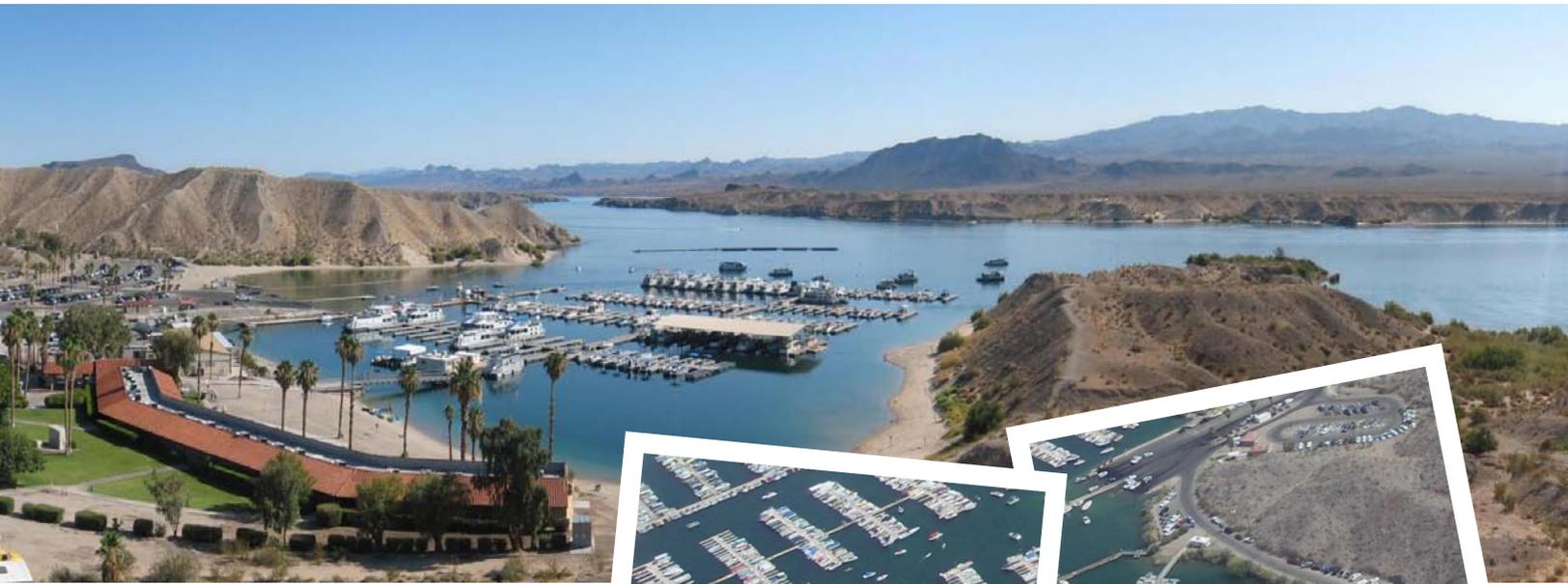




# COTTONWOOD COVE *and* KATHERINE LANDING



*draft* DEVELOPMENT CONCEPT PLANS | ENVIRONMENTAL IMPACT STATEMENT



**DRAFT DEVELOPMENT CONCEPT PLANS /  
ENVIRONMENTAL IMPACT STATEMENT**

**COTTONWOOD COVE AND KATHERINE LANDING**  
**Lake Mead National Recreation Area**  
**Clark County, Nevada**  
**Mohave County, Arizona**

**March 2013**

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**DRAFT  
DEVELOPMENT CONCEPT PLANS /  
ENVIRONMENTAL IMPACT STATEMENT**

**COTTONWOOD COVE AND KATHERINE LANDING,  
LAKE MEAD NATIONAL RECREATION AREA  
CLARK COUNTY, NEVADA  
MOHAVE COUNTY, ARIZONA**

Cottonwood Cove and Katherine Landing are two of the major developed areas on Lake Mohave within the Lake Mead National Recreation Area. The purpose of the development concept plans for these two areas is to reevaluate the implementation strategies that were identified in the 1986 *Lake Mead National Recreation Area General Management Plan / Development Concept Plans / Final Environmental Impact Statement* and to incorporate the concepts and carrying capacities that were approved in the 2003 *Lake Mead National Recreation Area Lake Management Plan / Final Environmental Impact Statement*. Each development concept plan provides an integrated plan for development with site-specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in the 1986 and 2003 plans.

This *Draft Cottonwood Cove and Katherine Landing Development Concept Plans/ Environmental Impact Statement* presents three alternatives for managing the Cottonwood Cove and Katherine Landing developed areas. It also analyzes the impacts of implementing each of the alternatives. “**Alternative 1: No Action, Continue Current Management Trends**” reflects current management direction and serves as a baseline for comparison with the other alternatives. Existing facilities would be retained with minimal changes. “**Alternative 2: Implement Previous Planning Proposals**” would implement previous planning proposals that separate day use and marina facilities, maintain the type of overnight facilities, and provide flood mitigation. “**Alternative 3: Enhance Visitor Experience and Park Operations (Preferred Alternative)**” would enhance day-use opportunities, upgrade and expand the type of overnight facilities, and provide flood mitigation.

The impacts of implementing the various alternatives were analyzed under five broad topic areas: natural resources; cultural resources; visitor use and experience; the socioeconomic environment; and Park operations. The key impacts of implementing these alternatives are summarized in table 5 and detailed in chapter 4.

This document has been distributed to other agencies and interested organizations and individuals for their review and comment (see “How to Comment on This Document,” page iv). The public comment period for this document will last for 60 days after the Environmental Protection Agency’s notice of availability has been published in the *Federal Register*.

## How to comment on this document

Comments on this draft development concept plans / environmental impact statement (DCPs/EIS) are welcome and will be accepted during the 60-day public review and comment period. During the comment period, a series of public meetings will be scheduled to provide opportunities to meet with members of the NPS planning team to discuss the plans. Comments may be submitted using the several methods noted below.

We prefer that readers submit comments online (through the park planning website identified above) so the comments become incorporated in the NPS Planning, Environment, and Public Comment System. An electronic public comment form is provided through this website.

Please submit comments

**online:** <http://parkplanning.nps.gov/lake>

or

**by mail:** Lake Mead National Recreation Area  
ATTN: Draft DCPs/EIS, National Park Service  
601 Nevada Way  
Boulder City, NV 89005

or

**hand delivery:** at public meetings to be announced in the local media following the release of this draft development concept plans / environmental impact statement.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment — including your personal identifying information — may be publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

# SUMMARY

## BACKGROUND

The National Park Service (NPS) has prepared draft development concept plans and a draft environmental impact statement for the Cottonwood Cove and Katherine Landing developed areas on Lake Mohave within Lake Mead National Recreation Area (NRA). The purpose of the development concept plans is to reevaluate the implementation strategies for these two areas that were identified in the 1986 *Lake Mead National Recreation Area General Management Plan / Development Concept Plans / Final Environmental Impact Statement* (GMP) and to incorporate the concepts and carrying capacities that were approved in the 2003 *Lake Mead National Recreation Area Lake Management Plan / Final Environmental Impact Statement* (LMP). Each development concept plan provides an integrated plan for development with site-specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in the general management plan and lake management plan.

The general management plan addressed the need to provide recreational opportunities while preserving and protecting natural and cultural resources. It established land-based management zones and included development concept plans for Cottonwood Cove and Katherine Landing that identified limits on the development, established the number and type of facilities, and addressed flood hazards. The general management plan's vision for both areas was to accommodate increasing use, enhance the visitor experience, and mitigate flood hazards. The lake management plan established water-based management zones and provided further guidance for the long-term protection of park resources while allowing a range of recreational opportunities to support visitor needs. A number of the management actions identified in both approved plans require more site-specific development planning. There are also a number of management issues that have not been adequately addressed or resolved in the previous planning efforts and that require a more detailed examination of development and operational needs.

The primary issues affecting the management of the Cottonwood Cove and Katherine Landing developed areas are as follows:

- providing flood mitigation
- enhancing shoreline-based day-use opportunities and facilities to meet a growing demand
- improving the safety and ease of access, providing better organized and more convenient parking, and providing the authorized number of parking spaces
- improving NPS campgrounds to function effectively to meet visitor needs while protecting the cultural landscape
- providing adequate visitor information and education programs and determining if commercial services and NPS educational and interpretive services be provided in a joint facility enhancing operational facilities to function effectively and efficiently, meeting the needs of both park staff and visitors
- identifying which concession facilities or services are still necessary and appropriate at these sites for public use and enjoyment of the park

This *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement* (DCPs/EIS) presents and analyzes three alternatives for managing the Cottonwood Cove and Katherine Landing developed areas on Lake Mohave. "Alternative 1: No Action, Continue Current Management Trends" represents the continuation of existing conditions, operations, and management practices within each developed area. The action alternatives ("Alternative 2: Implement Previous Planning Proposals" and "Alternative 3: Enhance Visitor Experience and Park Operations [Preferred Alternative]") were developed to satisfy the purpose and need for the project, achieve the project objectives, and meet relevant NPS policies and legal requirements. Alternative 3 is the agencies' preferred alternative for each of the developed areas.

## PURPOSE AND NEED FOR THE PLANS

The *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement* reevaluates the implementation strategies for the Cottonwood Cove and Katherine Landing developed areas that were identified in the general management plan and incorporate the concepts and carrying capacity identified in the lake management plan. Each development concept plan provides site-specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in both plans. The management zoning designations and overall strategies for managing each developed area are consistent with the previous plans, although specific actions (e.g., facility locations, roadway circulation) could differ from those recommended in those plans.

## OBJECTIVES IN TAKING ACTION

The following objectives were developed based on the purpose and need for this project and were used in the development of the action alternatives:

- enhance visitor and staff safety
- enhance the recreational experience
- protect and enhance the natural, scenic, and cultural resources of the areas
- provide necessary and appropriate facilities and services for visitors

## ISSUES

The NPS staff, general public, developed area concessioners, and representatives from other agencies, organizations, and businesses identified a number of issues and concerns during scoping for this planning effort. The following issues were raised through scoping:

- flood mitigation
- no-boat / shoreline users
- traffic circulation, parking, and launch ramps

- overnight visitor facilities
- visitor orientation, interpretation, and education
- National Park Service and concessioner support facilities
- other commercial visitor facilities

## IMPACT TOPICS

The National Park Service has prepared these development concept plans in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality's (CEQ's) *Regulations for Implementing the National Environmental Policy Act* (CEQ 1993), and the NPS Director's Order 12: *Conservation Planning, Environmental Impact and Decision Making* (NPS 2000). Impact topics allow comparison of the environmental consequences of implementing each of the alternatives. The impact topics in these concept plans were identified based on substantive issues expressed by the public or other agencies during scoping, federal laws, and other legal requirements, CEQ guidelines, NPS *Management Policies 2006*, and staff subject-matter expertise.

The NPS planning team selected the following impact topics for analysis based on the potential for each topic to be affected by the alternatives:

- native plant communities and soils
- wildlife
- threatened, endangered, and special status species
- floodplains
- archeological resources
- historic structures
- cultural landscape
- ethnographic resources
- visitor use, experience, and safety

- park operations
- socioeconomic environment

The following impact topics were considered but dismissed from further analysis because they would not be affected, or the potential for impacts under all the alternatives would be negligible or minor:

- natural soundscapes
- lightscares
- scenic resources
- air quality and climate change
- water quality
- ecologically critical areas, wild and scenic rivers, or other unique natural areas
- wetlands
- threatened and endangered species not addressed in these plans
- nontribal ethnographic resources
- museum collections
- environmental justice
- paleontological resources
- prime and unique farmlands
- Indian trust resources
- conflicts with land use plans
- energy requirements and conservation potential
- natural or depletable resource requirements and conservation potential
- urban quality and design of the built environment
- wilderness

## **ALTERNATIVES SELECTED FOR ANALYSIS FOR COTTONWOOD COVE DEVELOPED AREA**

The alternatives presented in these development concept plans were developed by the NPS planning team of the Cottonwood Cove developed area. The NPS management policies, the national recreation area's mission statement and goals, relevant laws and regulations, and public input all helped to direct and shape the alternatives.

### **Summary of Alternative 1: No Action, Continue Current Management Trends**

The no-action alternative reflects current management of the developed area and serves as a baseline for comparison with the other alternatives. This alternative would essentially maintain existing conditions at Cottonwood Cove. The existing visitor, National Park Service, and concession support facilities would be maintained with minimal changes.

### **Summary of Alternative 2: Implement Previous Planning Proposals**

Alternative 2 would maintain many of the existing facilities and continue to implement some of the specific actions identified in the general management plan and the lake management plan that have not yet been completed. Flood hazards would be addressed through structural protection, relocation of some facilities, and use of a flood warning system.

A new visitor contact / ranger station would be constructed near the launch ramp. The existing ranger station would be converted for use as a campground office. Overnight visitor facilities would be retained in their current locations. The existing motel could be expanded. A new day-use area (picnic and no-boat area) would be developed in Ski Cove. The main access road would remain two lanes through the developed area. Parking capacity would be increased and the marina expansion would be allowed to the carrying capacity authorized in the lake management plan. The National Park Service and concessioner housing and maintenance areas would be relocated to the bluff south of the access road.

### **Summary of Alternative 3: Enhance Visitor Experience and Park Operations (Preferred)**

Alternative 3 would focus on enhancing and dispersing day use along the lakeshore. The site just north of the motel would be redeveloped for a combined visitor/commercial services center that would consolidate store and restaurant functions in one location. Visitor information and exhibit/interpretive space would also be provided, but are not expected to occupy a substantial percentage of space. The existing picnic area would be configured for group and individual sites with additional site amenities (e.g., shade structures, tables, grills). A new day-use area (picnic and no-boat area) would be developed in Ski Cove, with a designated trail access to Cottontail Cove. The lower campground would be converted to a day-use picnic area during the summer season and continue to operate as a campground during the winter season.

The existing motel could be expanded. The trailer village would be removed and the area would be redeveloped for overnight accommodations (i.e., recreational vehicle park, cabin units, and park models with individual bathrooms) managed by the concessioner. The upper campground would be redeveloped for concessioner and NPS volunteer housing, with a portion of the campground — perhaps one loop — retained for visitor tent/car camping. A new launch / ready lane extending from the launch ramp to the upper campground would be constructed. Parking capacity would be increased and the marina expansion would be allowed to the carrying capacity authorized in the lake management plan. A new paved loop road through the developed area would provide an alternate route to the motel and visitor contact / commercial services facility, with a spur to the Ski Cove day-use area. Flood hazards would be addressed through structural protection, relocation of some facilities, and use of a flood warning system.

A new law enforcement / emergency services center that would accommodate a ranger station, fire station, and helipad would be developed at the site of the existing ranger station. The NPS housing and maintenance functions would be retained in their current locations and rehabilitated as needed. The existing ranger station and nearby helipad would be retained. In

the long term, however, the National Park Service would explore options for a consolidated law enforcement / emergency services facility in the general vicinity of the ranger station or in the housing area. Relocation of concession housing to a portion of the redeveloped upper campground area would consolidate concession housing that is currently scattered throughout the developed area and allow concession maintenance to be expanded into the existing adjacent concession housing area.

## **ALTERNATIVES SELECTED FOR ANALYSIS FOR KATHERINE LANDING DEVELOPED AREA**

The alternatives presented in these development concept plans were developed by the NPS planning team of the Katherine Landing developed area. The NPS management policies, the national recreation area's mission statement and goals, relevant laws and regulations, and public input all helped to direct and shape the alternatives.

### **Summary of Alternative 1: No Action, Continue Current Management Trends**

The no-action alternative reflects current management of the developed area and serves as a baseline for comparison with the other alternatives. Existing facilities within Princess Cove, Cabinsite Point, and North and South Arizona Telephone Cove would be retained in their current locations with minimal changes.

### **Summary of Alternative 2: Implement Previous Planning Proposals**

Alternative 2 would maintain many of the existing facilities and would implement previous planning proposals identified in the general management plan and the lake management plan that have not yet been completed. Flood hazards would be addressed through structural protection, relocation of some facilities, and use of a flood warning system. Overnight visitor facilities would be retained in their current locations and may be improved but not expanded. The motel would be renovated and the campground would be minimally rehabilitated (for Americans with Disabilities Act access). The trailer village would remain, or, over time, portions would be

converted to a short-term recreational vehicle park. Commercial services (excluding the marina) would be expanded on their current sites. The marina is currently at the carrying capacity authorized in the lake management plan. The parking capacity authorized in the lake management plan would be maintained; however, parking would be developed closer to the lakeshore and the furthest parking area would be removed. Concessioner housing and maintenance areas would be retained in their current locations. NPS maintenance would be relocated to a new area on a bluff northwest of the developed area near the current water treatment plant.

### **Summary of Alternative 3: Enhance Visitor Experience and Park Operations (Preferred Alternative)**

Under alternative 3 the store and restaurant would be rehabilitated or replaced. Some visitor information and exhibit/interpretive space would be incorporated into the redesign. The motel would be removed and the site redeveloped for greatly expanded visitor parking near the lake with added shade/picnic facilities. The trailer village and short-term recreational vehicle and NPS campgrounds would be redeveloped for concessioner managed overnight facilities that would accommodate larger vehicles (larger sites with hookups), visitor tent/car camping, and additional types of overnight facilities (for instance, “cabins” or “park model” type units). Concession housing by the shoreline would be removed while the concession housing in the joint NPS/concession housing area would remain in its current location. A loop in the upper campground would be redeveloped for NPS volunteer housing. The NPS maintenance area would remain in the same location. NPS offices and operations (i.e., law enforcement, emergency services, interpretation offices) would also be consolidated in this area. The NPS housing at Katherine Landing is sufficient to meet existing needs. As such, NPS housing would remain in its current location.

### **ALTERNATIVES SELECTED FOR ANALYSIS FOR KATHERINE LANDING VICINITY (PRINCESS COVE, CABINSITE POINT, NORTH AND SOUTH ARIZONA TELEPHONE COVE)**

The boat launching and parking capacities at Princess Cove, Cabinsite Point, and North Arizona Telephone Cove would be adjusted to maintain the capacities authorized in the lake management plan for the southern portion of Lake Mohave. The facilities at Princess Cove would be retained; however, parking capacity currently exceeds the capacity identified in the lake management plan. The unpaved overflow parking area would be closed to parking. Cabinsite Point would be closed to motorized boat launching and the no-boat area enlarged. A new paved access road on higher ground between North and South Arizona Telephone Coves would be constructed. To improve ease of launch, a new concrete two-lane launch ramp would be established.

The facilities at Princess Cove would be retained. The existing paved parking area and existing unpaved overflow would remain. However, in the event that launch capacity at Katherine Landing is reduced because of the design of flood control channels, the park may consider paving and formalizing more of the overflow area.

The Cabinsite Point road access would be retained, boat launching would continue to be allowed, the no-boat area would be retained, and backcountry camping may be allowed at some of the former cabin sites to be developed by a partner.

The existing access roads to North and South Arizona Telephone Coves would be paved as would the parking area in North Arizona Telephone Cove. A picnic area would be developed near the shoreline at North Arizona Telephone Cove. The National Park Service

would continue to allow boat launching at North Arizona Telephone Cove under “backcountry lake access site” conditions. However, note that if the launch capacity at Katherine Landing is eventually reduced because of the design of flood control channels, the park might consider improving the launch at North Arizona Telephone Cove or at Cabinsite Point, to align with established capacity levels. In this event, potential improvements may include paving and extending existing launches or increasing the number of launch lanes.

## ENVIRONMENTAL CONSEQUENCES

Under alternative 1, adverse impacts to natural resources from facility maintenance and increased visitor use would be minor. There would continue to be a potential long-term moderate to major adverse impact on human life and property in the floodplains and a long-term moderate adverse impact on floodplain values because of the presence of facilities in the floodplain. No new impacts on cultural resources, park operations, or socioeconomic environment would occur. Alternative 1 would have moderate to major adverse long-term effects on the visitor experience to Lake Mohave due to continuing issues (such as visitor conflicts and inadequate overnight accommodations) that negatively affect the experience of a significant percentage of visitors.

Alternative 2 would result in long-term, minor to moderate, adverse impacts to native plant communities and soils from facility construction and associated visitor use. Local beneficial effects would also result from the selective removal of existing nonnative invasive species and restoration of some currently developed sites. Adverse impacts to wildlife would be minor. Alternative 2 would be likely to adversely affect the desert tortoise, banded Gila monster, and Western burrowing owls although impacts would be localized. The flood hazard to people and property in the floodplains would be greatly reduced at both developed areas, although there would be a minor to moderate adverse impact on floodplain values because of construction of additional flood control structures that divert and

channel flood flows. Overall impacts on visitor experience would be beneficial with some adverse impacts during construction activities. Negligible to minor impacts would occur to the socioeconomic environment.

Alternative 3 would have largely the same effects as described for alternative 2.

## NEXT STEPS AND IMPLEMENTATION OF THE PLANS

After the distribution of these development concept plans, there is a 60-day public review and comment period. After this comment period, the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the draft plan and incorporate appropriate changes into a *Final Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement*. The final plans will include letters from governmental agencies and tribes, any substantive comments on the draft document, and NPS responses to those comments.

There will be a 30-day no-action period following distribution of the *Final Cottonwood Cove and Katherine Landing Development Concept Plans/Environmental Impact Statement*. A record of decision may be prepared that would document the National Park Service-selected alternative, which would become the new management plan for the Cottonwood Cove and Katherine Landing development areas to be implemented over 20–25 years. Once a record of decision is signed by the NPS Pacific West regional director, the plans would then be implemented as funding and staffing allows.

It is important to note that not all of the actions in the alternative would necessarily be implemented immediately. The implementation of the approved plans, no matter which alternative might be selected, would depend on future National Park Service, state, and partner funding levels; staff to implement the plan; servicewide priorities; and partnership time and effort. Full implementation of the plan could be many years in the future.

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PURPOSE *of and*  
NEED *for the* PLAN

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# CHAPTER 1: INTRODUCTION AND PURPOSE AND NEED FOR THE DEVELOPMENT CONCEPT PLANS

## INTRODUCTION

This chapter begins by providing descriptions and background information on the Cottonwood Cove and Katherine Landing developed areas in the Lake Mead National Recreation Area (NRA) to explain what and where the areas are and why the National Park Service has prepared this *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement (DCPs/EIS)*. This chapter also explains the process used to develop these plans, as well as the purpose of and need for development concept plans and the actions proposed herein.

## DESCRIPTION AND BACKGROUND OF DEVELOPED AREAS

The Lake Mead National Recreation Area is located in southeastern Nevada and northwestern Arizona (see figure 1). The national recreation area encompasses approximately 1.5 million acres and includes both Lake Mead, formed by Hoover Dam, and Lake Mohave, formed by Davis Dam. Both are reservoirs created by the dams that impound the Colorado River and serve as the primary water resources in the region. The water levels of both lakes are controlled by the U.S. Bureau of Reclamation for the purposes of irrigation, drinking water, and power generation for communities in Arizona, Nevada, and Southern California. Lake Mohave experiences seasonal fluctuations of about 15 feet (ft), typically experiencing higher water in the early summer months and lower water in the fall months.

Cottonwood Cove and Katherine Landing are two of the major developed areas on Lake Mohave (see figure 2). Cottonwood Cove is located on the Nevada shore of the lake, approximately 22 miles north of Davis Dam. The developed area is accessible by a 15 mile road that runs east of

Searchlight to lake Mohave. The first 7 miles of that road is maintained by Clark County. Katherine Landing is located near the southern end of the lake in Arizona, approximately 1.5 miles north of the Davis Dam. This developed area is accessed by Nevada Highway 163 off of U.S. Highway 95 and by Arizona Highway 68 off of U.S. Highway 93.

The majority of development lies within Katherine Wash, but also extends to the north, encompassing South and North Telephone Cove, Cabinsite Point, and Princess Cove. Both developed areas accommodate a wide variety of recreational activities and provide public launch facilities and commercial marina services as well as other public use and support facilities.

The Lake Mead National Recreation Area is managed under the direction of the 1986 *Lake Mead National Recreation Area General Management Plan (GMP)* and the 2003 *Lake Mead National Recreation Area Lake Management Plan (LMP)*. The general management plan addresses the need to provide recreational opportunities while preserving and protecting the recreation area's natural and cultural resources. The plan established land-based management zones and included development concept plans for Cottonwood Cove and Katherine Landing that identify limits on the development, establish the number and type of facilities, and address flood hazards. The plan's vision for both areas is to accommodate a variety of uses, enhance the visitor experience, and mitigate flood hazards. The key management direction identified included the redesign of parking and circulation to improve ease of access and capacity; maximum limits on expansion of existing or development of new concession facilities pending an economic feasibility study; and alleviation of flood hazards through channeling the 100-year flood flows, relocating some facilities, and implementing flood warning systems.

FIGURE 1. LAKE MEAD NATIONAL RECREATION AREA

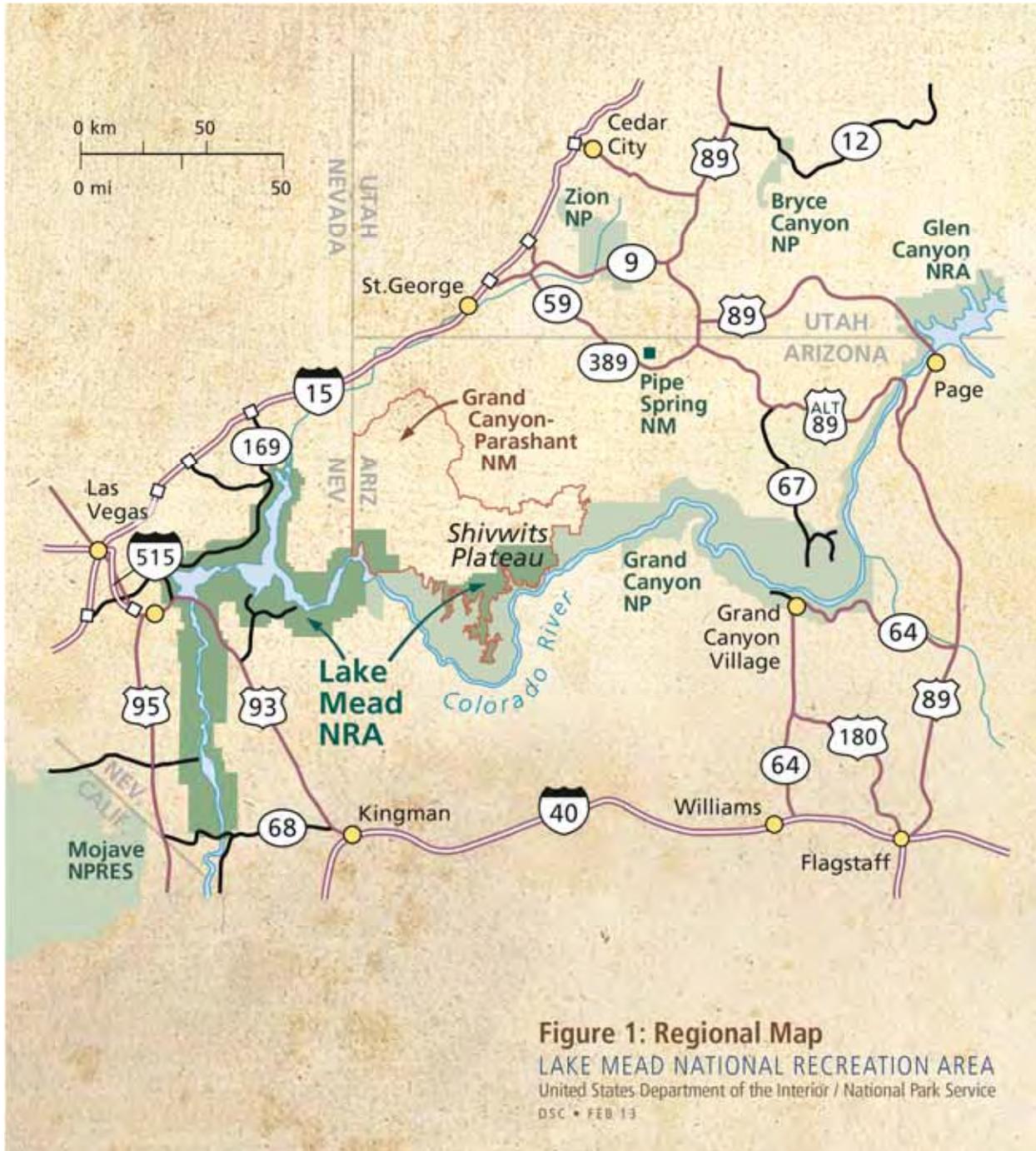


FIGURE 2. LOCATION OF COTTONWOOD COVE AND KATHERINE LANDING DEVELOPED AREAS IN LAKE MEAD NATIONAL RECREATION AREA



The lake management plan further refined the management of Lakes Mead and Mohave, the associated shoreline, and developed areas around the lakes to ensure the protection of park resources while allowing a range of recreational opportunities to support visitor needs. At Cottonwood Cove, the lake management plan authorized an increase in boating capacity and called for the separation of public and commercial marina operations. It was proposed to relocate the picnic area, public marina, and fuel sales to Ski Cove located immediately south of the existing marina, while the rental boat operation, motel, restaurant, and store would remain in their existing locations. The traffic circulation and parking would be designed to provide for the increased boating access and relocation of facilities. Implementation of these actions was based on a future site-specific development plan. At Katherine Landing, the plan maintains existing boating capacities and provides for the separation of recreational activities. Physical separation of recreational activities would be provided and some areas would be managed for specific activities only.

## **PURPOSE AND NEED**

Management direction established in the general management plan and the lake management plan provides the basis and guidance for the current planning effort. The purpose of the development concept plans for Cottonwood Cove and Katherine Landing is to reevaluate the implementation strategies for these two areas that were identified in the general management plan and to incorporate the concepts and carrying capacity identified in the lake management plan. Each development concept plan provides site-specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in the plans. The management zoning designations and overall strategies for managing each developed area are consistent with the previous plans, although specific actions (e.g., facility locations, roadway circulation) could differ from those recommended in those plans.

A number of the management actions identified in both approved plans required more site-specific

development planning prior to implementation, including a parking and traffic circulation analysis, structural flood protection designs, site assessments to evaluate facility locations, and an economic feasibility study of concession operations. This specific site planning will assist in identifying possible facility improvement, relocation, and expansion. In addition, other facility needs have arisen or conditions have changed since completion of the previous plans. Mission 66 was a federally sponsored program to improve infrastructure and recreational opportunities in national parks. In 2006, Cottonwood Cove was determined to be eligible for inclusion in the National Register of Historic Places for its Mission 66-era cultural resources. Katherine Landing may potentially be eligible for inclusion in the National Register for Mission 66-era resources. Consequently, development planning needs to take these National Register eligible resources into consideration. With the growth in communities outside of the park near both developed areas, there is also a need to reevaluate which concession operated services and support facilities are still necessary and appropriate at Cottonwood Cove and Katherine Landing and which services should be accommodated outside of the park.

## **OBJECTIVES IN TAKING ACTION**

The following objectives were developed based on the purpose and need for this project and were used in the development of the action alternatives (alternatives 2 and 3):

- Enhance visitor and staff safety — provide flood hazard mitigation, emergency services, and clear, safe, and efficient vehicular circulation.
- Enhance the recreational experience — provide for a range of visitor experiences and opportunities, including educational and interpretive opportunities that encourage the preservation of park resources and foster increased visitor understanding, appreciation, enjoyment, and stewardship.

- Protect and enhance the natural, scenic, and cultural resources of the areas — one of the key elements in maintaining a quality recreational setting is protecting the resources that make that recreational visit enjoyable.
- Provide necessary and appropriate facilities and services for visitors — determine which facilities or services are necessary and appropriate at these sites for the continued public use and enjoyment of the park, given changing visitor preferences and recent development in the surrounding area. What identified needs can be met outside recreation area boundaries? What is the economic feasibility of concession facilities determined to be needed within the recreation area?

## PLANNING ISSUES

Scoping is designed to be an early, open public process to determine the scope and significance of issues to be addressed in an environmental document for a proposed action. The NPS staff, the general public, developed area concessioners, and representatives from other agencies, organizations, and businesses identified a number of issues and concerns during scoping for this planning effort. Comments were solicited at public scoping meetings, through planning newsletters, and on the park's web site (see "Chapter 5: Consultation and Coordination"). The following seven major issues and concerns are addressed by these development concept plans.

### Flood Mitigation

The Cottonwood Cove and Katherine Landing developed areas are high hazard areas for flash floods. Consequently, flood mitigation is of paramount importance to public safety and protection of property in floodplains. Existing flood mitigation consists of a combination of diversion dikes and ditches that provide various levels of flood protection, ranging anywhere from approximately 10- to 100-year flows but that do not convey probable maximum flood (pmf) flows. Furthermore, the National Park Service currently expends considerable effort and resources in maintaining and removing debris from existing flood channels, cleaning culverts plugged with

sediment, and removing sediment from parking areas during even relatively minor storm events.

### Non-boating Public / Shoreline Users

The recreation area is experiencing increasing use by the non-boating public, who are seeking day-use opportunities to enjoy the area. This segment of the public has expressed concerns about there being an overemphasis on accommodating boaters in terms of shoreline use and facilities. They have expressed desire for more shoreline-based day-use opportunities and facilities, such as increased shoreline access, trails, picnic areas, restrooms, and shade structures.

At Cottonwood Cove, marina facilities, launch ramp, picnic area, and lower campground are all closely positioned at the mouth of Cottonwood Wash, resulting in safety concerns, congested conditions, and conflicts between user groups. Day-use picnickers often spread out into the lower campground sites. Unmet needs for day-use parking results in cars occupying the pull-through trailer spaces. Swimmers are in close proximity to boat traffic. Over time, growing numbers of day users and expansion of the marina to authorized capacity levels would further aggravate the extent and frequency of crowded conditions.

### Traffic Circulation, Parking, and Launch Ramps

Currently traffic circulation patterns and the amount and location of parking contribute to traffic congestion and safety problems. Road width and site distances along the main access road into Katherine Landing pose safety issues for bicyclists or maintenance personnel working along the road. At both developed areas, long boat launching lines back up traffic along the access roads. Launch lines can require up to an hour's wait or longer. Visitors traveling to other destinations have no way to safely or conveniently bypass the boat launch traffic.

Parking areas near the launch ramps are limited. During the summer, the campgrounds are used for overflow parking. Visitors vying for close-in parking results in cars occupying the pull-through trailer space and vehicles parked long-term in short-term parking spaces. The farther the distance to boat trailer parking areas, the longer it takes to launch or retrieve boats, resulting in

longer wait times and traffic lines and more congestion near the launch ramp and immediate harbor area.

Consideration needs to be given to improving the safety and ease of access, providing better organized and more convenient parking, and providing the authorized number of pull-through and single spaces. What can be done to make it easier and quicker to launch and retrieve boats?

### **Overnight Visitor Facilities**

Overnight visitor facilities include NPS-managed campgrounds and commercially managed recreational vehicle and trailer sites and motels. The layout and design of the NPS campgrounds do not function effectively and are not in keeping with contemporary design standards and visitor needs. Roads and sites do not adequately accommodate large recreational vehicles or meet accessibility standards. There are no utility hookups available. At both Cottonwood Cove and Katherine Landing, there is the additional concern of how to provide a more functional campground while protecting the cultural resources eligible for inclusion in the National Register.

With the growth of communities outside of the recreation area, debate has arisen as to whether the long-term trailer village sites and the motel at Katherine Landing are still necessary and appropriate for public use and enjoyment of the park. Are these uses appropriate? Could needs be better met outside area boundaries?

### **Visitor Orientation, Interpretation, and Education**

The recreation's area information and education programs encourage visitors' understanding of the park and its resources and provide park visitors with information they need to have a safe and enjoyable park experience. In general, orientation / information sign and boater education information waysides are insufficient and a lack of adequate facilities exist to support these visitor services.

At Cottonwood Cove, there is no visitor contact station. The ranger station is actually used as an office facility and not for visitor contact. Furthermore, no interpretive staff is regularly

assigned to Cottonwood Cove. At Katherine Landing, the combined ranger and interpretation office building at Katherine Landing also functions as a visitor contact station. There is limited space in the building to provide visitor services. The existing location is not near the lake and associated visitor facilities, which are the major destinations for most visitors. Therefore, only a small percentage of park visitors actually stop at the contact station. There is no provision for providing educational programs, including school programs, indoors out of the high temperatures in the summer. The picnic / amphitheater area used for these programs is too small for larger groups and the facilities are in poor condition. Concession facilities are a focal point of visitor activity. Can commercial services and NPS educational and interpretive services be provided in a joint facility?

### **National Park Service and Concessioner Support Facilities**

The National Park Service has various facilities that support the operation and maintenance of each developed area. These include office space and storage for law enforcement and interpretation staff, maintenance buildings and yards, housing for employees, trailer sites for volunteers, boat dock or slips, and water and wastewater systems. Many of the facilities were not designed for their current use levels, are in poor condition, not optimally located, or lack adequate space for storage, office space, parking, and other functions. While there is not sufficient housing for NPS employees at Cottonwood Cove, there is sufficient housing at Katherine Landing. However, older housing units are in poor condition and have required significant maintenance attention. Recreational vehicle sites with utility hookups for volunteers are lacking. Deficiencies in housing options affect the NPS and concessioners ability to attract qualified staff and volunteers.

At Katherine Landing, particularly, park operations are scattered in multiple locations and buildings. For instance, law enforcement and emergency services are spread out between the ranger station near the north campground, booking station near the government dock, first aid station near the launch ramp, and the fire station near the NPS housing area. Office and

storage space for interpretive staff is a similar situation. Lack of adequate space and dispersed facilities contributes to an inefficient operation. This issue centers on whether the existing operational facilities are functioning effectively and efficiently, meeting the needs of both park staff and visitors. Can replacement, rehabilitated, or relocated support facilities enhance operational efficiencies?

### Other Commercial Visitor Facilities

Concession-operated facilities at the developed areas provide numerous other services to visitors, such as marinas, houseboat and small boat rentals, dry boat storage, and retail including food service, gasoline, and related supplies. Commercial support facilities are provided for employee housing and maintenance. Some of the facilities are in poor condition or lack adequate space for storage, work areas, parking, and other functions.

With the growth of communities outside of the park, particularly in the vicinity of Katherine Landing, debate has arisen as to whether certain facilities and services are still necessary and appropriate for the public use and enjoyment of the park.

There is a need to evaluate the following three questions: Which facilities or services are still necessary and appropriate at these sites for public use and enjoyment of the park? Can identified needs be met outside park boundaries without compromising visitor experience and resource protection? What is the economic feasibility of concession facilities determined to be needed within the recreation area?

### IMPACT TOPICS

Impact topics allow comparison of the environmental consequences of implementing each of the alternatives. The impact topics in these development concept plans were identified based on substantive issues expressed by the public or other agencies during scoping, federal laws and other legal requirements, Council of Environmental Quality (CEQ) guidelines, NPS *Management Policies 2006*, and staff subject-matter expertise. The planning team selected the following impact topics for analysis based on the

potential for each topic to be affected by the alternatives.

