 - 3

BOULDER BASIN\_ZONE/Boxcar Cove Vicinity

A C T I O N S

BOULDER BASIN ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<u>Boxcar Cove Vicinity (Major New Development Area)</u>				
Utilities (water, power, and sewer)	None	Same as no action	Same as no action	Provide water system, sewage lagoons, power, telephone/radio \$2,100,000 - 3**
<u>Improved Access</u> (Access, unpaved parking, paved launch ramp primitive camp-ground restrooms marina wayside)	10.6 miles single-lane primitive roads, parking (4 acres), and campsites (2 acres); no ramps or restrooms	Same as no action	Provide at Saddle Cove and Boxcar Cove: each area would have 3 acres of gravel parking, 2-lane launch ramp, 2 acres primitive camping, two 12 sq.ft. toilets; access by Northshore Loop Road \$400,000	Same as no action
Northshore Area	8 miles existing gravel roads	Same as no action	2 lanes paved, 9 mi. low std. \$7,200,000	Improve 8 miles existing gravel access roads, add 3.5 miles new spur roads \$3,200,000 - 1
<b>NPS: Flood Mitigation</b>	\$ 0	\$ 0	\$ 0	\$ 0
Other NPS Development (New Areas)/Improved Access	0	0	7,600,000	4,832,500
Subtotal NPS Development/ Flood Mitigation	0	0	7,600,000	4,832,500
<b>CONCESSION: (New Areas)</b>	0	0	0	3,119,500
<b>TOTAL - Improved Access/ New Development/Road Improvements</b>	\$ 0	\$ 0	\$7,600,000	\$7,952,000
<b>NPS: Flood Mitigation</b>				
Structural	\$ 0	\$ 2,416,000	\$ 2,416,000	\$ 1,837,000
Nonstructural/Relocation	130,000	250,000	220,000	220,000
Subtotal	130,000	2,666,000	2,636,000	2,057,000
<b>Other NPS Development</b>				
Existing Areas	0	5,149,000	1,512,000	5,201,500
New Areas	0	0	7,600,000	4,892,500
Subtotal	0	5,149,000	9,112,000	10,094,000
<b>Total</b>	130,000	7,875,000	11,748,000	12,151,000
<b>CONCESSION: Development Costs</b>				
Existing Areas	0	8,865,000	2,250,000	8,802,500
New Areas	0	0	0	3,119,500
Subtotal	0	8,865,000	2,250,000	11,922,000
<b>GRAND TOTAL - Boulder Basin Zone (Boulder Beach areas, Las Vegas Wash, Callville Bay, major new developed area, Boxcar Cove vicinity, and improved access points)</b>	\$130,000	\$16,680,000	\$13,998,000	\$24,073,000

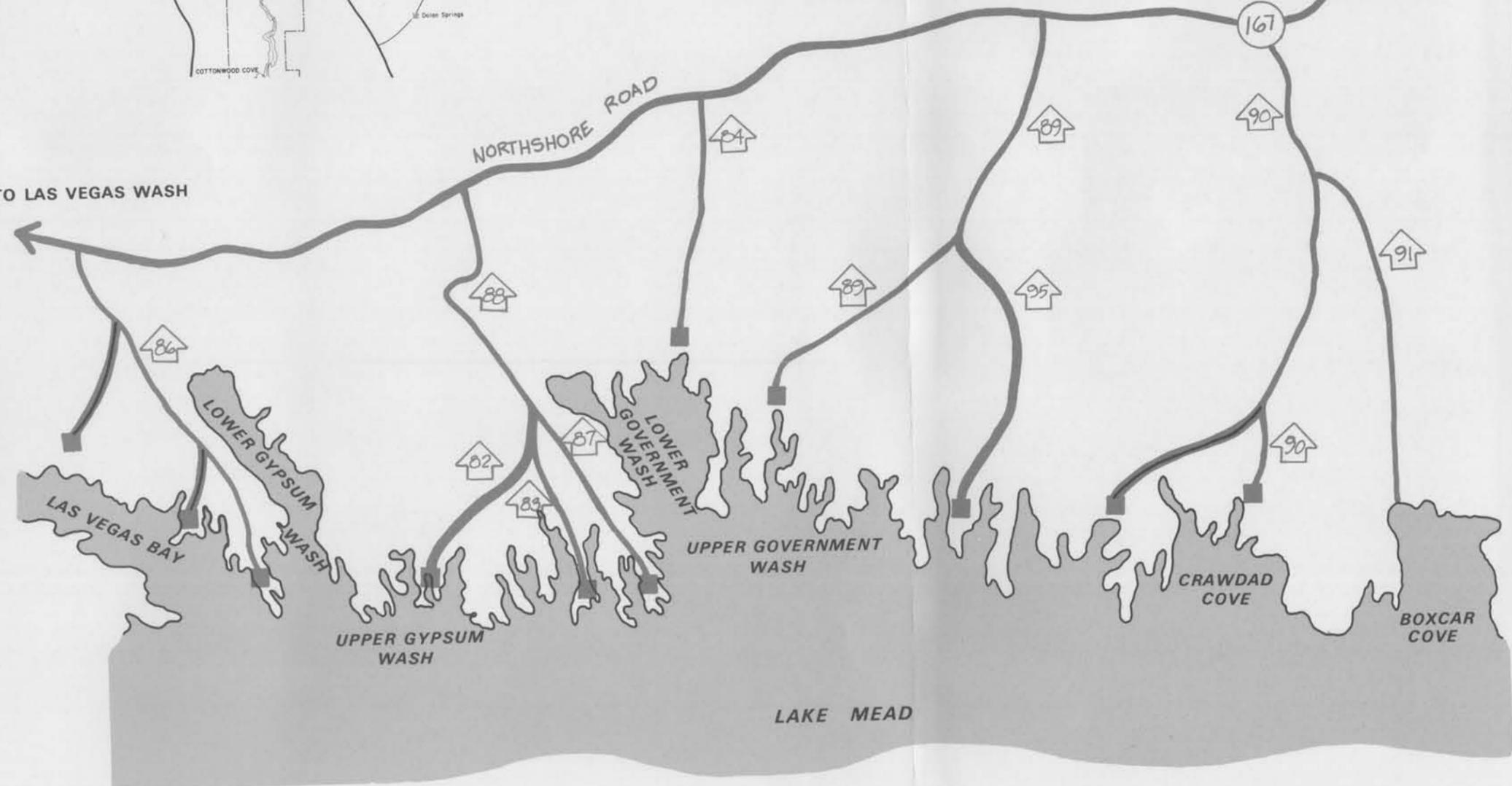
**BOULDER BASIN ZONE/Boxcar Cove Vicinity**



TO LAS VEGAS WASH

TO CALLVILLE BAY

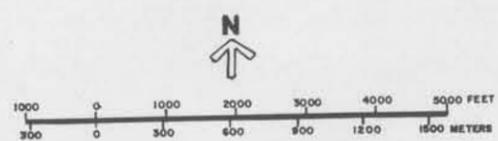
TO ECHO BAY



NRA BOUNDARY 

NEW SPUR ROADS 

EXISTING GRAVEL ROADS TO BE UPGRADED 



**PROPOSED NORTHSHORE  
AREA ROAD IMPROVEMENTS  
LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA**  
UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





echo bay zone

## ECHO BAY ZONE

### Proposed Action

Echo Bay. Situated on a high bluff, Echo Bay boasts spectacular views and uncrowded conditions along the Overton Arm of Lake Mead. It is out of flood-hazard areas.

The area is busiest during the late spring and summer months. It attracts pleasure boaters and fishermen. The resort also offers houseboat rentals, a vacation activity that is increasing in popularity. Echo Bay, along with Temple Bar in the Virgin/Temple Zone, is a primary staging area for houseboating because of the attractive lake area and sandy coves that surround the resort. The combination of facilities offered and the uncrowded conditions at the lake create the potential for a dramatic increase in use, with overflow from the adjacent, more crowded zones of the lake.

Visitation showed an increasing trend of 6 percent per year from 1979 to 1982, but for the same time overnight use decreased 4 percent per year. The plan proposes changes to increase parking capacity and to facilitate circulation. Several changes to facility locations are suggested to promote better relationships between uses. The airstrip at Echo Bay would have a north-south runway added, which would increase safety because of air currents in the area.

The main visitor use area (the marina/motel complex) would be redesigned to allow improved pedestrian and vehicular circulation. A site for a land-based store has been designated, should future visitor needs merit. Parking, a swim beach with picnic area, and an additional launch ramp are proposed just north of the resort in an adjacent cove to accommodate increased visitation. The first loop in the lower campground would be closed to use during high-water levels. An amphitheater would be added. A portion of the upper campground would be converted to RV sites, with the remaining campsites used for overflow. Housing for both concessioner and NPS use would be in an area north of the trailer village. The existing NPS housing/maintenance area would eventually be converted to visitor parking area, and concessioner maintenance would remain on the existing site.

The plan provides for expansion of the motel and support services, depending on demand. Houseboat rentals would be consistent with carrying capacity limits, which could be expanded to attract more people to the area. In addition, the plan provides for possible RV sites if demand would support the action. Any proposed concession expansion would be examined for feasibility in an economic feasibility study before it was approved.

Stewarts Point. This area currently functions as a vacation cabin site area. Since the cabins are not directly on the water, the area has become a popular beach camping and day use area that uses the cabin site access road. The beach area would be developed into an improved

access point that includes improving or adding the access road, a small parking area, launch ramp, restrooms, and level areas for camping. Nothing is proposed in the cabin site area.

Redstone Picnic Area. This small site contains a beautiful array of red Aztec sandstone rock formations that rise dramatically from the ground.

The site has great potential for a memorable visitor experience, apart from the lake itself. Trails that wind among these rocks would provide enjoyable walks, especially in conjunction with interpretive wayside exhibits. The existing small parking area would be enlarged and picnic tables and walk-in camping facilities would be provided as visitor demand warrants. The area is not in a flood-hazard zone.

Rogers and Bluepoint Springs. These two sites offer a different visitor experience apart from the lake-oriented activities available throughout the recreation area. Neither area is in a flood-hazard zone.

Rogers Spring is extremely popular. Groups on bus tours and individuals stop to enjoy this charming oasis year-round. Large trees surround and shade the warm spring pool. The plan proposes to expand the popular picnic area and to provide for increased parking within the confines of the existing disturbed area. Restroom facilities would be slated for improvement.