### Natural Resources

**Native Plant Communities and Soils.** The NPS Organic Act of 1916 (*United States Code [USC] Title 16, Chapter 1*) and NPS management policies both require the National Park Service to protect and conserve native plants, vegetative communities, and geologic resources, including soils that could be affected by visitors, development, and management actions. Actions in the alternatives could beneficially or adversely affect these resources. Although most of the proposed actions would occur within previously disturbed sites within the development areas, some actions would result in new ground disturbance and impacts on native vegetation communities and soils. The spread of nonnative species also is a major concern in the recreation area. The replacement of invasive exotic vegetation (e.g., oleanders, palms) with native species equivalents to historically planted species would benefit native plant communities.

**Wildlife.** As with the above resources, the NPS Organic Act and *Management Policies 2006* both require the National Park Service to protect and conserve native animal populations that could be affected by visitors, development, and management actions. The relocation or development of new facilities and construction of flood control structures could affect additional undeveloped land, disturbing wildlife and wildlife habitat. Aquatic species could be indirectly impacted from construction and improved shoreline access that contribute to erosion, runoff, or refuse that could affect lake water quality.

**Threatened, Endangered, and Special Status Species.** The Endangered Species Act of 1973 (ESA), as amended, requires an examination of impacts to all federally listed threatened or endangered plant and animal species. The NPS management policies repeat this requirement and add the further stipulation that the analysis examine impacts to state listed endangered, threatened, or rare species, and federal species proposed for listing. Wildlife habitat in the developed areas is generally not favorable for rare, sensitive, and listed species that do not inhabit previously disturbed areas, and/or are intolerant

of human disturbance. However, the following species have been recorded or there is suitable or critical habitat in the general vicinity of the developed areas and could be affected: desert tortoise (federally threatened), razorback sucker (federally endangered), bonytail chub (federally endangered), southwestern willow flycatcher (federally endangered), western burrowing owl (Nevada state protected species), and banded Gila monster (Nevada state protected species).

**Floodplains.** Executive Order 11988, “Floodplain Management,” and Director’s Order 77-2, *Floodplain Management*, require the examination of the impacts to floodplains. It is NPS policy to recognize and manage for the preservation of floodplain values, to minimize potentially hazardous conditions associated with flooding, and to comply with the NPS Organic Act and executive order related to the management of activities in flood-prone areas. Portions of both developed areas are located within high hazard flash floodplains. The alternatives in this plan address flood mitigation to reduce hazards to human life and property. The lower washes have been extensively altered by existing development and use and natural floodplain functions and values (e.g., soils, vegetation, geomorphology) have already been negatively impacted and substantially altered. Because of the development within these washes, protection of people and property is considered to be of the highest priority. Further alterations to the floodplains under the alternatives would have negligible or minor additional adverse effects to natural floodplain values and are not evaluated further in these development concept plans.

### Cultural Resources

Law, regulation, or policy sources relevant to the impact analysis of cultural resources are Section 106 and 110 of the National Historic Preservation Act of 1966, as amended (16 USC 470 et sequ.); *Code of Federal Regulations* (CFR), Title 36, Part 68: Secretary of the Interior’s Standards for the Treatment of Historic Properties, effective September 29, 1983, as amended; NPS-28: *Cultural Resource Management Guidelines*; American Indian Religious Freedom Act (42 USC 1996); Native American Graves Protection and Repatriation Act; NPS management policies; and the National Environmental Policy Act, as amended.

**Archeological Resources.** Regulations implementing the Archeological Resources Protection Act define archeological resources to be any material remains of human life or activities that are at least 100 years of age, and that are of archeological interest. Of archeological interest means capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled collection, analysis, interpretation, and explanation (NPS 1998).

In the Cottonwood Cove and Katherine Landing developed areas, prehistoric archeological resources most likely would include petroglyphs, rock shelters, lithic testing sites, rock alignments, stone circles, geoglyphs/intaglios (linear designs scratched into the desert pavement), and surface/subsurface archeological remains. Historic resources could include disturbed areas and refuse relating to mining and ranching activities.

Ground disturbance associated with proposed actions, such as for new flood control structures and relocation of some facilities to presently undeveloped sites could disturb currently unidentified archeological resources. This is particularly true for areas outside of the developed areas. Thus, this topic is retained for further analysis.

**Historic Structures.** Historic structures served and may continue to serve some form of human activity and are generally immovable. They include buildings and monuments, canals, bridges, roads, defensive works, etc. (NPS 1998). The Cottonwood Cove developed area includes a Mission 66-era historic district that has been determined eligible for the National Register of Historic Places. The Katherine Landing developed area includes a Mission 66-era designed landscape that is potentially eligible for the National Register. These designed landscapes contain buildings, structures, and associated features that could be affected by the alternatives. In addition, other historic structures such as mine shafts, the ruins of mining and ranch structures, and historic roads could be in the project areas outside the developed areas and coves adjacent to

Katherine Landing. Therefore, the historic structures are retained for further analysis.

**Cultural Landscapes.** Cultural landscapes are complex resources that range from large rural tracts covering several thousand acres to formal gardens of less than an acre. Natural features such as landforms, soils, and vegetation are not only part of the cultural landscape, but they also provide the framework within which it evolves. In the broadest sense a cultural landscape is a reflection of human adaptation and use of natural resources. It is often expressed in the ways the land is organized and divided, and also through such factors as settlement patterns, land use, circulation, and the built environment. The character of a cultural landscape is defined both by physical materials such as roads, structures, and vegetation patterns and by cultural attributes such as values and traditions. Each of the developed areas has Mission 66 character-defining features such as herringbone pattern campgrounds, motel accommodations, designed landscape plantings, etc. In addition, many archeological and ethnographic resources (see below) could be interpreted as cultural landscapes with character-defining features such as petroglyphs, trail systems, and viewsheds/vistas. Landscape features such as these could be affected by the alternatives, so this topic is retained.

**Ethnographic Resources.** An ethnographic resource is defined by the National Park Service as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it (NPS 1998). Ethnographic (Ruppert 1976) and archeological (McClellan, Phillips, and Belshaw 1980) overviews and assessments of Lake Mead National Recreation Area recognized only Native American groups as traditionally affiliated peoples of the area. Thirty years of consultation have identified the Chemehuevi, Paiute, Hopi, Zuni, and the dispersed Yuman tribes (Mojave, Hualapai, Havasupai, Yavapai, Maricopa, Ak-Chin, Quechan, and Pai Pai) as having and continuing to have cultural ties to the park.

In prehistoric periods, the Yuman tribes—and possibly their predecessors—followed traditional trails throughout the lower Colorado region as

part of ceremonial pilgrimages. These trails were marked by a system of petroglyphs, trail shrines, rock alignments, geoglyphs, and vistas (Ezzo and Altschul 1993). Hundreds of petroglyphs have been documented in Grapevine Canyon and around the base of Spirit Mountain approximately 15 miles south of Cottonwood Cove. Others have been recorded adjacent to and south of Katherine Landing (Peterson, L., pers. comm., February 24, 2011), adjacent to Lake of Las Vegas (northwest of Boulder City, Nevada (Peterson, J., pers. comm., February 24, 2011), and near Tule Springs, Clark County, Nevada (BLM 2010). Taken collectively, these geographic features constitute an extensive ceremonial network extending throughout much of the region (Ezzo and Altschul 1993).

Some of these features have been more thoroughly documented and have been determined to be traditional cultural properties. These include the Spirit Mountain and Goldstrike Canyon / Sugarloaf Mountain traditional cultural properties. These locations, especially the Spirit Mountain traditional cultural property, continue to be used for ceremonial purposes by contemporary Yuman tribes<sup>1</sup> and possibly other tribes. Undocumented elements of the ceremonial network could be in project areas outside of the developed areas. Therefore, this topic is retained for further analysis. If such features are encountered, tribal consultations should take place to determine their ethnographic significance and to determine appropriate mitigation measures.

### Visitor Use, Experience, and Safety

Both developed areas accommodate a wide variety of recreational activities and provide public launch facilities and commercial marina services as well as other public use and support facilities. A primary focus of the development planning effort is to improve the visitor experience and to address issues related to shoreline access and crowding, overnight accommodations, and traffic flow and congestion. Actions being proposed in the alternatives, such as the development of shoreline and overnight facilities, would affect visitor use and experience. The alternatives also would affect

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<sup>1</sup> This statement is based on extensive conversations with Felton Bricker (Mojave tribe) and Loretta Jackson (Hualapai tribe) with former Lake Mead Cultural Resource Specialist Leslie Peterson between 1992–1994.

interpretive and educational opportunities, which would affect the visitor experience as well.

Safety for National Park Service and concessioner employees and the public would be affected by the alternatives. The alternatives would affect the provision of emergency services and information visitors need to have a safe park experience. The alternatives also address several other safety concerns such as crowding, congestion, and traffic circulation. Therefore, safety is considered in the analysis of impacts. The minimization of potentially hazardous conditions to human life and property associated with flooding are covered under the impact topic, "Floodplains."

### Park Operations

Park operations, including maintenance, law enforcement, emergency services, and interpretation and education would be affected by proposed facility improvement, location, and expansion. The separation or consolidation of facilities, provision of new or improved facilities, and transfer of campground management to the concessioner would affect park staff responsibilities and operational effectiveness and efficiency. This topic covers such things as NPS staffing, maintenance and operation activities, operational efficiencies, and response times.

### Socioeconomic Environment

The socioeconomic environment impact topics include concession operations within the recreation area as well as effects on the local and regional economy. Proposed actions affecting visitor facilities and services and concessioner support facilities would affect concession operations as well as potentially the local and regional economy. Socioeconomic impact topics include:

#### Construction-related Economic Impacts.

Actions proposed in the no action and action alternatives would have impacts on site-specific, local, and regional economic output and employment resulting from construction projects associated with each alternative.

#### Visitor Spending-related Economic Impacts.

Actions proposed in the no action and two action alternatives would have impacts on site-specific, local, and regional economic output and

employment resulting from changes to visitor spending associated with each alternative. Therefore, this topic is retained.

**Impacts on Other Park Concessions and Local Businesses.** Actions proposed in the no action and action alternatives would have the potential of impacting marina and other concession operations because the proposed action could influence the number and duration visits to the developed areas. Therefore, this impact topics is retained.

## IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

Also included is a discussion of some impact topics that are commonly addressed in environmental impact statements, but that are dismissed from detailed analysis in the plans. Potential impact topics were dismissed from further analysis because they would not be affected, or the potential for impacts under all the alternatives would be negligible or minor. The topics are listed below with an explanation of why they were dismissed from further analysis.

### Natural Soundscapes

The NPS management policies require the agency to preserve, to the greatest extent possible, the natural soundscapes of park units. Directors Order 47: *Soundscape Preservation and Noise Management* (NPS 2000) defines appropriate and inappropriate sound. As visitors move away from developed areas, they are more able to enjoy the natural sounds of water, wind, and wildlife. Actions proposed under the alternatives would primarily occur in or adjacent to areas that are already developed and higher levels of visitor use occur, where minor or short-term additions to background noise levels are not as noticeable and visitors are already exposed to noise from vehicles, motors, and visitors. For this reason, natural soundscapes have been dismissed as an impact topic in this document.

### Lightscaapes

The NPS management policies state that the National Park Service will preserve, to the greatest extent possible, the natural lightscaapes of parks, including natural darkness. The agency strives to

minimize the intrusion of artificial light into the night scene by limiting the use of artificial outdoor lighting to basic safety requirements, shielding the lights when possible, and using minimal impact lighting techniques. The actions proposed in the alternatives could result in new locations of some facilities, some of which could necessitate nighttime lighting. However, the effects of this lighting would be local and minimized by the mitigation techniques described above. It is expected that any new development would have a negligible impact on the night sky. Therefore, lightscapes are dismissed from further analysis as an impact topic.

### Scenic Resources

The enabling legislation of the Lake Mead National Recreation Area specifically addresses the preservation of the scenic features of the area. The National Park Service manages the natural resources of the area, including highly valued associated characteristics such as scenic views, to maintain them in an unimpaired condition for future generations (NPS *Management Policies 2006*).

The area's scenic vistas are an important visual resource, and striking backdrops for recreational activities include deep canyons, dry washes, sheer cliffs, distant mountain ranges, the lakes, colorful soils and rock formations, and mosaics of different vegetation. The general management plan identified outstanding view corridors within the Lake Mead National Recreation Area that provide spectacular views of significant natural features. The alternatives would not place new facilities within any outstanding view corridor. Consistent with the general management plan, new or rehabilitated structures would be located within the existing developed areas in the vicinity of other man-made structures. The design of the buildings and related structures shall, to the extent possible, use materials, colors, textures, screening, shielded or downward lighting, landscaping, and native vegetation that would blend them into the natural setting and surrounding buildings. Consequently, outstanding view corridors would not be impacted. Any impacts on the visual quality or view of the developed areas are expected to be minor. Therefore, this impact topic was dismissed from further consideration.

### Air Quality and Climate Change

Section 118 of the 1963 Clean Air Act (42 USC 7401 et sequ.) requires a park to meet all federal, state, and local air pollution standards. The Lake Mead National Recreation Area is designated a Class II Air Quality Area under the Clean Air Act, as amended. The act states that the federal land manager has an affirmative responsibility to protect recreation area air quality-related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. Air quality impacts have occurred in the recreation area due primarily to external sources. Construction activities necessary under the alternatives would have short-term, negligible impact on the airshed due to releases of pollutants from construction vehicle emissions and construction related impacts from the disturbance of soils. Dust abatement efforts would be implemented to control fugitive dust emissions during construction and impacts would be local. Use levels may increase with implementation of the alternatives, but the increase is not expected to be substantial and the emissions from additional vehicles would be negligible compared to current levels. Greenhouse gases, such as carbon dioxide would be emitted from the use of heavy equipment, trucks, and other vehicles. These emissions would be small and would not contribute to climate change. In the long term, project actions associated with the alternatives such as circulation and parking facility improvements would reduce vehicle emissions to the extent that they reduce queuing and unnecessary engine idling. This would be considered a long-term, beneficial impact on air quality. In all of the alternatives, the National Park Service would continue to protect and conserve air quality as required under the NPS Organic Act and management policies. Therefore, air quality is not analyzed in detail.

### Water Quality

Lake Mohave's waters support the area's natural ecosystems and are important for recreational activities, such as boating, fishing, and swimming. The Clean Water Act, and supporting criteria and standards promulgated by the U.S. Environmental Protection Agency (EPA), the Nevada Department of Environmental Protection (NDEP), and the Arizona Department of

Environmental Quality (ADEQ) have been used at the Lake Mead National Recreation Area to protect the beneficial uses of water quality, including human health, health of the aquatic ecosystem, and recreational use. In supporting federal and state regulations, the NPS management policies states that the National Park Service will “take all necessary actions to maintain or restore the quality of surface waters and groundwater within the recreation area consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations.”

The water quality of Lake Mohave has consistently met established standards for full body contact (e.g., swimming) and state drinking water quality standards. The primary water concern for the recreation area is reduction of quality due to chemical and biological pollutants in lake water, including petrochemicals and bacteria associated with human waste. Turbidity (water cloudiness) and sedimentation have not been major concerns thus far. In recent years, sanitation facilities for recreational lake users have been improved with the construction of additional shoreline restroom facilities as well as floating toilets in high use areas.

Under the alternatives, any ground-disturbing activity (e.g., maintenance, construction, visitor use) that results in removal of vegetation and the exposure of soils or an increase in impervious surfaces could result in increased surface water runoff and erosion. These impacts could lead to increased turbidity, sedimentation, or pollution reaching Lake Mohave. The natural hydrology of the park is defined by local heavy thunderstorms causing rapid runoff and flash flooding, which erodes and deposits sediments in washes that are dry between storm events. Any increase in sediments or turbidity of lake waters would be local and minimal when compared to natural hydrological events. The use of best management practices or other mitigation during construction and operations, such as berms or silt fencing, would reduce runoff and erosion. Impacts on water quality, if detectable, would be local, short term, and within or below water quality standards and/or historical ambient or desired water quality conditions because of the small portion of the lake affected, the naturally high sediment loads carried during storm events, the use of mitigation measures, and the short-term nature of

construction activities. Therefore, this impact topic was dismissed from further analysis.

### **Ecologically Critical Areas, Wild and Scenic Rivers, or Other Unique Natural Areas**

No areas within the project area are designated as ecologically critical areas, nor are there any existing or potential wild and scenic rivers within the project area. The Lake Mead National Recreation Area is an important natural area, but the alternatives would not threaten the associated qualities and resources that make the recreation area unique. Therefore, this topic was dismissed from further analysis as an impact topic.

### **Wetlands**

Wetlands are protected and managed in accordance with Executive Order 11990, “Protection of Wetlands,” NPS Director’s Order 77-1: *Wetland Protection*, and its accompanying handbook. This guidance requires the National Park Service to protect and enhance natural wetland values, and requires the examination of impacts to wetlands. No actions are proposed in the development concept plans that would affect wetlands or springs. Therefore, wetlands are not analyzed as an impact topic.

### **Threatened and Endangered Species Not Addressed in these Development Concept Plans**

The following species have been dismissed from further analysis in these development concept plans. The bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list of threatened and endangered species on August 9, 2007. Threatened status was reinstated for desert nesting bald eagles, which does not include population locations inside the recreation area. Bald eagles are winter visitors to the recreation area and have been sighted in large trees or cliffs along the shoreline of both lakes. There has been only one confirmed pair of nesting eagles in the recreation area, in Black Canyon north of Willow Beach. Development proposed under the alternatives near the lake would be within or immediately adjacent to the existing developed high visitor use areas, large trees or cliffs areas would not be affected, and ample shoreline would still be available for eagles to disperse. Fish

populations that provide food for wintering eagles are not expected to be affected. Therefore, the alternatives are not expected to affect bald eagles.

The federally endangered Yuma clapper rail (*Rallus longirostris yumanensis*) is a wading bird that inhabits fresh water and brackish marshes and is associated with dense emergent riparian vegetation. No confirmed sightings have occurred within the recreation area. However, potential habitat for this species exists in the southern portion of the park near Davis Dam. None of the alternatives propose development or visitor use in or near potential habitat for this species. Therefore, no affect to this species is expected.

There are no federally listed threatened or endangered plant species in the recreation area. A number of sensitive plant species, the first three of which are identified by Nevada as state critically endangered species, sticky buckwheat (*Eriogonum viscidulum*), three-sided milkvetch (*Astragalus geyeri* var. *triquetrus*), Las Vegas bearpoppy (*Arctomecon californica*), and sticky ringstem (*Amulocaulis leiosolenus*) occur in the northern portion of the recreation area along Lake Mead, but have not been recorded near Lake Mohave. They occur on gypsum soils or sand dunes. No impacts on these species would occur.

### **Nontribal Ethnographic Resources**

Nontribal groups of Mormons settled in the area to use the Colorado River for agriculture and transportation of goods in maintaining Mormon settlement and the spread of their religion throughout the West. However, their use of the area was sporadic and short-lived, so nontribal ethnographic resources are dismissed from further analysis.

### **Museum Collections**

None of the alternatives would affect the protection, preservation, and curation of museum objects and materials. There are no museum collection facilities in the project areas.

### **Environmental Justice**

Executive Order 12898, “General Actions to Address Environmental Justice in Minority

Populations and Low-income Populations” (FR 1994), requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The alternatives would not have disproportionately high and adverse effects on minorities or low-income populations or communities as defined in EPA’s *Environmental Justice Guidance* (EPA 1998).

### **Paleontological Resources**

The Lake Mead National Recreation Area and surrounding lands contain paleontological resources. There are no known or recorded paleontological resources within the areas of potential effect for the alternatives. Most of the proposed facilities and associated ground disturbance under any of the alternatives would occur within the existing previously disturbed developed areas. Some proposed work, primarily the flood control structure above Cottonwood Cove, would disturb some currently intact desert wash and intervening ridge lands. Because most work would occur within previously disturbed areas, the alternatives are not expected to affect paleontological resources; however, appropriate steps would be taken to protect any paleontological resources that are inadvertently discovered during construction. Should currently unidentified paleontological resources be discovered during project implementation, work in that location would stop until the resources are properly evaluated and avoided if necessary. This impact topic was dismissed from further consideration.

### **Prime and Unique Farmlands**

The Farmland Protection Policy Act (7 USC 4201 et sequ.) and the U.S. Department of the Interior (Environmental Statement Memorandum No. ESM94- 7) require an evaluation of impacts to prime or unique agricultural lands. Prime or unique farmland is defined as soil that particularly produces general crops such as common fruits, vegetables, and nuts. None of the soils in the recreation area are classified as prime or unique farmlands.

### **Indian Trust Resources**

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians because of their status as Indians.

### **Conflicts with Land Use Plans**

There are no potential conflicts between the alternatives and land use plans, policies, or controls (including state, local, or Native American) for the project areas.

### **Energy Requirements and Conservation Potential**

The National Park Service would pursue sustainable practices whenever possible in all decisions regarding national park operations, facilities management, and development in the recreation area. Whenever possible, the National Park Service would use energy conservation technologies and renewable energy sources. Thus, it is expected that none of the alternatives would result in an appreciable change in energy consumption. Any impacts would be negligible and this topic was dismissed from further consideration.

### **Natural or Depletable Resource Requirements and Conservation Potential**

None of the alternatives being considered would result in the extraction of resources from the park. Relatively small quantities of depletable resources would be used in the construction of new facilities in the alternatives, but the impact on these resources would be expected to be negligible. Under all of the alternatives, ecological principles would be applied to ensure that the park's natural resources were maintained and not impaired.

### **Urban Quality and Design of the Built Environment**

The quality of urban areas is not a concern in this plan. At both developed areas, park compatible design would be taken into consideration for structures built under all of the action alternatives. Emphasis would be placed on designs and materials and colors that blend in and do not detract from the natural and built environment. Therefore, adverse impacts would be expected to be negligible and this topic was dismissed from further consideration.

### **Wilderness**

No actions proposed in the development concept plans would occur within or adjacent to wilderness and there would be no effect on wilderness resources or values. Therefore, this topic was dismissed from further analysis.

## **PLANNING DIRECTION AND GUIDANCE**

Management of the Lake Mead National Recreation Area is guided by a number of laws and policies, some of which are applicable specifically to the recreation topics, and many others that are applicable to all units of the national park system. There are also a number of other current plans that affect management of the recreation area. These laws, policies, and other plans form the foundation and provided direction for the formulation of all of the development concept plan alternatives for Cottonwood Cove and Katherine Landing described in this document.

### **Applicable Laws and Policies**

The Lake Mead National Recreation Area was established in 1964 (Public Law [PL] 88-639) “for the general purposes of public recreation, benefit, and use, and in a manner that will reserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistent with applicable reservations and limitations relating to such area and with other authorized uses of the lands and properties within such area.” The Secretary of the Interior was authorized under the law to provide for general recreational use.

General recreational use was defined within section 4(b) of this legislation and included bathing, boating, camping, and picnicking.

Some laws and executive orders are applicable solely or primarily to units of the National Park Service. These include the Organic Act of 1916 creating the National Park Service, the General Authorities Act of 1970, and the act known as the Redwood Act amendment of March 27, 1978, relating to the management of the national park system. Others have much broader application, such as the Endangered Species Act, the National Historic Preservation Act, and Executive Order 11988. Those most directly related to the development concept plans' planning process are identified as follows.

**NPS Organic Act (16 USC 1).** This act provides the fundamental management direction for all units of the national park system to: promote and regulate the use of the federal areas known as national parks, monuments, and reservations. . . by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

**NPS General Authorities Act (16 USC 1a-1 et sequ.).** This act affirms that while all NPS units remain "distinct in character," they are "united through their interrelated purposes and resource into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not "derogat[e] . . . the purposes and values for which these various areas have been established."

**Redwoods Act, as amended 1978.** This act reasserted the systemwide standard of protection prescribed by the U.S. Congress in the original Organic Act. It states, "Congress further reaffirms, declares, and directs the promotion and regulation of the various areas of the national park system. . . shall be consistent with and founded in the purpose established by the first section of the

Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the national park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established except as may have been or shall be directly and specifically provided by Congress."

**NPS Management Policies 2006.** These policies identify and explain NPS policies for all units under its stewardship. The alternatives considered in this document incorporate and comply with the provisions of these mandates and policies.

**NPS Concessions Management Improvement Act of 1998 (PL 105- 391).** This is the legislation under which the National Park Service is to manage concession operations within units of the national park system. This act requires the National Park Service to provide a reasonable opportunity for profit to authorized concession operations. This act also provides for protection of concessioner investment and states that, "A concessioner shall have a leasehold surrender interest in each capital improvement constructed by a concessioner under a concessions contract, consisting solely of a right to compensation for the capital improvement." Leasehold surrender interest "shall not be extinguished by the expiration or other termination of a concessions contract and may not be taken for public use except on payment of just compensation."

**National Environmental Policy Act (NEPA).** This act was enacted in 1969 and requires agencies to fully consider the environmental costs and benefits of their proposed actions before they make any decision to undertake those actions. The act and subsequent regulations enacted by the Council of Environmental Quality establish two mechanisms to achieve this stated intent: (1) a requirement that all agencies make a careful, complete, and analytic study of the impacts of any proposal that has the potential to affect the environment, and alternatives to that proposal well before any decisions are made; and (2) the mandate that agencies be diligent in involving any interested or affected members of the public in the NEPA process. The National Park Service

establishes agency policy and procedural requirements for compliance with this act in Directors Order/Reference Manual 12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making*.

**Endangered Species Act of 1973, as amended (16 USC 1531-1543).** This act requires federal agencies to ensure that management activities authorized, funded, or carried out by the agency do not jeopardize the continued existence of listed endangered or threatened species, or result in the destruction or adverse modification of habitat that is critical to the conservation of the species.

**National Historic Preservation Act of 1966, as amended (16 USC 470).** This act requires federal agencies to consider the effects of their undertakings on historic properties that are either listed in or eligible to be listed in the National Register. The National Register includes districts, sites, buildings, structures, and objects important for their significance in American history, architecture, archeology, engineering, and culture. The goal of the Section 106 review process is to seek ways to avoid, minimize, or mitigate any adverse effects to historic properties that are listed in or eligible for listing in the National Register.

**Executive Order 11988, “Floodplain Management” (May 28, 1980).** This order was issued “to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.” The order requires federal agencies to develop agency specific guidance, provide leadership and take action to (1) reduce the risk of flood loss; (2) minimize the impact of floods on human safety, health and welfare; and (3) restore and preserve the natural and beneficial values served by floodplains. In compliance with Executive Order 11988, it is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. The National Park Service established procedures for implementing floodplain protection and management actions in units of the national park system as required by Executive Order 11988 and Director’s Order 77-2 in Procedural Manual 77-2: *Floodplain Management*.

**Southern Nevada Public Lands Management Act of 1998.** This act provides for the sale of certain federal lands in Clark County and the acquisition of environmentally sensitive lands. The purpose of the act is as follows: to promote orderly development in the Las Vegas valley and to lessen the impact of urban growth on the Lake Mead National Recreation Area, Red Rock Canyon National Conservation Area, and the Spring Mountains National Recreation Area.

The proceeds from public land sales are specified for

- capital improvement projects at Lake Mead, Red Rock Canyon, the Desert National Wildlife Refuge, and other federally managed recreational areas
- development of a multispecies habitat conservation plan in Clark County
- development of parks, trails, and natural areas in Clark County
- conservation and environmental education initiatives on federal land
- acquisition of environmentally sensitive lands
- restoration and conservation of Lake Tahoe

As land is sold, the agencies nominate projects fitting these purposes for approval by the Secretary of the Interior.

### Relationship with Other Plans

**1986 General Management Plan.** The recreation area operates under the management goals and objectives set forth in the general management plan (NPS 1986). The plan emphasizes long-term protection of park resources while accommodating increasing visitor use. It allows for increasing use through a combination of providing new developed areas, improved access points, and acceptable levels of expansion in existing developed areas. It establishes land-based management zones and strategies for meeting the goals and general purposes of the recreation area. The plan included development concept plans for Cottonwood Cove and Katherine Landing that identified limits on the development, established the number and type of facilities, and addressed

flood hazards. The general management plan is the foundation for this current planning effort and provided guidance for the preparation of the development concept plans for Cottonwood Cove and Katherine Landing. Any proposals in these development concept plans must be consistent with and supported by the general management plan.

**2003 Lake Management Plan.** The lake management plan tiers from the general management plan. It provides additional and more specific guidance for the long-term management of Lake Mead and Lake Mohave, the associated shoreline, and the development areas within the Lake Mead National Recreation Area to ensure the protection of park resources while allowing a range of recreational opportunities. The plan provides for an increase in boating capacity targeted at areas where growth can be accommodated within the physical, environmental, and social carrying capacity of the lakes. It identifies facility improvements, capacities, locations, and expansions for the developments that control access on Lake Mohave, with facility development based on the lake's carrying capacity. The plan calls for the continued operation of the three existing marinas on Lake Mohave, with authorized expansion of the marina and associated parking at Cottonwood Cove and maintenance of the existing marina and associated parking capacities at Katherine Landing. The plan also maintained the existing public launch ramp capacities at both areas.

All the alternatives considered in these development concept plans are consistent with and contribute to fulfilling the management intent and direction established in the lake management plan to the extent practicable. The identified recreational opportunities and types and capacities of commercial marina services and public launch ramps were used to guide the development of the alternatives presented in these plans.

**2001 Strategic Plan.** The 1993 *Lake Mead National Recreation Area Statement for Management* (NPS 1993) and the 1998 *Lake Mead National Recreation Area Strategic Plan* (NPS 1998) established goals relating to resource protection, public enjoyment, and visitor

satisfaction. The 2001 *Strategic Plan* (NPS 2001b) has reaffirmed these goals.

**2003 Commercial Services Plan and Concessions Contracts.** The commercial services plan for the recreation area provides guidelines for assessing the changing conditions and increasing pressures of visitor needs and adopting a strategy that balances visitor needs with the purposes and values of the recreation area. The *Commercial Services Plan* evaluates the existing management strategy and ensures that, under the proposed alternatives, a range of visitor services would be provided, and that natural and cultural resources would be protected. Concession contracts are agreement(s) between the Secretary of the Interior, or authorized delegates, and a concessioner, whereby the concessioner is required and authorized to provide certain necessary and appropriate visitor accommodations, facilities, or services within a park unit under administration of the secretary. The secretary authorizes concession operations by both contracts and permits.

Concession contracts are issued via competitive bid, and prospectuses will be released for new contracts for park concession operations at Cottonwood Cove and Katherine Landing. Execution of new concession contracts will implement and authorize concession projects approved in the record of decision for the development concept plans, as feasible.

The concessions contracts between the National Park Service and commercial marina operators also recognize that the establishment and maintenance of concessioner facilities and services “involve a substantial investment of capital and the assumption of the risk of operating loss, and it is therefore proper, in consideration of the obligations assumed hereunder and as an inducement to capital, that the concessioner be given assurance of security of such investment and of a reasonable opportunity to make a fair profit.” In addition, the concessions contract specifically states, “it is the intention of the parties that any acts, policies, or decisions of the Secretary under this contract will be consistent with reasonable protection to the concessioner against loss of its investment and against substantial increase in costs, hazards, and difficulties of its operations.”

**Lake Mead NRA Exotic Plant Management**

**Plan.** The goal of this plan is to protect and maintain native plant communities by preventing and removing exotic plants using an integrated approach that maximizes the effectiveness of the action while minimizing undesirable impacts. The plan provides a comprehensive exotic plant management plan that would serve to direct exotic plant management activities undertaken by the National Park Service and cooperators over the next 20 years. The plan prescribes specific integrated pest management strategies and actions to address prevention of new exotic plant invasions, early detection and eradication of incipient exotic plant populations, and containment and control of established populations.

**Clark County Multiple Species Habitat**

**Conservation Plan (MSHCP).** This plan was approved by the U.S. Fish and Wildlife Service (USFWS) in 2000. The Clark County Multiple Species Habitat Conservation Plan was prepared pursuant to Section 10 (a) of the Endangered Species Act of 1973, as amended, in support of an application for an incidental take permit for species listed under the act (CCDCP 2000). This plan identifies those actions necessary to meet the conservation goals and objectives of the plan for 78 species covered under the permit, including one species listed as endangered (Southwestern willow flycatcher, *Empidonax traillii extimus*), one species listed as threatened (desert tortoise, *Gopherus agassizii*), and two candidate species for federal listing (relict leopard frog, *Rana onca*, and yellow-billed cuckoo, *Coccyzus americanus*). The planning area includes designated critical habitat for the desert tortoise and proposed designated critical habitat for the flycatcher. This plan also identified 103 evaluation and 51 watch-list species that may be considered for inclusion under the permit for future phases of the plan. All unlisted covered species are addressed in the Multiple Species Habitat Conservation Plan as if they were

listed, meaning that the conservation measures in the plan for those species would satisfy permit issuance criteria under Section 10(a)(1)(B) of the Endangered Species Act if the species was listed during the term of the permit. A total of 232 species are addressed. Implementation of the conservation measures in the plan is a cooperative effort among many cooperators, including but not limited to the U.S. Fish and Wildlife Service, the Bureau of Land Management, the U.S. Forest Service, the National Park Service, the U.S. Department of Defense, Nevada Department of Wildlife, Nevada Department of Forestry, and other federal and state land managers and regulators. This plan includes species and habitats that occur in the Lake Mead National Recreation Area that might be impacted by the alternatives in these development concept plans.

**Lower Colorado River Multiple Species Habitat Conservation Plan (LCR-MSHCP).**

This long-term effort aims to conserve and work toward the recovery of state and federally listed species, and protect and maintain wildlife habitat along the Lower Colorado River from Lake Mead to the southern international boundary with Mexico through the implementation of a habitat conservation plan.

The purposes of the Lower Colorado River Multiple Species Habitat Conservation Plan are to conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed; accommodate present water diversions and power production and optimize opportunities for future water and power development, to the extent consistent with the law; and provide the basis for incidental take authorizations. The NPS actions covered in this plan include riparian habitat restoration, fishery management, and boating access.



# ALTERNATIVES

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## CHAPTER 2: ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

### INTRODUCTION

This chapter presents the range of alternatives for management and site planning. The alternatives are organized by area: Cottonwood Cove, Katherine Landing, and the Katherine Landing Vicinity, which includes four small visitor areas north of Katherine Landing — Princess Cove, Cabinsite Point, and North and South Arizona Telephone Cove.

Alternatives are described through a combination of text and graphics. Descriptive materials for each alternative include the following:

- An overview — a brief narrative overview summarizing the alternative concept and highlighting key actions.
- A conceptual site plan — a conceptual site plan graphically depicting proposed locations and general sizes for visitor and support services and facilities. The site plan also illustrates major changes to circulation.
- An alternatives comparison table — a table describing the alternatives in more detail, explaining each alternative's approach to selected management topics and proposed new (or rehabilitated) facilities.
- An environmental consequences summary — another table summarizing the key differences in environmental impacts which would result from implementing the alternatives.

This chapter also

- describes the process used to develop alternatives and select the agency's preferred alternative
- lists elements of draft alternatives that were eventually eliminated from consideration and summarizes the rationale for dismissal
- identifies the environmentally preferable alternative as defined by Section 101 of the National Environmental Policy Act

Furthermore, this chapter includes preliminary cost estimates for capital development. This information was developed for comparative purposes only and should not be used for budgetary purposes.

### The Purpose of Alternatives

An alternative is a proposal that offers a choice between one or more things, only one of which will be chosen. It provides the opportunity for carefully considering the consequences of a range of choices and making the best possible decision. The National Park Service employs this principle in its planning. Alternatives development and analysis is at the heart of the NPS planning process.

In this context, an alternative is a distinct set of proposed management strategies and actions, including facilities and services. The National Environmental Policy Act and NPS policies require park managers to consider a full range of reasonable alternatives, including a no-action alternative, before choosing a preferred alternative. Alternatives enable the agency to test out different approaches to resolving issues. They provide a basis for comparing advantages and environmental consequences in order to determine the course of action that is most prudent and beneficial.

### Introduction to the Range of Alternatives

The National Park Service developed the alternatives through a collaborative process over a period of time. Planning team members based the alternatives upon a thorough investigation of site conditions. The alternatives offer site-specific proposals for the type, extent, and location of facilities and services consistent with established plans. However, they reflect differing approaches to resolving identified issues, which are discussed in chapter 1 of this document.

### Consistency with Established Plans

As discussed in chapter 1, management direction established in the 1986 *Lake Mead National Recreation Area General Management Plan* and the 2003 *Lake Mead National Recreation Area Lake Management Plan* provides the basis for the current planning effort. Therefore, the following parameters are considered to be “givens” that define the scope and thus the range of alternatives:

- The alternatives are consistent with the general management plan’s vision for both areas, which is to accommodate increasing use, enhance the visitor experience, and mitigate flood hazards.
- Marina, public boat launch, and parking facilities at each developed area are consistent with the carrying capacity and zoning identified in the lake management plan.

There are three alternative approaches to management and site planning that are presented by area. Alternative 1, the no-action alternative, does not meet the purpose and need for the project or reflect further implementation of previous planning proposals, but provides a basis for comparison with action alternatives. In planning, an examination of the no-action alternative is useful to determine why certain changes may or may not be needed or advisable. Alternative 2 closely reflects management decisions and proposals from the general management plan and the lake management plan. Alternative 3, the preferred alternative, is consistent with established management decisions; however, this alternative revisits proposals from established plans that have not yet been enacted in light of new information. All of the alternatives are described in the following sections.

**The Preferred Alternative.** The “preferred” alternative is the alternative which the National Park Service believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. The National Park

Service has identified alternative 3 as the preferred alternative.

*Process for defining the preferred alternative* — Initially, the National Park Service selected the “draft preferred” alternative during a three-day interdisciplinary workshop. Workshop participants used the Choosing By Advantages (CBA) method to select the draft preferred alternative. This method is a systematic method for evaluating a range of alternatives to arrive at a carefully considered and well-informed decision. This method evaluates and compares the advantages provided by the specific management actions and facilities proposed under each alternative according to a set of evaluation criteria, or “factors.” In using this approach, the National Park Service seeks to determine which alternative offers the greatest advantage overall.

*Evaluation factors* — Workshop participants used four evaluation factors. These factors were derived from identified planning issues and from the impact topics considered in these concept plans. The four evaluation factors are as follows:

1. **Resource Condition** — protect and enhance natural and cultural resource conditions
2. **Visitor Experience** — provide for a range of quality visitor experiences and opportunities. Provide appropriate visitor facilities and services and maintain a quality recreational setting
3. **Visitor and Staff Safety** — provide safe visits and safe living/working conditions for staff
4. **Park and Concessioner Operations** — improve the efficiency, reliability, and sustainability of park operations

The evaluation also considered projected costs and information regarding financial viability.

## COTTONWOOD COVE ALTERNATIVES

### Narrative Description of Alternatives

**Alternative 1: No Action, Continue Current Management Trends.** The no-action alternative reflects a continuation of current management trends. Under the no-action alternative, all

current facilities would remain in place, with only minimal changes. See figure 3 at the end of this chapter for a map.

The National Park Service would continue to operate the upper and lower campgrounds, and would not establish any new facilities for day use. The ranger station and NPS housing and maintenance areas would be retained in their current locations.

The concessioner would continue to operate the existing commercial services. This includes the 25-unit motel by the lakeshore, the marina (approximately 235 slips), the existing store and café (which occupy separate, temporary structures and the large long-term trailer village), and the small short-term recreational vehicle (RV) area.

The existing flood control ditches and dikes would not be upgraded.

**Alternative 2: Implement Previous Planning Proposals.** The overarching concept for this alternative is to implement actions proposed in two previous plans, the general management plan and the lake management plan. These park plans authorized an increase in boating capacity, provided for a separation of shoreline public use areas and commercial marina facilities, and incorporated flood protection measures to convey and channelize flood flows through the developed area. See figure 4 at the end of this chapter for a map.

In this alternative, a new modest visitor contact station would be built close to the boat launch, increasing the NPS presence in this busy area. In addition to visitor contact, this would also serve NPS administrative purposes, including law enforcement.

Day-use activities such as picnicking and beach access would be moved away from Cottonwood Cove, which is heavily used by boaters, and relocated to Ski Cove. New picnic areas on the gentle slopes above Ski Cove would be configured to accommodate individual and group sites, featuring a number of shade shelters and tables/grills. The Ski Cove beach would become a designated no-boat area. Restrooms would also be provided in this area. A new paved spur road would provide access to this newly developed area

and a small parking area would be developed above Ski Cove.

In this alternative, the current ranger station, which is primarily administrative in nature, would be adapted to house a campground office. Otherwise, both existing campgrounds would be retained with minimal changes.

The capacity of some commercial visitor amenities — the motel, restaurant, and dry storage — could be increased. If desired, the concessioner could double the capacity of the motel by adding a second story. The existing long-term trailer village would remain in place or be converted to short-term RV sites over time, as discussed in the general management plan.

In accordance with the lake management plan, the concessioner would be permitted to expand the marina to approximately 484 slips. Marina expansion is proposed in part to help offset the loss of revenue from a trailer village that would be reduced in size, or possibly phased out altogether. The permitted marina expansion is one reason that the increase in parking would be warranted.

The main access road would remain with two lanes. Throughout the developed area, some informal parking areas would be paved and striped, and additional parking areas developed. This should enhance convenience for visitors, particularly for boaters launching out of Cottonwood Cove. Per the lake management plan, parking capacity in the developed area would be expanded to approximately 322 double parking spaces (dps) (to accommodate boat launchers) and 500 single parking spaces (sps) (for other visitors, including beachgoers and those who rent boats). This addition of new parking close to the water should reduce congestion and improve convenience for visitors, particularly for boaters launching out of Cottonwood Cove.

The NPS housing and maintenance areas and concessioner housing would be rebuilt in new locations outside of the floodplain. These functions would be relocated to a new site on a bluff south of the main entrance road. Berms would be constructed to visually screen this area from view of the access road. An existing gravel road provides access to this area; this road would be extensively upgraded. The existing NPS housing area would be reused for parking.

Comprehensive redesign of flood control measures would provide a new level of security for residents (e.g., park and concession employees) and park visitors, including overnight guests. Preliminary design for the flood control structures has been completed (HDR 2004a, 2004b). The conceptual designs include new channels and dikes to intercept and divert a majority of flood flows north of the developed area, and to convey additional pmf flows through the developed area.

**Alternative 3: Preferred, Enhance Visitor Experience and Park Operations.** Under alternative 3, opportunities for shoreline day use would be enhanced by improving the quality of existing facilities in Cottonwood Cove and by distributing day use. Existing picnic and no-boat areas in Cottonwood Cove would remain in place. The existing picnic area would be outfitted with additional shade shelters and picnic tables. New shoreline use areas for beach access and picnicking would be developed in Ski Cove, and a new designated trail built between Ski Cove and Cottontail Cove. These improvements would provide beachgoers with new destinations that are removed from heavily used Cottonwood Cove. The Ski Cove beach would be a dedicated no-boat area. Above the beach, a new picnic area featuring shade shelters and tables/grills would be carefully designed to serve both individuals and groups. Ski Cove would be served by a new paved road spur and a small parking area. The beach at Cottontail Cove would remain open to boats. See figure 5 at the end of this chapter for a map.

The concessioner would operate all overnight accommodations, including the existing motel, camping options, and a new redesigned RV park on the site of the current trailer village.

The upper campground would be extensively rehabilitated. A portion — perhaps one loop — would be retained with minimal changes, to cater to tent campers seeking a “less developed” camping experience. This solution would allow for some retention of historic landscape patterns, protecting the Mission 66 character. A portion of the upper campground would be redesigned to support NPS volunteer use, featuring large RV sites with hookups. Perhaps 10 to 12 such RV volunteer spaces would be established. Concessioner housing would also be relocated to

the upper campground area, with existing concessioner employee dormitories moved to this new location.

The lower campground — already a favorite place for picnicking during summer months — would seasonally be used as a picnic area; but retained for camping during winter months.

Within the life of the new concession contract, the area currently occupied by the long-term use trailer village would be redeveloped for premier short-term use accommodations. Long-term trailer sites, as they presently exist, with private trailers left on site for the sole and exclusive use of the owners and their guests would be phased out. The area would primarily become a new RV park; however, the concessioner would be permitted to provide concession owned accommodations rented on a per night bases, such as cabin units, “park models” with individual bathrooms, or similar accommodations as part of the mix. Park models are generally considered recreational vehicles because they are transportable. However, they are often intended for long-term placement in one location. Typical use is for a vacation cabin. Park models have been identified as appropriate for concession operations because of the recreational use patterns associated with these types of units. Further, since they are property of the concessioner, they can be removed from the recreation area when they reach their maximum useful life.

This new area would provide an expanded number of RV sites. The quality of these sites would be greatly increased over current conditions. They would be designed to accommodate large contemporary recreational vehicles, with pull-through parking and other amenities. Design of the RV park would not reflect tight spacing and linear arrangement of many commercial style RV parks. Instead, units would be widely spaced to allow greater separation and sense of privacy. Overall, the design may be analogous to the new RV campground at Willow Beach. The gently sloping site could also be contoured to provide recreational vehicle and cabin guests with views to the lake. New or enhanced utilities and other infrastructure would be constructed to support this new use. For example, individual restrooms in park models or cabin units would require enhanced water and wastewater systems.

The existing motel would remain. The concessioner would be allowed to expand the motel capacity, but this expansion would be achieved through placement of an additional structure behind the existing building rather than a second story. The concessioner may explore the possibility of adding meeting or multipurpose space, so that the motel would better accommodate conferences or other events.

The site just north of the motel would be redeveloped for a combined visitor/commercial services center. This facility would consolidate store and restaurant functions in one location. Visitor information and exhibit/interpretive space would also be provided, but are not expected to occupy a substantial percentage of space. This visitor/commercial services center and other new structures would be designed to coordinate with each other and the existing motel, and to harmonize with the surroundings through appropriate use of siting, materials, and other design elements. For example, this facility could be sited to physically align with the motel. Buildings along the waterfront would exhibit a unified, consistent design character. The area between these buildings and the lakeshore would be redesigned for pedestrians, with outdoor seating and shade.

As in alternative 2, the marina would be allowed to expand, per direction in the lake management plan. The concessioner could also adjust the ratio of small to larger slips, provided that it continues to offer a number of smaller slips, ensuring that the marina continues to serve a variety of boaters.

The main access road would be widened throughout the developed area by adding a new launch/ready lane down to the launch ramp. Some informal parking areas would be paved and striped and additional parking areas developed closer to the lake to accommodate the expanded marina and motel and shoreline day use. These improvements should reduce congestion and alleviate long wait times for boat launchers and other visitors. A new road would be added along the southern edge of the developed area, forming a paved loop with the existing access road. This loop would function in combination with the new launch-ready lane to improve ease of circulation. It would connect with the new spur leading to Ski Cove. These actions would be implemented once the trailer village is phased out.

The existing ranger station would be retained. The NPS housing and maintenance areas would be expanded within the existing areas. However, in the long term, the National Park Service would explore options for a consolidated law enforcement/emergency services facility in the general vicinity of the ranger station or in the vicinity of the housing area. The concessioner maintenance area would remain in its current location, and could potentially expand into the area currently occupied by concessioner employee dormitories.

As in alternative 2, comprehensive redesign of flood control would provide increased safety over current conditions.

### **Actions Common to Alternatives 2 and 3**

**Pedestrian Connections.** New pedestrian connections to areas of interest (for instance, along the shoreline, to and from remote parking areas, visitor service areas, and remote beach areas). In addition, the park would investigate options for providing designated trail access to the beach immediately north of Cottonwood Cove, to reduce resource damage associated with multiple trailing.

### **Flash Flood Mitigation Measures.**

*Overall* — Implement structural and nonstructural flood mitigation measures to protect the public. Improvements were designed to protect public recreation facilities and also protect the health and safety of visitors and employees in overnight areas. Recommendations were designed to remove all developed areas with overnight occupancy from inundation during the 500-year maximum flood. In general, flood mitigation measures would consist of the following components:

- constructing a diversion dike and channel system in Ranger Wash upstream of the developed area to intercept and redirect a majority of flood flows into a parallel wash north of the developed area
- reinforcing and extending existing diversion dikes

- constructing approximately 9,300 ft of concrete-lined channels (up to 52 ft wide at the top)
- constructing a flood deflector wall and concrete swale outlet at the lake
- adding low-flow road crossings and realigning road segments to accommodate flood channels
- maintaining the existing Early Warning Detection System (EWDS), posting flood warning signs, and developing an evacuation plan
- relocating miscellaneous utilities and restoring surfaces

The following text summarizes mitigation measures for specific areas. All dimensions are approximate based on preliminary design estimates (HDR 2004a, 2004b). Design of flood control channels and other measures would be refined in future design development.

*Lower campground channel* — Proposed flood mitigation improvements in the lower campground area would increase the capacity of an existing flood control channel. The proposed improvements consist of

- installing gabions on the existing (earthen) diversion dike at far west end of campground
- constructing approximately 1,500 ft of concrete-lined channel with a concrete cut-off wall at the entrance
- adding erosion protection at both the channel entrance and outfall
- restoring surface and campsite

*Lower access road wash* — The Lower Access Road Wash extends from the lake to the confluence with the Dry Boat Storage Wash, approximately 50 ft west of the Dry Boat Storage Access road. Proposed flood mitigation improvements in this area would increase the capacity of the existing channel and provide a direct flow path across the lower parking lot to the lake. The proposed improvements consist of

- constructing approximately 2,400 ft of concrete-lined channel with a deflection wall at the downstream end
- adding a low-water crossing / concrete swale across the lower parking lot (near the launch ramp)
- adding a low-water crossing where the channel crosses the upper boat storage access road
- adding erosion protection at the parking lot swale outfall
- restoring surfaces along the channel length

**Note:** conceptual dimensions of the proposed Lower Access Road concrete channel include a depth of 6½ ft and a bottom width of 25 ft, with 2:1 side slopes resulting in a top width of 52 ft. As the channel approaches the lower parking lot, the design concept reduces the channel depth to allow large flood flows (e.g., 100 year and pmf flow) to fan out across the parking area.

*Upper access road channel* — The proposed channel for the Upper Access Road Wash extends from the Dry Boat Storage Access road to approximately 1,500 ft west of the ranger station. Proposed improvements in this area create a channel along the north side of the access road to convey flows. A portion of the Upper Access Road basin would continue to be conveyed in the existing channel along the south side of the main campground, which eventually enters the Lower Access Road Channel. Proposed flood mitigation improvements consist of

- modifying the existing dike 1,500 ft west of the ranger station
- constructing approximately 3,400 ft of concrete-lined channel
- relocating approximately 900 ft of the main access road (shifting it south to accommodate the proposed concrete channel)
- adding low-water crossings at the tank access road and at the current NPS housing area access road

**Note:** conceptual dimensions of the proposed concrete channel include a depth of 6½ ft and a bottom width of 20 ft, with 2:1 side slopes resulting in a top width of 46 ft.

*Dry boat storage channel* — The Dry Boat Storage Wash conveys flows from the Ranger Wash basin as an existing diversion dike is located above the NPS housing area that directs flow to the Dry Boat Storage Channel. As described below, a vast majority of the tributary area would be diverted out of this wash with the Ranger Wash diversion. Proposed flood mitigation improvements consist of

- extending the existing diversion dike above the NPS housing area
- constructing approximately 2,000 ft of concrete-lined channel
- relocating approximately 300 ft of the upper boat storage yard gravel access road (shifting it north to accommodate the proposed concrete channel)

**Note:** conceptual dimensions of the proposed concrete channel include a depth of 5 ft and a bottom width of 8 ft, with 2:1 side slopes resulting in a top width of 28 ft.

*Ranger wash diversion* — Currently, the 1.6 square mile ranger basin drains to the Dry Boat Storage Channel. Analysis indicates that this basin alone contributes approximately 8,400 cfs to the developed area of Cottonwood Cove during the pmf event. The proposed Ranger Wash diversion system is located approximately 1/2 mile upstream from the existing diversion dike above the NPS housing area. The diversion system would consist of two diversion dikes and two channels, including

- a trapezoidal dike (20 ft high × 500 ft long) with a diversion channel (200 ft long) constructed by a 40 ft cut through a wash side wall
- a trapezoidal dike (20 ft high × 500 ft long) with a 700 ft long diversion channel constructed by a 60 ft cut through a wash side wall

*Early warning detection system* — Nonstructural flood control mitigation would consist of maintaining the existing Early Warning Detection System, placement of flood warning signs, and development of an evacuation plan. Among other measures, this would include

- replacement warning sirens
- new rain gauges
- a new stream gauge
- upgrades to radio equipment (e.g., repeaters, rain gauge radio transmitters)
- new software systems

*Sustainable design and character* — In alternatives 2 and 3, new design and construction within the project area would reflect the principles of sustainability. Sustainability is a concept that “recognizes that human civilization is an integral part of the natural world and that nature must be preserved and perpetuated if the human community is to sustain itself” (NPS 1994). A sustainable development exemplifies the cohesive integration of buildings, landscape, and the natural environment. At Cottonwood Cove and Katherine Landing, new design would employ appropriate strategies for reducing the environmental impact of new buildings and other facilities. Strategies may include highly efficient mechanical and electrical systems; recycled or locally produced materials; onsite generation of renewable energy; and shielded or downward outdoor lighting.

The approach to plantings would also reflect sustainability principles. As facilities are rehabilitated, replaced, or redesigned, the National Park Service would replace invasive nonnative vegetation with native species that are well suited to the arid climate and that will not pose a threat to the park’s natural resources. Where practical, palms, oleanders, and other exotic species formerly planted in developed areas would be replaced with native equivalents. Tamarisk and other exotic plants also would be replaced in connection with shoreline redevelopment projects at Ski Cove, Cottonwood Cove, or Katherine Landing.

The design of new facilities would also respect scenery as an important visual resource. Wherever possible, new buildings, structures, pavements, site furnishings, and other improvements should employ consistent use of materials, colors, textures, and screening to coordinate each other and harmonize with the natural setting. New and rehabilitated facilities would also accommodate people of all abilities in accordance with federal guidelines and regulations. New facilities would

be designed to minimize impacts on dark skies. For example, building entries, pathways and ramps, accessible parking, and other improvements would adhere to the *Architectural Barriers Act Accessibility Standards for Federal Facilities* and the *Accessibility Guidelines for Outdoor Developed Areas*.

The Cottonwood Cove alternatives are compared in table 1.

**TABLE 1. COTTONWOOD COVE ALTERNATIVES COMPARISON**

<b>Title</b>	<b>Alternative 1: No Action Continue Current Management Trends</b>	<b>Alternative 2: Implement Previous Planning Proposals</b>	<b>Alternative 3: Preferred Enhance Visitor Experience and Park Operations</b>
<b>Summary of Biggest Ideas</b>	<ul style="list-style-type: none"> <li>Retain existing facilities (e.g., motel, campgrounds, marina, trailer village) with minimal changes</li> </ul>	<ul style="list-style-type: none"> <li>New day-use areas (picnic and no-boat areas) in Ski Cove; new spur road to access Ski Cove</li> <li>Trailer village sites would remain or be converted to short-term sites over time</li> <li>Motel expansion, addition of second floor would double capacity</li> <li>Increase parking capacity and allow marina expansion as per the lake management plan</li> <li>Housing and maintenance areas relocated to bluff south of access road</li> <li>Minimal rehabilitation to campgrounds</li> </ul>	<ul style="list-style-type: none"> <li>New day-use areas (picnic and no-boat areas) in Ski Cove, and designated trail to Cottontail Cove; existing day-use areas in Cottonwood Cove remain</li> <li>Trailer village phased out within the next concession contract. Site redeveloped for premier overnight accommodations (RV park or cabin units) managed by concessioner</li> <li>Motel expands; additional structures double capacity and include meeting space (for hosting meetings and other events)</li> <li>Upper campground redeveloped for concessioner and volunteer housing; Volunteer loop is configured for large vehicles with hookups; one loop retained with no changes for visitor camping (tent/car)</li> <li>Maintain character of Mission 66 to the extent possible</li> <li>Use lower campground for picnic uses during the summer months; operate as campground for winter season</li> <li>New paved loop road provides alternate route to motel area, with spur to Ski Cove</li> <li>Increase parking capacity and allow marina expansion as per the lake management plan</li> </ul>
<b>Visitor Orientation and Interpretation</b>		<ul style="list-style-type: none"> <li>New (modest) visitor contact/ranger station near launch</li> <li>Enhance amphitheater setting</li> </ul>	<ul style="list-style-type: none"> <li>Combined commercial services / visitor contact facility would replace existing store and café. Primarily, this would be a commercial services facility, but its design would also incorporate visitor contact and/or interpretive spaces and exhibits. Note that the existing store and café are temporary structures</li> <li>Explore potential for concession staff to provide orientation/interpretation services</li> <li>Integrate new employee picnic facilities into new entrance station along County</li> </ul>

**TABLE 1. COTTONWOOD COVE ALTERNATIVES COMPARISON (CONTINUED)**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2: Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>No-boat Areas</b>	<ul style="list-style-type: none"> <li>Existing no-boat areas at beaches north of the launch ramp and in front of the motel</li> </ul>	<ul style="list-style-type: none"> <li>Relocate no-boat areas to beach at Ski Cove</li> </ul>	<p>Road 164</p> <ul style="list-style-type: none"> <li>Retain existing no-boat areas north of the launch ramp and in front of motel</li> <li>New no-boat area in Ski Cove</li> <li>New fishing pier adjacent the no-boat area north of launch ramp; would be separated from the no-boat area</li> </ul>
<b>Flash Flood Mitigation</b>	<ul style="list-style-type: none"> <li>Maintain existing flood control ditches and earthen dikes</li> <li>Maintain the Early Warning Detection System</li> </ul>	<ul style="list-style-type: none"> <li>Construct engineered system of diversion dikes and concrete channels to convey the 500-year flood</li> <li>Maintain the Early Warning Detection System, install flood warning signs, and develop evacuation plan</li> </ul>	<ul style="list-style-type: none"> <li>Construct engineered system of diversion dikes and concrete channels to convey the 500-year flood</li> <li>Maintain the Early Warning Detection System, install flood warning signs, and develop evacuation plan</li> </ul>
<b>Picnic Area</b>	<ul style="list-style-type: none"> <li>Maintain existing picnic facilities (8 tables per 1 shade shelter, 2 restrooms)</li> </ul>	<ul style="list-style-type: none"> <li>Relocate picnic area to Ski Cove, with additional shelters and tables/grills; configure for group and individual sites</li> </ul>	<ul style="list-style-type: none"> <li>Enhance existing picnic facilities for group and individual sites, with additional shelters and tables/grills</li> <li>Expand day use; new picnic area at Ski Cove; configure for group and individual sites</li> <li>Outdoor dining/gathering areas would be part of enhanced pedestrian plaza in connection with the commercial services/visitor contact facility</li> </ul>
<b>Pedestrian Connections</b>	<ul style="list-style-type: none"> <li>Limited trail opportunities are available for area visitors</li> </ul>	<ul style="list-style-type: none"> <li>New pedestrian connections to areas of interest, especially along the lakefront in the developed areas</li> </ul>	<ul style="list-style-type: none"> <li>New pedestrian connections to areas of interest in the developed area</li> <li>New lakefront pedestrian connections would stretch from Cottontail Cove north to new fishing pier in Cottonwood Cove (new designated trail from Ski Cove to Cottontail Cove)</li> </ul>
<b>Launch Area</b>	<ul style="list-style-type: none"> <li>Retain existing launch ramp (15-lane capacity)</li> <li>Retain existing courtesy dock</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing launch ramp (15-lane capacity)</li> <li>Retain existing courtesy dock</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing launch ramp (15-lane capacity)</li> <li>Consider providing expanded courtesy dock space for visitors if this can be accommodated with minimal operational issues (e.g., extend existing dock to 120 ft or add an additional courtesy dock)</li> </ul>

**TABLE 1. COTTONWOOD COVE ALTERNATIVES COMPARISON (CONTINUED)**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2: Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Upper Campground</b>	<ul style="list-style-type: none"> <li>Maintain existing upper campground (100 sites)</li> </ul> <p><b>NOTE:</b> Restrooms have recently been replaced and/or renovated, and old, ditch irrigation system has been replaced by more efficient drip irrigation.</p>	<ul style="list-style-type: none"> <li>Maintain existing upper campground (100 sites)</li> <li>Adaptively reuse ranger station for campground office</li> </ul>	<ul style="list-style-type: none"> <li>Concessioner would manage entire campground operation</li> <li>Extensively rehabilitate upper campground:</li> <li>Upgrade a portion to house VOLUNTEERS (larger vehicle design; hookups): perhaps 10–12 spaces, depending on need</li> <li>Retain a portion (perhaps 1 loop) without modifications for visitor camping (tent/car)</li> <li>Maintain Mission 66 character to the extent possible</li> <li>Redevelop a portion of campground for concessioner housing</li> <li>All overnight visitor use would be concession operated, including camping</li> </ul>
<b>Lower Campground</b>	<ul style="list-style-type: none"> <li>Maintain existing lower campground (42 individual and 2 group sites)</li> </ul> <p><b>NOTE:</b> Restrooms have recently been replaced and/or renovated, and old, ditch irrigation system has been replaced by more efficient drip irrigation.</p>	<ul style="list-style-type: none"> <li>Maintain existing lower campground (42 individual and 2 group sites)</li> </ul>	<ul style="list-style-type: none"> <li>Use lower campground as picnic area during summer months; operate as campground for winter season</li> <li>All overnight visitor use would be concession operated, including camping</li> </ul>
<b>Marina Services</b>	<ul style="list-style-type: none"> <li>Retain existing marina (approximately 300 slips)</li> <li>Existing fuel/rental dock</li> <li>Existing dry storage</li> <li>Existing convenience store</li> <li>Existing ice house</li> <li>Existing restaurant</li> <li>Existing fuel pumps (land) near ramp</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing marina (expansion to 484 slips)</li> <li>Existing fuel/rental dock</li> <li>Expand dry storage</li> <li>Existing convenience store</li> <li>Existing ice house</li> <li>Expand restaurant</li> <li>Relocate fuel pumps across from ranger station</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing marina (expansion to 484 slips)</li> <li>Existing fuel/rental dock</li> <li>Existing dry storage</li> <li>Combined commercial services / visitor contact facility (retail, restaurant, ice house, concession administration, interpretive space, NPS contact)</li> <li>Maintain fuel pumps</li> </ul>
<b>Overnight Accommodations</b>	<ul style="list-style-type: none"> <li>Existing motel (24-25 units)</li> <li>Existing short-term RV sites (approximately 70 sites)</li> <li>Long-term trailer village sites (223)</li> </ul>	<ul style="list-style-type: none"> <li>Expand existing motel. Additional story would double capacity</li> <li>Existing short-term RV sites (retain number of RV sites at 70, or expand number as trailer village sites are converted to short term)</li> <li>Retain or convert long-term trailer sites to short term</li> </ul>	<ul style="list-style-type: none"> <li>Expand existing motel; additional structure would double capacity (to 50 rooms); design to make motel suitable for meetings, conferences, retreats, and other events (e.g., add meeting space and potentially a courtyard)</li> </ul>

TABLE 1. COTTONWOOD COVE ALTERNATIVES COMPARISON (CONTINUED)

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2: Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
			<ul style="list-style-type: none"> <li>Additional premier accommodations (rental cabins or RV park) would be constructed at current trailer village site (per advice of Dornbusch Associates, retain number of RV sites at 70; and 10 park model cabins [number may increase over time, depending on demand]). Maximum number would be set by site constraints</li> </ul>
<b>Circulation/Access</b>	<ul style="list-style-type: none"> <li>Maintain the main 2-lane paved access spine</li> </ul>	<ul style="list-style-type: none"> <li>Construct new paved access spur road to Ski Cove area</li> <li>Pending flood control design, realign access road (900 linear feet [lf]) and Dry Storage Road (300 lf) to accommodate flood mitigation</li> </ul> <p><b>NOTE:</b> Estimates of lf from HDR, Inc. (HDR 2004a).</p>	<ul style="list-style-type: none"> <li>New launch/ready lane from campground to launch ramp</li> <li>Construct new paved access loop road, providing alternate route to motel area, with spur to Ski Cove area</li> <li>Pending flood control design, realign access road (900 lf) and Dry Storage Road (300 lf) to accommodate flood mitigation</li> </ul> <p><b>NOTE:</b> Estimates of lf from (HDR 2004a).</p>
<b>Parking</b>	<ul style="list-style-type: none"> <li>Maintain existing parking capacity at 731 spaces (paved and unpaved):</li> <li>Total paved/unpaved dps: 301</li> <li>Total paved sps: 129</li> </ul> <p><b>NOTE:</b> Estimates of existing parking capacity are derived from aerial counts of existing stalls.</p>	<ul style="list-style-type: none"> <li>Increase parking capacity as per the lake management plan (322 dps and 500 sps):</li> <li>Additional parking: Formalize unpaved parking areas behind the store and west of launch ramp area; add new parking at Ski Cove, near the ranger station, and potentially the existing NPS housing area (which would be removed)</li> </ul>	<ul style="list-style-type: none"> <li>Increase parking capacity as per the lake management plan (322 dps and 500 sps):</li> <li>Additional parking: Formalize unpaved parking areas behind the store; convert portions of the short-term RV park and trailer village to accommodate expanded marina parking; additional new parking at Ski Cove. As a general rule, pave parking areas where feasible</li> </ul>
<b>Law Enforcement and Emergency Services</b>	<ul style="list-style-type: none"> <li>Existing ranger station (administration)</li> <li>Existing fire station (in maintenance yard)</li> <li>Existing helipad (near NPS housing)</li> </ul>	<ul style="list-style-type: none"> <li>New modest ranger/visitor contact station by boat launch</li> <li>Adapt existing ranger station (primarily administrative in nature) to campground office</li> </ul>	<ul style="list-style-type: none"> <li>Existing helipad, ranger station, and fire station would be retained in current locations (somewhat separated, but still fairly close to one another)</li> <li>In the long term, National Park Service would explore options for dedicated consolidated law enforcement/emergency services center in this general vicinity (near existing ranger station or near housing area)</li> </ul>

TABLE 1. COTTONWOOD COVE ALTERNATIVES COMPARISON (CONTINUED)

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2: Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Concession and NPS Housing</b>	<ul style="list-style-type: none"> <li>Existing concession housing is scattered throughout the developed area in three separate locations (dry storage area and trailer village)</li> <li>Existing NPS housing is near NPS maintenance yard</li> </ul>	<ul style="list-style-type: none"> <li>Relocate National Park Service and concessioner housing to high bluff south of entrance road but maintain as separate areas</li> </ul>	<ul style="list-style-type: none"> <li>NPS housing would remain in current location; rehabilitate or preserve existing structures</li> <li>Relocate concessioner housing to current campground area in order to consolidate concession housing that is currently scattered throughout the developed area</li> </ul>
<b>Maintenance</b> (NPS and Concessioner)	<ul style="list-style-type: none"> <li>Existing concessioner maintenance area</li> <li>Existing NPS maintenance area</li> </ul>	<ul style="list-style-type: none"> <li>Allow concessioner maintenance area to expand into the area currently occupied by concessioner employee dormitories. Relocate and incorporate dormitories into larger concession housing area</li> <li>Relocate NPS maintenance area to high bluff south of road</li> </ul>	<ul style="list-style-type: none"> <li>Allow concessioner maintenance area to expand into the area currently occupied by concessioner employee dormitories. Relocate and incorporate dormitories into larger concession housing area</li> <li>Retain existing NPS maintenance area as is</li> </ul> <p><b>NOTE:</b> There was interest in expanding this area but existing NPS housing would remain in place so space may be limited.</p>
<b>Overhead Lines</b>	<ul style="list-style-type: none"> <li>Certain utilities are carried by way of overhead wires</li> </ul>	<ul style="list-style-type: none"> <li>If feasible, remove overhead wires and bury utilities underground</li> </ul>	<ul style="list-style-type: none"> <li>If feasible, remove overhead wires and bury utilities underground</li> </ul>

### Elements Considered but Dismissed

During the alternatives development process, certain elements initially considered as part of the range of alternatives were dismissed from further consideration. The following list summarizes these elements for Cottonwood Cove and offers a brief summary of the rationale for dismissal.

**Relocation of Marina to Ski and Cottontail Coves.** Rationale for dismissing this element includes the following:

- Separating certain functions and uses — in particular, separating the store/restaurant and launch ramp from the marina — would negatively impact concession operations and visitor experience.
- Extensive facility infrastructure would be required to support a functional marina in this new location — for instance, roads, sizable parking area, fuel service, utilities, and new support buildings. This extensive development would be expensive to build, operate, and maintain, and would result in impacts on natural resources (likely terrestrial and aquatic).
- Limited space is available for parking and other support within Ski or Cottontail Coves, so a marina would probably be infeasible.

**Motel Function Relocated from Lakeshore or Removed Altogether.** Rationale for dismissing this element includes the following:

- The existing motel by the lakeshore is an appropriate and successful component of the current visitor experience.
- The motel is profitable in its current location.

**Conversion of Lower Campground to Year-round Picnic Area.** Rationale for dismissing this element includes the following:

- Conversion would result in cultural resource impacts. The cultural landscape is associated with the Mission 66 period of NPS development and is eligible to the National Register of Historic Places.

Removing camping near the lakeshore at Cottonwood Cove would negatively impact the visitor experience. The demand for day use of this area is in the summer, when camping is in lesser demand; so applying a different management approach (i.e., splitting camping / day use) by season seems to be a better solution.

### **New Law Enforcement / Emergency Service Facility on Current Site of NPS Housing.**

Rationale for dismissing this element includes the following:

- There would be impacts on cultural resources impacts because conversion to this type facility would require removing or transforming contributing historic structures from a property eligible in the National Register.
- There is limited space in this area for this function.

## KATHERINE LANDING ALTERNATIVES

### Narrative Description of Alternatives

**Alternative 1: No Action, Continue Current Management Trends.** The no-action alternative reflects a continuation of current management trends. Under the no-action alternative, all current visitor and support facilities would remain in place, with only minimal changes. See figure 6 at the end of this chapter for a map.

The existing ranger station would be retained in its current location. As a result, it would continue to receive minimal visitation. The National Park Service would continue to operate the campground. The campground would not be redesigned; sites would remain small, and better suited to tent/car camping than to the increasing number of campers who arrive in large recreational vehicles. Occupancy would likely remain low.

The National Park Service would also retain existing picnic facilities, which are located near to the abandoned beach. Many years ago this beach was closed to swimming. No new facilities for day use would be established at Katherine Landing. The existing amphitheater — currently in poor condition — would be retained.

The marina would remain the current size. The concessioner would continue to offer overnight accommodations including approximately 28 short-term RV sites and the existing 50-room motel. Because no major changes are proposed, motel vacancy rates would remain low. The long-term trailer village would be retained.

Primary access to Katherine Landing would remain by way of the existing paved road. For most of its length this road is two lanes, but it widens to three lanes between the intersection with Cabinsite Road and the launch ramp.

The National Park Service would continue to maintain the existing system of ditches and channels.

**Alternative 2: Implement Previous Planning Proposals.** Similar to Cottonwood Cove, the overarching concept for alternative 2 is to implement actions proposed in the general management plan and the lake management plan. At Katherine Landing, these plans provided for a separation of shoreline public use areas and commercial marina facilities, and incorporated flood protection measures to convey and channelize flood flows through the developed area. The lake management plan also established boating capacity on the southern portion of Lake Mohave at current levels; and therefore capped the marina at its current size (824 slips) and set limits on parking. In accordance with this direction, this alternative maintains the current total number of parking spaces across the developed area, although it does propose changes in the location of parking. See figure 7 at the end of this chapter for a map.

The general management plan proposed construction of a new ranger station close to the launch ramp. Alternative 2 addresses this proposal by removing the current ranger station and relocating law enforcement and visitor contact functions to a site south of the launch ramp. This area is currently occupied by the NPS information station (or first aid station). Therefore, this proposal would mean repurposing (and probably expanding) this information station and nearby parking. Although the new ranger station would increase NPS presence along the lakeshore, visitation may remain limited due to its location south of the launch ramp, separated from the

store and restaurant. This has been the case with the current information station.

The site on which the current ranger station stands would be converted to waysides, as proposed in the general management plan. Additional waysides would be constructed at the intersection of Katherine Landing and Cabinsite roads. Potentially, waysides in this location could highlight recreational opportunities that are available at sites to the north of Katherine Landing — Princess Cove, Cabinsite Point, and North and South Arizona Telephone Cove.

Existing picnic facilities and the nearby amphitheater would be removed and the site redeveloped for parking. This change would greatly increase the quantity of parking near to the lakeshore, thereby improving convenience for visitors — most of whom visit Katherine Landing to take advantage of the lake. In order to maintain current parking levels across the developed area, parking lot C, which is located nearly a mile from the lakeshore, would be removed and the site restored.

The National Park Service would continue to operate the campground, which would be minimally modified. New improvements would enhance accessibility, including designing a percentage of sites to be universally accessible. A new amphitheater/outdoor program area would be established in a central location within the campground.

In accordance with the lake management plan, the marina would remain at its current size.

Katherine Landing would continue to offer overnight lodging. The motel would be renovated — or alternately, rehabilitated for a new adaptive use. The general management plan proposed doubling the capacity of the motel. However, a recent study of financial viability for concessions operations (conducted in connection with this plan) indicated that motel occupancy rates are very low and motel expansion is not warranted. Therefore, this alternative retains the motel at its current size (50 units).

The store and restaurant would be expanded on their current sites. This should allow the concessioner to store and offer for sale more

products, and may also address overcrowding during peak periods.

The long-term trailer village would remain or be converted to short-term RV sites over time.

This alternative also proposes changes to support facilities. Temporary structures in the concessioner housing area would be replaced by permanent buildings. The NPS maintenance area and fire station would be relocated away from South Katherine Wash to a bluff northwest of the developed area, near the water treatment plant. The administrative road leading to the treatment plant would be extensively improved to support this increase in use.

In the developed area, the Katherine Landing access road would be retained without major changes.

**Alternative 3: Preferred, Enhance Visitor Experience and Park Operations.** Alternative 3 proposes important changes to facilities in response to changing visitor preferences and to changing circumstances in the surrounding area. New types of overnight accommodations would take the place of outdated forms. Visitor services would be improved. Circulation would be redesigned to alleviate congestion and promote smoother traffic flow for visitors and for staff. See figure 8 at the end of this chapter for a map.

Under alternative 3, the store and restaurant would be rehabilitated or replaced. Some visitor information and exhibit/interpretive space would be incorporated into the redesign. As at Cottonwood Cove, inviting outdoor spaces would also be included, and interpretive signs may also be installed. Outdoor gathering areas could also double for interpretive programs. The park would explore options for concession staff — rather than NPS personnel — to provide interpretation and orientation services if it is financially feasible.

The existing ranger station, which is located far from the lakeshore, would be rehabilitated to house office space for an expanded and redesigned campground (described in the following information).

As in alternative 2, the current picnic and amphitheater area would be converted to paved

parking close to the lakeshore, and lot C would be removed or greatly reduced to maintain available parking within the developed area at current levels.

A new picnic area would be constructed near the lakeshore. This picnic area would be designed so that visitors are physically separated from the water.

The marina would remain the current size. As at Cottonwood Cove, the concessioner would be permitted to adjust the ratio of small (less than 23 ft) to large (greater than 23 ft) slips, provided that the marina continues to offer a number of smaller slips, and thus serves a variety of boaters.

Use of the Katherine Landing motel has dropped. Now, motel occupancy remains low on all but peak weekends. This trend is related to a variety of factors, including the recent economic downturn, cost of lodging, the condition of the motel, and a general decline in park visitation. Another factor is that tourism to nearby Laughlin has dramatically expanded in the years since Katherine Landing was designed and built. Currently, Laughlin provides approximately 5,000 units of overnight lodging (hotel or hotel/casino rooms). This alternative responds to these circumstances by removing the motel function from Katherine Landing. The site would be redeveloped for parking.

As at Cottonwood Cove, the trailer village would be removed. Long-term trailer sites, as they presently exist, with private trailers left on site for the sole and exclusive use of the owners and their guests would be phased out. The majority of that site would be incorporated within an expanded and redesigned campground. As at Cottonwood Cove, the concessioner would manage all campground operations. Some portion of the campground would retain its current configuration for tent/car camping. But a large percentage of the area would be redeveloped for RV sites designed to accommodate views to the lake. Featuring pull-through parking, hookups, and other amenities, these sites would accommodate the large recreational vehicles that are increasingly popular in the recreation area. As at Cottonwood Cove, RV sites would be spaced to allow a degree of separation and privacy. Design may be analogous to the new RV campground at Willow Beach. Campground redesign would

adhere to applicable standards and guidelines of accessibility. The implementation would be completed as it is financially feasible.

Under this alternative, the National Park Service would permit the concessioner to offer other types of accommodations within the campground — for example cabins, “park models” with individual bathrooms, or similar units. The exact mix of accommodations is yet to be determined. A recent financial feasibility study suggested that a mix of these accommodation types could prove financially viable, but recommended a conservative approach to development. The study suggested starting with a modest number of units and gradually building additional units as market conditions could support. The National Park Service would allow site development within physical constraints and may establish an acceptable maximum number (or range) of units.

Currently, National Park Service volunteer sites are scattered throughout Katherine Landing. Under this alternative they would be consolidated. Campground loop D would be established as a new volunteer loop. This would involve redesigning that loop for large RV sites and adding a new laundry/shower facility. Because of the extensive volunteer program in this portion of the park, approximately 25 volunteer sites would be developed.

The NPS maintenance area would remain on the current site. Consolidated NPS offices also would be built in this vicinity. The existing joint NPS/concession housing area would remain in its current location. Residential units may be renovated or replaced as appropriate. Concession housing by the shoreline would be removed and restored, but concession housing in the joint NPS/concession housing area would remain. The lakeshore concession maintenance area would be retained.

From the entrance station to the Cabinsite Road intersection, the Katherine Landing access road would be widened to three lanes, effectively extending the right-turn lane for Cabinsite Road. This change should help alleviate congestion on busy days and facilitate smooth flow of traffic to the launch ramp and areas north of Katherine Landing. As in alternative 2, waysides would be erected at the intersection of Cabinsite and Katherine Landing roads.

The existing road leading to the NPS maintenance area would be upgraded and extended to form a new administrative loop road. This paved loop would serve the consolidated NPS offices, maintenance area, and volunteer loop. Throughout the developed area, additional options for enhancing internal circulation would be explored, to better serve visitors as well as administrative and emergency functions.

Circulation for pedestrians and cyclists would also be expanded, including a bike path to Katherine Landing via the Katherine access road from Highway 68. The National Park Service would establish formal trailheads with designated parking and informational signs for both the Fishermen’s Trail and the Lakeview Trail. Removing concessioner housing from the lakeshore area would support this action.