Bluepoint Spring offers a similar feature to Rogers Spring but on a much more limited scale. The plan proposes to maintain the subdued and intimate character of the site by suggesting little expansion or improvement, except for the addition of picnic tables and a shade shelter next to the warm spring waters.

#### No-Action Alternative

Visitors would be provided a full range of services and facilities for lake access, overnight use, and houseboat staging.

#### Alternative A

Major emphasis would not change; developed area facilities would be expanded to accommodate more use.

#### Alternative B

Major emphasis would not change; Stewarts Point access and launch ramp would be improved.

ECHO BAY ZONE

A C T I O N S

ECHO BAY ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<u>Echo Bay</u>				
Flood Mitigation	No flood hazard	Same as no action	Same as no action	Same as no action
Access	Paved 2-lane road--4 mi.	Improve circulation within development \$225,000	Same as no action	Same as alternative A \$225,000 - 2**
Parking	1,040 spaces (paved or unpaved)	Expand by 1/2 \$715,000	Same as no action	Same as alternative A \$715,000 - 1
Launch Ramp	9 paved lanes	Retain existing ramp, provide additional ramp (4 lanes) \$25,000	Same as no action	Same as alternative A \$25,000 - 2
Courtesy Dock	6-boat capacity	Double size \$50,000	Same as no action	Same as alternative A \$50,000 - 1
Swim Beach	Undesignated .7 acre	Designated with 4 lifeguard stands \$3,000	Same as no action	Same as alternative A \$3,000 - 1
Ranger Station	Permanent 2,500-sq. ft. facility on access road	Add contact station near ramp with restrooms; 1,000 sq. ft. \$70,000	Same as no action	Same as alternative A \$70,000 - 1
Interpretation/Information	Contact at ranger station, marina wayside (10'x7') campground wayside (12'x7'), add amphitheater (150 seats)	Rehabilitate all \$35,000	Same as alternative A \$35,000	Same as alternative A \$35,000 - 1
NPS Boat Dock	None	Provide 4 slips near ramp \$10,000	Same as alternative A \$10,000	Same as alternative A \$10,000 - 1
NPS Maintenance	Two 100-sq. ft. permanent buildings and 12,000 sq. ft. unpaved storage yard, 12,000 sq. ft. paved area	Relocate--2,100-sq. ft. building, 15,000 sq. ft. yard \$250,000	Same as no action	Same as no action (relocate in long-term) \$250,000 - 2
NPS Housing	Three 2,400-sq. ft. residences and a 5,600-sq. ft. fourplex apartment	Relocate \$650,000	Same as no action	Same as no action (relocate in long term) \$650,000 - 2
Picnic Area	None	Provide 10 sites \$9,000	Same as no action	Same as alternative A \$9,000 - 2
Campground	2 locations, 166 sites	Convert portion of upper campground to concession-operated RV sites with full hookups, 42 sites \$120,000	Same as no action	Same as alternative A \$120,000 - 2

A C T I O N S

ECHO BAY ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<u>Echo Bay</u>				
Trailer Village	69 long-term and 58 short-term sites	Short-term, expanded in upper campground (see campground)	Same as no action	Same as alternative A
Motel	52 units	Double size; add landscaping (1,400 sq.ft.), pool, and office space (600 sq.ft.) \$1,250,000 - 2	Same as no action	Same as alternative A \$1,250,000 - 2
Restaurant	120 seating capacity	Expand to 200 seats with motel \$300,000	Same as no action	Same as no action
Store	On marina--9,000 sq.ft.	Same as no action	Same as no action	Add land-based store; 2,000 sq.ft. \$150,000 - 2**
Marina	314 slips, no moorings	Carrying capacity expansion limit: 530 slips \$630,000	Same as no action	Same as alternative A \$630,000 - 2
Dry Boat Storage	97 spaces	Expand within limits, of wash 200 spaces \$10,000	Same as no action	Same as alternative A \$10,000 - 2
Rental Boats	70 houseboats, 18 ski/patio/fishing	Expand houseboats to 90 and ski/patio/fishing boat fleets to 25 consistent with carrying capacity	Same as no action	Same as alternative A
Concession Maintenance	Replace existing burned facility--9,600-sq.ft. building, 33,000-sq.ft. pavement and unpaved storage	Same as no action \$400,000	Same as no action \$400,000	Same as no action \$400,000 - 1
Concession Housing	In trailer village area 34 units on 4.4 acres	Same as no action	Same as no action	Same as no action
Gas Station	4 pumps	Same as no action	Same as no action	Same as no action
Gas Dock	10-boat capacity	Same as no action	Same as no action	Same as no action
Airstrip	Paved, 3,000' long x 50' wide	Add north/south paved runway (3,000' long x 50' wide) and lights (1,000), improve access (long term)- (75,000) \$246,000	Same as no action	Same as alternative A \$246,000 - 2

ECHO BAY ZONE

A C T I O N S

	No Action	Alternative A	Alternative B	Proposed Action
<b>ECHO BAY ZONE</b>				
<u>Improved Access:</u> <u>Stewarts Point</u>				
Flood Hazard	No flood hazard	Same as no action	Same as no action	Same as no action
Access	.8 mi. paved road to cabins, 2.4 mi. dirt road to water	Same as no action	Pave to water .8 mi. \$75,000	Same as alternative B \$75,000 - 2
Parking	Unpaved along road	Same as no action	Add 15 paved spaces \$20,000	Add 15 paved spaces \$20,000 - 2
Launch Ramp	None	Same as no action	Provide 2 lanes (paved) \$15,000	Same as alternative B \$15,000 - 2
Campground	Primitive beach camping (6 acres)	Same as no action	Same as no action	Same as no action
Restrooms	Existing--12 sq. ft. pit toilet	Same as no action	Add 12 sq. ft. organic toilet \$16,000	Same as alternative B \$16,000 - 2
Cabins	60 cabin sites	Same as no action	Same as no action	Same as no action
<u>Other Areas:</u> <u>Redstone Picnic Area</u>				
Access	Pullout off Northshore Road .3 mi.	Same as no action	Same as no action	Same as no action
Parking	Paved, 15 spaces	Same as no action	Double size \$9,000	Same as alternative B \$9,000 - 2**
Picnic Area	None	Same as no action	Provide 5 tables and 1 shelter \$7,000	Same as alternative B \$7,000 - 2
Campground	None	Same as no action	Provide small walk-in campground of 10 sites \$9,000	Same as alternative B \$9,000 - 2
Restrooms	Existing 12 sq. ft. pit toilet	Same as no action	Improve, add new organic toilet \$16,000	Same as alternative B \$16,000 - 2
Interpretive Trail	None	Provide 500' gravel trail \$6,000	Same as alternative A \$6,000	Same as alternative A \$6,000 - 2
<u>Rogers Spring</u>				
Access	Pullout off Northshore Road .4 mi.	Same as no action	Same as no action	Same as no action
Parking	Unpaved, 10 spaces	Same as no action	Pave and expand 10 spaces \$13,000	Same as alternative B \$13,000 - 2
Picnic Area	2 shelters and tables	Same as no action	Add 5 tables \$2,000	Same as alternative B \$2,000 - 2