As in alternative 2, comprehensive redesign of flood control would provide a new level of security for residents (e.g., park and concession employees) and park visitors, including overnight guests.

### **Actions Common to Alternatives 2 and 3**

#### **Flash Flood Mitigation Measures.**

*Overall* — Implement structural and nonstructural flood mitigation measures to protect the public. Improvements were designed to protect public recreation facilities and also protect the health and safety of visitors and employees in overnight areas. These recommendations were designed to remove all developed areas with overnight occupancy from inundation during the 500-year flood. In general, flood mitigation measures would consist of the following components:

- rehabilitating the existing diversion dike (upstream of the developed area) that directs flows from North Katherine Wash around the developed area into South Telephone Cove Wash
- raising, extending, and rehabilitating the existing diversion dike that directs flows from North Katherine Wash into South Katherine Wash
- building new diversion dikes

- using the existing borrow pit as a sediment basin, with a low level outlet and an overflow spillway
- constructing approximately 5,700 ft of concrete-lined channels (up to 65 ft in width at the top)
- providing erosion protection at channel outfalls
- providing concrete-lined low-flow road crossings
- installing an Early Warning Detection System at Katherine Landing; placing flood warning signs and developing an evacuation plan for Katherine Landing and North and South Arizona Telephone Coves
- completing miscellaneous utility relocations and surface restoration

The launch ramp would remain at 8 lanes. However, because the design of flood control may continue to evolve, there exists a possibility that the redesign of the main channel may overlap a portion of the launch ramp and reduce the number of available lanes. Launching at Katherine Landing is very popular, so a reduction in launch capacity would adversely impact visitors. In this event, the National Park Service may explore options for increasing launch capacity elsewhere — for instance by improving the launch ramp and parking at Cabinsite Point or North Arizona Telephone Cove. These actions would only be implemented consistent with capacity levels established by the lake management plan.

The following sections summarize mitigation measures for specific areas. All dimensions are approximate based on preliminary design estimates (HDR 2004a, 2004b). Preliminary design for the flood control structures has been completed (HDR 2004a, 2004b). The conceptual designs include new channels and dikes to intercept and divert a majority of flood flows north of the developed area, and to convey additional pmf flows through the developed area.

*Dry Boat Storage Wash* — Proposed flood mitigation improvements in this area would increase the capacity of an existing channel. The proposed improvements consist of

- constructing approximately 650 ft of concrete-lined channel with a concrete cut-off wall at the entrance
- adding erosion protection at both the channel entrance and outfall
- adding low-flow concrete-lined crossings at the road and the boat storage access
- restoring surfaces

**Note:** conceptual dimensions of the concrete channel include a depth of 6 ft and a bottom width of 12 ft with 2:1 side slopes resulting in a top width of 36 ft.

*South Katherine Wash* — Proposed flood mitigation improvements would increase the capacity of the existing channel and provide a better outlet. The proposed improvements consist of the following:

- using the existing borrow pit as a sediment basin with a low-level outlet and an overflow spillway (the borrow pit would require additional excavation and be enclosed on the west side and a box culvert would meter out 100-year flows and the spillway would address bigger floods)
- constructing approximately 5,050 ft of concrete-lined channel (extending from the borrow pit to the outlet at the lake) with a concrete cut-off wall at the entrance
- adding erosion protection at both the channel entrance and outfall
- adding low-flow concrete-lined crossings at the water tank access and the borrow pit access
- adding a concrete swale section (or alternate solution) at the outlet road area
- restoring surfaces

**Note:** conceptual dimensions of the concrete channel include a depth varying between 8 ft

and 10 ft and a bottom width of 25 ft, with 2:1 side slopes resulting in a top width of 57 ft and 65 ft, respectively.

*South Katherine Wash Outlet* — HDR, Inc. proposed alternate design solutions for the outlet, and these solutions would be reevaluated during future design development. The alternate solutions are as follows:

1. A concrete v-shaped swale overlapping the southern lanes of the boat launch. This swale would be approximately 450 ft in length, with side slopes at 10:1 and 20:1. At a grade of 0.4%, this swale can convey the 100-year flood. (Note: these dimensions are approximate and preliminarily indicate that trailer traffic can adequately cross this swale; however, this geometry should be verified with further design development); or
2. A U-shaped channel and box culvert, with low-water crossing on the road currently leading to the concessioner's maintenance area (instead of the v-shaped swale).

*North Katherine Wash* — Flood flows are conveyed towards Lake Mohave on the north side of the access road. Proposed flood mitigation improvements would provide a better outlet for the flows. The proposed flood mitigation improvements consist of

- constructing a gabion-lined diversion dike to convey flow across the access road to South Katherine Wash
- adding a low-water crossing at access road with a double 6 ft × 6 ft box to convey lower frequency storms

- raising the existing dike east of the south campground and adding gabion protection
- relocating the parking lot entrance
- restoring surfaces

The new dike would be located upstream of the north campground and would divert flows from North Katherine Wash, leaving only local drainage through the current concessioner trailer village and the north campground areas.

*South Telephone Cove Wash* — Flood flows are diverted from North Katherine Wash towards South Telephone Cove Wash by an existing diversion dike. Proposed flood mitigation improvements would provide a better outlet for the flows. The proposed improvements consist of

- rehabilitating the existing diversion dike
- adding a low-water crossing at the county road with downstream protection
- restoring surfaces

*Early Warning Detection System* — Nonstructural flood mitigation would consist of installing an Early Warning Detection System at Katherine Landing. Flood mitigation would also include placement of flood warning signs and development of an evacuation plan for Katherine Landing and North and South Arizona Telephone Coves.

*Sustainable design and character* — See “Actions Common to Alternatives 2 and 3” section in this chapter for Cottonwood Cove.

The Katherine Landing alternatives are compared in table 2.

**TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON**

<b>Title</b>	<b>Alternative 1: No Action Continue Current Management Trends</b>	<b>Alternative 2 Implement Previous Planning Proposals</b>	<b>Alternative 3: Preferred Enhance Visitor Experience and Park Operations</b>
<b>Biggest Ideas</b>	<ul style="list-style-type: none"> <li>• All current facilities (e.g., motel, campgrounds, marina, trailer village) would remain, with only minimal changes</li> <li>• HDR, Inc.'s flood control recommendations would not be implemented</li> </ul>	<ul style="list-style-type: none"> <li>• HDR, Inc.'s flood control recommendations would be implemented</li> <li>• Trailer village would remain or over time be converted to short-term RV sites</li> <li>• Commercial services (but not the marina) would be expanded on their current sites</li> <li>• NPS maintenance would be relocated to a new area on a bluff northwest of the developed area</li> <li>• Maintain/renovate motel or adaptive reuse of motel structure for other use</li> <li>• Campground would be minimally rehabilitated (for Americans with Disabilities Act [ADA] access, etc.)</li> <li>• Increased parking near lake; current satellite lot (C) would be removed</li> </ul>	<ul style="list-style-type: none"> <li>• HDR, Inc.'s flood control recommendations would be implemented to the 500-year flood</li> <li>• Rehabilitate or replace existing store and restaurant. Integrate some visitor orientation/exhibit space and outdoor gathering areas</li> <li>• Motel removed; site redeveloped for greatly expanded visitor parking near lake. Provide other forms of overnight accommodations (see below)</li> <li>• Trailer village phased out within the next concession contract. The site would be redeveloped as part of an expanded, accessible campground that would be concessioner-run and would accommodate larger vehicles (larger sites with pull-through parking and hookups, etc.). Some portion of the campground would retain its current configuration for tent/car camping. Cabins may be part of the mix (exact mix of accommodations to be determined)</li> <li>• Consolidated NPS offices and operations (law enforcement/emergency, interpretation offices, etc.) in the vicinity of the NPS maintenance area</li> <li>• Retain NPS maintenance area in same location</li> </ul>
<b>Flash Flood Mitigation</b>	<ul style="list-style-type: none"> <li>• Maintain existing earthen diversion dikes and channels</li> <li>• Maintain existing reinforced (gabion) channel in places along South Katherine Wash (immediately south of developed area)</li> </ul>	<ul style="list-style-type: none"> <li>• Construct engineered system of diversion dikes, channels, and detention basin to convey pmf flows through North and South Katherine Washes</li> <li>• Install Early Warning Detection System for Katherine Landing</li> <li>• Place flood warning signs and develop an evacuation plan for Katherine Landing and North and South Arizona Telephone Coves</li> <li>• Construction of flash flood mitigation would be phased in, beginning with the highest priority projects</li> </ul>	<ul style="list-style-type: none"> <li>• Same as alternative 2</li> </ul>

**TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Visitor Orientation and Interpretation</b>	<ul style="list-style-type: none"> <li>Maintain existing ranger station with visitor contact (in current location far from the lakeshore)</li> <li>Maintain existing information station by launch ramp (it is often unmanned)</li> <li>Maintain existing entrance station</li> <li>Enhance/replace existing waysides (launch area)</li> </ul>	<ul style="list-style-type: none"> <li>Convert existing ranger station / visitor contact to waysides</li> <li>New modest ranger/visitor contact station by launch (would probably mean rehabilitating the existing information station)</li> <li>Maintain existing entrance station</li> <li>New informational wayside at junction with SR 68</li> <li>Establish new wayside at Cabinsite Road junction</li> <li>Relocate amphitheater to campground area (between campground and new RV park)</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitate or replace existing store and restaurant. Integrate some visitor contact/exhibit spaces in the redesign. Improve lakeshore pedestrian environment with waysides and outdoor gathering/program areas. Explore potential for concession staff to provide orientation/interpretation services</li> <li>Explore potential for development of interagency regional visitor contact facility outside park</li> <li>New informational wayside at junction with SR 68</li> <li>Establish new wayside at Cabinsite Road junction</li> <li>Convert existing ranger station/visitor contact to visitor services and an office serving RV/cabin campground. Transfer maintenance of the campground office to the concessioner</li> <li>Replace temporary booth at entrance station with permanent structure that coordinates with other satellite buildings</li> </ul>
<b>Picnic Area</b>	<ul style="list-style-type: none"> <li>Maintain existing picnic area and facilities (large group shelter adjacent to the abandoned beach area, which is overgrown)</li> </ul>	<ul style="list-style-type: none"> <li>Remove existing picnic area. Implement measures to discourage water access in this area</li> </ul>	<ul style="list-style-type: none"> <li>Establish new picnic area near or along the waterfront (but designed to be physically separated from the water to discourage water access)</li> <li>Outdoor dining/gathering areas would be part of combined commercial services / visitor contact facility</li> <li>Integrate new picnic areas into existing accessible fishing point; also, explore options for additional accessible fishing pier located near the northern portion or the marina (abandoned beach area)</li> </ul>
<b>Trails / Connections</b>	<ul style="list-style-type: none"> <li>Maintain existing trail system, consisting of two informal but well-used trails for accessing the water (Fisherman's and Lakeview Trails); interpretive use focuses on Lakeview Trail</li> </ul>	<ul style="list-style-type: none"> <li>Same as alternative 1, maintain existing trail system, consisting of two informal but well-used trails for accessing the water (Fisherman's and Lakeview Trails); interpretive use focuses on Lakeview Trail</li> </ul>	<ul style="list-style-type: none"> <li>Expand and enhance existing trail system</li> <li>Establish formal trailheads for both Fisherman's and Lakeview Trails</li> <li>New Lakeshore Trail along waterfront</li> <li>If suitable trail corridors can be found, establish additional short trails to access the lake in Katherine Landing vicinity (Katherine</li> </ul>

TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
			Landing to Princess Cove) <ul style="list-style-type: none"> <li>• Ensure safe vehicular/bike/pedestrian access as part of road upgrade</li> </ul>
<b>Launch Ramp Area</b>	<ul style="list-style-type: none"> <li>• Maintain existing launch ramp (eight-lane potential)</li> <li>• Existing courtesy dock (92 ft)</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain 8-lane potential, if main flood channel outlet will allow; extend existing launch ramp for low-water launching (Note: probably not feasible)</li> <li>• Consider extending courtesy dock (to approximately 120 ft)</li> </ul> <p><b>NOTE:</b> If there is a reduction in launch lanes (e.g., if channel cuts off southernmost lanes), coordinate changes in launch capacity with sites to the north (for instance, by improving launch at Cabinsite Point or North Arizona Telephone, or expanding parking at Princess Cove) to align with the lake management plan capacity levels.</p>	<ul style="list-style-type: none"> <li>• Retain existing launch ramp. Maintain 8-lane potential if main flood channel outlet will allow</li> <li>• Consider expanding courtesy dock space for visitors (e.g., extend existing dock) if this can be accommodated with minimal operational issues</li> </ul> <p><b>NOTE:</b> If there is a reduction in launch lanes (e.g., if channel cuts off southernmost lanes), coordinate changes in launch capacity with sites to the north (for instance, by improving launch at Cabinsite Point or North Arizona Telephone, or expanding parking at Princess Cove) to align with the lake management plan capacity levels.</p>
<b>Marina and Commercial Services</b>	<ul style="list-style-type: none"> <li>• Maintain existing marina (824 slips)</li> <li>• Retain existing convenience store (3,162 square feet [sq ft])</li> <li>• Retain existing restaurant</li> <li>• Retain existing land-based fuel pumps</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain existing marina (824 slips)</li> <li>• Expand convenience store capacity (up to double)</li> <li>• Expand restaurant capacity (up to double)</li> <li>• Retain existing land-based fuel pumps</li> <li>• Remove island with ice station</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain existing marina capacity (824 slips)</li> <li>• Permit concessioner to redistribute emphasis from smaller (&lt;2–3 ft) slips to larger (&gt;2–3 ft) slips, provided that it continues to offer a number of smaller slips, ensuring marina is accessible to a wide range of boating public</li> <li>• New shaded pedestrian plaza along the waterfront</li> <li>• Rehabilitate or replace store and restaurant. Integrate some new visitor contact/exhibit space in redesign, including outdoor gathering/dining areas</li> <li>• Maintain land based fuel service</li> </ul>

TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Overnight Accommodations</b>	<ul style="list-style-type: none"> <li>Maintain existing motel (50 units)</li> <li>Retain existing short-term RV park (approximately 28 sites)</li> <li>Maintain existing long-term trailer village sites</li> </ul>	<ul style="list-style-type: none"> <li>Renovate motel but do not increase capacity, or adaptive reuse of motel structure</li> <li>Expand existing short-term RV park into trailer village area, with eventual goal of converting entire trailer village to short-term use</li> </ul> <p><b>NOTE:</b> Although the financial analysis contract analyzed a range of different combinations and numbers of sites (RV /cabins/park models), the exact mix of accommodation types are to be determined.</p>	<ul style="list-style-type: none"> <li>Motel function would cease</li> <li>Overnight accommodations (e.g., premier RV park [pull-through parking, utilities], cabins, park models, or similar) would be integrated into expanded campground, which would be concession managed and would include a large portion of the current trailer village site; exact mix of accommodation types are to be determined</li> </ul> <p><b>NOTE:</b> Although the financial analysis contract analyzed a range of different combinations and numbers of sites (RV /cabins/park models), the exact mix of accommodation types are to be determined). Extent of overnight accommodations would be set by site constraints</p>
<b>Campground</b>	<ul style="list-style-type: none"> <li>Maintain existing campground (171 sites), with slight changes</li> <li>Increase number of volunteer sites</li> </ul> <p><b>NOTE:</b> pedestrian connections to access road have recently been implemented.</p>	<ul style="list-style-type: none"> <li>Rehabilitate campground to accommodate ADA campsites</li> <li>Increase number of volunteer sites</li> <li>Relocate amphitheater to campground; locate and orient away from the access road</li> </ul>	<ul style="list-style-type: none"> <li>Convert existing campground to concessioner-run RV/cabin campground (mix to be determined; see Overnight Accommodations above)</li> <li>Incorporate current trailer village area into the expanded campground footprint</li> <li>Upgrade some existing loops for larger, contemporary vehicles and hookups (i.e., "big-rig ready," with pull-through parking and utility hookups); reduce number of sites to retain footprint of existing loops</li> <li>Retain some portion without modifications for tent camping</li> <li>Establish loop D as volunteer loop with new laundry/shower</li> <li>Add new restroom to loop B</li> <li>Concessioner would manage entire campground operation</li> <li>Convert existing ranger station to campground office and visitor services. Assign to concessioner</li> <li>Relocate amphitheater to campground; locate and orient away from the access road</li> </ul>

**TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Long-term Trailer Village</b>	<ul style="list-style-type: none"> <li>Retain existing long-term trailer village (approximately 104 sites; see Overnight Accommodations and Campground above)</li> </ul>	<ul style="list-style-type: none"> <li>Over time, convert portions of the trailer village to RV park, until the entire village is converted to short term (eventually)</li> </ul>	<ul style="list-style-type: none"> <li>Trailer village function would be removed during the new concession contract. Explore strategies for phased conversion over time</li> <li>Redevelop site for new overnight accommodations (e.g., premier RV park, cabins) and for concession housing</li> </ul>
<b>Dry Storage (boats/trailers)</b>	<ul style="list-style-type: none"> <li>Retain existing dry storage function and area</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing dry storage function and area</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing dry storage function and area for boats and trailers</li> </ul>
<b>Boat Wash</b>	<ul style="list-style-type: none"> <li>Existing boat wash station in boat rental area (for concession operation)</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing boat wash station in boat rental area (for concession operation)</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing boat wash area for concession operation</li> <li>Mobile boat wash area would offer an option for larger boats (parking lot C – north side)</li> </ul>
<b>Circulation and Access</b>	<ul style="list-style-type: none"> <li>On the access road, maintain 250 ft turning lane at Cabinsite Road junction</li> <li>Maintain existing three-lane paved access from Cabinsite Road to launch ramp</li> </ul>	<ul style="list-style-type: none"> <li>On access road, maintain 250 ft turning lane at Cabinsite Road junction</li> <li>Maintain existing three-lane paved access from Cabinsite Road to launch ramp</li> <li>New paved access road from Cabinsite Road to new NPS maintenance area (i.e., significantly upgrade existing unpaved road to water treatment plant)</li> <li>Investigate reservation system</li> <li>Assuming HDR, Inc. flood control design, new low-water crossings in connection with concrete channels (access road west of parking area C, water tank access road, Cabinsite Road)</li> </ul>	<ul style="list-style-type: none"> <li>On access road, extend right turn lane from entrance station to Cabinsite Road</li> <li>Maintain existing three-lane paved access from Cabinsite Road to launch</li> <li>New paved loop serving both north and south areas of the development (housing area to campground loop D)</li> <li>Assuming HDR, Inc. flood control design, new low-water crossings in connection with concrete channels (access road west of park area C, water tank access road, Cabinsite Road), same as alternative 2</li> <li>Explore options for improving site’s internal circulation for emergency access, administration, and visitation</li> </ul>

**TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Parking</b>	<ul style="list-style-type: none"> <li>• Maintain existing parking areas and parking capacity:</li> <li>• Total dps: approximately 525</li> <li>• Total sps: approximately 440</li> </ul> <p><b>NOTE:</b> The lake management plan authorizes 325 sps and 469 dps.</p>	<ul style="list-style-type: none"> <li>• Maintain authorized parking capacity from the lake management plan (325 sps and 469 dps) but locate closer to lakeshore to improve function for users</li> <li>• Convert picnic area / amphitheater to parking to increase parking near lake</li> <li>• Redesign parking near information station to accommodate flood channel (remove if necessary depending on outlet solution)</li> <li>• Probably, following more study of parking, remove or reduce parking area C (shuttle parking) to maintain current total number of parking spaces across the developed area</li> <li>• Better organize and delineate parking throughout (day use versus overnight; sps versus dps, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain authorized parking capacity from the lake management plan (325 sps and 469 dps) but locate closer to lakeshore to improve function for users</li> <li>• Convert motel site to parking (primarily dps) to greatly expand parking for launch ramp and marina</li> <li>• Expand parking (primarily sps) north of access road to serve marina, picnic area, amphitheater, and combined commercial services / visitor contact facility</li> <li>• Probably, following more study of parking, remove or reduce parking area C (shuttle parking) to maintain current total number of parking spaces across the developed area</li> <li>• Better organize and delineate parking throughout (day use versus overnight; sps versus dps, etc.)</li> </ul>
<b>Law Enforcement/ Emergency</b>	<ul style="list-style-type: none"> <li>• Existing ranger / visitor contact station</li> <li>• NPS booking station / government dock</li> <li>• Existing fire station (in housing area)</li> <li>• Emergency helicopters land on launch ramp</li> <li>• Existing fire station in housing area</li> </ul>	<ul style="list-style-type: none"> <li>• New (modest) ranger / visitor contact station by launch</li> <li>• Retain government dock and booking station</li> <li>• Retain first aid station function by launch (most likely at ranger station)</li> <li>• Emergency helicopters would continue to land on launch ramp</li> <li>• Relocate fire station to new NPS maintenance area on bluff</li> </ul>	<ul style="list-style-type: none"> <li>• Law enforcement / emergency functions would be located in consolidated offices in general vicinity of NPS maintenance area with interpretation/maintenance offices</li> <li>• In this area, develop helicopter landing area for medical emergencies, if feasible</li> <li>• Provide covered parking for emergency services vehicles</li> <li>• Retain fire station. Design flood control channel as appropriate</li> <li>• Extend government dock at same location</li> <li>• New paved administrative loop would better serve law enforcement/emergency services</li> <li>• Small parking area adjacent to launch ramp would be converted to helipad and/or emergency parking</li> <li>• Retain first aid function at current building near boat launch</li> </ul>

**TABLE 2. KATHERINE LANDING ALTERNATIVES COMPARISON (CONTINUED)**

<b>Title</b>	<b>Alternative 1: No Action Continue Current Management Trends</b>	<b>Alternative 2 Implement Previous Planning Proposals</b>	<b>Alternative 3: Preferred Enhance Visitor Experience and Park Operations</b>
<b>NPS Housing</b>	<ul style="list-style-type: none"> <li>Existing NPS/concessioner joint housing area</li> <li>A few volunteer spaces are accommodated within the housing area and the campground</li> </ul>	<ul style="list-style-type: none"> <li>Maintain existing joint NPS/concessioner housing</li> </ul>	<ul style="list-style-type: none"> <li>Existing joint NPS/concessioner housing area would remain in the same location</li> <li>Rehabilitate existing NPS housing</li> <li>Convert campground loop D to volunteer trailer court</li> </ul>
<b>Concession Housing</b>	<ul style="list-style-type: none"> <li>Existing concessioner housing is concentrated in two locations: the joint NPS/concessioner housing area and the concessioner area near the boat rental operation</li> </ul>	<ul style="list-style-type: none"> <li>Maintain existing joint NPS/concessioner housing area</li> <li>Replace trailers in the shoreline concession area (near the boat rental area) with permanent structures and screen from view: build dorm and single family housing</li> </ul>	<ul style="list-style-type: none"> <li>Concession housing by the shoreline would be removed and restored while the concession housing in the joint NPS/concessioner housing area would remain</li> </ul>
<b>NPS Maintenance Area</b>	<ul style="list-style-type: none"> <li>Maintain existing NPS maintenance area, which is screened from public view by a natural topographic feature</li> </ul>	<ul style="list-style-type: none"> <li>Relocate NPS maintenance area to a new area on a bluff northwest of the developed area; provide access via paved spur road</li> </ul>	<ul style="list-style-type: none"> <li>Maintain existing NPS maintenance area. Integrate with new NPS administrative offices, law enforcement, and emergency services in this general location</li> </ul>
<b>Concession Maintenance Area</b>	<ul style="list-style-type: none"> <li>Existing concessioner maintenance area is located near the boat rental area</li> </ul>	<ul style="list-style-type: none"> <li>Expand in existing concessioner maintenance area if necessary and feasible (not much room; most likely not feasible)</li> </ul>	<ul style="list-style-type: none"> <li>Maintain existing concessioner maintenance area. Preserve the public character of new adjacent trailhead if the expansion of maintenance into the current lakeshore concessioner housing area becomes necessary</li> </ul>

### Elements Considered but Dismissed

During the alternatives development process, certain elements initially considered as part of the range of alternatives were dismissed from further consideration. The following list summarizes these elements for Katherine Landing and offers a brief summary of the rationale for dismissal.

#### Marina Reconfigured and Boat Launch

**Relocated.** Rationale for dismissing this element includes the following:

- This idea was proposed to provide enough space to accommodate the boat launch and the outlet for the flood control channel for Katherine Wash. Initially it was unclear whether the proposed conceptual design for flood channel (HDR 2004b) would allow boat launch function to continue in this location.
- This would require extensive facilities infrastructure development. Analysis indicates that the cost to construct the new boat launch and related facilities would be very high.
- Relocating the boat launch is likely to result in adverse environmental impacts.
- Further flood control design is necessary and pending; however, it is believed that a solution could be reached that would reduce the size of the outlet and allow the boat launch to remain.

**Expansion of Motel.** Rationale for dismissing this element includes the following:

- Financial analysis indicates that motel expansion would be financially infeasible. Motel occupancy rates are very low so expansion is not warranted.
- National Park Service Management Policies state that concession facilities must be necessary and appropriate. One of the factors for determining whether a concession facility is necessary and appropriate is an analysis of whether a commercial operation can be provided outside park boundaries. Due to the significant presence of affordable lodging facilities located immediately outside the park in Bullhead City, Arizona and Laughlin,

Nevada, within easy driving distance of Katherine Landing, overnight accommodations are no longer necessary and appropriate at Katherine Landing.

- Expansion was proposed by the general management plan. Because this specific proposal was not feasible, it was adjusted in the corresponding alternative (alternative 2).

**Reuse Motel Structures for NPS Administration.** Rationale for dismissing this element includes the following:

- This element does not appear to be a good location for this type of facility. Administrative and support functions would require a substantial footprint. Public use occurs in the immediate surroundings. There is a conflict between these types of uses (for example, emergency access difficulties).

### KATHERINE LANDING VICINITY ALTERNATIVES (PRINCESS COVE, CABINSITE POINT, AND NORTH AND SOUTH ARIZONA TELEPHONE COVE)

#### Narrative Description of Alternatives

##### Overview of the Entire Range of Alternatives.

The planning team developed alternatives to test different options for visitor opportunities, access, and emergency services at Princess Cove, Cabinsite Point, and North and South Arizona Telephone Cove. Existing facilities were reviewed and the need for changes was assessed, with the goal of maintaining a variety of recreational settings across these four sites.

The team also reviewed direction contained in the lake management plan. This plan had determined that recreational boating on the southern portion of Lake Mohave (i.e., from Princess Cove south) was at or exceeding capacity for safety and visitor enjoyment. It therefore directs park managers *not* to implement measures that would cause recreational boating on this portion of the lake to rise — such as adding new parking areas or launch lanes. The plan even recommends exploring closing an existing launch at South Arizona Telephone Cove or Cabinsite Point.

**Alternative 1: No Action, Continue Current Management Trends.** The no-action alternative

reflects a continuation of current management. No changes to facilities are proposed. See figure 9 at the end of the chapter for a map.

**Alternative 2: Implement Previous Planning Proposals.** Alternative 2 reflects past proposals from established plans. For instance, it proposes closing Cabinsite Point to launching, per the lake management plan, and exploring options for an entirely new access road to North and South Arizona Telephone Cove, as reflected in the general management plan. (It also presents some new ideas to allow park managers to test out a full range of options.) See figure 10 at the end of the chapter for a map.

**Alternative 3: Enhance Visitor Experience and Park Operations (Preferred Alternative).** Alternative 3 is consistent with established direction but proposes some new changes to enhance visitor experience and improve access and emergency services. For instance, it includes new picnic facilities at Cabinsite Point, a new helipad at Princess Cove, and reconfiguring the intersection of Cabinsite Point and Princess Cove roads. See figure 11 at the end of the chapter for a map.

The Katherine Landing vicinity alternatives are compared in table 3.

## ESTIMATED COSTS

Capital improvement costs were also a consideration in the selection of the preferred alternative. The following cost estimates were developed to inform decision making at the preferred alternative workshop. To the extent possible, the National Park Service and industry cost estimating guidelines were used to develop the figures, which describe anticipated costs in 2010 dollars.

The cost estimates integrate figures from the following three different sources:

- NPS personnel developed costs for NPS visitor and support facilities — for example, orientation and interpretation facilities, day-use areas, roads and parking, and NPS maintenance and housing areas. These costs were developed using the agency’s Current Replacement Value (CRV) calculator.
- The National Park Service contracted the financial consulting firm Dornbusch Associates to analyze the financial viability of the draft alternatives for concessions operations. As part of this contract, Dornbusch prepared class C construction cost estimates for facilities that could potentially be funded by a concessioner. These include commercial visitor facilities (e.g., marinas, stores, motels, and other overnight accommodations) and support facilities (e.g., concessioner housing or maintenance areas).
- Costs for flood control measures were derived from figures reported by HDR, Inc. in the structural flood mitigation reports prepared for the National Park Service in 2004. An inflation factor was applied to update these costs to 2010 dollars. These amounts were for a PMF event. When final design is completed, the cost will be for a 500-year structural protection.

To develop the estimates, general assumptions were made regarding the extent of the work to be undertaken. The cost figures identified in this document enabled the planning team to compare the projected magnitude of costs across alternatives (see table 4). However, the estimates are at a class C (general and preliminary) level and therefore should not be used for budgetary purposes. These figures are not intended to replace more detailed consideration of design program and final construction estimates.

**TABLE 3. KATHERINE LANDING VICINITY ALTERNATIVES COMPARISON**

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Princess Cove</b>			
<b>Access</b>	<ul style="list-style-type: none"> <li>Maintain paved access road</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Retain paved access road, same as No Action; <i>plus</i> reconfigure intersection with Cabinsite Road to a “T” intersection, establishing Princess Cove as the primary through route</li> </ul>
<b>Parking</b>	<ul style="list-style-type: none"> <li>Paved parking area (approximately 100 dps and 50 sps need to confirm) (lake management plan assumes 100 dps)</li> <li>Informal gravel overflow lot (approximately 50 dps) used during peak periods</li> </ul>	<ul style="list-style-type: none"> <li>Retain paved parking area</li> <li>Disallow use of overflow area to enforce capacity defined by the lake management plan (would likely require reservation system or increased law enforcement)</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing paved parking area and existing unpaved overflow</li> </ul> <p><b>NOTE:</b> In the event that launch capacity at Katherine Landing is reduced due to flood control design, park may consider paving and formalizing more of this overflow area).</p>
<b>Boat Launch</b>	<ul style="list-style-type: none"> <li>Maintain existing concrete boat ramp (8-lane capacity)</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>
<b>Picnic/Camping</b>	<ul style="list-style-type: none"> <li>Maintain existing picnic area (6 shelters, vault toilet, 6 sps)</li> <li>Continue to allow backcountry camping nearby, off 4x4 road</li> </ul>	<ul style="list-style-type: none"> <li>Maintain existing picnic facilities, same as no-action alternative</li> <li>Disallow backcountry camping off nearby 4x4 road</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative, retain existing picnic facilities</li> <li>Continue to allow backcountry camping nearby, off 4x4 road just north of Princess Cove</li> </ul>
<b>Emergency Services</b>	<ul style="list-style-type: none"> <li>No facilities</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Establish helipad for emergency evacuations</li> </ul>
<b>Cabinsite Point</b>			
<b>Access</b>	<ul style="list-style-type: none"> <li>Retain existing paved access road</li> </ul>	<ul style="list-style-type: none"> <li>Retain access road, same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Retain access road, same as no-action alternative</li> </ul>
<b>Parking</b>	<ul style="list-style-type: none"> <li>Existing parking would remain informal and unpaved, occurring on a series of benches that terrace to lake, but separated from lakeshore</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing unpaved parking; plus allow for additional parking at some of the former cabin sites</li> </ul>
<b>Boat Launch</b>	<ul style="list-style-type: none"> <li>Retain unimproved shallow launch, which works well for low level of use</li> </ul>	<ul style="list-style-type: none"> <li>Close site to launching</li> <li>Do not permit motorized boats to beach</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative, retain unimproved shallow boat launch</li> </ul>
<b>No Boat Areas</b>	<ul style="list-style-type: none"> <li>Very small designated no-boat area just north of launch zone</li> </ul>	<ul style="list-style-type: none"> <li>Enlarge no-boat area to include popular SCUBA destination</li> </ul>	<ul style="list-style-type: none"> <li>Retain small no-boat area, same as no-action alternative</li> </ul>
<b>Picnic</b>	<ul style="list-style-type: none"> <li>Continue to manage as backcountry site with no formal picnic areas (users picnic informally; erect own shade shelters)</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Develop designated picnic facilities including picnic tables and group/individual shade shelters; do not provide drinking water, provide appropriate restroom facilities (vault toilet)</li> </ul>

TABLE 3. KATHERINE LANDING VICINITY ALTERNATIVES COMPARISON (CONTINUED)

Title	Alternative 1: No Action Continue Current Management Trends	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Camping</b>	<ul style="list-style-type: none"> <li>No camping in area</li> </ul>	<ul style="list-style-type: none"> <li>Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>Backcountry camping would be allowed at some former cabin sites</li> </ul>
<b>North and South Arizona Telephone Cove</b>			
<b>Access</b>	<ul style="list-style-type: none"> <li>Access roads to both sites are graded, unpaved and located in washes</li> </ul>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – If feasible, construct new paved access road on higher ground between North and South Arizona Telephone Coves</li> <li>South Arizona Telephone Cove – If feasible, construct new paved access road on high ground south of wash</li> </ul> <p><b>NOTE:</b> New access road proposed by the general management plan may not be feasible, given that access roads have been constructed in the wash.</p>	<ul style="list-style-type: none"> <li>Both North and South Arizona Telephone Coves – Design access roads to eliminate or greatly reduce exposure to flood hazards</li> </ul>
<b>Parking</b>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Maintain existing unpaved parking area and earthen berms to separate parking from beach and delineate launch access (approximately 230–250 dps)</li> <li>South Arizona Telephone Cove – Retain paved parking area (approximately 27 dps, 8 sps)</li> </ul>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Same as no-action alternative</li> <li>South Arizona Telephone Cove – Retain paved parking area, same as no-action alternative, plus expand to south of cove, if needed (probably southeast of existing parking, based on site constraints)</li> </ul>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Retain unpaved parking area, same as no-action alternative</li> <li>South Arizona Telephone Cove – Retain paved parking area, same as no-action alternative</li> </ul>
<b>Boat Launch</b>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Continue to allow boat launching under “backcountry lake access site” conditions; launch is informal, gravel, shallow, two-lane capacity</li> </ul>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Establish concrete two-lane launch ramp to improve ease of launch</li> </ul> <p><b>NOTE:</b> This would differ from the general management plan but the overall approach to satellite areas is consistent with the lake management plan, and the team used the alternatives to try out a range of options for each site.</p>	<ul style="list-style-type: none"> <li>North Arizona Telephone Cove – Same as no-action alternative</li> </ul> <p><b>NOTE:</b> If launch capacity at Katherine Landing is reduced due to flood control design (e.g., if new/improved channel cuts off southernmost lanes), the park might consider improving the launch at North Arizona Telephone Cove or at Cabinsite Point, to align with established capacity levels set by the lake management plan: for example, pave/extend launch ramp or increase number of launch lanes.</p>
<b>No-boat Areas</b>	<ul style="list-style-type: none"> <li>South Arizona Telephone Cove – Retain as designated no-boat area, providing safe and comfortable setting for swimming and other non-motorized activities</li> <li>North Arizona Telephone Cove – No designated no-boat area</li> </ul>	<ul style="list-style-type: none"> <li>South Arizona Telephone Cove – Same as no-action alternative</li> <li>North Arizona Telephone Cove – Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>South Arizona Telephone Cove – Same as no-action alternative</li> <li>North Arizona Telephone Cove – Same as no-action alternative</li> </ul>

**TABLE 3. KATHERINE LANDING VICINITY ALTERNATIVES COMPARISON (CONTINUED)**

<b>Title</b>	<b>Alternative 1: No Action Continue Current Management Trends</b>	<b>Alternative 2 Implement Previous Planning Proposals</b>	<b>Alternative 3: Preferred Enhance Visitor Experience and Park Operations</b>
<b>Picnic</b>	<ul style="list-style-type: none"> <li>• South Arizona Telephone Cove – Maintain designated picnic facilities (two vault toilets, six single site shelters)</li> <li>• North Arizona Telephone Cove – No formal picnic facilities</li> </ul>	<ul style="list-style-type: none"> <li>• South Arizona Telephone Cove – Same as no-action alternative</li> <li>• North Arizona Telephone Cove – Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>• South Arizona Telephone Cove – Same as no-action alternative</li> <li>• North Arizona Telephone Cove – Establish developed picnic area with tables, grills, and shelters, provide appropriate restroom facilities (vault toilet)</li> </ul>
<b>Camping</b>	<ul style="list-style-type: none"> <li>• Continue to prohibit camping</li> </ul>	<ul style="list-style-type: none"> <li>• Same as no-action alternative</li> </ul>	<ul style="list-style-type: none"> <li>• Same as no-action alternative</li> </ul>

TABLE 4. COST ESTIMATES

	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Cottonwood Cove</b>		
Flash Flood Control	\$12,768,000	\$12,768,000
Orientation and Visitor Contact Facilities	\$310,519	\$0 <sup>a</sup>
Commercial Services Facilities	\$822,854	\$1,807,837
Marina Expansion	\$3,026,513	\$3,026,513
Administration and Support Facilities (National Park Service and concessioner)	\$6,980,813	\$3,210,603
Day-use Areas (Cottonwood Cove, Ski Cove, and/or Cottontail Cove)	\$1,289,268	\$1,777,299
Overnight Accommodations (motels, RV park, camping, etc.)	\$9,254,723	\$9,254,723
Long-term Trailer Village (demolition)	\$960,000	\$960,000
Road Construction	\$2,833,150	\$2,305,118
Parking	\$4,088,055	\$4,088,055
<b>TOTAL – Cottonwood Cove</b>	<b>\$42,333,895</b>	<b>\$39,198,148</b>
<b>Katherine Landing</b>		
Flash Flood Control	\$9,419,035	\$9,419,035
Visitor Orientation and Interpretation Facilities	\$1,125,000	\$337,774 <sup>b</sup>
Commercial Services Facilities	\$1,299,382	\$926,199
Picnic Areas, Fishing Piers, Gathering Areas, Pedestrian Plazas	\$8,837	\$792,643
Trails	\$0	\$82,523
Launch Ramp, etc.	\$1,640,595	\$0
Marina	\$0 <sup>c</sup>	\$0 <sup>d</sup>
Motel (renovation, demolition, etc.)	\$2,500,000	\$350,753
Other Overnight Accommodations (campgrounds, RV park)	\$2,078,608	\$3,154,180
Long-term Trailer Village (demolition)	\$520,000	\$520,000
Boat Wash Station	\$0	\$5,000
Road Construction	\$875,167	\$1,051,651
Parking	\$3,820,938	\$3,820,938
NPS Administration Facilities (including Law Enforcement / Emergency Services)	\$0 <sup>e</sup>	\$2,105,031
National Park Service and Concessioner Housing	\$1,212,953	\$1,713,465
National Park Service and Concessioner Maintenance Areas	\$1,721,099	\$469,421
<b>TOTAL – Katherine Landing</b>	<b>\$26,221,614</b>	<b>\$24,748,613</b>
<b>Katherine Landing Vicinity (Princess Cove, Cabinsite Point, North and South Arizona Telephone Cove)</b>		
<b>Princess Cove</b>		
Access	0	\$339,935
Emergency Services Facilities (i.e., helipad)	0	146,194
<b>Subtotal – Princess Cove</b>	<b>\$0</b>	<b>\$486,129</b>

TABLE 4. COST ESTIMATES (CONTINUED)

	Alternative 2 Implement Previous Planning Proposals	Alternative 3: Preferred Enhance Visitor Experience and Park Operations
<b>Cabinsite Point</b>		
Access	\$0	\$0
Boat Launch (changes)	\$10,000	\$0
No-boat Area (changes)	\$10,000	\$0
Picnic Facilities	\$0	\$387,000
<b>Subtotal – Cabinsite Point</b>	<b>\$20,000</b>	<b>\$387,000</b>
<b>North and South Arizona Telephone Cove</b>		
Access – North	\$1,333,080	\$533,232
Access – South	\$2,110,710	\$710,976
Parking – North	\$0	\$0
Parking – South	\$473,842	\$0
Boat Launch – North	\$282,968	\$0
Picnic Facilities – North	\$0	\$298,550
<b>Subtotal – North and South Arizona Telephone Cove</b>	<b>\$4,200,600</b>	<b>\$1,542,758</b>
<b>SUBTOTAL – Princess Cove, Cabinsite Point, North and South Arizona Telephone Cove</b>	<b>\$4,220,600</b>	<b>\$2,415,887</b>

**Notes:**

- The Visitor Contact Facility costs (i.e., commercial/visitor services facility) are included under Commercial Services Facilities.
- The Visitor Contact Facility costs (i.e., rehabilitated store and restaurant) are included under Commercial Services Facilities.
- Estimate does not include \$7.6 million in deferred maintenance.
- Estimate does not include \$7.6 million in deferred maintenance.
- The New Ranger Station costs are included under Visitor Orientation and Interpretation Facilities.

## ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferable alternative in its NEPA documents for public review and comment. Guidance from the CEQ states the environmentally preferable alternative is “the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

The NPS has identified alternative 1, the no-action alternative, as the environmentally preferable alternative. Although the other alternatives would greatly improve visitor experience and safety, overall, alternative 1 would result in the least damage to the biological and physical environment and best protect and preserve cultural resources among the alternatives. Alternative 1 would leave the existing facilities in place, essentially maintaining conditions at status quo, resulting in minor

additional impacts from facility maintenance and visitor use. There would be no new impacts to cultural resources and they would continue to be managed similar to existing practices. As a result, after completing the environmental analysis, the NPS identified the no-action alternative as the environmentally preferable alternative and the alternative that best meets the definition established by the CEQ.

## CONSISTENCY OF THE ALTERNATIVES WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) requires an analysis of how each alternative meets or achieves the purposes of the act, as stated in section 101(b). Each alternative analyzed in a NEPA document must be assessed as to how it meets the followings purposes:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.

2. Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural and natural aspects of our national heritage, and, wherever possible, maintain an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Taken as a whole, alternative 3 would best satisfy the above goals. Goals 2, 3, and 4 are most pertinent to this analysis.

**Goal 2.** Alternative 3 best “assures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.” During the evaluation of the draft alternatives, alternative 3 consistently rated highest under the “visitor and staff safety” factor. This alternative would provide an added measure of protection from flash floods for residents (e.g., National Park Service and concessioner staff) and visitors staying overnight.

Improvements to circulation would also yield benefits to safety. These improvements include the following: the new loop road at Cottonwood Cove, the extended right-turn lane for the Cabinsite Road at Katherine Landing, the reconfigured intersection of Cabinsite and Princess Cove roads, new administrative roads at Katherine Landing, and increased and better organized parking convenient to the water. These improvements should reduce accidents, improve emergency access, and alleviate visitor frustration with long launch lanes and wait times. Currently, this frustration leads to conflicts between visitors — occasionally even to physical fights. The improved NPS visitor contact near the lakeshore

should prove beneficial to visitor safety. While some new areas would be developed, overall the aesthetic qualities of the environment would be enhanced. New facilities would be designed to coordinate with each other and harmonize with the surrounding lands through appropriate use of siting, materials, and other design elements. In time, existing temporary (i.e., “butler-style”) buildings would be phased out in favor of permanent structures. For example, at Cottonwood Cove new structures could feature stylistic elements that respond to the architectural features of the existing motel. The new combined commercial / visitor services facility could be sited to physically align with the motel. Redesign should promote a more unified aesthetic environment at the waterfront. Removing overhead wires and burying utilities would also be an aesthetic enhancement.

**Goal 3.** Alternative 3 best achieves goal 3 because it represents the widest range of beneficial uses. Alternative 3 preserves the same general uses that are present today (e.g., camping, lodging/overnight accommodations, day use, interpretation) but it adds new visitor opportunities that are more responsive to contemporary visitor preferences. For example, in alternative 3, the concessioner would provide a greater number and quality of RV sites, with bigger, accessible spaces, pull-through parking, and other modern features. At Katherine Landing, the motel — that does not perform well — would be replaced by these and other forms of accommodations, such as cabins or “park models.”

**Goal 4.** Resource condition was one of the factors on which the alternatives were evaluated at the preferred alternatives workshop. This factor is associated with goal 4 since it addresses the impacts of proposals on both natural and cultural resources. The no-action alternative generally performed best under this category because no previously undeveloped sites would be developed, thus limiting damage to natural resources (e.g., habitats, water quality) and cultural resources (including historic structures and cultural landscape features and patterns associated with Mission 66 design and construction). By contrast, alternatives 2 and 3 both propose changes that would result in some adverse impacts on natural and cultural resources. On the other hand, both

action alternatives also contain elements to mitigate these impacts — for instance, replacing exotic oleanders and palms that currently cause resource damage with native species that are compatible with the cultural landscape.

Alternative 3 best promotes “diversity and variety of individual choice.” It greatly expands options for shoreline day use. For example, new picnic and no-boat areas in Ski and Cottontail Coves would offer another option for beach users — an alternative to Cottonwood Cove, which is comparatively congested. Alternative 3 provides an option for visitors to fish at a designated pier in Cottonwood Cove and also gives visitors new choices for overnight accommodations. Furthermore, new loop roads and other circulation improvements would provide visitors and staff greater choices for navigating through developed areas.

## MITIGATION MEASURES

Mitigation measures are specific actions designed to reduce, minimize, or eliminate impacts of alternatives and to protect Lake Mead National Recreation Area resources and visitors. Monitoring activities are actions to be implemented during or following project implementation to assess levels of impact. The following measures relate to construction activities and facility operation would be implemented under all applicable alternatives and are assumed in the analysis of effects for each alternative.

### Vegetation and Soils

To minimize impacts on vegetation and soils and to prevent the introduction and minimize the spread of exotic vegetation and noxious weeds, the following mitigation measures would be incorporated into the action alternatives:

- Topsoil would be collected and stockpiled from construction areas. Upon completion of construction, topsoil would be placed in disturbed areas to enhance the recovery of native vegetation and reduce erosion.
- Construction equipment would be pressure-washed prior to entering the park to ensure it is free of foreign soils and plant material.

- Vegetation salvage would occur within project boundaries as deemed appropriate by NPS resource managers. Salvaged plants would be stored at the park’s native plant nursery and used to revegetate the project site.
- Disturbed areas would be monitored for two to three years following construction to identify exotic vegetation. Remedial or control of exotic vegetation would be completed in accordance with the recreation area’s exotic plant management plan.
- Staging for a construction office, construction vehicles and equipment, and materials storage would be located in previously disturbed areas, outside of high visitor use areas, and would be clearly identified in advance.

### Special Status Species

To minimize impacts on special status species, the following mitigation measures would be incorporated into the action alternatives:

- Construction activities would comply with all applicable conservation measures and terms and conditions contained in the 2002 and 2010 programmatic biological opinions (USFWS 2002a and 2010) for the federally listed Mohave desert tortoise and its critical habitat, the Southwestern willow flycatcher, the bonytail chub and its critical habitat, and the razorback sucker and its critical habitat, and the 2005 biological and conference opinion for the Lower Colorado River Multi-Species Conservation Program (see appendix B). A number of the mitigation measures identified for listed species, such as proper trash disposal, would also benefit wildlife and wildlife habitat in general.
- Burrowing owl and banded Gila monster habitat is present in the area surrounding the developed areas. Project areas would be surveyed for burrowing owls prior to construction. Any identified burrows would be avoided until after the young fledged or collapsed while unoccupied. To minimize potential impacts on banded Gila monsters, any found within a construction area would be captured and relocated by a qualified biologist.

- Based on the Migratory Bird Treaty Act of 1918, land clearing or other surface disturbance would be conducted outside the avian breeding season or have a qualified biologist survey the area prior to clearing. If a migratory bird nest were found with nestlings present, impacts would be avoided until birds fledge.

### **Water and Air Quality**

To minimize impacts on water and air quality, the following mitigation measures would be incorporated into the action alternatives:

- A National Pollutant Discharge Elimination System (NPDES) permit would be obtained and a stormwater pollution prevention plan prepared as required for specific projects. Any activities involving dredging or the placement of fill material in waters of the United States would comply with requirements of section 404 and 401 of the Clean Water Act and with other applicable state permit programs.
- Best management practices (earthen berms, silt fences, etc.) would be implemented to keep stormwater runoff sediments from entering Lake Mohave from construction areas. All erosion control materials such as straw bales must be certified as weed free.
- Best management practices would be in place during refueling and other activities that may release hazardous materials into the environment. A hazardous spill plan would be developed prior to construction projects.
- Marina operators would be required to follow the Best Management Practices, Watercraft and Marina Operations, Dry Boat Storage, and Boat Repair Services for the Lake Mead National Recreation Area.
- Dust abatement measures would be developed to minimize impacts on air quality during construction activities.

### **Visitor Experience and Safety**

To minimize impacts on visitor experience and safety, the following mitigation measures would be incorporated into the action alternatives:

- Barricades, construction fencing, signs, or other measures as appropriate would be used around construction areas to discourage visitors from entering construction areas.
- Construction work will be conducted to avoid peak visitor use times (i.e., weekends, holidays) to the extent practical to minimize inconveniences to park visitors.
- Public information regarding implementation of projects located in public areas would be made available.
- An informational brochure or flyer about the projects could be produced and distributed at the entrance station or other on site facilities and sent to those with reservations at park facilities, postings on the area's website, press releases, and/or other methods.
- Facilities would be accessible to visitors, including those with disabilities, in compliance with federal standards.

### **Visual Quality**

To minimize impacts on visual quality, the following mitigation measures would be incorporated into the action alternatives:

- The design of the buildings and other structures shall, to the extent possible, use materials, colors, textures, screening, landscaping, and native vegetation in order to blend into the natural setting and harmonize with surrounding buildings.
- Structures would be sited and sized so that they do not compete with views and vistas and are incorporated into the surrounding landscape.
- In order to blend into the surrounding landscape, cut and fill slopes would be rounded and topsoil would be salvaged and placed on the roughened and contoured slopes.

### **Cultural Resources**

The National Park Service would preserve and protect, to the greatest extent possible, resources that provide evidence of the human occupation of

project areas. Mitigative measures intended to reduce or eliminate adverse effects to cultural resources could include the following:

- Continue to develop inventories for and oversee research about archeological, historical, and ethnographic resources to better understand and manage the resources. Continue to manage cultural resources and collections following federal regulations and NPS guidelines.
- Subject projects to site-specific planning and compliance. Make efforts to avoid adverse impacts through adherence to the Secretary of the Interior's *Standards for Archeology and Historic Preservation, Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*, and *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.
- Make use of screening and/or sensitive design that would be compatible with historic resources. Consult with the Arizona and Nevada State Historic Preservation Offices as needed. If adverse impacts could not be avoided, mitigate these impacts through a consultation process with all interested parties.
- Inventory all unsurveyed areas in the recreation area for archeological, historical, and ethnographic resources as well as cultural and ethnographic landscapes.
- Document cultural and ethnographic landscapes in the recreation area and identify treatments.
- Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible.
- Avoid or mitigate impacts to ethnographic resources. Mitigation would include continuing to provide access to traditional use and spiritual areas and screening new development from traditional use areas.
- Continue ongoing consultations with culturally associated American Indian people. Protect sensitive traditional use areas to the extent feasible.
- Wherever possible, locate projects and facilities in previously disturbed or existing developed areas.
- Design facilities to avoid known or suspected archeological resources.
- If previously unknown cultural resources are discovered during project work, cease all work in the area until the site can be evaluated by a qualified person and appropriate treatment can be implemented.
- Encourage visitors through the park's interpretive programs to respect and leave undisturbed any inadvertently encountered archeological resources and to respect and leave undisturbed any offerings placed by American Indians.
- Strictly adhere to NPS standards and guidelines on the display and care of artifacts, including the U.S. Department of the Interior's *Museum Management Handbook*. This would include artifacts used in exhibits in the visitor center.

In addition, for structures and landscapes, mitigative measures include documentation according to standards of the *Historic American Buildings Survey*, *Historic American Engineering Record*, and *Historic American Landscape Survey*. The level of this documentation, which includes photography, archeological data recovery, and/or a narrative history, would depend on significance (national, state, or local) and individual attributes (an individually significant structure, individual elements of a cultural landscape, etc.) and be determined in consultation with the state historic preservation officer and tribal historic preservation office.

## SUMMARY OF ENVIRONMENTAL IMPACTS

The National Park Service analyzed the environmental impacts of implementing the three alternatives on natural resources, cultural

resources, visitor use and experience, park operations, and socioeconomics. Table 5 summarizes the key differences in impacts across

the alternatives. “Chapter 4: Environmental Consequences” describes the analysis process and findings in greater depth.

TABLE 5. SUMMARY OF ENVIRONMENTAL IMPACTS

	Alternative 1: No Action	Alternative 2	Alternative 3: Preferred
<b>Natural Resources</b>			
<b>Native Plant Communities and Soils</b>	There would be additional minor, long-term, adverse impacts to soils and vegetation from facility maintenance and visitor use that disturb soils and vegetation and potentially contribute to the introduction and spread of nonnative and invasive plant species.	There would primarily be long-term, minor, adverse impacts to native plant communities and soils from facility construction and associated visitor use in previously disturbed areas. Approximately 44 acres of local, long-term minor to moderate adverse impacts would result from development of additional lands and construction of flood control structures. Local beneficial effects would also result from the selective removal of existing nonnative invasive species and restoration of some currently developed sites.	The impacts would be similar to alternative 2, but would affect approximately 37 acres.
<b>Wildlife</b>	There would be additional minor, long-term, adverse impacts to terrestrial and aquatic species from facility maintenance and increased visitor use.	The adverse impacts to terrestrial wildlife would be long-term and minor, affecting individuals from wildlife populations in local areas, but not resulting in loss of population viability for these species. Impacts from in-water work and from construction in or near the lakeshore would be short term and minor and would not adversely affect fish populations.	The impacts would be similar to alternative 2.
<b>Threatened, Endangered, and Special Status Species</b>	Continued maintenance activities and visitor use in the developed areas may affect, but would not be likely to adversely affect the razorback sucker, bonytail chub, Southwestern willow flycatcher, desert tortoise, Western burrowing owl, and banded Gila monster populations or designated critical habitat.	The alternative may affect, but would not be likely adversely affect the Southwestern willow flycatcher, razorback sucker, bonytail chub, or their critical habitat. Alternative 2 would be likely to adversely affect the desert tortoise, banded Gila monster, and Western burrowing owls although impacts would be local. Potential impacts on the desert tortoise and banded Gila monster include temporary or permanent loss of suitable habitat from new development and incidental harassment and possibly loss of individuals from construction activities. There would be no disturbance to designated critical habitat for the desert tortoise. Potential impacts to Western burrowing owls would include short-term disturbance from construction activities and long-term local loss of habitat from new development.	The impacts would be similar to alternative 2.

**TABLE 5. SUMMARY OF ENVIRONMENTAL IMPACTS (CONTINUED)**

	<b>Alternative 1: No Action</b>	<b>Alternative 2</b>	<b>Alternative 3: Preferred</b>
<b>Natural Resources (continued)</b>			
<b>Floodplains</b>	There would continue to be a potential long-term moderate to major adverse impact on human life and property in the floodplain and a long-term moderate adverse impact on floodplain values because of the presence of facilities in the floodplain.	The flood hazard would be greatly reduced at both developed areas through the use of structural and nonstructural protection, resulting in a long-term substantial benefit to safety for people and property in the floodplains. There would be a long-term minor to moderate adverse impact on floodplain values because of construction of additional flood control structures that divert and channel flood flows.	The impacts would be similar to alternative 2.
<b>Cultural Resources</b>			
<b>Archeological Resources</b>	There would be no new impacts on archeological resources. There would be no cumulative impacts on archeological resources under the no-action alternative.	Ground-disturbing activities would be sited away from known National Register eligible archeological resources and would be avoided to the greatest extent possible resulting in no to negligible, local adverse impacts. Cumulative impacts would be indirect and direct, long-term/permanent, minor to major, and adverse; NPS contributions would be potentially extremely small.	The impacts would be the same as alternative 2.
<b>Historic Structures</b>	There would be no new impacts on historic structures. There would be no cumulative impacts on historic structures under the no-action alternative.	Structures contributing to the historic district (Cottonwood Cove) and structures potentially eligible for listing in the National Register (Katherine Landing) would be removed or altered/remodeled; resulting in permanent, direct, local, major adverse impacts on significant and potentially significant historic structures. Cumulative impacts would be direct, regional, long term/permanent, moderate to major, and adverse; NPS contributions would be substantial.	The impacts would be the same as alternative 2.
<b>Cultural Landscapes</b>	There would be no new impacts on cultural landscapes. There would be no cumulative impacts on cultural landscapes under the no-action alternative.	Landscape components contributing to a determined eligible cultural landscape (Cottonwood Cove) and components potentially National Register eligible (Katherine Landing) would be removed, altered or remodeled, and/or visually impacted, resulting in in permanent, long-term, local, direct, moderate to major adverse impacts. There would be no cumulative effect.	The impacts would be the same as alternative 2.
<b>Ethnographic Resources</b>	There would be no new impacts on ethnographic resources. There would be no cumulative impacts on ethnographic resources under the no-action alternative.	Ground-disturbing activities would be sited away from National Register eligible ethnographic resources resulting in no or negligible, local, adverse impacts. Cumulative impacts would be regional, permanent, direct, minor to major, and adverse; NPS contributions would be minimal.	The impacts would be the same as alternative 2.

TABLE 5. SUMMARY OF ENVIRONMENTAL IMPACTS (CONTINUED)

	Alternative 1: No Action	Alternative 2	Alternative 3: Preferred
<b>Cultural Resources (continued)</b>			
<b>Cultural Landscapes</b>	There would be no new impacts on cultural landscapes. There would be no cumulative impacts on cultural landscapes under the no-action alternative.	Landscape components contributing to a determined eligible cultural landscape (Cottonwood Cove) and components potentially National Register eligible (Katherine Landing) would be removed, altered or remodeled, and/or visually impacted, resulting in permanent, long-term, local, direct, moderate to major adverse impacts. There would be no cumulative effect.	The impacts would be the same as alternative 2.
<b>Ethnographic Resources</b>	There would be no new impacts on ethnographic resources. There would be no cumulative impacts on ethnographic resources under the no-action alternative.	Ground-disturbing activities would be sited away from National Register eligible ethnographic resources resulting in no or negligible, local, adverse impacts. Cumulative impacts would be regional, permanent, direct, minor to major, and adverse; NPS contributions would be minimal.	The impacts would be the same as alternative 2.
<b>Visitor Use Experience and Safety</b>			
	The no-action alternative would have moderate to major adverse long-term effects on the visitor experience to Lake Mohave. Significant issues (such as visitor conflicts and inadequate overnight accommodations) that affect the experience of a significant percentage of visitors that would continue not to be fully addressed.	This alternative would result in minor to moderate, long-term, and beneficial impacts on visitor experience. Some additional minor to moderate, short-term, and adverse impacts on visitor experience would be caused by construction activities associated with this alternative.	This alternative would result in moderate to major, long-term, and beneficial impacts to visitor experience and safety. The main issues affecting visitor use, experience, and safety — congestion, circulation, access, parking, and overnight accommodations — would be all addressed in this alternative in reasonable and effective ways that would significantly improve current conditions. By resolving the causes of visitor conflict and by meeting the needs of overnight visitors, the changes would be readily apparent to all visitors and the effects would be felt in a positive manner.
<b>Socioeconomic Environment</b>			
	Besides the ongoing direct and indirect economic impacts of visitor spending at both locations, there would be no additional impacts on socioeconomic resources from the no-action alternative.	Construction and increased visitor spending would result in minor, short- and long-term, beneficial impacts for concession-operated facilities. Effects on local communities and the region would be beneficial, but negligible to minor because the park is a small part of the overall regional economy. Impacts associated with spending and employment shifts would be expected to occur over the duration of concession contracts, the length of which would be 10 years with the potential for contract extensions or renewals. Short-term impacts would include construction spending, which would occur over an estimated 2 to 3 years. See table 16 for a summary of socioeconomic impacts of alternative 2.	Construction and increased visitor spending would result in minor, short- and long-term, beneficial impacts for concession-operated facilities. Effects on local communities and the region would be beneficial, but negligible to minor because the recreation area is a small part of the overall regional economy. Impacts associated with spending and employment shifts would be expected to occur over the duration of concession contracts, the length of which would be 10 years with the potential for contract extensions or renewals. Short-term impacts would include construction spending, which would occur over an estimated 2 to 3 years. See table 19 for a summary of socioeconomic impacts of alternative 3.

**TABLE 5. SUMMARY OF ENVIRONMENTAL IMPACTS (CONTINUED)**

	<b>Alternative 1: No Action</b>	<b>Alternative 2</b>	<b>Alternative 3: Preferred</b>
<b>Park Operations</b>			
	The impacts of insufficient recreation area staffing (at current levels) on operational needs would be adverse and long term. However, the no-action alternative would not impact park operations.	Alternative 2 would increase demands on NPS staff at both Cottonwood Cove and Katherine Landing.	Alternative 3 would increase demands on NPS staff at both Cottonwood Cove and Katherine Landing, although certain NPS responsibilities will be shifted to the concessioner.

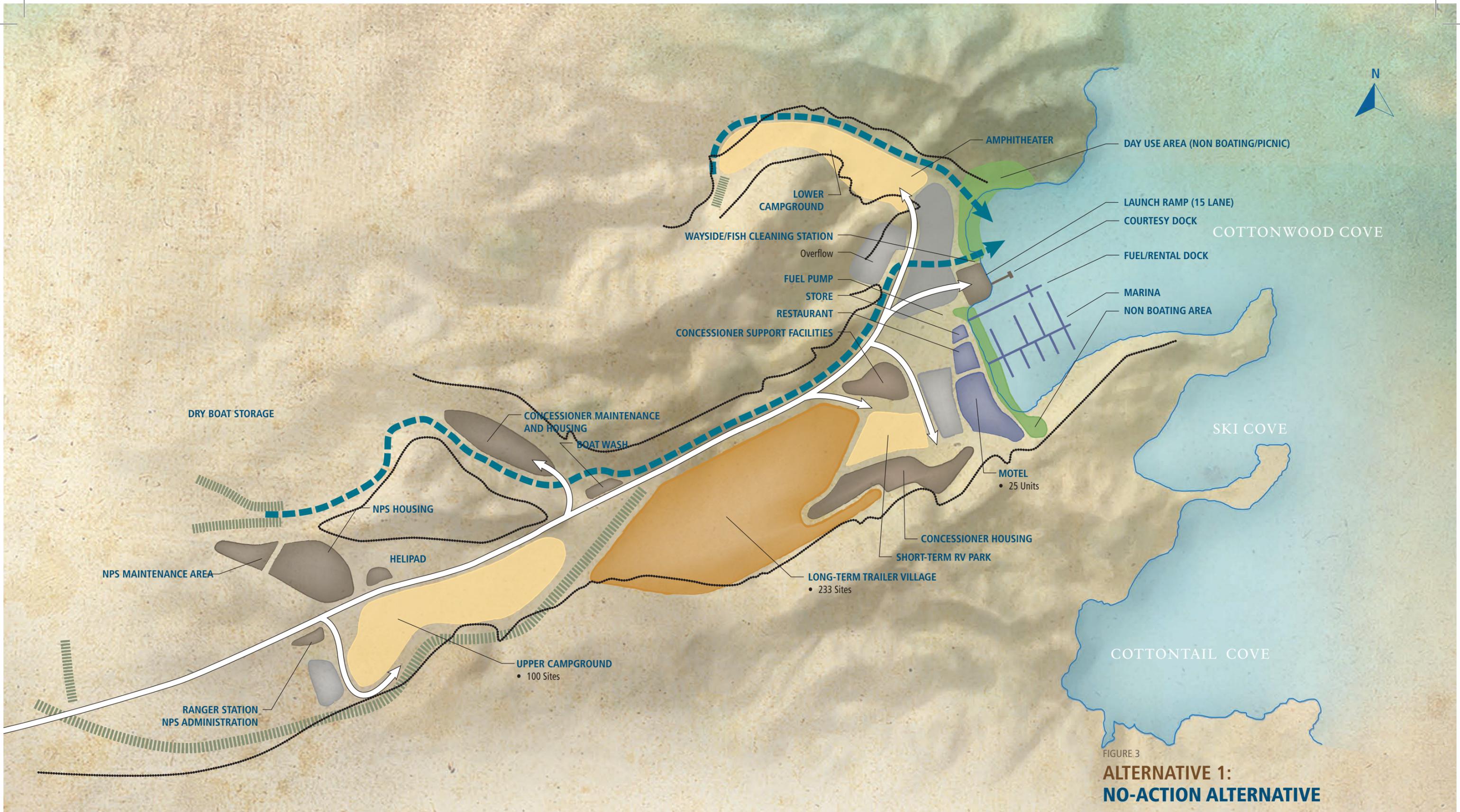
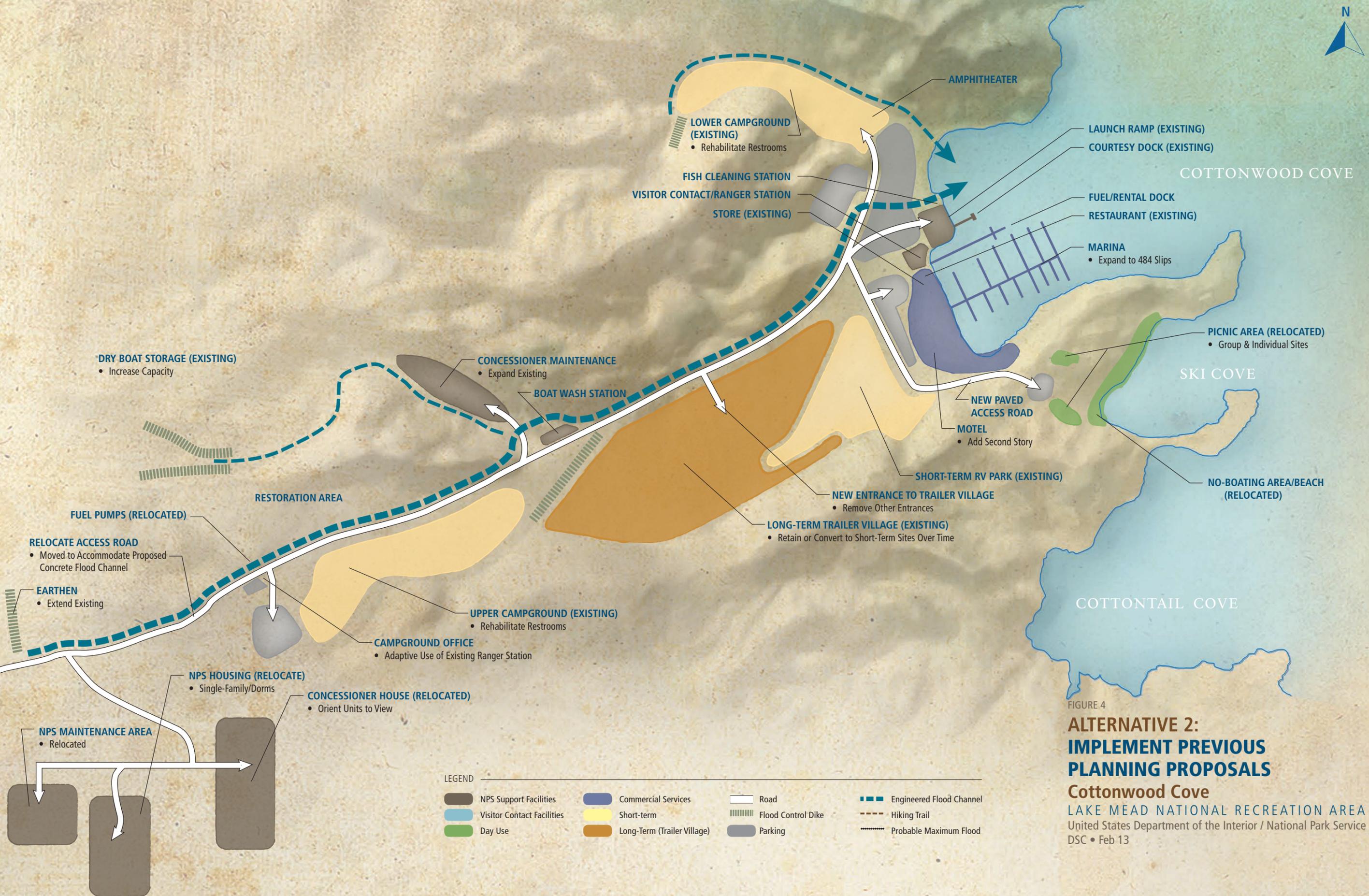


FIGURE 3  
**ALTERNATIVE 1:  
 NO-ACTION ALTERNATIVE**

**Cottonwood Cove**  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
 DSC • Feb 13

LEGEND			
	NPS Support Facilities		Commercial Services
	Visitor Contact Facilities		Short-term
	Day Use		Long-Term (Trailer Village)
	Road		Parking
	Flood Control Dike		Engineered Flood Channel
	Probable Maximum Flood		Hiking Trail

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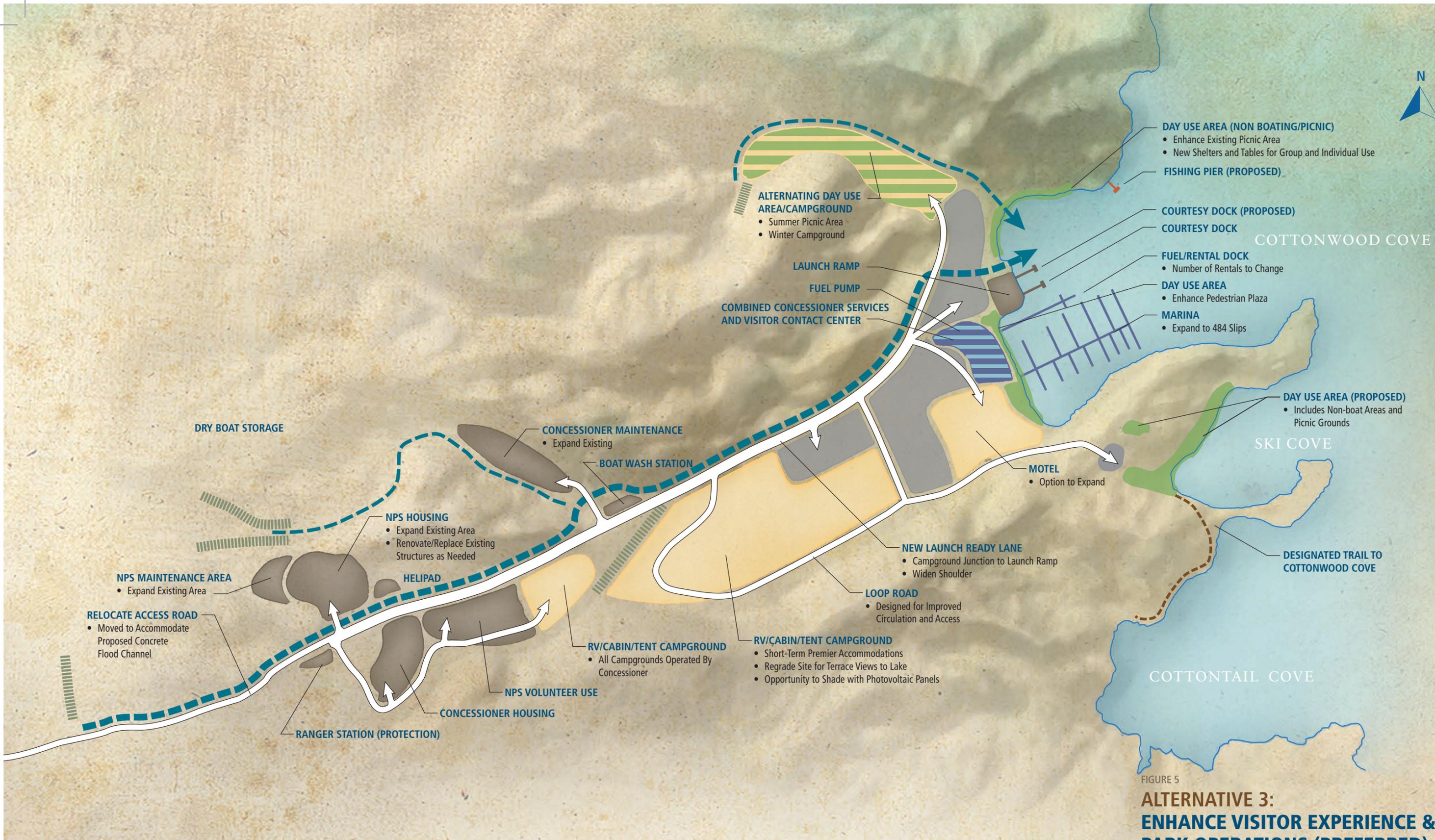


FIGURE 5  
**ALTERNATIVE 3:  
 ENHANCE VISITOR EXPERIENCE &  
 PARK OPERATIONS (PREFERRED)**  
**Cottonwood Cove**  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
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LEGEND

NPS Support Facilities	Commercial Services	Road	Engineered Flood Channel
Visitor Contact Facilities	Short-term	Flood Control Dike	Hiking Trail
Day Use	Long-Term (Trailer Village)	Parking	Probable Maximum Flood

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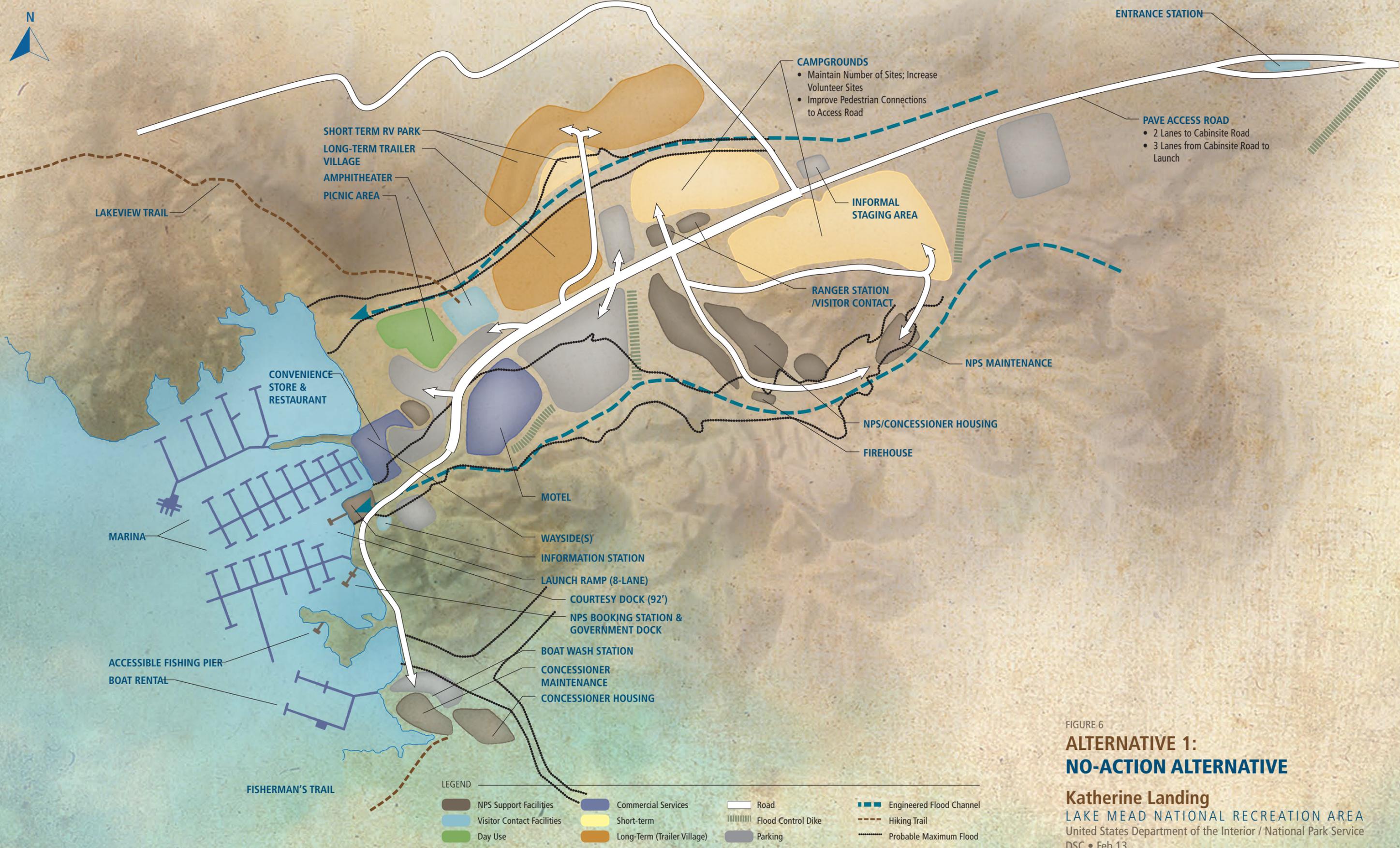
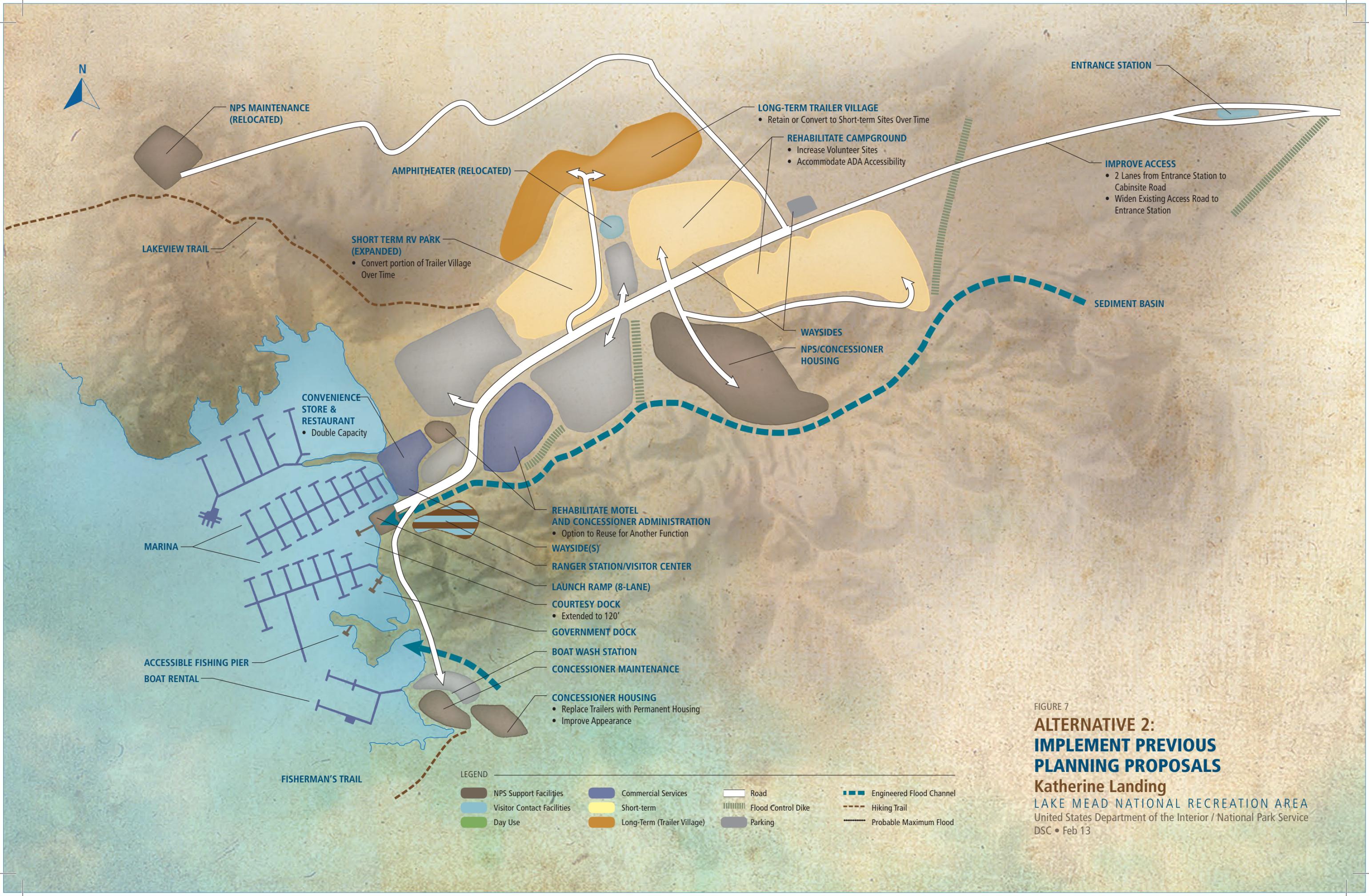