**ECHO BAY ZONE/Improved Access and Other Areas**

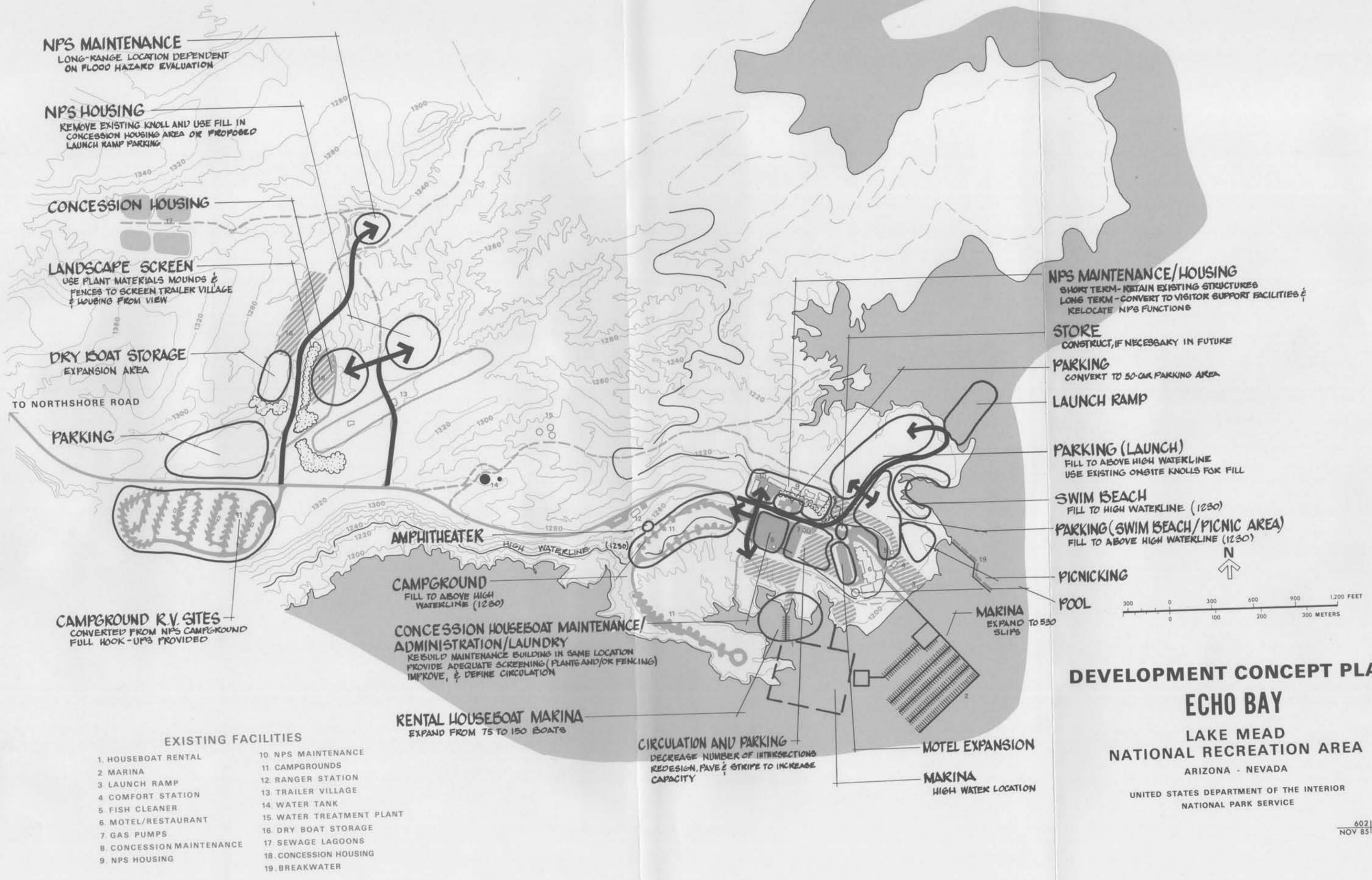
A C T I O N S

ECHO BAY ZONE	No Action	Alternative A	Alternative B	Proposed Action
Improved Access: <u>Rogers Spring</u>				
Restrooms	Existing 12 sq.ft. pit toilet	Same as no action	Add 12 sq.ft. organic toilet \$16,000	Same as alternative B \$16,000 - 2
Interpretation/Information	Interpretive wayside (10'x7')	Rehabilitate \$6,000	Same as alternative A \$6,000	Same as alternative A \$6,000 - 2
<u>Bluepoint Spring</u>				
Picnic Area	2 sites	Same as no action	Add 1 shelter and 3 tables \$4,000	Same as alternative B \$4,000 - 2
<u>Northshore Road (Nevada 167)</u>				
Access	Paved 2-lane road, 63 mi. with 26 25'x150' pullouts	Same as no action	Increase number of scenic pullouts by 10, 37,500 sq.ft. \$35,000	Same as alternative B \$35,000 - 2
<b>NPS: Flood Mitigation</b>				
Structural		\$ 0	\$ 0	\$ 0
Nonstructural/Relocation		0	0	0
Subtotal		0	0	0
<b>Other NPS Development</b>				
Existing Areas		2,300,000	294,000	2,021,500
New Areas		0	0	0
Subtotal		<u>2,300,000</u>	<u>294,000</u>	<u>2,021,500</u>
Total		2,300,000	294,000	2,021,500
<b>CONCESSION: Development Costs</b>				
Existing Areas		2,710,000	400,000	3,075,500
New Areas		0	0	0
Total		<u>2,710,000</u>	<u>400,000</u>	<u>3,075,500</u>
<b>GRAND TOTAL - Echo Bay Zone</b>		<b>\$ 5,010,000</b>	<b>\$694,000</b>	<b>\$ 5,097,000</b>

\*\*The plan implementation section defines three priorities indicated here as 1, 2, and 3

**ECHO BAY ZONE/Improved Access and Other Areas**





**NPS MAINTENANCE**  
LONG-RANGE LOCATION DEPENDENT ON FLOOD HAZARD EVALUATION

**NPS HOUSING**  
REMOVE EXISTING KNOLL AND USE FILL IN CONCESSION HOUSING AREA OR PROPOSED LAUNCH RAMP PARKING

**CONCESSION HOUSING**

**LANDSCAPE SCREEN**  
USE PLANT MATERIALS MOUNDS & FENCES TO SCREEN TRAILER VILLAGE & HOUSING FROM VIEW

**DRY BOAT STORAGE**  
EXPANSION AREA

TO NORTHSHORE ROAD

**PARKING**

**CAMPGROUND R.V. SITES**  
CONVERTED FROM NPS CAMPGROUND FULL HOOK-UPS PROVIDED

**AMPHITHEATER**

**CAMPGROUND**  
FILL TO ABOVE HIGH WATERLINE (1250)

**CONCESSION HOUSEBOAT MAINTENANCE/ ADMINISTRATION/LAUNDRY**  
REBUILD MAINTENANCE BUILDING IN SAME LOCATION PROVIDE ADEQUATE SCREENING (PLANTS AND/OR FENCING) IMPROVE, & DEFINE CIRCULATION

**RENTAL HOUSEBOAT MARINA**  
EXPAND FROM 75 TO 150 BOATS

**CIRCULATION AND PARKING**  
DECREASE NUMBER OF INTERSECTIONS REDESIGN, PAVE & STRIPE TO INCREASE CAPACITY

**MOTEL EXPANSION**

**MARINA**  
HIGH WATER LOCATION

**NPS MAINTENANCE/HOUSING**  
SHORT TERM - RETAIN EXISTING STRUCTURES  
LONG TERM - CONVERT TO VISITOR SUPPORT FACILITIES & RELOCATE NPS FUNCTIONS

**STORE**  
CONSTRUCT, IF NECESSARY IN FUTURE

**PARKING**  
CONVERT TO 50-CAR PARKING AREA

**LAUNCH RAMP**

**PARKING (LAUNCH)**  
FILL TO ABOVE HIGH WATERLINE USE EXISTING ON-SITE KNOLLS FOR FILL

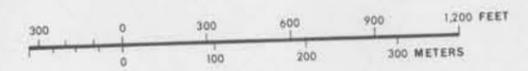
**SWIM BEACH**  
FILL TO HIGH WATERLINE (1250)

**PARKING (SWIM BEACH/PICNIC AREA)**  
FILL TO ABOVE HIGH WATERLINE (1250)

**PICNICKING**

**POOL**

**MARINA**  
EXPAND SLIPS TO 530



**EXISTING FACILITIES**

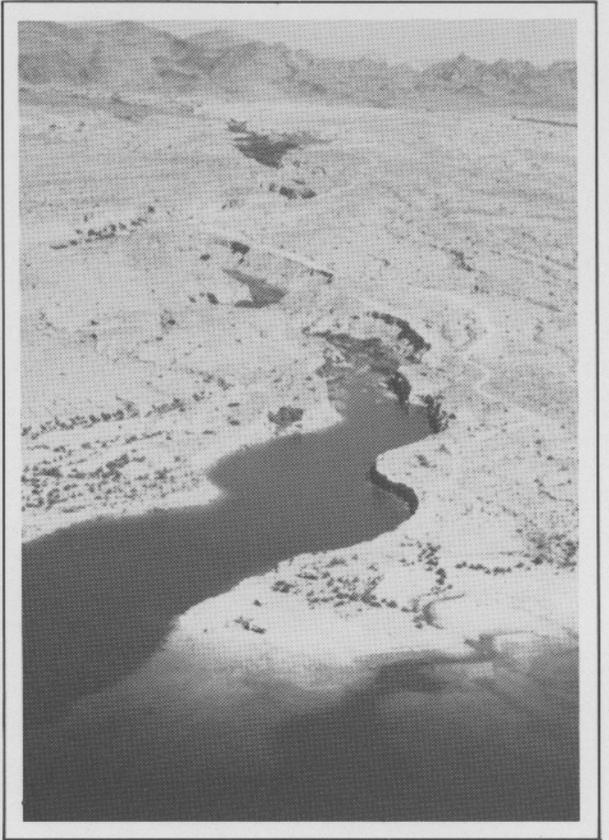
- |                           |                           |
|---------------------------|---------------------------|
| 1. HOUSEBOAT RENTAL       | 10. NPS MAINTENANCE       |
| 2. MARINA                 | 11. CAMPGROUNDS           |
| 3. LAUNCH RAMP            | 12. RANGER STATION        |
| 4. COMFORT STATION        | 13. TRAILER VILLAGE       |
| 5. FISH CLEANER           | 14. WATER TANK            |
| 6. MOTEL/RESTAURANT       | 15. WATER TREATMENT PLANT |
| 7. GAS PUMPS              | 16. DRY BOAT STORAGE      |
| 8. CONCESSION MAINTENANCE | 17. SEWAGE LAGOONS        |
| 9. NPS HOUSING            | 18. CONCESSION HOUSING    |
|                           | 19. BREAKWATER            |

**DEVELOPMENT CONCEPT PLAN**  
**ECHO BAY**

LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





overton beach zone

## OVERTON BEACH ZONE

### Proposed Action

As Lake Mead extends northward, the visitor experience changes. In contrast to the Boulder Basin, where hot boaters and water skiers abound in great numbers, the Overton Beach area attracts fewer people because of its distance from any major metropolitan areas. Fishermen make up a large percentage of use in this area during the fall, winter, and spring months, while pleasure boaters predominate in the summer. The sandy coves and shorelines provide opportunities for fishermen and boaters throughout the year.

Of all zones on the lake, Overton is the smallest and also the closest to its capacity on peak weekends. Visitation has shown an increasing trend of 2 percent per year from 1978 to 1982. Despite its distance from major cities, its popularity is increasing as more visitors discover the north end of the lake. To accommodate the increased use, the plan proposes expansion and relocation of facilities to best serve existing and future visitor needs. Developing a fee campground; constructing a new convenience store with laundry and showers; adding parking and RV sites where demand exists; and locating these and other facilities out of flood-hazard zones and above the high waterline (1230') would make a more workable and pleasant experience for those who come to enjoy the area. The campground would be relocated because it is in a wash that has a flash-flood hazard. Relocation and expansion of the campground would cost \$120,000.

Development costs would be borne by the National Park Service. Historically this area has not been economically viable for the concessioner. However, the National Park Service has determined that services should be available at this location so they would probably make all or a portion of the improvements which would provide a feasible operation for the concessioner.

### No-Action Alternative

Visitors seeking a less crowded and more rustic developed area with fewer services would be attracted to Overton Beach; primitive camping and support services along with access to the northermost portion of Lake Mead would be primary attractions. Flood mitigation actions would be the same as for the proposed action.

### Alternative A

Major emphasis would not change; more overnight visitors would be accommodated through the development of a motel. Flood mitigation actions would be the same as for the proposed action.

## Alternative B

The new gravel road between Overton and Overton Beach would open many new access opportunities along this section of Lake Mead shoreline.

Visitors seeking a less crowded and more rustic developed area with fewer services would be attracted to Overton Beach; primitive camping and support services along with access to the northernmost portion of Lake Mead would be primary attractions.

Flood mitigation actions would be the same as for the proposed action.