FIGURE 6  
**ALTERNATIVE 1:  
 NO-ACTION ALTERNATIVE**

**Katherine Landing**  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
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**NPS MAINTENANCE (RELOCATED)**

**AMPHITHEATER (RELOCATED)**

**LONG-TERM TRAILER VILLAGE**  
 • Retain or Convert to Short-term Sites Over Time

**REHABILITATE CAMPGROUND**  
 • Increase Volunteer Sites  
 • Accommodate ADA Accessibility

**ENTRANCE STATION**

**IMPROVE ACCESS**  
 • 2 Lanes from Entrance Station to Cabinsite Road  
 • Widen Existing Access Road to Entrance Station

**LAKEVIEW TRAIL**

**SHORT TERM RV PARK (EXPANDED)**  
 • Convert portion of Trailer Village Over Time

**SEDIMENT BASIN**

**WAYSIDES**  
**NPS/CONCESSIONER HOUSING**

**CONVENIENCE STORE & RESTAURANT**  
 • Double Capacity

**REHABILITATE MOTEL AND CONCESSIONER ADMINISTRATION**  
 • Option to Reuse for Another Function

**MARINA**

**WAYSIDE(S)**  
**RANGER STATION/VISITOR CENTER**

**LAUNCH RAMP (8-LANE)**

**COURTESY DOCK**  
 • Extended to 120'

**GOVERNMENT DOCK**

**BOAT WASH STATION**

**CONCESSIONER MAINTENANCE**

**ACCESSIBLE FISHING PIER**  
**BOAT RENTAL**

**CONCESSIONER HOUSING**  
 • Replace Trailers with Permanent Housing  
 • Improve Appearance

**FISHERMAN'S TRAIL**

**LEGEND**

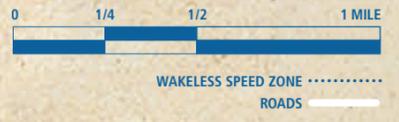
NPS Support Facilities	Commercial Services	Road	Engineered Flood Channel
Visitor Contact Facilities	Short-term	Flood Control Dike	Hiking Trail
Day Use	Long-Term (Trailer Village)	Parking	Probable Maximum Flood

FIGURE 7  
**ALTERNATIVE 2:  
 IMPLEMENT PREVIOUS  
 PLANNING PROPOSALS**  
**Katherine Landing**  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
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Backcountry camping allowed along 4x4 road

**PRINCESS COVE**

- Maintain existing paved parking lot and unpaved overflow lot
- Maintain existing boat ramp (8-lanes)
- Maintain existing picnic areas

Maintain existing paved access road

**CABINSITE POINT**

- Maintain access road
- Maintain existing unpaved parking
- Maintain unimproved shallow boat launch
- Maintain small no-boating area
- No formal picnic areas and no camping
- Camping prohibited

**NORTH ARIZONA TELEPHONE COVE**

- Maintain existing unpaved parking area and berms
- Maintain boat launch as backcountry lake access
- No formal picnic areas
- Camping prohibited

Maintain existing unpaved access road(s)

**SOUTH ARIZONA TELEPHONE COVE**

- Maintain paved parking area
- Maintain cove as designated no-boating area
- Maintain designated picnic facilities
- Camping prohibited

**KATHERINE LANDING**

KATHERINE LANDING ACCESS ROAD

STONEHOUSE ROAD

DAVIS DAM

NEVADA TELEPHONE COVE

TO HWY 163

TO BULLHEAD CITY

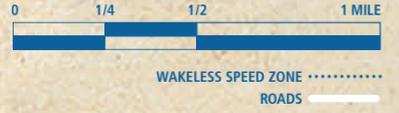
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FIGURE 9  
**ALTERNATIVE 1:  
 NO-ACTION ALTERNATIVE**

**Katherine Landing Vicinity**  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
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Backcountry camping prohibited along 4x4 road

**PRINCESS COVE**

- Maintain existing paved parking lot and discontinue use of overflow lot
- Maintain existing boat ramp (8-lanes)
- Maintain existing picnic areas

Retain in current condition paved access road

**CABINSITE POINT**

- Retain in current condition access road
- Maintain existing unpaved parking
- Close boat launch and enlarge no-boating area for SCUBA destination
- No formal picnic areas
- Camping prohibited

**NORTH ARIZONA TELEPHONE COVE**

- Maintain existing unpaved parking area and berms
- Construct 2-lane concrete launch ramp
- No formal picnic facilities
- Camping prohibited

Redesign access road to minimize flood risk

**SOUTH ARIZONA TELEPHONE COVE**

- Maintain paved parking area and expand to south if needed
- Maintain cove as designated no-boating area
- Maintain designated picnic facilities
- Camping prohibited

**KATHERINE LANDING**

KATHERINE LANDING ACCESS ROAD

NEVADA TELEPHONE COVE

TO HWY 163

STONEHOUSE ROAD

DAVIS DAM

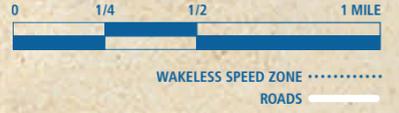
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TO BULLHEAD CITY

FIGURE 10  
**ALTERNATIVE 2:  
 IMPLEMENT PREVIOUS  
 PLANNING PROPOSALS**  
 Katherine Landing Vicinity  
 LAKE MEAD NATIONAL RECREATION AREA  
 United States Department of the Interior / National Park Service  
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Backcountry camping allowed along 4x4 road

**PRINCESS COVE**

- Maintain existing paved parking lot and unpaved overflow lot
- Maintain existing boat ramp (8-lanes)
- Maintain existing picnic areas
- Establish helipad

Retain in current condition paved access road

**CABINSITE POINT**

- Retain in current condition
- Maintain existing parking and allow for additional lot on former cabin sites
- Maintain unimproved shallow boat launch
- Maintain small no-boating area
- Develop picnic facilities
- Back country camping allowed at former cabin sites

Reconfigure to "T" intersection

**NORTH ARIZONA TELEPHONE COVE**

- Retain gravel parking area
- Maintain boat launch as backcountry lake access
- Establish developed picnic area
- Camping prohibited

Redesign access road to minimize flood risk

**SOUTH ARIZONA TELEPHONE COVE**

- Maintain paved parking area
- Maintain cove as designated no-boating area
- Maintain designated picnic facilities
- Camping prohibited

**KATHERINE LANDING**

KATHERINE LANDING ACCESS ROAD

NEVADA TELEPHONE COVE

TO HWY 163

STONEHOUSE ROAD

DAVIS DAM

163

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TO BULLHEAD CITY

FIGURE 11

**ALTERNATIVE 3:**

**ENHANCE VISITOR EXPERIENCE & PARK OPERATIONS (PREFERRED)**

**KATHERINE LANDING VICINITY**

LAKE MEAD NATIONAL RECREATION AREA  
UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE  
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*Affected*  
ENVIRONMENT

***BACK OF DIVIDER***

## CHAPTER 3: AFFECTED ENVIRONMENT

### INTRODUCTION

This chapter describes the natural and cultural resources; visitor use, experience, and safety; socioeconomic environment; and park operations in the vicinity of Cottonwood Cove and Katherine Landing areas that might be affected either directly or indirectly by implementing any of the alternatives. The impact topics presented in this chapter correspond to those topics contained in “Chapter 4: Environmental Consequences.”

Complete and detailed descriptions of the environment and existing use at Lake Mead National Recreation Area are located in the *Lake Mead National Recreation Area Lake Management Plan and Final Environmental Impact Statement* (LMP)(NPS 2002), *Lake Mead National Recreation Area Resource Management Plan* (NPS 1999), and the *Lake Mead National Recreation Area General Management Plan* (NPS 1986).

### NATURAL RESOURCES

#### Native Plant Communities and Soils

The majority of Lake Mead National Recreation Area is characterized by generally north-south trending mountain ranges separated by broad, shallow valleys. The mountains are dissected by deep ravines that open into broad alluvial fans. Commonly, adjoining fans coalesce and form a continuous alluvial apron, known as a bajada, along the base of the mountains. These slopes extend down to the lakeshore. The topography of the developed areas and surrounding lands consist mainly of uplands interspersed with large washes, typical of many areas in the recreation area. A caliche capstone covers the sides of some washes and helps stabilize the soil and create suitable conditions for burrowing animals such as the desert tortoise, burrowing owl, and Gila monster.

Soils in the recreation area are generally shallow, friable, wind-deposited, or alluvial materials that are susceptible to wind and water erosion. The soils typically develop on gray alluvium and have high salt-alkali contents that often form caliche hardpans. The alluvial outwash areas contain red desert soils that are slightly leached and rich in

lime and mineral plant nutrients. Rain events constantly change and reshape the washes, while turning upland soils into hard, compacted desert pavement, wherein the surface fines have been removed by wind and water and the rocks that remain armor the surface, preventing further erosion. The process usually takes a very long time, although periodic erosion events may remove large amounts of soil rapidly during severe rain and wind storms.

Evaporation rates are much greater than precipitation and this creates extremely low soil moisture conditions throughout the year, which severely restricts plant growth. Soils generally take a long time to recover if disturbed because of the lack of precipitation and slow plant growth. Within both developed areas, soils have been permanently altered by the construction of facilities such as roads, parking areas, and buildings. Geology and soils on the peripheries of the developed areas more closely resemble those of adjacent natural areas. The surrounding areas consist mainly of upland soils interspersed with large washes, typical of many areas in the recreation area.

Desert creosote-bursage shrub communities and desert wash communities typically surround the developed areas. The creosotebush-bursage community is regionally common and covers nearly three quarters of the recreation area. Vegetation cover is sparse and is dominated by creosote bush and bursage. This community occurs below 4,000 feet (ft) in valley bottoms and lowlands of mild slope aspect. It is locally well-developed on lower bajadas, alluvial fans, and playas. Vegetation cover is sparse in this community and dominated by creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Primary associated shrub species can include blackbrush (*Coleogyne ramosissima*, usually at higher elevations), Mormon tea (*Ephedra* spp.), indigo bush (*Psoralea fremontii*), shadscale (*Atriplex confertifolia*), hopsage (*Grayia spinosa*), desert thorn (*Lycium* spp.), ratany (*Krameria erecta*), burro bush (*Hymenoclea salsola*), honey mesquite (*Prosopis glandulosa*), and brittlebush (*Encelia farinosa*). Other associated species can include yucca

(*Yucca* spp.) and prickly pear cactus (*Opuntia erinacea*). Profusions of annual wildflowers can be observed in this community in the spring.

The desert wash community is found in the washes and includes plants of the surrounding creosote bush community as well as species such as mesquite, catclaw acacia, desert willow, cheeseweed, and nonnative saltcedar (*Tamarix* spp). There are no wetlands or desert springs in then project areas.

Two plants, smoke tree (*Psoralea argophylla*) and American threefold (*Trixis californica*) are common and widespread species in the Sonoran desert. Neither plant is federally or state listed. However, these species are of interest to the park because their northern distribution extends into the recreation area. Populations of both species occur along southern Lake Mohave. American threefold is only known from Empire Wash on the northeastern edge of the Newberry Mountains and smoke tree from Nevada Telephone Cove. There are no recorded occurrences of either of these plants in the vicinity of Cottonwood Cove or Katherine Landing. However, American threefold may occur along the shoreline between Katherine Landing and Princess Cove.

Saltcedar is widespread and well established along the Lake Mohave shoreline where it displaces native riparian plant species. Other nonnative plant species that are known to be invasive that have been found on the shoreline of Lakes Mead and Mohave are athel (*Tamarix aphylla*), fountaingrass (*Pennisetum setaceum*), tree tobacco (*Nicotiana glauca*), oleander (*Nerium oleander*), date palm (*Phoenix* sp.), Mexican paloverde (*Parkinsonia aculeata*), Sahara mustard (*Brassica tournefortii*), camelthorn (*Alhagi pseudoalhagi*), and giant reed (*Arundo donax*). The invasive annual grass Mediterranean grass (*Schismus* spp.) occurs at the lowest elevations like creosotebush shrublands. Construction, development, and landscaping all are ground-disturbing activities that have the potential, or that have led to the introduction and spread of alien plant species. Several species of invasive plants were first introduced to the recreation area in landscaping and still remain in landscaped areas, with a few species that have naturalized into adjacent natural areas. Examples include the following: giant reed (*Arundo donax*), Bermuda grass (*Cynodon dactylon*), oleander (*Nerium oleander*), tree

tobacco (*Nicotiana glauca*), fountaingrass (*Pennisetum setaceum*), date palm (*Phoenix dactylifera*), athel (*Tamarix aphylla*), and chastetree (*Vitex agnus-castus*) (NPS 2010).

## Wildlife

The desert, riparian, and aquatic ecosystems present at the Lake Mead National Recreation Area provide habitat for a rich diversity of animal species. The recreation area contains over 500 species of vertebrates, including, fish, amphibians, reptiles, birds, and mammals. The last survey of the recreation area lists 54 species of reptiles and amphibians occurring within the recreation area (Schwartz et al. 1978). Desert creosote and bursage shrub communities provide food sources, perch sites, and cover for many desert animals. Desert reptiles and amphibians hibernate or estivate in burrows under the plants, avoiding predators and excessive daytime temperatures. Desert tortoises dig shelters where plant roots stabilize the soil. Diurnal lizards and nocturnal snakes are relatively common reptiles in the creosote bush and bursage community. For the most part, they prefer the rocky slopes and dry washes where boulders and brush furnish plenty of shelter and shade. The coachwhip, gopher snake, common king snake, sidewinder, glossy snake, and speckled rattlesnake are commonly encountered snakes at the park. Many lizards may be found throughout the park including side-blotched lizard, desert iguana, Great Basin collared lizard, Western whiptail, Western banded gecko, chuckwalla, and desert spiny lizard.

The most recent inventory and review of literature for Lake Mead National Recreation Area has documented 57 mammal species as occurring within the recreation area boundaries (Drost and Hart 2008). White-footed mice, pocket mice, kangaroo rats, and woodrats comprise the vast majority of individual mammals occurring at the recreation area. Because of the extensive aquatic, wetland, and riparian habitat created by Lake Mead and Lake Mohave, 356 species of birds have been recorded at the recreation area. Aquatic and shorebird species such as great blue heron, American coot, ruddy duck, cinnamon teal, semipalmated plover, and willet generally restrict their activities to the lakes, the shoreline areas surrounding the lakes, and associated wetland habitats. Riparian zones along the lake, side canyons, washes, and around spring sources are

the most heavily used corridors for breeding and foraging by nonaquatic bird species such as Gambel's quail, red-tailed hawk, greater roadrunner, cactus wren, phainopepla, and house sparrow.

Developed areas, in which the habitat has been altered, typically only support a small subset of the park's wildlife. Opportunistic predators and scavengers are likely to be more abundant in these areas due to the greater abundance of food left by humans. The outer edges of the developed zones usually more closely resemble the desert habitat of the surrounding region, but because of disturbance it is less desirable for desert-dwelling species.

Lake Mohave supports a number of fish species, including game, nongame, and endemic fish species. Nongame species, such as carp, and game species including largemouth bass, striped bass, catfish, crappie, and blue gill inhabit the waters of the reservoir. Rainbow trout are stocked in select areas. Quagga mussels, freshwater mollusks that are alien to North America, have been found in Lakes Mead and Mohave. These mussels deplete the plankton levels, reducing the food supply for native aquatic organisms. They also attach to and damage infrastructure such as water intake pipes, docks, and boats. To help prevent the spread of Quagga, visitors are encouraged to clean that their boats, vehicles, trailers, and other equipment at the boat wash stations after exiting the lakes.

### **Threatened, Endangered, and Special Status Species**

Two endemic fish species remain in the lakes, despite the alteration of the riverine environment resulting from the construction of the Hoover and Davis dams. The razorback sucker (*Xyrauchen texanus*) occurs in both lakes, with the largest remaining population in the Colorado River system inhabiting Lake Mohave. The bonytail chub (*Gila elegans*) exists in Lake Mohave. Both of these fish are listed as federally endangered species. Lakes Mead and Mohave have been designated as critical habitat for the razorback sucker, and Lake Mohave has been designated as critical habitat for the bonytail chub.

Surveys for razorback suckers have been conducted since the early 1990s by biologists

working with the Native Fish Work Group. The biologists determined that there are at least nine coves on Lake Mohave that are important for razorback sucker recovery and where spawning activities occur. Spawning takes place from January through May and occurs in shallow, rocky areas. Young fish may stay in these shallow areas during the first few weeks of their lives, while adult fish utilize all areas of the lake. As part of an augmentation program for razorback suckers and bonytail chub, larvae are collected from Lake Mohave during the spawning season and raised in labs and backwater ponds and re-released into Lake Mohave in hopes that larger fish will be able to avoid predation and enter the breeding population. There are no rearing ponds in the Cottonwood Cove or Katherine Landing areas.

Populations of bonytail chub consist of large, old adults with recruitment being virtually nonexistent. These fish were once known to reproduce in lower Lake Mohave, although it is unclear if this is still the case. Bonytail chubs are known to utilize both deep water channels and shallow shoreline habitats.

The Lake Mead National Recreation Area provides important habitat for the desert tortoise (*Gopherus agassizii*). The Mohave population of the desert tortoise, which occurs north and west of the Colorado River in Arizona, Utah, Nevada, and California, are federally listed threatened species (USFWS 2008). Cottonwood Cove is within this geographic area. Desert tortoise that occur east and south of the Colorado River in Arizona are referred to as the Sonoran population. The Sonoran population is a federal candidate species. Katherine Landing is within this geographic area. The Mohave population occurs on sandy loam to rocky soils in valleys, bajadas, and hills in Mohave desert scrub. The Sonoran population occurs primarily on rocky slopes and bajadas of Mohave and Sonoran desert scrub. Washes and valley bottoms may be used in dispersal.

This species occurs throughout the recreation area in Mohave desert scrub habitats away from the shoreline areas. Tortoise populations in the area are generally low density, with scattered high density areas. Most habitat of the Mohave population of the desert tortoise within the recreation area south of Hoover Dam is protected by wilderness or critical habitat designations.

The developed areas are located in marginal habitat with low tortoise densities. The project area at Cottonwood Cove is located within noncritical habitat, although the Cottonwood Cove access road does pass through critical habitat. Near the access road to Cottonwood Cove, tortoise densities are low-to-medium, but are particularly hard to quantify because drought-induced mortality has significantly reduced populations in those areas (NPS 1997, 2002).

The Mohave population is most active during the spring when plants are most abundant with additional activity in late summer monsoons (August to September), while the Sonoran population is also active in the spring, but most active during the summer monsoon season. Desert tortoises retreat into burrows the remainder of the year to avoid extreme weather conditions and conserve water and energy. Tortoises require loose soil to excavate burrows below rocks, boulders, or vegetation, and also use rock crevices. They eat a variety of annual and perennial grasses, forbs, and succulents (AZGFD 2010).

Desert tortoise populations have been declining throughout their range due to urban development, disease, off-road vehicle disturbance, construction activities, mining, and grazing. Habitat fragmentation because of urbanization is a continuing problem. The park provides large areas of protected, continuous habitat. All undisturbed areas in the proposed project areas are considered potential habitat for desert tortoise.

The Southwestern willow flycatcher (*Epidonax trailii extimus*) was federally listed as endangered in 1995, and is a neotropical migrant known to visit both Lakes Mead and Mohave. Declines in Southwestern willow flycatcher populations are primarily due to habitat alteration for water impoundment and diversion, agriculture, and development.

Willow flycatchers generally nest in dense riparian habitats with standing water or saturated soils. Although typically associated with native riparian tree species, willow flycatchers have been observed nesting in tamarisk and other nonnative riparian vegetation (USFWS 2002b). Nesting occurs in the Overton Wildlife Management Area, along the Virgin and Muddy River inflows into Lake Mead, and at the Lake Mead delta near the

Grand Canyon. Additional suitable habitat exists along the shoreline of Lake Mohave, although surveys have been conducted of several coves that contain suitable habitat and no nesting has been documented. The size and shape of habitat patches used by breeding flycatchers vary considerably, but it is likely that much of the shoreline habitat lacks suitable amounts of riparian vegetation with the proper structural and hydrological characteristics to be used for anything other than migration or dispersal.

The Gila monster (*Heloderma suspectum*) is classified as a protected reptile in Nevada. The banded Gila monster (*H.s. cinctum*) is the subspecies that occurs in Clark County in Nevada. This species is found primarily below 5,000 ft elevation and its geographic range approximates that of the desert tortoise. Gila monster habitats are associated with desert wash, spring, and riparian habitats that integrate with complex rocky desert scrub lands. They will use and are occasionally encountered out in gentler terrain of alluvial fans (bajadas). The Gila monster is diurnal and is most active from March to June. Although they are diurnal they spend most of their time underground (AZGFD 2002). The banded Gila monster may occur near the developed areas.

Western burrowing owls (*Athene cunicularia hypugea*) are a protected species in Nevada. They are found in desert shrub habitats and utilize animal burrows for nesting. They could occupy lands near the developed areas.

### Floodplains

Desert washes are dry most of the time and only run following rain events. The washes at Cottonwood Cove and Katherine Landing are subject to flash flooding caused by intense thunderstorms over their drainages. Precipitation typically falls as winter rain and late summer thunderstorms associated with the southwestern monsoonal flow. However, precipitation is highly variable, with significantly above average rainfall in some years (such as 2004–2005) and below average rainfall in most years. A flash flood is one that occurs in a short time interval (minutes to hours) following a rain event, and for which there is insufficient time for persons on-site to become aware of the flood and safely evacuate. Areas subject to flash flooding are considered high hazard areas and the regulatory floodplain

includes the area covered by the extreme flood that is considered the largest flood possible in the drainage. The extreme flood magnitude can be determined by any one of several accepted extreme flood procedures and this plan uses the probable maximum flood (pmf) to define the regulatory floodplain.

Beginning in the early 1980s, a series of flood studies at both developed areas were prepared (USGS 1981, NPS 1982, 1983, and 1986, FLRA 1983). Structural flood mitigation discussed under the alternatives was reviewed and updated in 2004 (HDR 2004a and HDR 2004b). The previous studies have estimated flood depths at Cottonwood Cove of approximately 6 to 7 ft during the probable maximum flood and depths that range from 3 to 6 ft during the 100-year storm event. These flood depths impact visitor facilities including camping areas, motel, and the trailer village, and concessioner and National Park Service staff housing areas. At Katherine Landing estimated flood depths are approximately 3 to 8 ft during the probable maximum flood and range from 1 to 6 ft during the 100-year storm event. These flood depths impact visitor overnight facilities including camping areas, trailer village, and the concessioner housing. The development concept plan graphics for the no-action alternative for each developed area show the extent of the pmf flows.

The following washes/basins were identified for the purposes of calculating flood flows at Cottonwood Cove and Katherine Landing. Based on the most recent hydrologic and hydraulic calculations, tables 6 and 7 summarize the runoff peaks at the outlets of the basins for the 100-year and pmf flows. The warning time, or time from the onset of rainfall until the pmf flows reach various facilities, varies between approximately 42 minutes for Ranger Wash basin to 8 minutes for the Dry Boat Storage basin at Cottonwood Cove. At Katherine Landing, warning times vary between approximately 7 minutes at the Dry Boat Storage Wash to 33 minutes at the motel in South Katherine Wash. Warning times for South and North Telephone Coves are approximately 51 and 79 minutes.

**TABLE 6. SUMMARY OF PEAK RUNOFF  
(COTTONWOOD COVE)**

Wash/Channel	100-year peak (cfs <sup>a</sup> )	pmf peak (cfs)
Ranger Residence	1,900	8,400
Upper Access Road	600	2,500
Dry Boat Storage	150	600
Lower Access Road	2,200	11,000
Lower Boat Storage	125	500
Upper Campground	400	1,800

a. cfs = cubic feet per second.

**TABLE 7. SUMMARY OF PEAK RUNOFF  
(KATHERINE LANDING)**

Wash/Channel	100-year peak (cfs)	pmf peak (cfs)
North Katherine Wash	230	1,500
South Katherine Wash	950	6,500
Dry Boat Storage Wash	350	1,730
South Telephone Cove Wash	1,400	8,150
North Telephone Cove Wash	4,500	25,500

Potential flood and flood debris hazards are defined by the depth of flow, velocity, extent of inundation, and the amount and character if the debris likely to be mobilized by flood flows. Generally, the higher the flow velocity and depth, the greater are the flood hazards. For example, anyone caught in a 2 ft deep rapidly flowing flow could be swept away. If depths and velocities increase, automobiles, recreational vehicles, and trailers can be transported by flood flows.

Existing water diversion structures at Cottonwood Cove include the following. In the upper Access Road Wash there is a diversion dike 1,500 ft west of the ranger station that directs flow south across the access road to a narrow channel along the south side of the main campground. Previous reports indicate this upstream diversion dike may be overtopped in flood flows greater than the 50-year event. Another diversion dike, further downstream and east of the main campground, directs flow from the main campground channel back to the north across the main access road and into the lower access road channel. Previous reports indicate this channel can convey the 100-year flood; however,

maintenance of this channel is difficult and sedimentation appears to have reduced the conveyance capacity. The lower diversion dike is immediately above the trailer village. Flood flows are conveyed along the north side of the access road in an earthen channel to the west side of the lower parking lot. At this point, flows are discharged to the parking lot surface where sheet flow occurs with discharge to the lake.

Currently, the 1.6 square mile (sq mile) Ranger Wash basin drains to the Dry Boat Storage Wash. This basin alone contributes approximately 8,400 cfs to the developed area of Cottonwood Cove during the pmf event. There is a well-defined channel that extends from the upper boat storage yard, past the concessioner housing area and down to the access road. The Dry Boat Storage Wash conveys flows from the Ranger Wash basin where an existing diversion dike is located above the NPS housing area that directs flow to the Dry Boat Storage channel. The west end of the dike has been breached by a dirt access road and reduces the top elevation of the dike approximately 3 to 4 ft. Previous reports also indicate the Dry Boat Storage channel has adequate capacity to convey the 100-year flood but it overtops in the probable maximum flood.

At the lower campground, flood flows are conveyed around the campground by an existing diversion dike located at the far west end of the campground and an earthen channel located along the northern side of the campground.

At Cottonwood Cove, rain gauges located upstream of the developed area are used to monitor rainfall in real time. An automated system consisting of flash flood hazard monitoring and warning equipment is in place to notify the public in the developed area of flood danger. All hydrologic data and siren activation/deactivation capability is also available at the emergency dispatch center in Boulder City, Nevada.

At Katherine Landing, the South Katherine Wash flood flows are conveyed towards Lake Mohave on the south side of the access road. Two existing dikes divert the flows to the south and into an earth-lined channel starting at the NPS maintenance area. The existing channel has gabion-lined segments as it flows past the motel area. The channel discharges onto the roadway east of the boat ramp and flows into the lake.

North Katherine Wash flood flows are conveyed towards Lake Mohave on the north side of the access road. The existing alignment of this wash flows through the north campground as well as the trailer village.

Flood flows through the Dry Boat Storage Wash are conveyed through the maintenance area by an existing earth-lined channel located just east of the maintenance area. The existing inflow channel from the south is well defined. The wash from the east is well defined in the lower reach but in the upper reaches it tends to be less defined because of the development of the boat storage area.

South Telephone Cove Wash flood flows are diverted from North Katherine Wash towards South Telephone Cove Wash by an existing diversion dike. Sediment clogs the existing diversion outlet pipes and in large flows the drainage overtops the roadway and flows to the south entering North Katherine Wash.

In addition to flood protection, considerable effort by NPS staff is expended in maintaining existing flood channels and removing debris deposited during relatively minor storm events. Maintenance includes restoration of waterlines that have been exposed as a result of flow velocity/scour, cleaning of culverts plugged with sediment and debris, and removal of sediment from parking areas. Under current operations, parking lot sediment removal can reduce the pavement life because of equipment (e.g., front-end loader) impacting the asphalt surface.

## CULTURAL RESOURCES

### Cultural Context

This section summarizes the prehistory and history of the project areas at the two developed areas and the coves adjacent to Katherine Landing. In general, the prehistory of the American Southwest is commonly divided into following broad temporal periods: the Paleoindian, Archaic, Formative, Protohistoric, and Historic (EcoPlan 2011). The following briefly describes these temporal periods. More detailed overviews of the prehistory can be found in Reid and Whittlesey (1997), McQuire and Schiffer (1982), Faught and Freeman (1998), and Mabry and Faught (1998).

**Paleoindian Period (ca. 12000–8000 BC).**

Following the last major glaciation of the Pleistocene epoch, small bands of nomadic hunters and gatherers migrated across the greater southwest and elsewhere. Subsistence was based largely on hunting large game, or megafauna (e.g., mammoth). Hallmarks of the Paleoindian material culture were large, finely made spear points (EcoPlan 2011). Population densities were low and social structures are presumed to have been simple and probably egalitarian.

**Archaic Period (ca. 8000 BC – AD 700).**

Beginning around 8000 BC, the moist climate conditions of the Paleoindian period began transitioning to an increasingly drier climate. During this period, most of the lower Colorado Region became desert and a mass extinction of megafauna occurred. These drastic and somewhat rapid changes forced humans to modify their subsistence strategies. Smaller game was hunted with darts thrown by dart throwers or atlatls. A wider variety of plants were gathered (e.g., agave, cacti, pinyon pinenuts) and used for food, clothing, and structures. Stone tools were more crudely made and included spear points, knives, and other tools. Archaic bands continued to be migratory, seasonally moving from lower elevations to higher elevations as different resources became available. Habitation sites included rock shelters, caves, and temporary surface structures. Other features associated with Archaic peoples include petroglyphs, and possibly geoglyphs, rock alignments, and trail shrines. Towards the end of this period, Archaic peoples gradually began to adopt and depend on agriculture (EcoPlan 2011).

**Formative (ca. AD 700 – 1300) and Protohistoric (ca. AD 1300 – 1500) Periods.** The appearance of ceramics marks the end of the Archaic and the beginning of the Formative period. In the study area, the Patayan cultural tradition dominated the region. This cultural tradition is widely used to refer to numerous groups occupying the lower Colorado River Valley and surrounding uplands from the Grand Canyon to the Colorado River delta. Heilman et al. describe the cultural tradition as follows:

“Most Patayan sites are relatively ephemeral and appear to represent the remains of limited-activity camps (McGuire 1982). Rare

habitation sites consisting of Rancheria type settlements located on upland areas have been noted. Associated artifact assemblages consist of chipped stone with small, triangular sidenotched projectile points [dart points and arrowheads] and large, percussion-flaked choppers. Mortars and pestles also have been identified at Patayan sites (McGuire and Schiffer 1982). Ceramics are typically buff to gray, and are sometimes reddish in hue. Ceramics are rarely decorated, but do include red-on-buff wares.

Three branches of the Patayan cultural tradition have been identified in northern Arizona [and southern Nevada]: the Coconina, Cerbat, and Prescott. The Cerbat branch inhabited the desert and riverine areas that border the Colorado River near the Mohave Valley (McGuire and Schiffer 1982). They manufactured Tizon Brown [ceramics], which include three sequential types: Cerbat, Sandy, and Aquarius Brown. Structures characteristic of the Cerbat branch include rock shelters and caves as well as simple circular brush structures used as temporary dwellings (EcoPlan 2011).”

The Patayan tradition is divided in phases: Patayan I, II, and III. The different phases are largely distinguished by ceramic temper, vessel form, and innovations in ceramic manufacturing and decoration (EcoPlan 2011). The distinctions between the latter Patayan III and Protohistoric peoples is somewhat blurred. Patayan ceramics have been found in association with Historic period metal and glass, suggesting associations may have extended in the 1800 or early 1900s (EcoPlan 2011). During Patayan III/Protohistoric transition, it appears that inhabitants of the region dispersed and redistributed themselves in the region (EcoPlan 2011).

**Historic Period (ca. AD 1500 – 1950).** The lower Colorado Region was not settled by Euroamericans until the late 1850s. Early explores such as Sitgreaves (in 1851), Whipple (in 1853–1854), and Ives (in 1858) attempted to develop a trail from New Mexico to California. Later Edward F. Beale constructed a federally funded wagon road following the 35th Parallel from New Mexico to California in the late 1850s.

Portions of this road were constructed slightly south of the study area (EcoPlan 2011).

The 1850s saw a large influx of miners to the region. In the 1860s mines and prospects sprang up in the Cerbat and Black mountains. A regional mining camp, Kingman, developed into the area's first town and later an important business town, site for a train depot, and eventually the county seat of Mohave County. During the 1860s, gold was discovered at the Pyramid Mine; later in 1900 gold and silver were discovered at the Katherine Mine, located in the Katherine Landing developed area (EcoPlan 2011). The Katherine Mine, determined eligible for listing in the National Register of Historic Places as an historic district / cultural landscape, operated intermittently from 1900 to 1942, producing over \$12 million in gold.

During the late 19th and early 20th centuries, the Yuman tribes were forced on to a series of reservations along the Colorado River with their children being forced to attend boarding schools. These tribes shared many cultural elements, including mythic tradition, cosmology, and religion. In their world view, the entire lower Colorado Region consisted of an intricate system of trails, shrines, other symbolic objects (petroglyphs, geoglyphs, rock alignments), and physical features (mountains and vistas) that connected the scattered tribes with sacred sites in the region. Pilgrimages, in person and in dreams, were made to these areas. One of the most important sacred areas in the Yuman cosmology is Spirit Mountain, located approximately 15 miles south of Cottonwood Cove near Laughlin, Nevada. The site is now listed in the National Register as a traditional cultural property (NPS 2005).

During the early 20th century, communities began to develop along the Colorado River. However, these communities were subject to repeated devastating floods by the (then) unpredictable Colorado River. In 1931, construction of Hoover Dam began and concluded in 1935. The purpose of the dam was to tame and regulate the flow of the Colorado River. Subsequently, Davis Dam, north of Laughlin and approximately 45 miles south of Hoover Dam, was built. The purpose of this dam is to reregulate waters received from Hoover Dam, as well as generate electricity (EcoPlan 2011).

Today, Cottonwood Cove and Katherine Landing developed areas are regionally popular recreation destinations for local communities and visitors to area. Boating dominates both developed areas, although day use, tent camping, and RV camping are increasingly popular.

The lower Colorado Region, including the developed areas, also remains important to the Yuman tribes and the Chemihuevi tribe along the Colorado River. During their reservation period, many of these tribes resisted missionization and continued to practice their traditional life ways and religion (Ezzo and Altschul 1993; Cleland 2011). Tribes, like the Hualapai in the Grand Canyon and the Paipai below the Mexican border, continue to make pilgrimages to sites like Spirit Mountain and Grapevine Canyon to perform ceremonies.

### Archeological Resources

**Cottonwood Cove.** Portions of the developed area have been inventoried for archeological resources. To date, 14 prehistoric archeological sites and 1 historic site have been recorded in and around the Cottonwood Cove developed area. The prehistoric sites consist of 8 petroglyph sites (one also possessing a lithic scatter and another also possessing a rock alignment), 2 rock shelters, 2 rock circles, and 2 lithic scatters. None have been listed in the National Register, but the sites are managed as if they were eligible for listing. In addition, 8 isolated finds have been documented. These are primarily projectile points (Osborne, G.A., pers. comm. on April 20, 2011). Because they are isolated finds, they do not have the integrity or scientific values to make them eligible for the National Register.

The historic site consists of the remains of the Quartette Mine Mill (site no. 26CK8444). The site is submerged 10 to 45 ft below the surface of Lake Mohave in the southeast corner of Cottonwood Cove. The site consists of three masonry walls supported by rock buttresses. The site can only be reached by diving or viewed through a remotely operated vehicle. The site was recorded by the NPS Submerged Resources Center in 2008. At that time, the site's condition was rated as good; however, water movement, sedimentation, invasive quagga mussels, and recreational activities (boating/fishing) pose threats to its integrity. The site has not been evaluated for

National Register significance (NPS 2008). The site is not listed on the recreation area's list of classified structures (Osborne, G.A., pers. comm. on April 20, 2011). As with other developed area sites are managed as though they are eligible for listing.

Based on this data, there is a possibility for intact archeological resources to exist in portions of the developed area that are undisturbed by development, recreation area operations, or visitor use. The potential for intact sites is corroborated by the results of the 1993 survey of the Newbery Mountains south of Cottonwood Cove. During the survey, 54 prehistoric sites and 2 historic sites in the 5,530-acre survey area were documented (NPS 1993).

Potential types of unrecorded archeological resources include, but are not limited to, lithic scatters, surface sites, rock alignments, trails and trail shrines, petroglyphs, geoglyphs, rock shelters (prehistoric resources) and trash scatters, mining prospects, mines and mining related equipment, historic roads and railroad segments, corrals, and other ranching-related remains (historic resources).

**Katherine Landing.** Over 20 archeological sites have been recorded in and around the Katherine Landing developed area. Seven of these are prehistoric sites. Site types include lithic scatters (4) lithic / ceramic / ground stone scatter (1), rock alignment/lithic scatter (1), and petroglyph (1). In addition, 14 isolated finds have been documented in the developed area. Resource types include mortars, rock rings, lithic scatters, ceramics, and a projectile point (Osborne, G.A., pers. comm. on April 20, 2011).

Twelve of the sites are historic and related to mining activity. The Katherine Mine and Mill site is located north of the project area and was determined eligible for the National Register in 2009.

The Princess Cove Mine (site no. AZ F:10:43 [ASM]) is located in the vicinity of Princess Cove Road. The site is a historic period load-rock mine with 24 features including 2 mine adits, 3 mine

shafts, 9 prospects, 9 rock cairns, 1 rock alignment, and 3 trash scatters. Artifacts at the site suggest mining operations took place in the late 19th or early 20th century. Bricks, household ceramic fragments, and plate glass fragments suggest there was a residential structure in the vicinity, although there is no evidence to indicate its exact location. The site appears to be linked to the Katherine Mining District. In 2001, the site was recommended as being eligible for listing in the National Register under criterion A, since it contributed to the development of industry and economy in the region. It also may be eligible under criterion D because of its potential to yield information important to the early mining history of the local Katherine Landing area. In 2001, the site's condition was assessed as overall good (NPS 2001a).

An additional three sites were recorded in a recent survey of the Katherine Landing access road. One site is an unwidened segment of State Road 68 that relates to the Historic State Highway System (EcoPlan 2011). The segment is located east of the access road's juncture with State Road 68. The survey recommends the road segment be treated as contributing element to the Historic Highway System, which has been determined eligible for listing in the National Register under criterion D. The segment west of the access road leading to Nevada has been widened and is not eligible for listing (EcoPlan 2011).

The second site recorded in the survey was the access road itself. The road predates the Mission66 period and lacks several of the design elements of the Mission 66 initiative. In addition, the road has been modified numerous times since its construction in ca. 1952. The access road survey concludes that the road should not be considered eligible for listing in the National Register (EcoPlan 2011). The last site, a mining prospect, was also recommended as not eligible for the National Register (EcoPlan 2011).

As with the Cottonwood Cove developed area, there is a potential for additional intact archeological sites that could have National Register significance in areas that have not been disturbed by development or visitor use.

## Historic Structures

Table 8 summarizes the general location, condition, and National Register eligibility of historic structures listed on the park's list of classified structures for Cottonwood Cove and Katherine Landing developed areas. The Quartette Mining Company Railroad Grade consists of railroad segment with a can scatter, bolt scatter, and other historic railroad debris. The site has been determined eligible for listing in the National Register. The eastern end of the railroad grade could be in the project area.

Many of the Cottonwood Cove developed area structures are contributing elements to a Mission 66 historic district, which was determined to be eligible in the National Register in 2006. They are discussed in more detail under "Cultural Landscapes." These structures are in the area of potential effect.

The two Katherine Landing structures are contributing elements to the National Register eligible Katherine Mine historic district (NPS 2009). As noted, the mine site is outside of the area of potential effect outlined in the alternatives.

## Cultural Landscapes

Both developed areas were expanded as part of the Mission 66 movement. Both represent examples of historic design landscapes, as defined by NPS-28: *Cultural Resource Management Guideline*. Cottonwood Cove developed area has been determined eligible for the National Register as a historic district. The integrity of the Katherine Landing landscape is not as intact as that at Cottonwood Cove; however, it has the potential to be determined eligible and is being considered as part of a multiple property National Register nomination being developed to establish a cultural context for the Mission 66 initiative within the recreation area (NPS 2007). There are no defined ethnographic landscapes within the project areas, but the potential for one or more exists (see discussion under "Ethnographic Resources").

**Mission 66 Cultural Landscapes.** The Mission 66 program (1956–1966) was a major post-World War II funding initiative that commemorated the National Park Service's 50th anniversary. Mission 66 was not simply a development program; it was a redefinition of how national

parks would function as public places. Mission 66 architecture represents a departure from earlier styles in the national parks. By the 1950s, modernist architecture had emerged as the dominant style. Park service architects designed buildings that adapted various strains of postwar American modernism while also being mindful of the programmatic and aesthetic requirements of national parks. This resulted in a distinctive building type known as Park Service Modern. Mission 66 buildings were utilitarian, functional, and without the "historical allusions" of rustic style. Architects designed each visitor center individually, while houses, comfort stations, and other small buildings were often based on standardized design to limit costs (NPS 2007).

Mission 66 developed areas usually contained three to four discrete functional areas: visitor services, visitor accommodations (including picnicking and camping), employee housing, and park support services. These functional areas typically were located in two distinct zones: visitor services and park support. Park support areas such as housing and maintenance yards typically were separate and screened from public view. Modern roads allowed vehicular access between these sites (NPS 2007).

The Mission 66 plan for Lake Mead National Recreation Area imparted similar patterns of development and circulation for each developed area. A highly visible and easily accessible visitor center or ranger station marked the entrance to the developed areas. A long access road, leading from a main road or highway toward the lake, ended at or near a boat launch. Spur roads along the way led to distinct functional areas — NPS employee housing and maintenance areas, concessioner public use and maintenance areas, and campgrounds. The configuration of each developed area was determined principally by the terrain and shape of the shoreline in each location. The designed landscapes at each area also shared common characteristics. These were characterized by geometric forms and paving patterns as well as the use of exotic vegetation for both shade and aesthetic purposes. Park planners considered trees and shrubs, which provided screening and shade, an integral part of Mission 66 development at the recreation area (NPS 2007).

**TABLE 8. LIST OF CLASSIFIED STRUCTURES IN THE VICINITY OF COTTONWOOD COVE AND KATHERINE LANDING DEVELOPED AREAS, LAKE MEAD NATIONAL RECREATION AREA**

Structure Name	Site No.	Area	LCS <sup>a</sup> No.	Condition	Year Assessed	Certified	Park No.	National Register Status
Quartette Mining Co. Railroad Grade	26CK6581	Cottonwood Cove	21276	Fair	2006	2003	RR-08	Determine Eligible-Keeper
Administration Building		Cottonwood Cove	55646	Good	2003	2003	118	Entered-Documented
Cottonwood Cove Residence #201		Cottonwood Cove	330037	Good	2006	2006	201	
Cottonwood Cove Residence #202		Cottonwood Cove	330046	Good	2006	2006	202	
Cottonwood Cove Residence #203		Cottonwood Cove	330051	Good	2006	2006	203	
Cottonwood Cove Road		Cottonwood Cove	330053	Good	2006	2006	TBD <sup>b</sup>	
Cottonwood Cove Utility Building		Cottonwood Cove	330055	Good	2006	2006	241	
Cottonwood Cove Ranger Station		Cottonwood Cove	444196	Good	2006	2006	240	
Katherine Mine Mill Site	AZ F:14:108 (ASM)	Katherine Landing	55668	Fair	2003	2003	HS-13A	Determined Eligible-SHPO <sup>c</sup>
Katherine Mine Mill Site Stone Foundation	AZ F:14:108 (ASM)	Katherine Landing	55669	Fair	2003	2003	HS-13B	Determined Eligible-SHPO

a. LCS = List of Classified Structures

b. TBD = To be determined

c. SHPO = state historic preservation officer

For more than two decades after its founding in 1936, the recreation area lacked adequate visitor services, facilities, and roads. As the southwestern U.S. population boomed during the postwar period, the public overwhelmed the few facilities the recreation area offered. The Mission 66 program provided the first large influx of funding to the recreation area. Establishing developed areas transformed the recreation area from a park with little infrastructure into a regional recreation destination with modern services and amenities (NPS 2007).

While the Mission 66 program served to reinvigorate the National Park Service, 50 years later the continued importance of these structures is questioned by some. The modern architectural style is not as popular as it was in the 1960s. Many of the aging properties are in need of repair and pose safety concerns. Others no longer serve the needs of contemporary visitors. For example, most campgrounds were designed for tent camping, not the larger recreational vehicles that are popular today. In several parks, Mission 66 structures have been demolished or substantively remodeled to address these concerns and needs (Hill 2009).

**Cottonwood Cove.** Most of the development at Cottonwood Cove occurred between 1960 and 1966. The National Park Service constructed three employee residences in 1960. In 1964, park personnel built a ranger station that was designed to serve as an information center for visitors entering the park. Two years later, the park personnel constructed a 200 ft × 300 ft boat ramp, with 15,000 square feet of parking. The two campgrounds at Cottonwood Cove were built in 1965. The upper campground contained three loops and 100 campsites (though plans originally called for 8 loops and 219 sites), while the lower campground contained 42 individual and two group sites. Like other Mission 66-era campgrounds, the campgrounds at Cottonwood Cove included one-way loop roads and campsites along herringbone spurs, a design that minimized the impact on the surrounding environment. By 1966, the trailer village contained 3 loops and 23 spaces, as well as a comfort station that included showers and laundry. The park constructed a

utility building near the residential area in 1966. A number of structures called for in Mission 66 plans — such as two additional NPS residence buildings, a concessioner motel, and an expanded trailer park — were not built until after the Mission 66 period.

In 2006, the Cottonwood Cove developed area was determined eligible for listing in the National Register as an historic district. The eligibility statement in the determination of eligibility states:

“The Cottonwood Cove Mission 66 District is eligible for the National Register of Historic Places at the state level of significance under Criterion A in its association with events that made a significant contribution to the broad patterns of planning and park development, entertainment/recreation. The Cottonwood Cove Mission 66 District is also eligible under Criterion C at the state level of significance, as an embodiment of the distinctive characteristics of Modern park planning and architecture during the Mission 66 period. . .

The district is less than 50 years old and is eligible under Criteria Consideration G. The Mission 66 development at Cottonwood Cove is an exceptional example of Mission 66 development at the park that possesses substantial physical integrity to the period of significance, 1953–1966, and contains all of the elements of a Mission 66 developed area, including the public use resources of a ranger station, two campgrounds, concessioner amenities, as well as support resources including a maintenance utility area and NPS employee housing area. The district retains intact resources that relate the developed area to the Modern movement in terms of planning, building mass, spatial relationships, proportion, fenestration pattern, texture of materials, and structural expression (NPS 2006).”

Table 9 presents buildings, sites, and a structure located within the developed area, noting whether the buildings, sites, or the structure are contributing or noncontributing features to the historic district.

TABLE 9. COTTONWOOD COVE DEVELOPED AREA HISTORIC DISTRICT BUILDINGS AND SITES

Resource Name	Resource Type	Contributing or Noncontributing
Cottonwood Cove Ranger Station (bldg. no. 240) and associated features	Building	Contributing
Cottonwood Cove Upper Campground and associated features	Site	Contributing
Cottonwood Cove Boat Launch Area	Site	Contributing
Cottonwood Cove Lower Campground and associated features	Site	Contributing
Cottonwood Cove Utility Building (bldg. no. 241)	Building	Contributing
Cottonwood Cove Fire Station (bldg. no. 242) and associated features	Building	Noncontributing
Cottonwood Cove NPS Residential Area	Site	Contributing
Cottonwood Cove Residence No. 201	Building	Contributing
Cottonwood Cove Residence No. 202	Building	Contributing
Cottonwood Cove Residence No. 203	Building	Contributing
Cottonwood Cove Duplex Residence Nos. 204 and 205	Building	Noncontributing
Cottonwood Cove Concessioner Public Use Area	Site	Contributing
Cottonwood Cove Concessioner Store	Building	Noncontributing
Cottonwood Cove Concessioner Cafe	Building	Noncontributing
Cottonwood Cove Road	Structure	Contributing

**Katherine Landing.** Mission 66 park planners considered the Katherine Landing developed area as “one of the best developments in the recreation area” and they sought to expand both existing pre-Mission 66 concession and NPS facilities through the Mission 66 initiative. Park planners wanted to capitalize on the “spacious and attractive” harbor as well as the “splendid” beach. To this end, the National Park Service built a campground, a beach house, and a comfort station in 1958. By 1962, the park had added picnic shelters, comfort stations, and a boat ramp. The concessioner built an additional eight-room motel in 1957, and constructed an airstrip and combined boathouse-supply building by 1962. However, the National Park Service believed the site still did not meet visitors’ needs as visitation continued to increase. They hoped to build a ranger contact station, three new residences, a utility area, and enlarge the campground campfire circle. The agency also sought to relocate the airstrip, which lay in the path of a proposed campground expansion. Planners wanted the concessioner to expand boat-docking facilities and overnight accommodations, enlarge the restaurant, construct a boat repair and storage area, and build 11 new residences. According to park planners,

these proposed Mission 66 developments would bring development up to acceptable levels. However, many of the structures, such as the ranger station, were constructed after Mission 66; others were never built (NPS 2007).

By 1964, Katherine Landing was the second most visited site in the recreation area, with over 375,000 visitors per year. A 3-bedroom single-family home, a duplex, a 250-seat campground amphitheater, and 3 comfort stations were also completed in 1963. The next year, 117 new campsites, with picnic tables and fireplaces, were added to the campground (NPS 2007).

Today, Katherine Landing has a developed marina with boat slips, gas dock, restaurant, general store, and motel. The developed area also contains a campground with amphitheater, a swim beach, hiking trails, ranger station, visitor center, National Park Service and concession housing and maintenance areas, and other support structures for marina, law enforcement, and public safety. Of these, a duplex and single-family residence, and an amphitheater are extant Mission 66 features (NPS 2007).

## Ethnographic Resources

No ethnographic resources have been formally identified or assessed in the land around the developed areas. However, it is known that some Yuman tribes continue to travel to places like Spirit Mountain and Grapevine Canyon for ceremonial purposes. In addition, Cleland (2011) describes a large-scale ethnographic trail system that extends from below Davis Dam to the Gulf of California. The trail system is punctuated with petroglyphs, geoglyphs, rock alignments, trail shrines, and other resources that are prevalent in undisturbed areas (Cleland 2011, NPS 1993). While these features are often considered to be archeological resources, the fact that many are incorporated into contemporary traditional ceremonies indicates that they may be significant as ethnographic resources, as well. It is likely that the defined trail system, described by Cleland, extends northward into the recreation area. Therefore, in undisturbed areas in and around the developed areas, there is a potential for ethnographic resources. These resources could also be viewed as an ethnographic cultural landscape(s).

## VISITOR USE AND EXPERIENCE

### Visitation Statistics

Visitation statistics are recorded and managed by the NPS Public Use Statistics Office. The reports analyzed in figures 12, 13, 14, and 15 include annual park visitation, visitation by month/year, and the recreation area year to date visitors by district report.

Annual visitation to the Lake Mohave District of the recreation area has fluctuated over the past decade, including multiple periods of steep increases and decreases.

Visitors to Lake Mohave generally make up about 19% of total visitors to the Lake Mead National Recreation Area. The annual visitation numbers of this specific district, however, do not follow the same pattern as that of the overall park. Since the year 2000, visitation to the recreation area as a whole has not fluctuated in either direction more

than 4.84%, except for an almost 11% decrease between 2001–2002. In the same period, the Lake Mohave District received barely any change in visitation.

Lake Mohave's peak season — bringing in nearly 50% of annual visitation — consists of the summer months, June through August, with a strong shoulder season in April, May, and September. The other half of the year, October through March, accounts for only 25% of the Lake Mohave District's yearly visitor count.

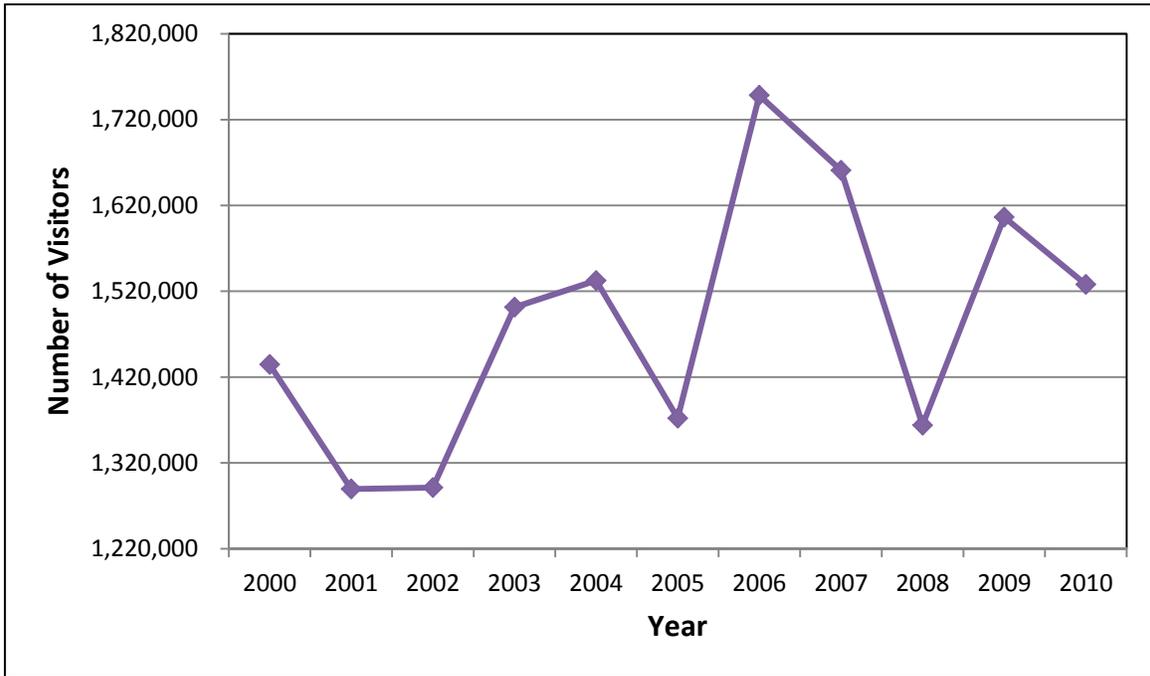
These percentages do not differ too greatly from Lake Mead National Recreation Area's overall monthly visitation statistics, although the overall park's numbers are somewhat more evenly distributed among the three seasons: summer brings in 35%, the shoulder season 28%, and the off-season accounts for 37% of visitors. It must be kept in mind, however, that the off-season is comprised of six months, and the other two seasons are made up of three months each. Also of note is that summer visitation, in July and August especially, has dropped off slightly in the Lake Mohave District in the past three years, which is consistent with park visitation as a whole in those two months.

### Visitor Access and Circulation

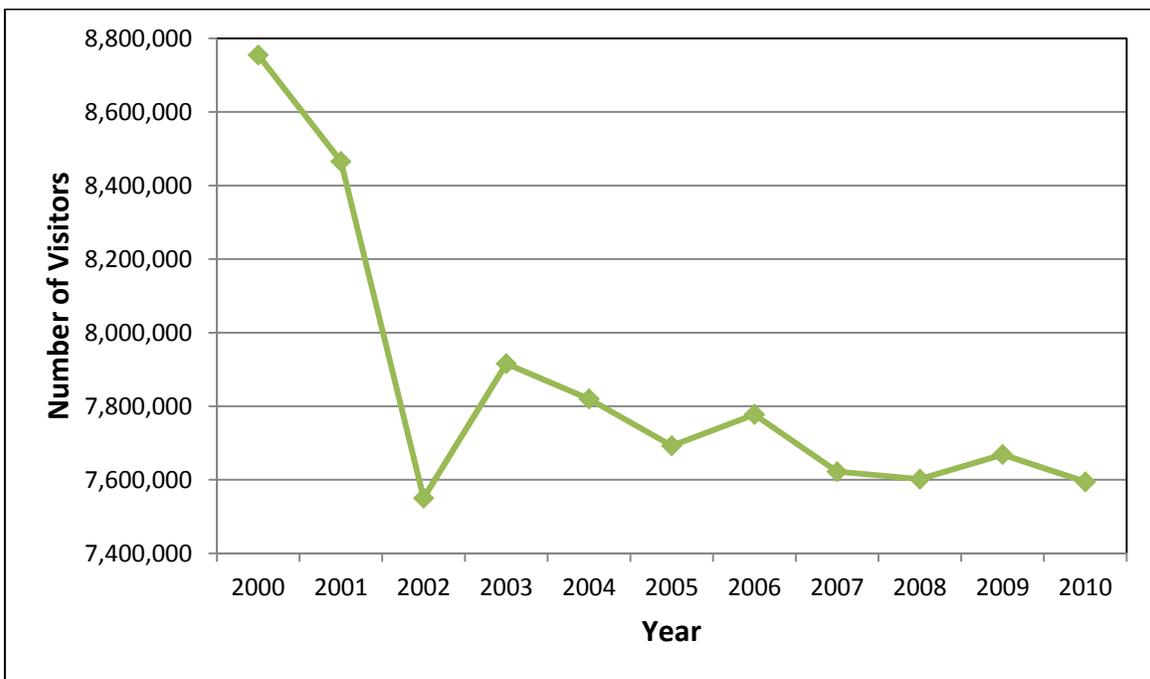
The largest airport nearby to the recreation area is McCarran International Airport in Las Vegas, Nevada, approximately 70 miles away from Cottonwood Cove, the northernmost developed area of Lake Mohave. The most convenient airport for direct access to Lake Mohave, however, is the expanding Laughlin-Bullhead International Airport in Bullhead City, Arizona, which is located just outside the park's southern boundary near Katherine Landing. Other small airports are located in surrounding communities.

Vehicular access to Cottonwood Cove is along a road of the same name, which branches off of U.S. Route 95 from Searchlight, Nevada. Several highways provide access to Katherine Landing via Katherine Spur from Davis Dam Road — Arizona Route 68 from the east, Arizona Route 95 from the south, or Nevada Route 136 from the west.

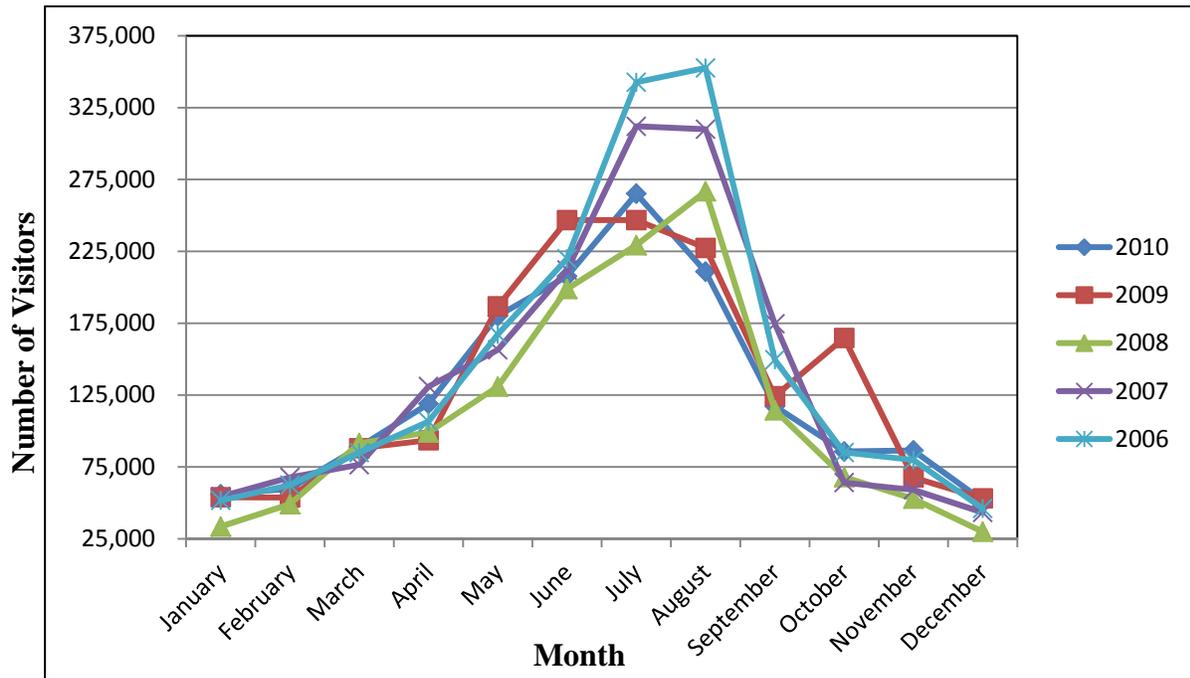
**FIGURE 12. LAKE MOHAVE DISTRICT – ANNUAL VISITATION TO THE LAKE MOHAVE DISTRICT OF LAKE MEAD NATIONAL RECREATION AREA**



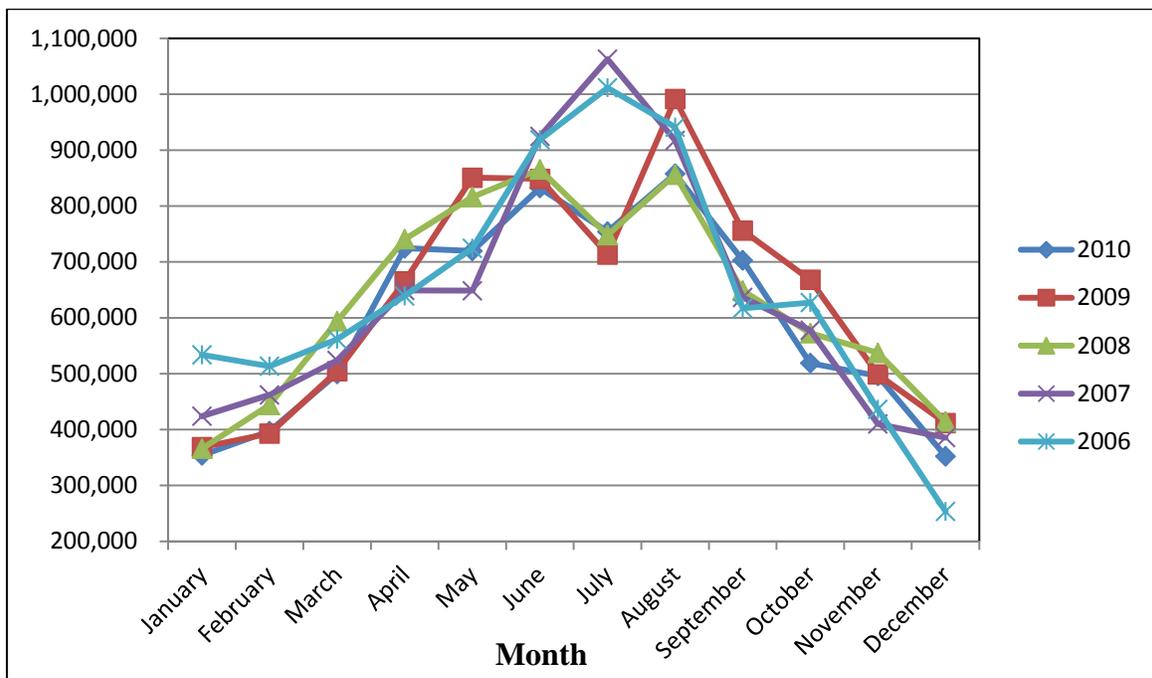
**FIGURE 13. LAKE MEAD NATIONAL RECREATION AREA – ANNUAL VISITATION TO LAKE MEAD NATIONAL RECREATION AREA, INCLUDING THE LAKE MOHAVE DISTRICT**



**FIGURE 14. LAKE MOHAVE DISTRICT – MONTHLY VISITATION TO THE LAKE MOHAVE DISTRICT OF LAKE MEAD NATIONAL RECREATION AREA**



**FIGURE 15. LAKE MEAD NATIONAL RECREATION AREA – MONTHLY VISITATION TO LAKE MEAD NATIONAL RECREATION AREA, INCLUDING THE LAKE MOHAVE DISTRICT**



Fees exist to enter the park and collection booths are set up on entry roads. Private vehicles and motorcycles are charged \$10, which covers all passengers and is valid for 7 days. A yearly (January 1 – December 31) vehicle pass is another option for private vehicles and motorcycles, at a cost of \$30. Individuals, which include hikers, bicyclists, and pedestrians, are charged \$5 per person for a 7-day pass, or \$30 for a yearly pass. Vessel fees are separate, and the cost is \$16 per vessel for up to 7 days or \$30 for a yearly pass. The Federal Lands passes — Senior (\$10 for a lifetime; if over 62 years of age), Access (free for a lifetime; for those with a permanent medical disability), and Annual (\$80 for 1 year from month of purchase; available to anyone) — are sold and accepted.

A network of backcountry roads has been developed to provide access to the lakeshore and other areas of interest in the backcountry. Approved roads are signed with a yellow arrow. Driving on roads or trails not marked with the yellow arrow is prohibited, as is driving off-road, in washes, or cross-country.

Katherine Landing has the largest percentage of boating access at Lake Mohave, as it is the largest developed section of the recreation area in terms of existing marina slips (824). The most common types of boats used to get around the lake are runabouts (defined as less than 24 ft in length) and personal watercraft, the latter of which are more common on Lake Mohave than on Lake Mead.

Both the Cottonwood Cove and Katherine Landing experience congestion during busy times because of long back-ups behind the launch ramp. At Katherine Landing especially, parking at the lakeshore is not sufficient during these periods and visitors must park far away in one of the multitude of small lots surrounding the area. Visitor conflicts, both verbal and physical, arise due to the inconvenience of parking, long waits on the boat launch, and cutting in line.

### **Visitor Recreation and Activities**

Lakes Mead and Mohave are oases in the desert; and therefore are highly popular for water-based recreation. These activities include motor boating, house boating, sailboarding and sailing, canoeing, kayaking, rafting, waterskiing, fishing,

wakeboarding, swimming, SCUBA diving, use of personal watercraft, and boat touring.

Visitors also participate in land-based recreation such as picnicking, nature study, hiking, biking, and camping along the lakeshore. Guided hikes depart from a variety of locations at different times, and include destinations such as the Katherine Mine, Hamblin Mountain, and Fortification Hill.

### **Visitor Facilities, Services, and Amenities**

Both Cottonwood Cove and Katherine Landing have concessioners that each have a number of facilities and offer a variety of services and amenities. These year-round resorts have diverse accommodation options, including motel rooms, RV sites with full hookups (electric, water, and sewage), and houseboat rentals. Although these overnight facilities exist, the limited variety and current quality are not meeting current visitor needs and preferences, and therefore have extremely low occupancy rates. For instance, there are not enough campsites large enough to accommodate recreational vehicles, and there are too few spaces with hookups. Katherine Landing also faces accessibility challenges for those with mobility impairments.

The resorts also have their own dining establishments and gift shops that offer the usual souvenir clothing and gifts, as well as, fishing licenses, bait, and tackle. These facilities get very crowded at peak periods. In addition, coin-operated laundry machines and public restrooms are available on the premises. Cottonwood Cove has recreational facilities that include a sand volleyball court, shuffle board, and horseshoe pit.

The resorts manage the marinas and boat launches on their respective properties. In addition to houseboats, visitors can also rent powerboats, fishing boats and personal watercraft, and accessories like water skis, kneeboards, and wakeboards are also available. The boat launches have wide ramps with easy access to parking and tie-down areas. For additional convenience, the marinas rent out boat slips and secure dry storage areas.

Although there is no visitor center in the Lake Mohave District, the ranger station at Katherine Landing allows the public to make reservations for guided hikes and the staff provides assistance. Gift shops also provide park information.

### Visitor Safety

Congestion at launch sites and on access roads not only detracts from the visitor experience, but hinders the ability of park staff to respond to emergencies. Physical altercations have been known to arise because of the high level of frustration, especially when visitors cut in the lines at the launch ramps.

Safety issues also exist in regards to parking at each location. At Cottonwood Cove, the parking area is susceptible to flash flooding, particularly near the launch ramp. At Katherine Landing, most visitors must park in one of the various small lots and walk a fair distance in temperatures over 100°F, which can cause heat exhaustion or even heat stroke.

Cottonwood Cove, in addition to having a marina and boat launch, has two no-boat areas. The proximity of these conflicting uses leads to conflicts among the user groups and safety issues.

A number of safety concerns exist simply because of the nature of the recreational opportunities, such as the need to wear a personal flotation device and to be mindful of the weather. Based on the current location of the Cottonwood Cove ranger station, visitors do not currently stop and receive information regarding safety.

Fire hazards also exist because of the current close proximity of long-term trailers at Katherine Landing, which would allow for a fire to spread quickly from one trailer to another.

## SOCIOECONOMIC ENVIRONMENT

Cottonwood Cove is located on the west shore of Lake Mohave within Clark County in Nevada. The nearest community is Searchlight, Nevada, located 15 miles west of the lake. Boulder City, Nevada, is 40 miles north of Searchlight, and the Las Vegas metropolitan area (including North Las Vegas and Henderson) is 60 miles north, approximately an hour's drive from Searchlight.

Katherine Landing is located near Davis Dam on the southeastern shore of Lake Mohave, within Mohave County in Arizona. Bullhead City, Arizona, and Laughlin, Nevada, are the two closest cities to Katherine Landing, each located within 8 miles of the Katherine Landing marina. Kingman, Arizona, is approximately 35 miles east of Katherine Landing.

Economic impacts presented in this report are calculated using multipliers for Clark County and Mohave County. The actual influence area for economic and social considerations associated with Lake Mohave encompasses Searchlight, Boulder City, and Laughlin, Nevada, and Bullhead City and Kingman, Arizona. Although Las Vegas is located within Clark County, impacts on the Las Vegas metropolitan area from actions at Cottonwood Cove and Katherine Landing are considered negligible.

### Regional Land Use

Lake Mohave has a surface area of 28,260 acres and 150 miles of shoreline. Portions of the recreation area, including a 300 ft zone around the shoreline of both lakes, are jointly administered by the National Park Service for recreation and resource protection and by the U.S. Bureau of Reclamation (BOR) for project purposes and security areas at and around Davis Dam. The reclamation bureau manages the lake level, and there is an annual fluctuation between the lake elevations of 630 ft and 645 ft above mean sea level (NPS 2002).

The Lake Mead National Recreation Area boundaries typically extend between one and five miles from the shoreline of Lake Mohave, and large tracts of land within the recreation area are managed jointly by the National Park Service and Bureau of Reclamation. These areas include the Eldorado Wilderness near the southern end of Black Canyon, the Ireteba Wilderness near Nevada Bay and Cottonwood Cove, the Nellis Wash Wilderness, and the Spirit Mountain Wilderness near Nevada Telephone Cove. All of these areas are on the Nevada side of the lake.

The recreation area around Lake Mohave borders arid, mountainous land in unincorporated Clark County in Nevada and Mohave County in Arizona. Development within Laughlin and Bullhead City approaches the border of the

recreation area, only a few miles from the services at Katherine Landing.

## Population

The region surrounding Lake Mohave, while sparsely populated, has experienced high population growth rates over the past 20 years. Population growth rates in Clark and Mohave counties were approximately five times faster than the national growth rate between the 1990 and 2000 censuses, and have remained two to four times faster than the national average over the past decade. Table 10 presents population data for communities surrounding Lake Mohave.

The population of Searchlight was 576 in 2000, according to the U.S. Census Bureau. A 2009 projection was not available for Searchlight as of March 2011.

The recent economic downturn has slowed population growth, especially since 2006, and current forecasts for regional population growth over the upcoming decade are more in line with national average estimates. The census bureau projects population growth of approximately 1.0% per year through 2020.

## Regional Economic Status and Forecast

The average monthly unemployment rate in Clark County in 2010 was 14.9%, among the highest in the nation. Mohave County had an unemployment rate of 10.1% in 2010, according to the U.S. Bureau of Labor Statistics. After several years of economic expansion, employment peaked in 2006 and has declined significantly over the past 4 years.

According to the 5-year estimates in the census bureau's 2005–2009 American Community Survey, per capita income in Mohave County was \$21,321 in 2009 inflation-adjusted dollars. In Clark County, per capita income was \$27,395, while U.S. per capita income was \$27,041.

Table 11 presents employment statistics by industry in Clark County in 2003, 2006 (the year that employment peaked), and 2009. Note that the number of employed people fell by almost 100,000 (11.8%) between 2006 and 2009.

Leisure and hospitality industries employed over one-third of all Clark County residents in 2009, followed by trade, transportation, and utilities and professional and business services. The construction sector experienced the greatest decline in employment in both absolute and percentage terms, losing approximately 45,000 workers (41.2%) between 2006 and 2009. The current, depressed state of the construction industry in Clark County has kept construction costs down and ensures that employees will be available for the construction projects proposed in alternatives 2 and 3.

Mohave County's labor force is significantly smaller than that of Clark County. According to the labor statistics bureau, total wages for Clark County workers in 2009 were \$29.7 billion. Total wages for Mohave County workers in 2009 were \$1.1 billion.

Total employment in Mohave County declined by 19.4% between 2006 and 2009, as listed in table 12.

Trade, transportation, and utilities industries employed over one quarter of the Mohave County workforce in 2009, representing the largest share of total employment. Education and health services and leisure and hospitality industries were the next largest employers. As in Clark County, the construction sector in Mohave County experienced the largest decline in absolute and percentage terms between 2006 and 2009, losing approximately 5,500 jobs, or 62.9% of construction industry employment.

Within the leisure and hospitality industry, tourism is a key component of the economy of the Lake Mohave area. Visitors to Cottonwood Cove and Katherine Landing contribute to the local economy through the purchase and rental of watercraft and equipment, recreational equipment, and expenditures on lodging, food and beverage, and other travel-related services.

Regional economic recovery will be dependent on tourism and therefore on the overall health of the U.S. economy. The construction industry will continue to be depressed due to overbuilding that has resulted in an excess supply of housing inventory and because of low demand resulting from declining employment in all sectors of the economy.

**TABLE 10. POPULATION DATA FOR COMMUNITIES SURROUNDING LAKE MOHAVE**

Location	1990	2000	CAGR <sup>a</sup> 1990–2000	2009	CAGR 2000–2009
Bullhead City, AZ	21,951	33,769	4.4%	40,747	2.1%
Kingman, AZ	12,722	20,069	4.7%	27,521	3.6%
Mohave County, AZ	93,497	155,032	5.2%	194,825	2.6%
Boulder City, NV	12,567	14,966	1.8%	14,896	-0.1%
Las Vegas, NV	258,295	478,434	6.4%	567,641	1.9%
North Las Vegas, NV	47,707	115,488	9.2%	224,387	7.7%
Henderson, NV	64,942	175,381	10.4%	256,445	4.3%
Clark County, NV	741,459	1,375,765	6.4%	1,902,834	3.7%
United States	248,709,873	281,421,906	1.2%	307,006,550	1.0%

**Source:** U.S. Census Bureau, 1990 and 2000 Census data; 2009 data from American Community Survey 2005–2009.

a. Compound Annual Growth Rate.

**TABLE 11. EMPLOYMENT BY INDUSTRY IN CLARK COUNTY, NEVADA**

Industry	2003	2006	2009	Growth 2006–2009	Share 2009
<b>Total Employed</b>	<b>676,932</b>	<b>820,983</b>	<b>723,820</b>	<b>-11.8%</b>	<b>100%</b>
Construction	74,757	108,573	63,860	-41.2%	8.8%
Manufacturing	22,015	26,922	21,113	-21.6%	2.9%
Trade, Transport, and Utilities	132,549	156,012	148,544	-4.8%	20.5%
Professional and Business Services	86,561	115,212	99,254	-13.9%	13.7%
Education and Health Services	50,377	60,030	67,502	12.4%	9.3%
Leisure and Hospitality	238,726	271,700	251,347	-7.5%	34.7%
All Other Industries	71,947	82,534	72,200	-12.5%	10.0%

**Source:** U.S. Bureau of Labor Statistics.

**TABLE 12. EMPLOYMENT BY INDUSTRY IN MOHAVE COUNTY, ARIZONA**

Industry	2003	2006	2009	Growth 2006–2009	Share 2009
<b>Total Employed</b>	<b>39,124</b>	<b>46,823</b>	<b>37,739</b>	<b>-19.4%</b>	<b>100%</b>
Construction	5,828	7,297	2,707	-62.9%	7.2%
Manufacturing	3,303	3,987	2,853	-28.4%	7.6%
Trade, Transport, and Utilities	10,477	11,798	10,443	-11.5%	27.7%
Professional and Business Services	3,475	4,033	3,262	-19.1%	8.6%
Education and Health Services	5,635	6,927	7,667	10.7%	20.3%
Leisure and Hospitality	5,730	6,885	6,026	-12.5%	16.0%
All Other Industries	4,676	5,896	4,781	-18.9%	12.7%

**Source:** U.S. Bureau of Labor Statistics.

### Other Park Concessioners

In addition to the concession operations at Cottonwood Cove and Katherine Landing, there is a concession-run marina and watercraft rental operation at Willow Beach on the Arizona side of Lake Mohave, approximately 50 miles north of Katherine Landing. Six concession-run marinas and one tour boat service operate on Lake Mead, including facilities at Lake Mead Marina, Temple Bar, Echo Bay, Callville Bay, Overton Beach, Hemenway Harbor, and Las Vegas Wash. The tour boat operates out of Hemenway Harbor.