A C T I O N S

OVERTON BEACH ZONE		No-Action	Alternative A	Alternative B	Proposed Action
Flood Mitigation	Nonstructural measures: provide wash camping warning system \$120,000*	Nonstructural measures: relocate wash camping	Same as alternative A	Same as alternative A	Same as alternative A
Access	Paved, two lanes .2 mi.	Reconstruct 1/5 mi. of paved road \$30,000	Reconstruct 1/5 mi. paved road, provide new dirt road along shore from Overton, Nevada to Overton Beach \$7,105,000	Reconstruct 1/5 mi. paved road and improve circulation, reopen dirt road along shoreline in both directions (1/2 mi. each way) at low water \$105,000 - 1**	Same as alternative A
Parking	830 spaces (paved and unpaved)	Expand high-water parking by 50 gravel spaces \$40,000	Same as no action	Same as alternative A \$40,000 - 2	Same as alternative A
Launch Ramp	4 lanes (paved)	Expand by 2 paved lanes \$15,000	Same as no action	Same as no action	Same as no action
Courtesy Dock	4 boat capacity	Double size \$25,000	Same as no action	Same as alternative A \$25,000 - 2	Same as alternative A
Swim Beach	Unprotected (.92 acre)	Remain in same location, identify flood hazard \$5,000*	Same as no action	Same as alternative A \$5,000*	Same as alternative A
Ranger Station	450 sq.ft. trailer near ramp	Provide permanent facility of 1,000 sq.ft. \$70,000	Same as no action	Same as alternative A \$70,000 - 1	Same as alternative A
Interpretation/Information	None	Provide marina (10'x7') and campground wayside (12'x7') \$10,000	Same as alternative A \$10,000	Same as alternative A \$10,000 - 1	Same as alternative A
NPS Boat Dock	None	Provide 2 slips near ramp \$10,000	Same as no action	Same as alternative A \$10,000 - 1	Same as alternative A
NPS Maintenance	None	Provide 800 sq.ft. building, 5,000 sq.ft. paving \$125,000	Same as no action	Same as alternative A \$125,000 - 2	Same as alternative A
NPS Housing	Two 1,500 sq.ft. trailers	Remove trailers and construct 2 permanent houses in new location; 1,200 sq.ft. each \$190,000	Same as no action	Same as alternative A \$190,000 - 2	Same as alternative A
Campground	100 primitive sites	Relocate to north and west, expand by 1/2, designate sites \$135,000*	Same as alternative A \$135,000*	Relocate to north and west, expand by 1/3, designate sites \$120,000*	Relocate to north and west, expand by 1/3, designate sites \$120,000*
Picnic Area	None	Same as no action	Same as no action	Same as no action	Same as no action
Trailer Village	19 long-term and 13 short-term sites	Relocate and convert to 30 long-term and 13 RV sites \$200,000	Same as no action	Same as alternative A \$200,000 - 2	Same as alternative A \$200,000 - 2

OVERTON BEACH ZONE

A C T I O N S

VERTON BEACH ZONE	No-Action	Alternative A	Alternative B	Proposed Action
Motel	None	Same as no action	Same as no action	Same as no action
Restaurant/Store	None	Provide above high water-line; 3,000 sq.ft. restaurant/store \$150,000	Same as no action	Provide 1,800 sq.ft. convenience store \$125,000 - 1
Marina	50 moorings	Carrying capacity expansion limit: 140 moorings \$90,000	Same as no action	Same as alternative A \$90,000 - 2
Dry Boat Storage	40 spaces in side wash	Double size in existing location \$65,000	Same as no action	Expand in new location by .7 acre; add 800' fence \$36,000 - 2
Rental Boats	6 ski/patio/fishing boats	Double size	Same as no action	Same as alternative A
Concession Maintenance***	800 sq.ft. building, 5,000 sq.ft. paved area with dry boat storage	Rehabilitate \$150,000	Same as no action	Same as alternative A \$150,000 - 1
Concession Housing***	3-4 trailers	Provide five 1,200 sq.ft. houses \$590,000	Same as no action	Same as alternative A \$590,000 - 2
Gas Station	None	Provide in concession service area; 2 pumps \$30,000	Same as no action	Same as alternative A \$30,000 - 2
Gas Dock	3 pumps	Same as no action	Same as no action	Same as no action
<b>NPS: Flood Mitigation</b>				
Structural	\$ 0	\$ 0	\$ 0	\$ 0
Nonstructural/Relocation	120,000	140,000	135,000	125,000
Subtotal	120,000	140,000	135,000	125,000
<b>Other NPS Development</b>				
Existing Areas	0	1,790,000	10,000	1,026,000
New Areas	0	0	7,105,000	0
Subtotal	0	1,790,000	7,115,000	1,026,000
Total	120,000	1,930,000	7,250,000	1,151,000
<b>CONCESSION: Development Costs</b>				
Existing Areas	0	0	0	770,000
New Areas	0	0	0	0
Total	0	0	0	770,000
<b>GRAND TOTAL - Overton Beach Zone</b>	<b>\$120,000</b>	<b>\$1,930,000</b>	<b>\$7,250,000</b>	<b>\$1,921,000</b>

\* Actions related to flood mitigation  
 \*\* The plan implementation section defines three priorities indicated here as 1, 2, or 3.  
 \*\*\* NPS bought out concessioner in 1979

OVERTON BEACH ZONE



LAKE MEAD ELEV. 1190'

MARINA  
EXPAND TO 140 MOORINGS

RANGER STATION/CONCESSION BUILDING

CONCESSION BUILDING PARKING

CONCESSION & NPS HOUSING

RECREATION VEHICLE CAMPGROUND

TRAILER VILLAGE

DRY BOAT STORAGE  
CONCESSION MAINTENANCE

HIGH WATER LINE (1230)

DAY USE PARKING

OBLITERATE CAMPGROUND  
DUE TO HIGH WATERLINE

CAMPGROUND  
COMFORT STATIONS, PADS, TABLES  
ABOVE HIGH WATER

FLOOD HAZARD ZONE

100-YEAR FLOOD

PMF

PMF

PMF

TO 12

TO STATE HIGHWAY 169

EXISTING FACILITIES

- 1. LAUNCH RAMP
- 2. NPS HOUSING
- 3. CONCESSION HOUSING
- 4. RANGER STATION
- 5. COMFORT STATION
- 6. SWIM BEACH
- 7. TRAILER VILLAGE
- 8. CAMPING AREA
- 9. NPS MAINTENANCE
- 10. WATER TANK
- 11. WATER TREATMENT PLANT
- 12. SEWAGE LAGOONS



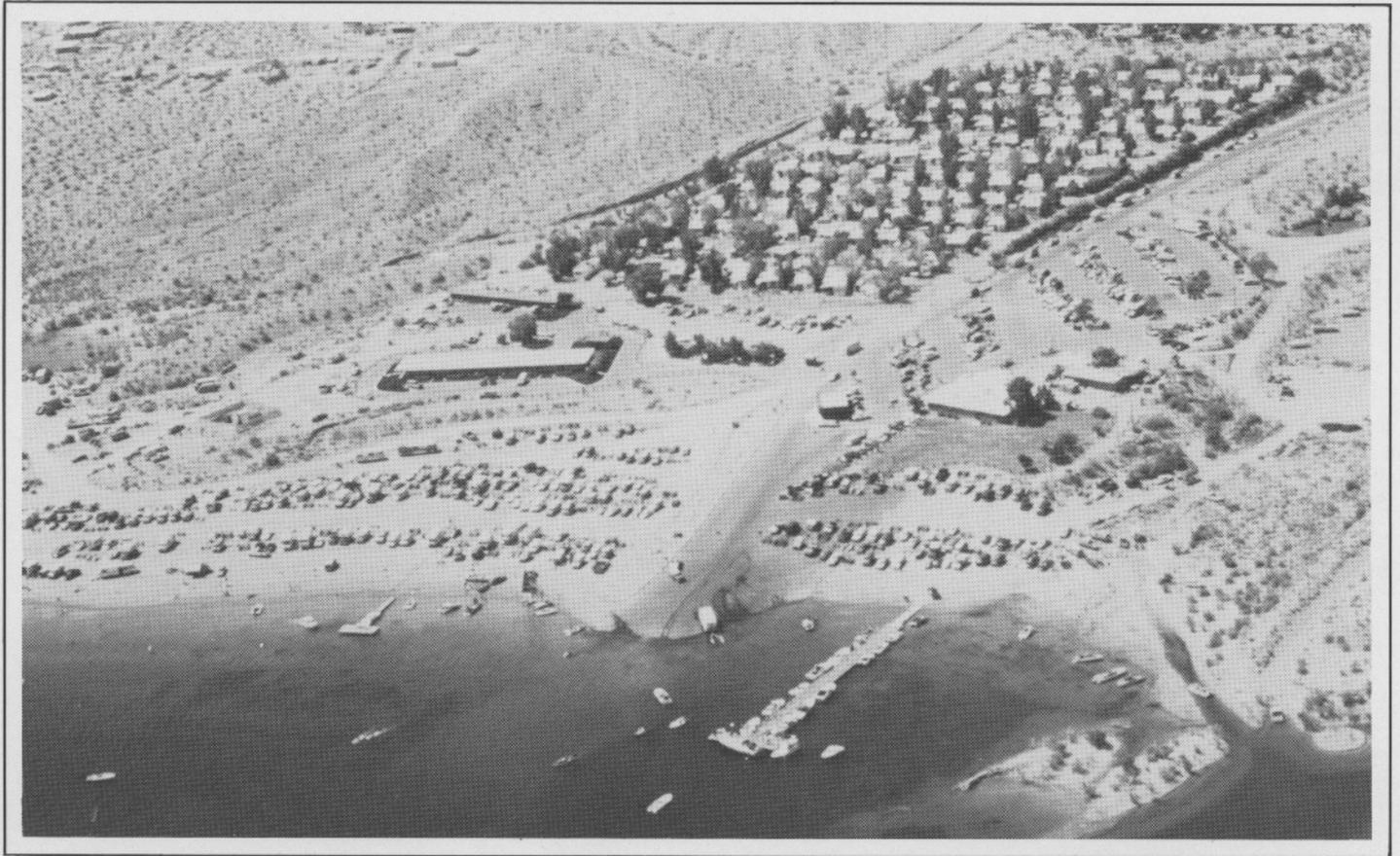
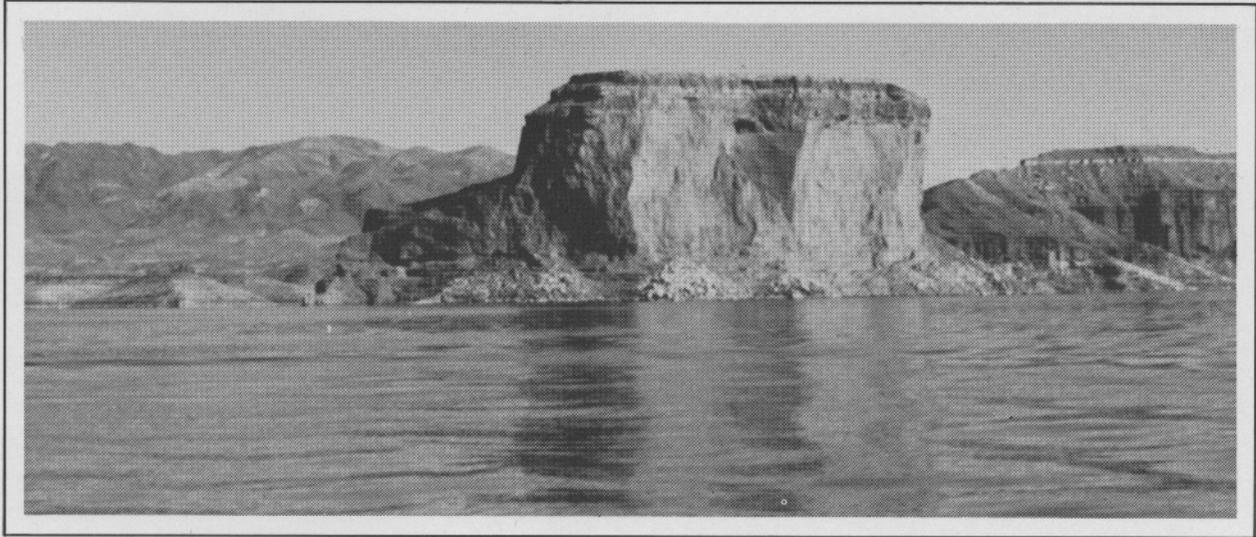
# DEVELOPMENT CONCEPT PLAN OVERTON BEACH

## LAKE MEAD NATIONAL RECREATION AREA

ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





virgin / temple zone

## VIRGIN/TEMPLE ZONE

### Proposed Action

This zone has much possibility for growth but currently receives light visitation. A decreasing trend of 18 percent per year occurred from 1979 to 1982. During the same time overnight use has shown an increasing trend of 11 percent per year. Temple Bar is more remote than any other development on Lake Mead, but it has the potential to become one of the most popular areas because it is near the Grand Canyon and the large lake area it accesses. Temple Bar is proposed for a houseboat staging area because the lake and landscape exploration opportunities are enormous.

The wide variety of scenery that surrounds Lake Mead is no more spectacular than at Temple Bar. The "Temple," a large rock monolith to the east, provides an impressive focus for the development and is one of the first features that the visitor sees. The importance of maintaining this view corridor cannot be emphasized enough. The spectacular physical setting of the resort is unique and should be respected, especially with regard to facility placement and/or expansion.

To accommodate future demands, visitor services and support facilities would be expanded. The motel/store/restaurant complex and gas station area would be filled to accommodate future expansion at an elevation above the high waterline. Circulation and parking would be improved, with space for high-water parking provided in the former dry boat storage area. This parking site can be expanded to the southeast as need demands. Concession housing would be relocated to a site adjacent to the NPS housing area, and visitor parking or other future use would replace the former housing site. All concession expansion must be determined to be feasible through an economic feasibility analysis before it is approved. The swim beach would be relocated and restrooms provided to prevent the possibility of waters being polluted beyond state standards.

An area for day use and future expansion has been identified along a finger of land west of the main development that faces the existing harbor, with spectacular views uplake and downlake from this peninsula. Fishermen, who make up a large majority of those who visit Temple Bar, currently use this increasingly popular site.

The Detrital Bay access point would be improved. A two-lane gravel road, parking area, launch ramp, restrooms, and level areas for camping would be located out of flood-hazard areas.

Dikes and channels would be used throughout the Temple Bar area to ensure 100-year flood protection. A warning system and evacuation plan would be implemented for floods exceeding the 100-year level. Concrete-lined diversion dikes would be placed above the NPS housing and maintenance area (#1), above the visitor center (#2), and above the launch/parking area (#3) to divert flood flows to the lake through a concrete-lined channel on the east side of the development. A bridge

would be required on the access road where it crosses the dike. A dip crossing would be placed on the airport road where it crosses the dike. A concrete-lined diversion dike (#4) would also be placed above the campground to divert flood flows to the lake through a concrete-lined channel on the west side of the development. One dip crossing would be required for roads crossing each channel. Specific sizes and costs of these items would be as follows:

<u>Item</u>	<u>Size</u>	<u>Cost</u>
Diversion dikes #1 and #2	1,800' x 50'	\$ 372,000
Diversion dike #3	570' x 50'	108,000
Access road crossing (bridge)	20' x 30'	70,000
Airport crossing (dip)		25,000
East channel	2,485' x 30'	505,000
Dip crossing	100 cu. yd.	50,000
Diversion dike #4	225' x 50'	48,000
West channel	1,470' x 36'	384,000
Dip crossing	107 cu. yd.	53,000
Warning system package		65,000
		<u>\$1,680,000</u>

#### No-Action Alternative

All types of visitors would be accommodated, but the adventuresome boater and fisherman would be the most accommodated because there would be a fuel stop on the east end of the lake, houseboat rentals, and other services to help visitors wanting to make an expedition toward Grand Canyon and into the most remote parts of Lake Mead.

Existing diversion dikes and channels would be maintained and a warning system package installed at a cost of \$65,000.

#### Alternative A

Day and overnight visitors would be accommodated through the improvement of facilities at Temple Bar, which would provide a complete range of visitor services. Temple Bar would remain the staging area for adventuresome visitors wishing to explore the most remote regions of Lake Mead and Grand Canyon National Park.

Flood mitigation actions would be the same as for the proposed action, except that all the diversion dikes mentioned would be higher and all the channels would be deeper to accommodate the probable maximum flood. Total costs for the items under this alternative would be \$1,900,000.

## Alternative B

Major emphasis would not change at Temple Bar. An additional improved access point would also be provided at Detrital Bay to help spread use more evenly throughout the zone.

Flood mitigation actions would be the same as for alternative A, except that the channels for probable maximum flood protection would be gabion-lined. Total costs for items under this alternative would be \$1,750,000.

A C T I O N S

VIRGIN/TEMPLE ZONE	No-Action	Alternative A	Alternative B	Proposed Action
Flood Mitigation	Nonstructural measures: Maintain existing drainage canals and dikes, install warning system \$65,000*	Structural measures: PMF flow diversion through development-in two concrete-lined channels \$1,900,000*	Combination of structural/nonstructural measures: unlined channelization of flows through area, minor relocation of some residences/campsites/trailer sites \$1,750,000*	Combination of structural/nonstructural measures; 100-year flows diverted by armored dikes into concrete-lined channels through developed area, install warning system \$1,680,000*
Access	Paved 2-lane road, 7.2 mi.	Improve circulation within development \$150,000	Same as no action	Same as alternative A \$150,000 - 1**
Parking	1,400 spaces (paved and unpaved)	Expand by 270 paved spaces \$350,000	Same as no action	Same as alternative A \$350,000 - 2
Launch Ramp	4 lanes	Expand by 4 lanes \$25,000	Same as no action	Same as alternative A \$25,000 - 2
Courtesy Dock	7-boat capacity	Double size \$25,000	Same as alternative A \$25,000	Same as alternative A \$25,000 - 2
Swim Beach	Undesignated area, .7 acre	Relocate and provide 10 picnic sites, restrooms \$90,000	Same as alternative A \$90,000	Same as alternative A \$90,000 - 2
Ranger Station	Inadequate location, 3,000 sq.ft. building	Relocate to launch ramp area; 1,000 sq.ft. \$70,000	Same as alternative A \$70,000	Same as alternative A \$70,000 - 2
Interpretation/Information	Contact at ranger station, marina wayside (10'x7'), campground wayside (12'x7'), amphitheater (150 seats)	Renovate all except amphitheater \$10,000	Same as alternative A \$10,000	Same as alternative A. \$10,000 - 1
NPS Boat Dock	None	Provide 4 slips \$10,000	Same as no action	Same as alternative A \$10,000 - 1
NPS Maintenance	Adequate--2,000 sq.ft. building, 27,000 sq.ft. paved area	Add 400 sq.ft. fire station \$125,000	Same as no action	Same as alternative A \$125,000 - 1
NPS Housing	5 permanent units (three 1,500 sq.ft., two 900 sq.ft.), three 3,000 sq.ft. trailer units	Improve area, add 5,000 sq.ft. dorm and two 1,200 sq.ft. houses \$590,000	Same as no action	Same as alternative A \$590,000 - 2
Picnic Area	None	Provide with swim beach (see Swim Beach)	Same as no action	Same as alternative A
Campground	153 sites	Same as no action	Same as no action	Same as no action
Cabin Sites	36 sites	In long-term replace with visitor facilities (swim beach, picnic, RV sites)	Same as no action	Same as no action
Trailer Village	103 long-term and 13 short-term sites	Add 80 RV sites in cabin site area \$200,000	Same as no action	Remove first two loops to provide additional high-water space for parking - 10 long-term and 7 short-term sites removed \$20,000 - 1

VIRGIN/TEMPLE ZONE

A C T I O N S

VIRGIN/TEMPLE ZONE	No-Action	Alternative A	Alternative B	Proposed Action
Motel	22 units	Expand 4 times and add 1,200 sq.ft. pool \$2,000,000	Same as no action	Same as alternative A \$2,000,000 - 2
Restaurant	76-seat capacity	Triple size \$600,000	Same as no action	Same as alternative A \$600,000 - 2
Store	Inadequate--1,500 sq.ft.	Expand by 2,000 sq.ft. with restaurant \$300,000	Same as no action	Same as alternative A \$300,000 - 2
Marina	64 slips, no moorings, breakwater needed	Carrying capacity expansion limit 980 slips \$2,750,000	Same as alternative A \$2,750,000	Same as alternative A \$2,750,000 - 2
Dry Boat Storage	200 spaces on old lagoon site	Expand by 1/2 \$30,000	Same as no action	Same as alternative A \$30,000 - 2
Rental Boats	15 ski/patio/fishing	Add 45 houseboats	Same as alternative A	Same as alternative A
Concession Maintenance	Inadequate location--2,500 sq.ft. building, 2,000 sq.ft. paved area	Expand with dry boat storage, 4,000 sq.ft. building, 5,000 sq.ft. paved area \$250,000	Same as alternative A \$250,000	Same as alternative A \$250,000 - 1
Concession Housing	14 trailer units	Relocate and add new sites in NPS housing area, 40 trailers at 910 sq.ft. each \$500,000	Same as no action	Same as alternative A \$500,000 - 2
Gas Station	Adequate two pumps	Same as no action	Same as no action	Same as no action
Gas Dock	4-boat capacity	Same as no action	Same as no action	Same as no action
Other	Post office substation 400 sq.ft.	Same as no action	Same as no action	Same as no action
New Facilities		Add 2,000 sq.ft. public shower/laundry building with store/restaurant \$190,000	Same as alternative A \$190,000	Same as alternative A \$190,000 - 2
Improved Access (Access, unpaved parking, paved launch ramp, primitive campground, restrooms, marina wayside)	Maintained 6-mi. dirt road to Detrital Bay; no ramp, parking, restrooms, or campsites	Same as no action	Provide 2-lane launch ramp, 4 acres primitive camping, 3 acres gravel parking, two 12 sq.ft. restrooms at Detrital Bay \$150,000	Same as alternative B \$150,000 - 3

VIRGIN/TEMPLE ZONE

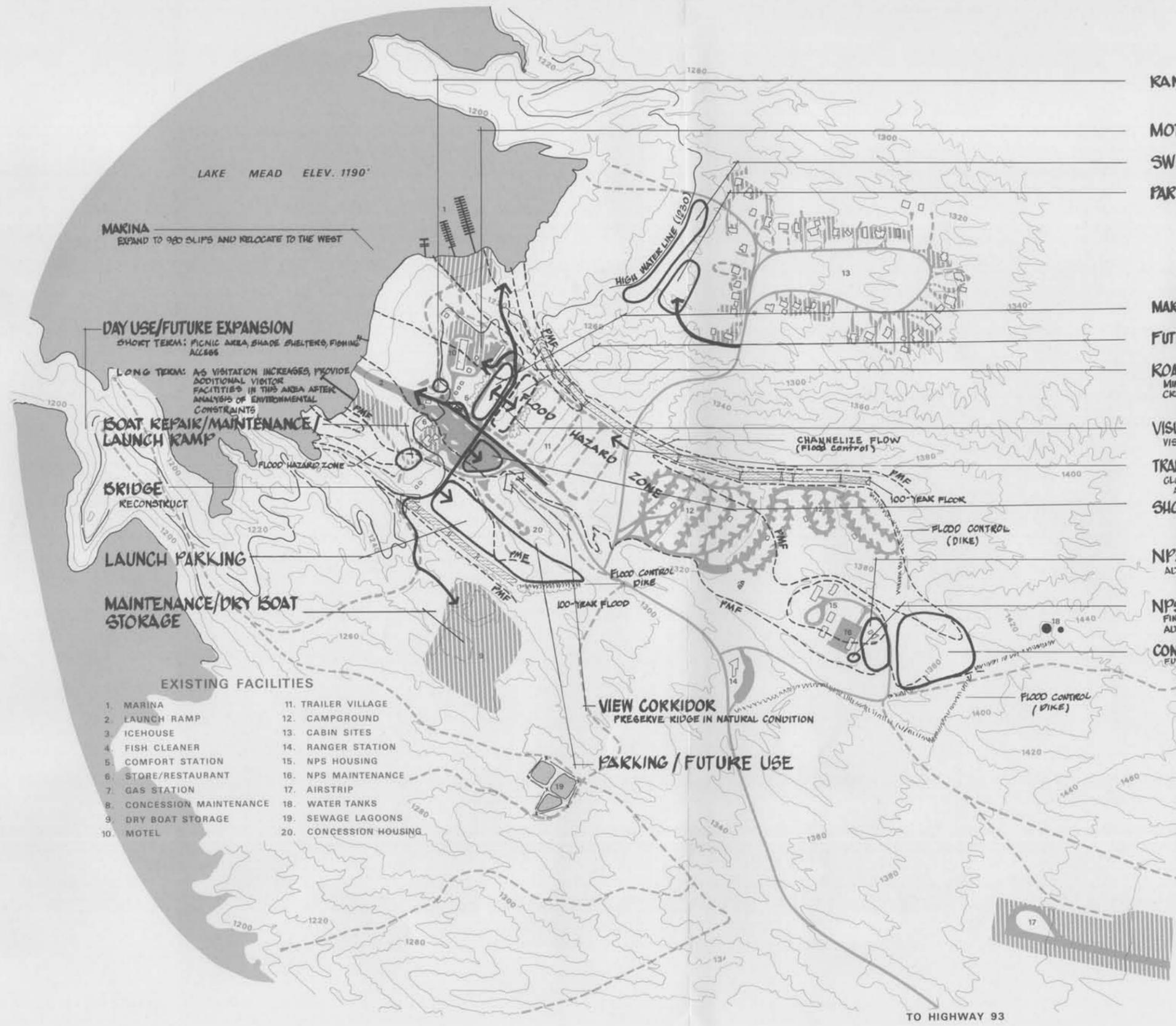
VIRGIN/TEMPLE ZONE

VIRGIN/TEMPLE ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<b>NPS: Flood Mitigation</b>				
Structural	\$ 0	\$ 1,900,000	\$ 1,750,000	\$ 1,615,000
Nonstructural/Relocation	65,000	0	0	65,000
Subtotal	65,000	1,900,000	1,750,000	1,680,000
<b>Other NPS Development</b>				
Existing Areas	0	1,385,000	135,000	1,197,500
New Areas/Improved Access	0	0	150,000	150,000
Subtotal	0	1,385,000	285,000	1,347,500
Total	65,000	3,285,000	2,035,000	3,027,500
<b>CONCESSION: Development Costs</b>				
Existing Areas	0	6,820,000	3,190,000	6,827,500
New Areas/Improved Access	0	0	0	0
Subtotal Concession Development	0	6,820,000	3,190,000	6,827,500
<b>GRAND TOTAL - Virgin/Temple Zone</b>	<b>\$65,000</b>	<b>\$10,105,000</b>	<b>\$ 5,225,000</b>	<b>\$9,855,000</b>

\* Actions related to flood mitigation

\*\* The plan implementation section defines three priorities indicated here as 1, 2, or 3.





LAKE MEAD ELEV. 1190'

MARINA  
EXPAND TO 980 SLIPS AND RELOCATE TO THE WEST

DAY USE/FUTURE EXPANSION  
SHORT TERM: PICNIC AREA, SHADE SHELTERS, FISHING ACCESS

LONG TERM: AS VISITATION INCREASES, PROVIDE ADDITIONAL VISITOR FACILITIES IN THIS AREA AFTER ANALYSIS OF ENVIRONMENTAL CONSTRAINTS

BOAT REPAIR/MAINTENANCE/ LAUNCH RAMP

BRIDGE RECONSTRUCT

LAUNCH PARKING

MAINTENANCE/DRY BOAT STORAGE

EXISTING FACILITIES

- |                           |                        |
|---------------------------|------------------------|
| 1. MARINA                 | 11. TRAILER VILLAGE    |
| 2. LAUNCH RAMP            | 12. CAMPGROUND         |
| 3. ICEHOUSE               | 13. CABIN SITES        |
| 4. FISH CLEANER           | 14. RANGER STATION     |
| 5. COMFORT STATION        | 15. NPS HOUSING        |
| 6. STORE/RESTAURANT       | 16. NPS MAINTENANCE    |
| 7. GAS STATION            | 17. AIRSTRIP           |
| 8. CONCESSION MAINTENANCE | 18. WATER TANKS        |
| 9. DRY BOAT STORAGE       | 19. SEWAGE LAGOONS     |
| 10. MOTEL                 | 20. CONCESSION HOUSING |

VIEW CORRIDOR  
PRESERVE RIDGE IN NATURAL CONDITION

PARKING / FUTURE USE

RANGER STATION/COMFORT STATION

MOTEL EXPANSION & PARKING

SWIM BEACH / PICNICKING

PARKING FOR SWIM BEACH

MARINA PARKING

FUTURE MARINA PARKING EXPANSION

ROAD IMPROVEMENTS

MINIMIZE NUMBER OF INTERSECTIONS  
CREATE 90 DEGREE INTERSECTIONS

VISUAL SCREEN

VISUALLY SEPARATE TRAILER VILLAGE FROM VISITOR USE AREA

TRAILER VILLAGE ENTRANCE

CLOSE EXISTING ENTRANCES TO MINIMIZE CONGESTION AND CIRCULATION CONFLICTS

SHORT TERM PARKING

NPS HOUSING

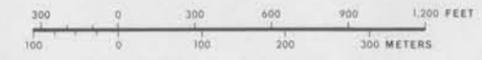
ADJUST FOR FLOOD HAZARD

NPS MAINTENANCE

FIRE STATION WITH NEW ACCESS  
ADJUST FOR FLOOD HAZARD

CONCESSION HOUSING

FUTURE EXPANSION



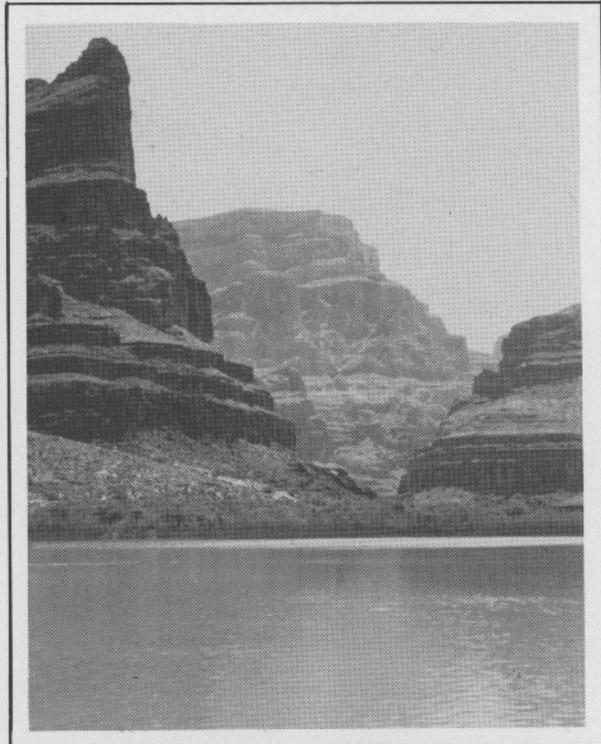
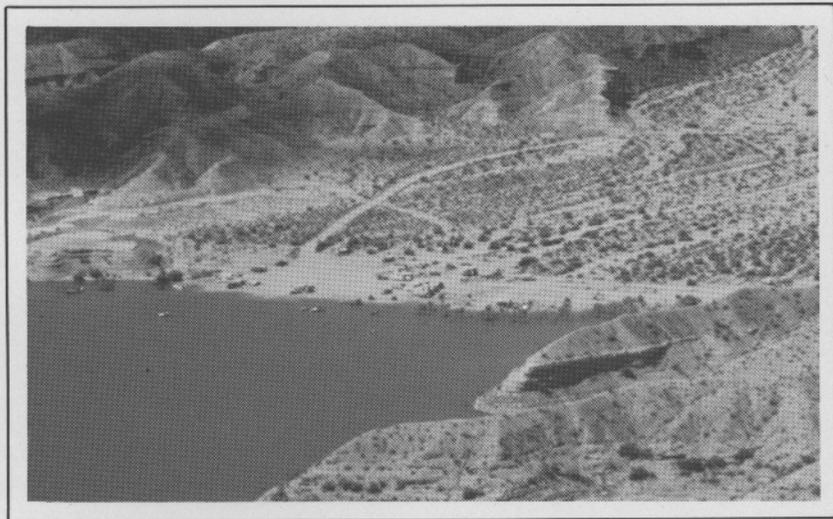
**DEVELOPMENT CONCEPT PLAN**  
**TEMPLE BAR**

LAKE MEAD  
NATIONAL RECREATION AREA  
ARIZONA - NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

TO HIGHWAY 93





gregg basin / grand wash zone

## GREGG BASIN/GRAND WASH ZONE

### Proposed Action

Tucked into the easternmost reaches of Lake Mead, this zone is currently underused, primarily because of road accessibility and distance from services. Although visitation may increase in coming years, the area will remain less crowded because it is isolated from major highways and population centers.

Improved access points at South Cove and Pearce Ferry provide unique experiences for those visitors who come to enjoy a more remote vacation experience. The numerous sandy coves and beaches, coupled with the close proximity to the Grand Canyon, make an attractive destination for those individuals seeking solitude. Also, Pearce Ferry serves as a major takeout point for rafters who float the Colorado River through the Grand Canyon.

The plan proposes minimal improvements that would provide for a better experience and still maintain the primitive, isolated flavor of these areas. A small primitive campground would be added at South Cove while the existing primitive campground at Pearce Ferry would be enlarged. Minor expansions to gravel parking areas would be accomplished when needed. Sanitation would be improved, and a clothes changing area for incoming raft-trip people and a ranger/contact station would be added at Pearce Ferry. Paving the airstrip and the road into the area would be considered only in the event that demand increased substantially in these areas.

### No-Action Alternative

Visitors that desire a primitive experience with limited access and no services would be accommodated.

### Alternative A

Major emphasis would not change.

### Alternative B

Visitors who need limited services (e.g., fuel) would be accommodated at Pearce Ferry and South Cove, and the increased use would change the character of the zone.

GREGG BASIN/GRAND WASH ZONE	No-Action Alternative	Alternative A	Alternative B	Proposed Action
<u>Improved Access:</u> <u>Pearce Ferry</u>				
Flood Mitigation	Nonstructural measures	Same as no action	Same as no action	Same as no action
Access	2-lane, 4-mi. gravel road	Same as no action	Pave road \$750,000	Same as alternative B \$750,000 - 2**
Parking	Unpaved--4 acres	Same as no action	Expand by 200 gravel spaces \$160,000	Same as alternative B \$160,000 - 2
Launch Ramp	Unpaved--40' width	Same as no action	Paved, 2 lanes and raft derigging area \$15,000	Same as alternative B \$15,000 - 2
Ranger/Contact Station	None	None	None	1,000 sq. ft. building (see interpretation/information)
Campground	Primitive 2 acres	Same as no action	Provide more primitive campsites (2 acres) \$1,000	Same as alternative B \$1,000 - 2
Gas Dock	None	Same as no action	Provide 2 pumps \$50,000	Same as no action
Restrooms	Pit toilets	Same as no action	Provide 250 sq. ft. pit toilet \$10,000	Same as alternative B \$10,000 - 2
Interpretation/Information	None	Same as no action	Add permanent 1,000 sq. ft. contact/ranger station, rest-room, showers, change room, diesel generator, marina wayside \$70,000	Same as alternative B \$70,000 - 2
<u>South Cove</u>				
Flood Mitigation	No flood hazard	Same as no action	Same as no action	Same as no action
Access	2-lane, .3 mi. paved road	Same as no action	Same as no action	Same as no action
Parking	25 spaces	Same as no action	Triple size \$60,000	Same as alternative B \$60,000 - 2
Launch Ramp	2 paved lanes	Same as no action	Same as no action	Same as no action
Campground	None	None	None	Primitive, 2 acres
Gas Dock	None	Same as no action	Provide 2 pump gas dock \$50,000	Same as no action
Restrooms	Pit toilets	Same as no action	Provide restrooms; 250 sq. ft. pit toilet \$10,000	Same as alternative B \$10,000 - 1
Interpretation/Information	None	Same as no action	Add marina wayside \$2,000	Same as alternative B \$2,000 - 1

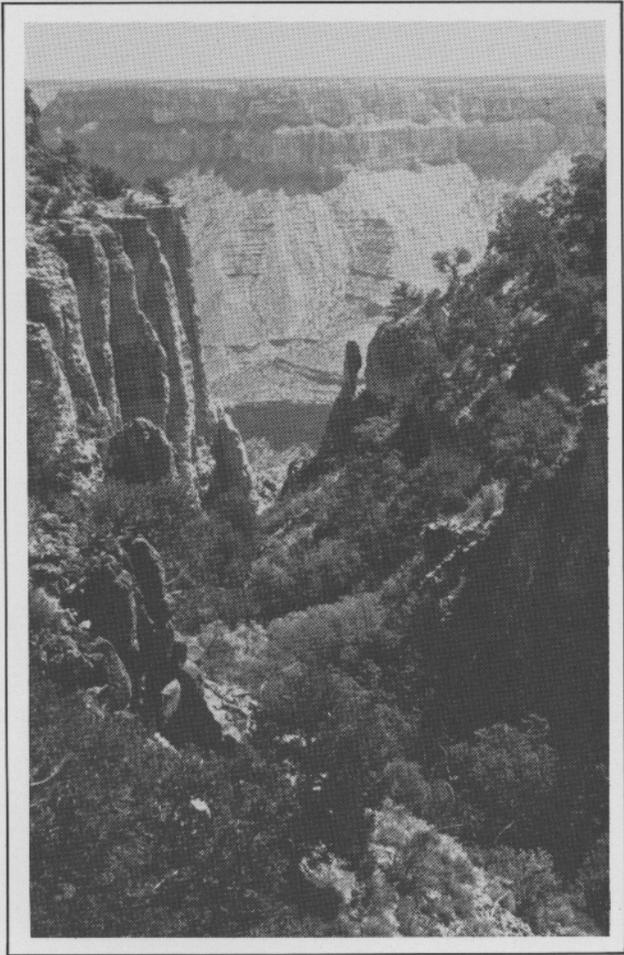
**GREGG BASIN/GRAND WASH ZONE/Improved Access**

A C T I O N S

GREGG BASIN/GRAND WASH ZONE	No-Action	Alternative A	Alternative B	Proposed Action
NPS: Flood Mitigation	\$ 0	\$ 0	\$ 0	\$ 0
Other NPS Development (Existing Areas)	0	0	1,078,000	1,078,000
Subtotal NPS Development/ Flood Mitigation	0	0	1,078,000	1,078,000
CONCESSION: (New Areas)	0	0	100,000	0
GRAND TOTAL - Gregg Basin/Grand Wash Zone	\$ 0	\$ 0	\$1,178,000	\$1,078,000

\*\*The plan implementation section defines three priorities indicated here as 1, 2, or 3.

**GREGG BASIN/GRAND WASH ZONE**



shivwits plateau zone

## SHIVWITS PLATEAU ZONE

### Proposed Action

The Shivwits Plateau provides a remarkable change of pace for visitors. Because most activities in the recreation area are oriented to the lake, the Shivwits Plateau provides a diversion, not only in its location, but because of the landscape character.

Inherent to the visitor experience on the Shivwits Plateau is its remoteness. The main access road to the Shivwits Plateau is a Washington County maintained dirt road that originates in St. George, Utah. However, some of the roads within the recreation area are rough and slow, so four-wheel-drive vehicles are recommended. What awaits those visitors who make the excursion is a forested landscape abundant with wildlife and magnificent views of the Grand Canyon.

To enhance the enjoyment of this unique place, without detracting from its remoteness and beauty, the plan proposes to add a few primitive campsites and associated toilet, plus an interpretive wayside.

The delapidated shack that is currently used for seasonal housing would be eliminated and replaced with a modular structure that would serve as a ranger station and housing.

A small dirt landing strip would be added for administrative access for fire control, resource management, and other uses. Currently planes must land on a portion of a dirt road. It would be approximately 3,000' x 50' and would cross an existing dirt road about 1½ miles south of the northern boundary. This site was selected because it is a big sagebrush flat that would not require ponderosa pine or pinyon/juniper forest clearing. The airstrip must cross, rather than parallel the road, because a north-south trending airstrip is necessary with the plateau's air patterns.

### No-Action Alternative

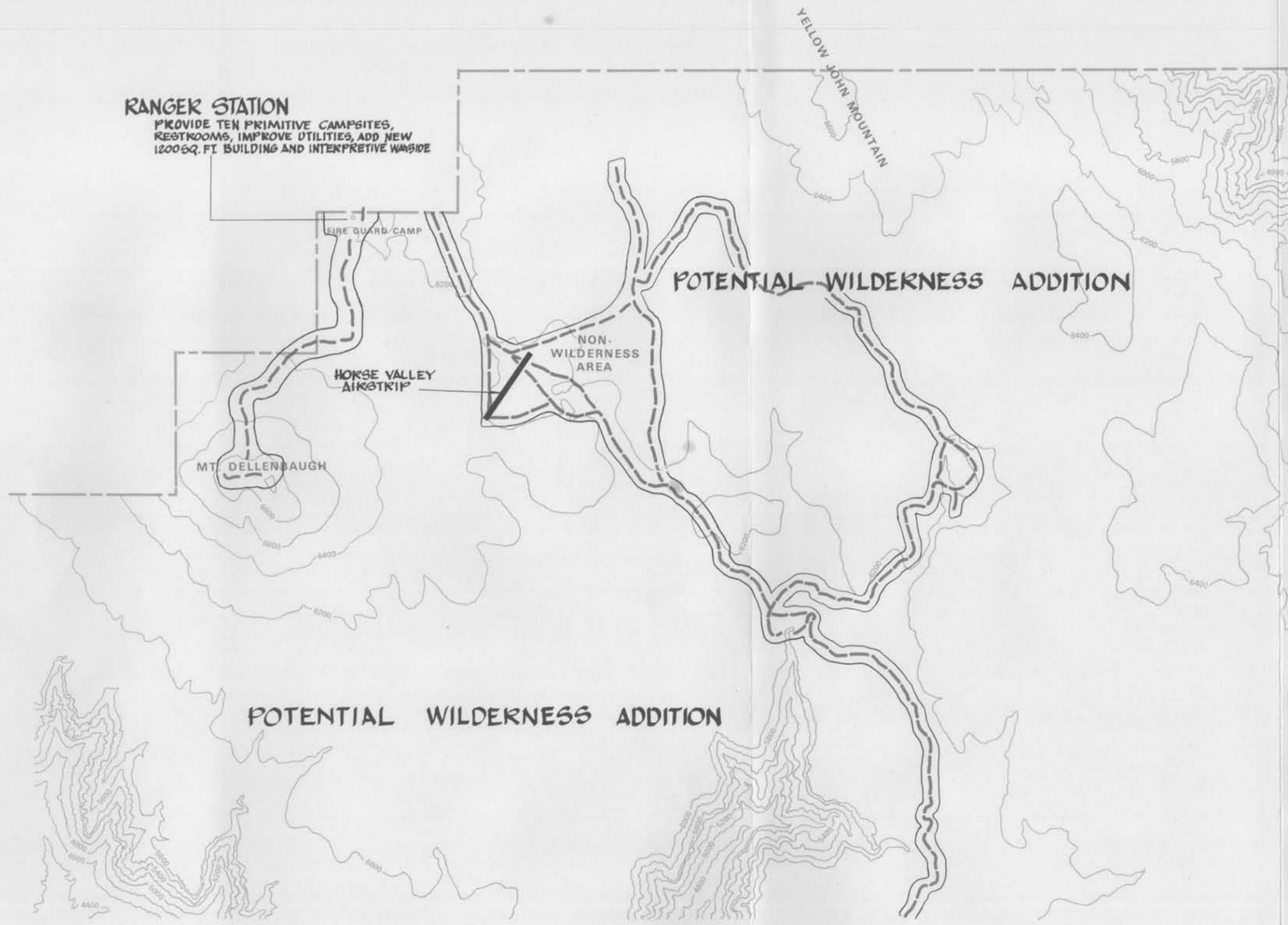
The remote and nonwater-related experiences would continue to be primitive.

### Alternative A

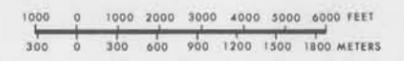
Same as the no-action alternative.

### Alternative B

The primitive experience of the Shivwits Plateau would be slightly changed by the improvement of roads and the addition of a primitive campground.



**NOTE:**  
 ALL AREAS WITHIN THE PARK BOUNDARY (SHIWITS AREA)  
 POTENTIALLY MEET THE WILDERNESS CRITERIA  
 EXCEPT THE HORSE VALLEY AND FIRE GUARD  
 CAMP AREAS



**DEVELOPMENT CONCEPT PLAN**  
**SHIWITS PLATEAU**  
 LAKE MEAD  
 NATIONAL RECREATION AREA  
 ARIZONA - NEVADA  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE



A C T I O N S

SHIVWITS PLATEAU ZONE	No-Action	Alternative A	Alternative B	Proposed Action																									
Flood Mitigation	No flood hazard	Same as no action	Same as no action	Same as no action																									
Access	2-lane dirt road	Same as no action	15 mi. improved--2 lane gravel \$750,000	Make minor spot improvements \$20,000 - 1**																									
Parking	Along roads	Same as no action	Provide 5 gravel spaces near ranger station \$2,000	Same as alternative B \$2,000 - 2																									
Campground	Undesignated	Same as no action	Provide 10 primitive sites near ranger station \$4,000	Same as alternative B \$4,000 - 2																									
Restrooms	None	Same as no action	Provide at primitive campground; 250 sq. ft. toilet \$10,000	Same as alternative B \$10,000 - 1																									
Utilities	Electrical generator	Same as no action	Provide water well and septic system to service ranger station/housing and campground \$35,000	Same as alternative B \$35,000 - 1																									
Ranger Station/NPS Housing	600 sq. ft. shack	Same as no action	Provide new 1,200 sq. ft. building to serve as ranger station and housing, new generator building, and storage building \$60,000	Same as alternative B \$60,000 - 1																									
Interpretation/Information	None	Same as no action	Provide 10'x7' wayside at primitive campground \$2,000	Same as alternative B \$2,000 - 1																									
Airstrip	None (use dirt road)	Same as no action	Same as no action	Dirt (3,000' long x 50' wide) \$200,000 - 2																									
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">NPS: Flood Mitigation</td> <td style="width: 10%; text-align: right;">\$ 0</td> </tr> <tr> <td>  Other NPS Development (Existing Areas)</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">863,000</td> <td style="text-align: right;">333,000</td> </tr> <tr> <td>  Subtotal NPS Development/Flood Mitigation</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">863,000</td> <td style="text-align: right;">333,000</td> </tr> <tr> <td>CONCESSION: (Existing Areas)</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> </tr> <tr> <td>GRAND TOTAL - Shivwits Plateau Zone</td> <td style="text-align: right;">\$ 0</td> <td style="text-align: right;">\$ 0</td> <td style="text-align: right;">\$863,000</td> <td style="text-align: right;">\$333,000</td> </tr> </table>					NPS: Flood Mitigation	\$ 0	\$ 0	\$ 0	\$ 0	Other NPS Development (Existing Areas)	0	0	863,000	333,000	Subtotal NPS Development/Flood Mitigation	0	0	863,000	333,000	CONCESSION: (Existing Areas)	0	0	0	0	GRAND TOTAL - Shivwits Plateau Zone	\$ 0	\$ 0	\$863,000	\$333,000
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\*\*The plan implementation section defines three priorities, indicated here as 1, 2, or 3.

SHIVWITS PLATEAU ZONE

## ALTERNATIVE COST COMPARISONS

Tables 16 and 17 present cost summaries for the three alternatives and the proposed action.

Table 16 summarizes costs for flood mitigation actions for each developed area. Most flood mitigation costs would be the responsibility of the Park Service. They include nonstructural and structural flood mitigation measures and any relocation of facilities proposed to be removed from flood-hazard areas.

Table 17 summarizes NPS and concession development costs for each zone. This table was derived from the individual actions presented in the detailed tables in this section. The costs for the proposed action tend to be higher than the costs of the other alternatives because the proposed action combines the most necessary and effective actions from alternatives A and B and contains solutions to some problems that are not considered in any other alternatives.

The increases in NPS operating costs shown at the bottom of the table are because of additional maintenance of flood mitigation structures and warning devices (alternatives A and B and the proposed action), increased maintenance on improved gravel roads (alternative B and the proposed action), and increased staffing for new developed areas (alternative B and proposed action).

Table 16: Flood Mitigation Cost Comparison

<u>Zone</u>	<u>No Action</u>	<u>Alternative A</u>	<u>Alternative B</u>	<u>Proposed Action</u>
Katherine	\$223,000	\$ 3,277,000	\$ 2,075,000	\$ 2,312,000
Cottonwood	0	6,800,000	2,750,000	2,817,000
Willow Beach	0	2,620,000	2,774,000	2,168,000
Boulder Basin	130,000	2,666,000	2,636,000	2,057,000
Echo Bay	0	0	0	0
Overton Beach	120,000	140,000	135,000	125,000
Virgin/Temple	65,000	1,900,000	1,750,000	1,680,000
Gregg/Grand	0	0	0	0
Shivwits Plateau	0	0	0	0
Total	\$538,000	\$17,403,000	\$12,120,000	\$11,159,000

Table 17: NPS and Concessioner Development Cost Summary by Zone

<u>Zone</u>	<u>No Action</u>	<u>Alternative A</u>	<u>Alternative B</u>	<u>Proposed Action</u>
Katherine				
NPS	\$ 0	\$ 3,905,000	\$ 665,000	\$ 8,275,500
Concessioner	0	3,085,000	4,000,000	4,372,500
Cottonwood				
NPS	0	1,827,000	13,245,000	10,445,000
Concessioner	0	2,400,000	2,422,000	6,832,000
Willow Beach				
NPS	0	542,000	2,809,000	142,000
Concessioner	0	570,000	0	1,470,000
Boulder Basin				
NPS	0	5,760,000	9,735,000	10,094,000
Concessioner	0	8,865,000	2,250,000	11,922,000
Echo Bay				
NPS	0	2,300,000	294,000	2,021,500
Concessioner	0	2,710,000	400,000	3,075,500
Overton Beach				
NPS	0	1,790,000	7,250,000	1,026,000
Concessioner	0	0	0	770,000
Virgin/Temple				
NPS	0	1,385,000	2,035,000	1,347,500
Concessioner	0	6,820,000	3,190,000	6,827,500
Gregg Basin/Grand Wash				
NPS	0	0	1,078,000	1,078,000
Concessioner	0	0	100,000	0
Shiwits Plateau				
NPS	0	0	863,000	333,000
Concessioner	0	0	0	0
<b>Total - All Zones</b>				
NPS	\$ 0	\$17,509,000	\$40,067,000	\$34,762,500
Concessioner	0	24,450,000	12,362,000	35,269,500
	\$ 0	\$41,959,000	\$52,429,000	\$70,032,000
<b>Annual NPS Operating Costs</b>	\$ 5,850,000	\$ 6,455,200	\$ 6,865,200	\$ 7,205,200

As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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