### Current Impacts of Visitor Spending

The report “Economic Benefits to Local Communities from National Park Visitation and Payroll, 2009” estimates that total visitor spending associated with visits to the Lake Mead National Recreation Area was \$265.7 million in 2009 (NPS 2011). Dividing this figure by 7.67 million visitors, average spending per visitor was approximately \$35. This includes expenses within the local region, excluding park entry fees (the local region is defined as a 60-mile radius around the park). Average spending figures are based on visitor survey data and national averages for all NPS units. In 2009, lodging and food and beverage expenses each accounted for around 25% of total spending, transportation expenses (mainly gasoline) accounted for 15%, groceries accounted for 9%, other retail 14%, and recreation and entertainment 10%. Of course, many visitors to the recreation area were day visitors or visitors driving through the area.

This visitor spending is estimated to support approximately 2,400 jobs in the local area (including concessioner and NPS jobs), accounting for \$79.4 million in labor income and \$130.2 million value added to the economy in 2009. Dividing labor income by jobs, annual wages averaged \$33,000 for these positions.

Local economic impacts of visitor spending are estimated in the Money Generation Model version 2 (MGM2), a set of Microsoft Excel workbooks for estimating the economic impacts

of NPS visitor spending on a local region (Stynes et al. 2009). This model uses multipliers for local areas around each park. The multipliers capture both the direct and secondary economic effects in gateway communities around the parks in terms of jobs, labor income, and value added. Value added is the sum of labor income, profits and rents, and indirect business taxes.

Economic impacts of current visitor spending specifically at the Cottonwood Cove and Katherine Landing concessions are presented in “Chapter 4: Environmental Consequences” of this document under “Impacts of the No-action Alternative.”

### PARK OPERATIONS

The general management plan divided the Lake Mead National Recreation Area into 9 management zones that generally correspond with developed areas in the recreation area. The Katherine Zone and Cottonwood Zone are relevant to these development concept plans. The subsequent lake management plan established 24 management zones for the recreation area where zones 1–4 correspond to Lake Mohave, including Cottonwood Cove and Katherine Landing.

According to the *Lake Mead National Recreation Area Business Plan* (NPS 1999), staffing requirements are not being met to adequately provide visitor services, facility upkeep and maintenance, and resource management throughout the recreation area.

Total salary and payroll benefits for the 379 employees of the recreation area totaled \$20.6 million in 2009 (NPS 2011). The economic impact of NPS payroll was estimated using multipliers for IMPLAN, the economic impact assessment software system, sector 439 (federal government payroll). The Lake Mead National Recreation Area payroll contributed \$25.8 million in value added to the local economy in 2009 and supported an additional 46 jobs in the local economy.





ENVIRONMENTAL  
*Consequences*

## Back of Divider

# CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

## INTRODUCTION

This chapter analyzes the environmental impacts of implementing the three alternatives on natural resources, cultural resources, visitor use and experience, socioeconomics, and park operations. The analysis is the basis for comparing the beneficial and adverse effects of implementing the alternatives.

This chapter begins with a description of the methods and definitions used impact topic. A description of the related laws, regulations, and policies and thresholds used in the impact analysis are then presented for each impact topic. Impact analysis discussions are organized by impact topic and each alternative. The existing conditions for all of the impact topics that are analyzed were identified in “Chapter 3: Affected Environment.” All of the impact topics are assessed for each alternative. The analysis of the no-action alternative (the continuation of current management trends) identifies the future conditions in the park if no major changes to facilities or NPS management occurred. The two action alternatives are then compared to the no-action alternative to identify the incremental changes in conditions that would occur because of changes in park facilities, uses, and management.

## METHODOLOGY

Impact analyses and conclusions are based on NPS staff knowledge of resources and the project area, public input, review of existing literature, and information provided by experts in the National Park Service or other agencies and American Indian tribes. The impact analysis for each impact topic involved the following steps:

- identify the area that could be affected
- compare the area of potential effect with the resources that are present
- identify the intensity, context, duration, and type of effect, both as a result of this action and from a cumulative effects perspective as

compared to the baseline (no-action alternative)

Impacts described in this section are based on the conceptual plan for the alternatives under consideration. Effects are quantified where possible; in the absence of quantitative data, best professional judgment prevailed. All the impacts have been assessed assuming that mitigating measures described in “Chapter 2: Alternatives, Including the Preferred Alternative” would be implemented to minimize or avoid impacts.

The environmental consequences for each impact topic were identified and characterized based on impact type, intensity, context, and duration, which are generally defined in the following sections.

### Types of Effects

**Beneficial Effects.** These effects are defined as positive changes in the condition or appearance of the resource or changes that move the resource toward a desired condition.

**Adverse Effects.** These effects are defined as changes that move the resource away from a desired condition or detract from its appearance or condition.

**Direct Effects.** These effects are caused by an action and occur at the same time and place as the action.

**Indirect Effects.** These effects are also caused by the action and occur later or farther away, but are still reasonably foreseeable.

### Intensity of Effects

“Intensity” refers to the degree or magnitude to which a resource would be beneficially or adversely affected. Each impact was identified as negligible, minor, moderate, or major. Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental impact statement.

## Context

“Context” refers to the setting within which an impact may occur, and can be site specific, local, parkwide, or regionwide. In this analysis, many economic impacts are local and regionwide and many impacts to park operations are site specific.

**Site-specific Impacts.** These impacts would occur at the location of the action.

**Local Impacts.** These impacts would occur within the general vicinity of the project area.

**Parkwide Impacts.** These impacts would affect a greater portion outside the project area yet within the park.

**Regionwide Impacts.** These impacts would extend beyond park boundaries.

## Duration of Effects

“Duration” refers to how long an impact would last. Unless otherwise specified, in these plans, “short-term” and “long-term” are used to describe the duration of the impacts.

**Short-term.** The short-term impact would be temporary in nature, such as impacts associated with construction. Typically short-term impacts would last as long as construction was taking place (assumed to be a two- to three-year period in this analysis).

**Long-term.** The long-term impact would last more than one year and could be permanent in nature, such as the loss of soil because of the construction of a new facility. More specifically, long-term impacts would be expected to occur throughout the concession contract period, which is assumed to be 10 years, with the potential for contract extensions/renewals beyond the initial 10-year period.

## CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other

actions” (40 Code of Federal Regulations [CFR] 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Each cumulative impact analysis is additive, considering the overall impact of the alternative when combined with effects of other actions — both inside and outside the recreation area — that have occurred or that would likely occur in the foreseeable future. To determine potential cumulative impacts, past, present, and future potential actions and developments within and surrounding each developed area were considered by the planning team. Some of these actions are in the early planning stages and the qualitative evaluation of cumulative impacts was based on a general description of the projects.

In this analysis, the geographic area in which cumulative impacts are analyzed includes Clark County, Nevada, and Mohave County, Arizona.

Specific projects or ongoing activities with the potential to cumulatively affect natural and cultural resources, visitor experience and safety, socioeconomics, or park operations (impact topics) that are evaluated for the project are identified in these plans and described in the following list. Some impact topics would be affected by several or all of the described activities, while others could be affected little or not at all. How each alternative would incrementally contribute to potential impacts for a resource is included in the cumulative effects discussion for each impact topic.

- The damming of the Colorado River at Hoover Dam (Lake Mead) and Davis Dam (Lake Mohave) and the introduction of sport fish has diminished the habitat required for successful recruitment of the federally listed razorback sucker and bonytail chub. The damming of the river and fluctuating water levels also greatly reduced natural riparian habitats used by the federally listed Southwest willow flycatcher.
- Reconstruction of the Katherine Landing access road is proposed from the road's intersection with Davis Dam Highway to the boat launch ramp at Katherine Landing Marina on Lake Mohave. The existing road

suffers from poor pavement conditions, narrow travel lanes, inadequate drainage, and heavy traffic volumes. Reconstruction of the road would alleviate these problems, improving safety and offering a more desirable visitor experience.

- In 2008, the Lake Mead National Recreation Area (NRA) finalized a *Wireless Telecommunication Facilities Plan and Environmental Assessment* (wireless telecommunication facilities plan) that identifies areas within the park suitable for new cellular towers. The Cottonwood Cove developed area is considered suitable in the plan and new structures could be permitted in the future. While specific locations have not been identified, cell towers would be constructed in previously disturbed areas.
- The *Lake Mead NRA Exotic Plant Management Plan* (exotic plant management plan) was approved in 2011. The overall goal of the plan is to maintain native plant communities by preventing and removing exotic plants using an integrated approach that maximizes the effectiveness of the action while minimizing the undesirable impacts of the exotic plant and the management action. The plan would enhance the overall effectiveness of exotic plant management in the park by consistently and comprehensively incorporating exotic plant prevention measures into park operations and in NPS-controlled activities such as concessions, contracts, research permits, special use permits, and other activities undertaken by non-NPS entities but under the authority of the park.
- The 2004 *Lake Mead NRA Fire Management Plan* (fire management plan) provides guidance on management of fires in the recreation area. The plan authorizes the use of wildland fire and prescribed fire to restore ecosystems to desired resource conditions, including the use of prescribed fire for exotic plant control.
- The 2003 *Lake Mead NRA Lake Management Plan* (LMP) authorized the expansion of the marina at Cottonwood Cove to 484 slips. The plan directed that the marina at Katherine Landing should remain at approximately the current size, with an authorized capacity of

824 slips. The plan also reduced the use of carbureted two-stroke engines until they are banned from the recreation area after 2012. Other actions to improve resource conditions related to shoreline and boating conflicts, litter and sanitation, sensitive wildlife habitat, and water quality.

- Searchlight Wind Energy, LLC. is proposing to develop an approximately 370 megawatt (mW) wind energy facility consisting of up to 161 wind turbine generators. The project is located on 24,383 acres of public lands between the community of Searchlight, Nevada, and the Lake Mead National Recreation Area. The proposed project would require the construction of new access roads, an overhead transmission line, two electrical substations, an electrical interconnection facility/switchyard, an operations and maintenance building, meteorological masts, as well as temporary and permanent areas for construction staging and storage.
- Lands surrounding the developed areas have been altered by past and ongoing actions such as past occupation by feral burros (which have been significantly reduced over the past decade), maintenance and use of approved backcountry roads, illegal off-road vehicle driving, power line corridors, and the spread of nonnative plants.

## CRITERIA AND THRESHOLDS FOR IMPACT ANALYSIS

### Natural Resources – Native Plant Communities and Soils

**Guiding Laws, Regulations, and Policies.** Soil resources would be protected by preventing or minimizing adverse potentially irreversible impacts to soils, in accordance with NPS *Management Policies 2006*, Director's Order 77, *Natural Resource Management*, and *Natural Resource Management Reference Manual #77* specifies soil resource management objectives. These management objectives are defined as: (1) preserve intact, functioning, natural systems by preserving native soils and the processes of soil genesis in a condition undisturbed by humans to the extent possible; (2) maintain significant cultural objects and scenes by conserving soils

consistent with maintenance of the associated historic practices, and by minimizing soil erosion to the extent possible; (3) protect property and provide safety by working to ensure that developments and their management take into account soil limitations, behavior, and hazards; and, (4) minimize soil loss and disturbance caused by special use activities and ensure that soils retain their productivity and potential for reclamation.

The NPS Organic Act of 1916 directs the park to conserve the scenery and the natural objects unimpaired for future generations. The NPS management policies defines the general principles for managing biological resources as maintaining all native plants and animals as part of the natural ecosystem. When NPS management actions cause native vegetation to be removed, then the National Park Service will seek to ensure that such removals will not cause unacceptable impacts on native resource, natural processes, or other park resources.

Exotic species, also referred to as nonnative or alien, are not a natural component of the ecosystem. They are managed, up to and including eradication, under the criteria specified in the NPS management policies and Director's Order 77.

#### **Intensity Thresholds.**

*Negligible impacts* — Soils would not be affected or the effect would be below or at the lower end of detection. Vegetation would not be affected or some individual native plants could be affected, but the changes would be so slight that they would not be of any measurable or perceptible consequence to the species' population.

*Minor impacts* — Soils and some individual native plants would be affected over a relatively small area and the effects would be local. The effects could include changes in the abundance or distribution of individuals in a local area, but not changes that affect the viability of local populations.

*Moderate impacts* — Soils and native plants would be affected over a relatively small area or multiple sites and would be readily noticeable. Impacts would cause a change in the abundance or distribution of local populations, but would not affect the viability of regional populations.

*Major impacts* — A substantial, highly noticeable effect on soils and native plant populations would occur over a relatively large area. Impacts would cause a change in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover or would return to a sustainable level.

#### **Natural Resources – Wildlife**

**Guiding Laws, Regulations, and Policies.** The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the National Park Service to mean native animal life should be protected and perpetuated as part of the recreation area's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible. The restoration of native species is a high priority. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and ecological integrity of plants and animals. The recreation area also manages and monitors wildlife cooperatively with the Arizona Game and Fish Department (AZGFD) and the Nevada Department of Wildlife (NDOW).

The Migratory Bird Treaty Act of 1918 makes it unlawful to kill, capture, buy, sell, import, or export migratory birds, eggs, feathers, or other parts. Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," issued in January 2001, restated the value of migratory birds and directed agencies to develop and implement memoranda of understanding with the U.S. Fish and Wildlife Service (USFWS) to protect them. The NPS memorandum of understanding with U.S. Fish and Wildlife Service was signed April 12, 2010 and establishes how the both agencies will jointly promote the conservation of migratory birds by incorporating bird conservation measures into agency actions and planning processes. It also identifies NPS actions that could result in the unintentional take of migratory birds or impacts on their habitats, so that strategies can be developed to avoid, minimize, or mitigate the effects of those actions.

#### **Intensity Thresholds.**

*Negligible impacts* — Effects on wildlife and aquatic species would be at or below the level of detection

and the changes would be so slight that they would not be of any measurable or perceptible consequence to species' populations.

*Minor impacts* — Effects on wildlife and aquatic species would be detectable, although the effects would be local. The effects could include changes in the abundance or distribution of individuals in a local area, but not changes that affect the viability of local populations.

*Moderate impacts* — Effects on wildlife and aquatic species would be readily detectable and would cause a change in the abundance or distribution of local populations, but would not affect the viability of regional populations.

*Major impacts* — Effects on wildlife and aquatic species would be substantial, highly noticeable, and might result in widespread change and be permanent in nature. Impacts would cause a change in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover or would return to a sustainable level.

## **Natural Resources – Threatened, Endangered, and Special Status Species**

### **Guiding Laws, Regulations, and Policies.**

Section 7 of the Endangered Species Act (ESA) mandates all federal agencies determine how to use their existing authorities to further the purposes of the Endangered Species Act to aid in recovering listed species, and to address existing and potential conservation issues. Section 7(a)(2) states that each federal agency shall, in consultation with the Secretary of the Interior, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

NPS management policies directs the parks to survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act (section 4.4.2.3). It sets the direction to meet the obligations of the Act. The NPS management policies also directs the National Park Service to inventory, monitor, and manage state and locally listed species, and other native species that are of special management concern to the parks, to

maintain their natural distribution and abundance.

The following impact intensity definitions are consistent with the language used to determine effects on threatened and endangered species under the federal Endangered Species Act.

### **Intensity Thresholds.**

*No effect* — The alternative would have no effect on the species or critical habitat if present.

*Not likely to adversely effect* — The alternative would be expected to have insignificant or discountable effects on a species or critical habitat (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or be completely beneficial.

*Likely to adversely effect* — The alternative would have a direct or indirect adverse effect on a species or critical habitat and the effect is measurable and likely to occur.

## **Natural Resources – Floodplains**

### **Guiding Laws, Regulations, and Policies.**

Executive Order 11988, "Floodplain Management," requires an examination of impacts to floodplains and of the potential risk involved in placing facilities within floodplains as well as the protection of floodplain values. The National Park Service established procedures for implementing floodplain protection and management actions in units of the national park system as required by Executive Order 11988 and Director's Order 77-2, *Floodplain Management*, in the NPS *Floodplain Management Procedural Manual 77-2*. When it is not practicable to locate or relocate development or inappropriate human activities to a site outside and not affecting the floodplain, a statement of findings for floodplains is required to be prepared (see appendix C).

### **Intensity Thresholds.**

*Negligible impacts* — Impacts on floodplain functions and values would be so slight that it would not be of any measurable or perceptible consequence. There would be no flood hazards to people or property.

*Minor impacts* — Impacts would result in a detectable change to floodplain functions and

values, but the expected change would be small, of little consequence, and local. There would be a slight change to the flood hazards to people or property.

*Moderate impacts* — Impacts would result in a change to floodplain functions and values that would be readily detectable, measurable, consequential, and local. There would be a noticeable change to flood hazards to people or property.

*Major impacts* — Impacts would result in a substantial change to floodplain functions and values and could affect large portions of the associated washes or basins. There would be a substantial change to flood hazards to people or property.

### Cultural Resources – General

**Guiding Laws, Regulations, and Policies.** This environmental impact statement addresses the effects of the three alternatives on cultural resources that are proposed by actions in these development concept plans. The method for assessing effects on cultural resources is designed to comply with the requirements of both the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA), and with implementing the following regulations: 40 CFR1500 and 36 CFR 800. Accordingly, the assessment of effects discusses the following characteristics of effects:

- direct and indirect effects
- duration of the effect (short term, long term)
- context of the effect (site-specific, local, regional)
- intensity of the effect (negligible, minor, moderate, major, both adverse and beneficial)
- cumulative nature of the effect

In accordance with 36 CFR 800, the regulations implementing Section 106 of National Historic Preservation Act, effects on cultural resources are identified and evaluated by

- Determining the area of potential effect (APE) [800.4(a)]
- Applying the criteria of adverse effect to affected historic properties in the area of potential effect [800.5.(a)(1)] is as follows:
  - An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register of Historic Places. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects are provided in 800.5(a)(2).
  - A finding of *no adverse effect* is found when the undertaking’s effects do not meet the criteria of 800.5(a)(1) [800.5.(b)].
- Considering ways to avoid, minimize, or mitigate or otherwise resolve adverse effects. The following are considered:
  - Consultation with the Nevada and Arizona state historic preservation officers / tribal preservation officers and others to develop and evaluate strategies to mitigate adverse effects [800.6].
  - Council on Environmental Quality (CEQ) regulations and Director’s Order 12 call for the discussion of mitigating impacts and an analysis of how effective the mitigation would be used in reducing the intensity of an impact, such as reducing it from moderate to minor intensity. Any resultant reduction in impact intensity is, however, an estimate of the effectiveness of mitigation under the National Environmental Policy Act only.

- Such reduction in impact intensity does not suggest that the level of effect as defined by Section 106 and 36 CFR 800 is similarly reduced. Cultural resources are nonrenewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss of integrity that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 and 36 CFR 800 may be mitigated, the effect remains adverse.

Section 106 summaries are included in the impact analysis sections of the “Impacts on Cultural Resources.” The Section 106 summaries provide an assessment of effect of the undertaking (implementation of the alternative) on historic properties, based on the Section 106 regulations.

### **Cultural Resources – Archeological Resources Intensity Thresholds.**

*Negligible impacts* — Impact is at the lowest level of detection. Impacts would be measurable but with no perceptible consequences. For purposes of Section 106, the determination of effect would be no adverse effect.

*Minor impacts* — Disturbance of a site(s) results in little loss of integrity. The determination of effect for Section 106 would be no adverse effect.

*Moderate impacts* — Site(s) is disturbed but not obliterated. The determination of effect for Section 106 would be adverse effect.

*Major impacts* — Site(s) is obliterated. The determination of effect for Section 106 would be adverse effect.

### **Cultural Resources – Historic Structures**

*Negligible impacts* — Impacts would be at the lowest levels of detection — barely perceptible and measurable. For purposes of Section 106, the determination of effect would be no adverse effect.

*Minor impacts* — Impacts would affect character-defining features but would not diminish the overall integrity of the building or structure. For purposes of Section 106, the determination of effect would be no adverse effect.

*Moderate impacts* — Impacts would alter a character-defining feature(s), diminishing the overall integrity of the building or structure to the extent that its National Register eligibility could be jeopardized. For purposes of Section 106, the determination of effect would be adverse effect.

*Major impacts* — Impacts would alter character-defining features, diminishing the integrity of the building or structure to the extent that it would no longer be eligible to be listed on the National Register. For purposes of Section 106, the determination of effect would be adverse effect.

### **Cultural Resources – Cultural Landscapes**

*Negligible impacts* — Impacts would be at the lowest levels of detection — barely perceptible and measurable. For purposes of Section 106, the determination of effect would be no adverse effect.

*Minor impacts* — Impacts would affect character-defining features or patterns but would not diminish the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be no adverse effect.

*Moderate impacts* — Impacts would alter character-defining features or patterns, diminishing the overall integrity of the landscape to the extent that its National Register eligibility would be jeopardized. For purposes of Section 106, the determination of effect would be adverse effect.

*Major impacts* — Impacts would alter character-defining features or patterns, diminishing the overall integrity of the landscape to the extent that it would no longer be eligible to be listed on the National Register. For purposes of Section 106, the determination of effect would be adverse effect.

## Cultural Resources – Ethnographic Resources

*Negligible impacts* — Impacts would be at the lowest levels of detection and barely perceptible. Impacts would neither alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the associated group’s body of practices and beliefs. For purposes of Section 106, the determination of effect would be no adverse effect.

*Minor impacts* — Impacts would be slight but noticeable and would neither appreciably alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the associated group’s body of beliefs and practices. For purposes of Section 106, the determination of effect would be no adverse effect.

*Moderate impacts* — Impacts would be apparent and would alter resource conditions or interfere with traditional access, site preservation, or the relationship between the resource and the associated group’s beliefs and practices, even though the group’s practices and beliefs would survive. For purposes of Section 106, the determination of effect would be adverse effect.

*Major impacts* — Impacts would alter resource conditions. Proposed actions would block or greatly affect traditional access, site preservation, or the relationship between the resource and the associated group’s body of beliefs and practices to the extent that the survival of a group’s beliefs and/or practices would be jeopardized. For purposes of Section 106, the determination of effect would be adverse effect.

## Visitor Use, Experience, and Safety

**Guiding Regulations and Policies.** Section 1.4.3 of the NPS management policies states that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks.

Section 7 of the NPS management policies states, “National parks are among the most remarkable

places in America for recreation, learning, and inspiration.” Section 8.2 of the NPS management policies states, “Management controls and conditions must be established for all park uses to ensure that park resources and values are persevered and protected for the future.” Director’s Order 42, *Accessibility for Park Visitors*, states that “the NPS will seek to provide the highest level of accessibility that is reasonable, and not simply provide the minimum level that is required by law.”

Part of the purpose of the Lake Mead National Recreation Area is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the park’s management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of the park’s facilities, services, and appropriate recreational opportunities.

### Intensity Thresholds.

*Negligible impacts* — The visitor to the developed areas is not affected, or changes in visitor use and experience are below or at the level of detection. The visitor is not likely to be aware of the effects associated with the alternative. Safety would not be affected, or the effects are at low levels of detection and do not have an appreciable effect on visitor or employee health and safety.

*Minor impacts* — Changes in visitor use and experience at the developed areas are detectable, although the changes would be slight. Some visitors are aware of the effects associated with the alternative, but the effects are slight and not noticeable by most visitors. The effect is detectable, but does not have an appreciable effect on health and safety.

*Moderate impacts* — Changes in visitor use and experience at the developed areas are readily apparent to most visitors. Visitors are aware of the effects associated with the alternative and might express an opinion about the changes. The effects are readily apparent and result in substantial, noticeable effects to health and safety on a local scale.

*Major impacts* — Changes in visitor use and experience at the developed areas are readily apparent to all visitors. Visitors are aware of the

effects associated with the alternative and are likely to express a strong opinion about the changes. The effects are readily apparent and result in substantial, noticeable effects to health and safety on a regional scale.

### Socioeconomic Environment

**Guiding Laws, Regulations, and Policies.** In accordance with NPS management policies, the recreation area may permit commercial services that are necessary and appropriate for public use and enjoyment of the area and are consistent to the highest practicable degree with the preservation and conservation of the area's resources and values.

#### Intensity Thresholds.

*Negligible impacts* — Impacts would be so slight as to be difficult to measure or perceive and have no meaningful implications for the socioeconomic environment.

*Minor impacts* — Impacts would be effects on the socioeconomic environment that would be slightly detectable; there would be a small change.

*Moderate impacts* — Impacts would be clearly detectable and could have an appreciable effect on the socioeconomic environment.

*Major impacts* — Impacts would have a substantial, highly noticeable influence on the socioeconomic environment and could permanently alter the socioeconomic environment.

### Park Operations

**Guiding Laws, Regulations, and Policies.** The NPS *Management Policies* (2006) directs the parks to pursue a human resources program that is comprehensive, that is based on competency, and that encompasses the entire workforce, including employees, volunteers, contractors, concession employees, interns, and partners (Section 1.9.1). Park operations encompasses the work of park staff in planning, resource protection and management, cultural resources, visitor safety and law enforcement, interpretation, facilities management, and commercial services (Sections 2–10).

#### Intensity Thresholds.

*Negligible impacts* — Impacts would be so slight as to be difficult to measure or perceive and have no meaningful implications for park operations.

*Minor impacts* — Impacts would be effects on park operations that would be slightly detectable; there would be a small change.

*Moderate impacts* — Impacts would be clearly detectable and could have an appreciable effect on park operations.

*Major impacts* — Impacts would have a substantial, highly noticeable influence on park operations and could permanently alter park operations.

## IMPACT ANALYSIS OF ALTERNATIVE 1: NO ACTION, CONTINUE CURRENT MANAGEMENT TRENDS

### Natural Resources

**Native Plant Communities and Soils.** Under no-action alternative, minimal changes would occur to existing facilities and no development of new facilities would take place. The overall development footprint would not be expanded. Within the developed areas, facilities, and infrastructure would require future maintenance and possibly replacement with age. No changes in visitation patterns are expected, although recreational use, particularly day use along the shoreline, could increase over time.

Impacts such as soil compaction, increased erosion, and trampling or removal of plants may increase because of maintenance activities, increased foot traffic, and social trail development. However, maintenance activities and visitor use would be concentrated in previously disturbed high-use areas, thus minimizing additional or new damage or loss of soils and vegetation. Most impacts would be to areas supporting nonnative herbaceous and shrub flora, such as landscaped or shoreline areas with salt cedar, although some individual native plants within the developed areas may also be impacted. These local adverse impacts on native vegetation and soils would be long term and minor.

Several species of invasive plants in landscaped areas have naturalized into adjacent natural areas and compete with native plant species. Maintaining existing exotic landscaping as part of the cultural landscapes at both developed areas provides reoccurring opportunities for seeds and propagules to spread nonnative plant species to surrounding native plant communities. Maintenance projects can also create ground disturbance that increases susceptibility to exotic plant establishment. The opportunity for the accidental introduction of nonnative seed sources by visitors would also continue. The National Park Service has an active restoration program that deals primarily with human-caused disturbances (e.g., damage to soils and plants due to construction) and a native plant nursery that propagates native plants for a variety of purposes. The NPS interpretation program educates park visitors and the surrounding communities about the native plant communities in the recreation area and prevention of introductions of nonnative plants. With local control and education efforts, impacts on native plant communities would be long term and minor.

*Cumulative effects* — Past and ongoing actions affecting soils and native plant communities on lands around the developed areas include occupation by burros, maintenance and use of approved backcountry roads, illegal off-road vehicle driving, and construction and maintenance of power line corridors. A priority for resource protection is to intensively manage these activities to prevent further disturbance or to limit disturbance from authorized activities to the extent possible as well as to treat areas to prevent the spread of invasive plants.

Future park construction projects affecting soils and vegetation include potential installation of a cellular tower at Cottonwood Cove and reconstruction of the Katherine Landing access road. Lands outside of the recreation area along the Cottonwood Cove access road may be lost or modified in the future because of development of a wind farm outside of Searchlight, Nevada. These projects would have adverse impacts on soils from ground disturbance and compaction during construction, and increases in impervious surfaces and subsequent increases in surface water runoff and erosion potential. Vegetation would be removed and the potential for the introduction of nonnative species and noxious weeds would

increase and could serve as a source population for nonnative plants that may disperse into native plant communities in the recreation area. Some of these effects are expected to be very limited such as for installation of the cellular tower within a previously disturbed area. Road reconstruction would result in temporary disturbance and permanent loss of vegetation and soils along the road corridor. Construction of a wind farm between the town of Searchlight and the recreation area boundary would impact approximately 600 acres which includes approximately 120 acres of permanent disturbance and approximately 480 acres of temporary disturbance for construction activities (URS 2009). It is expected that best management practices (BMPs) and mitigation measures would be implemented as part of the projects to reduce the extent of potential impacts. All of these past, present, and future actions would have short- and long-term minor to moderate adverse impacts on soils and native plant communities.

Long-term beneficial effects to native plant communities would be anticipated as a result of implementing the exotic plant management plan and the fire management plan, both of which seek to restore native plant communities and control exotic plants. Implementation of a comprehensive exotic plant management plan would enhance the overall effectiveness of exotic plant management in the recreation area and provide opportunities for more aggressive treatment, particularly for early detection and eradication of newly invading species. A comprehensive prevention program addressing both administrative actions as well as visitor and employee education would also create greater opportunities to intercept new introductions of nonnative plants. The use of prescribed fire for exotic plant control is addressed in the fire management plan. Provisions in the exotic plant management plan include systematically learning from treatment efforts, including prescribed fire, and integrating that knowledge into future decisions in an adaptive management framework.

While some cumulative actions would have beneficial long-term effects throughout the recreation area, overall, the cumulative effects to lands in and around the developed areas from past, present, and future actions in combination with the impacts of the no-action alternative would be minor to moderate and adverse over the

short and long term. The no-action alternative would contribute to long-term adverse impacts on soils and native vegetation; however, the contribution would be minor and would not change the intensity level of the cumulative effects.

*Conclusion* — The no-action alternative would result in additional minor, long-term, adverse impacts on soils and vegetation from facility maintenance and visitor use that disturb soils and vegetation and potentially contribute to the introduction and spread of nonnative and invasive plant species. Cumulative impacts on soils and vegetation from the no-action alternative in conjunction with past, present, and future projects would be minor to moderate and adverse over the short and long term. The no-action alternative, however, would contribute a local, minor increment to the overall cumulative impact.

**Wildlife.** Under the no-action alternative, existing impacts on wildlife would continue to occur as a result of routine maintenance activities and the high level of human activity in the developed areas. Habitat quality in the immediate areas is relatively low because of the existing level of development and human activity. In general, wildlife has become accustomed to human activity or has relocated outside of the developed areas. Should visitation continue to increase, it is expected to primarily occur within the existing developed areas, particularly along the shoreline. No wildlife habitat would be lost to new facility development.

Maintenance activities or increased use in the developed areas would affect low quality previously disturbed habitat. Impacts from maintenance activities of in-water structures and other nearshore facilities could create increased runoff, turbidity, or sedimentation of nearby aquatic habitats. Mitigation measures would be implemented to ensure that impacts are minimal. Habitat would potentially be affected by the introduction of nonnative species from maintenance of exotic landscaping or transportation into the recreation area by visitors. Area restoration and education programs would continue to address this issue.

Although some animals could be disturbed or displaced, impacts would not be expected to

adversely affect overall populations or habitats. Adverse impacts on wildlife and wildlife habitat from the no-action alternative would be local, long term, and minor.

*Cumulative effects* — As described in the “Native Plant Communities and Soils” section above, past and present actions on lands around the developed areas include occupation by burros, maintenance and use of approved backcountry roads, illegal off-road vehicle driving, and construction and maintenance of power line corridors. These actions disturb and fragment habitat, and likely introduce exotic plants and animals and result in injury or mortality as a result of encounters with humans and vehicles. Future projects affecting wildlife and habitat include potential installation of a cellular tower at Cottonwood Cove and reconstruction of the Katherine Landing access road. Lands outside of the recreation area along the Cottonwood Cove access road may be lost or modified in the future because of development of a wind farm outside of Searchlight. These projects would affect the behavior, distributions, and movements of some wildlife, such as dispersion of wildlife away from construction activity with reoccupation anticipated following construction, the loss of some less mobile species because of construction or operational activities, and reduction in habitat quality for adjacent areas because of noise and human activity during construction and possible introduction of invasive species. It is expected that best management practices and mitigation measures would be implemented as part of the projects to reduce the extent of potential impacts and that most of these actions would affect individuals or a few animals, not large populations. All of these past, present, and future actions would have short- and long-term, and minor to moderate adverse impacts on wildlife and wildlife habitat.

Long-term beneficial effects to native plant communities would be anticipated as a result of implementing the exotic plant management plan and fire management plan, both of which seek to restore native habitats and control exotic plants. Management actions associated with the lake management plan would improve water quality of the lake’s aquatic habitat through the reduction of the amount of waste fuels and human wastes in the lake.

While some cumulative actions would have beneficial long-term effects throughout the recreation area, overall, the cumulative effects to lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 1 would be minor to moderate and adverse over the short and long term. Alternative 1 would contribute an incremental long-term, minor adverse impact on the overall cumulative impact.

*Conclusion* – The no-action alternative would result in additional minor, long-term, adverse impacts on terrestrial and aquatic species from facility maintenance and increased visitor use. Cumulative impacts on wildlife from the no-action alternative in conjunction with past, present, and future projects would be minor to moderate and adverse over the short and long term. The no-action alternative, however would contribute a local, minor increment to the overall cumulative impact.

**Threatened, Endangered, and Special Status Species.** The no-action alternative would not appreciably change current conditions. Both Cottonwood Cove and Katherine Landing are major developed areas. Existing on land and in water facilities and continual high levels of visitor use at both developed areas have already negatively impacted habitat and use by threatened, endangered, and special status species. Continued use and maintenance of the developed areas would have little if any additional impact on these species. Mitigation measures from the 2002 and 2010 programmatic biological opinions would remain in effect (see appendix B).

There are no known spawning areas or nearby rearing ponds for razorback sucker or bonytail chub along the shoreline of either developed area. No impacts on spawning habitat are expected. As noted under the wildlife impact topic, impacts from maintenance activities of in-water structures and from other nearshore facilities could create increased runoff, turbidity, or sedimentation of Lake Mohave, which is critical habitat for both species. Adverse impacts would be short term and local because of the small areas affected, the disturbing activities would be temporary, and mitigation measures would be used to minimize potential impacts. Similar temporary impacts from increased shoreline recreation are expected to

continue to occur in areas already heavily used by visitors. Impacts would be short term and not likely to adversely affect razorback sucker, bonytail chub, or their critical habitat.

Southwestern willow flycatchers are transitory along the Lake Mohave shoreline and may use riparian habitat along the lakeshore in the developed areas during migration or dispersal. Continued maintenance and increased shoreline recreation in areas already heavily used by visitors may result in occasional flight responses and movement to other available habitat, but would not result in disturbance to breeding birds or nesting habitat. Impacts would be short term and not likely to adversely affect Southwestern willow flycatchers.

Potential noncritical habitat for the desert tortoise, Western burrowing owl, and banded Gila monster occur around the developed areas. Habitat quality in the immediate areas is relatively low because of the existing level of development and human activity. No habitat would be lost to new facility development under the no-action alternative. Maintenance activities or increased use in the developed area could affect low quality, previously disturbed habitat for these species. Mitigation measures would be implemented to minimize impacts. Thus, the no-action alternative would not be likely to adversely affect the species or desert tortoise critical habitat.

*Cumulative effects* – The damming of the Colorado River at Hoover Dam (Lake Mead) and Davis Dam (Lake Mohave) and the introduction of sport fish has diminished the habitat required for successful recruitment of razorback suckers and bonytail chubs. Heavy predation by sport fish on juveniles and the lack of suitable habitat required for recruitment necessitates active management of the species to ensure recovery. The damming of the river also eliminated natural riparian habitats used by Southwestern willow flycatchers. Fluctuating lake levels and extensive coverage by invasive salt cedar continue to negatively affect native riparian areas. These species also continue to be affected by recreational facilities and use of the lake and shorelines, which would include the authorized expansion of the marina at Cottonwood Cove.

Desert tortoise habitat in Lake Mead National Recreation Area has been altered or degraded by

development of facilities and recreational use. Roads and unauthorized off-road vehicle use result in fragmentation of habitat, tortoise mortality, and spread of exotic invasive plants that affect food availability and increase fire frequency. Infrastructure in desert tortoise habitat may facilitate predation of desert tortoises by attracting predators or by making them more visible to predators. Some visitors likely harass or collect tortoises and leave litter that tortoises may ingest or become entangled in. Wild burros have damaged habitat. Some of these same actions and impacts also result in the loss or alteration of potential habitat for burrowing owls and banded Gila monsters.

Future projects affecting wildlife and habitat include potential installation of a cellular tower at Cottonwood Cove and reconstruction of the Katherine Landing access road. Lands outside of the recreation area along the Cottonwood Cove access road may be lost or modified in the future because of development of a wind farm outside of Searchlight. These projects would result in loss of habitat and affect the behavior, distributions, and movements of terrestrial species of concern because of reduction in habitat quality for adjacent areas due to noise and human activity during construction and introduction of invasive species. Projects may result in the loss of some individuals because of construction activities and increased vehicle use or potentially higher speeds made possible by road improvements that increase the likelihood of vehicle collisions. It is expected that best management practices and mitigation measures would be implemented as part of the projects to reduce the extent of potential impacts.

These past, present, and future actions would have short- and long-term adverse impacts. The exotic plant management plan and fire management plan are expected to have long-term beneficial effects on terrestrial. Management actions associated with the lake management plan would improve water quality of the lake's aquatic habitat through the reduction of the amount of waste fuels and human wastes in the lake.

Some cumulative actions would contribute beneficial long-term effects throughout the recreation area on special status species and their habitat, whereas other cumulative actions would contribute adverse effects to the overall cumulative impact. Consequently, the cumulative

effects from past, present, and future actions in combination with the impacts of the no-action alternative would be both beneficial and adverse. The no-action alternative would contribute a local, discountable increment to the overall cumulative impact.

*Conclusion* — Continued maintenance activities and visitor use in the developed areas may affect, but would not be likely to adversely affect the razorback sucker, bonytail chub, Southwestern willow flycatcher, desert tortoise, Western burrowing owl, and banded Gila monster populations or designated critical habitat. When the effects of the no-action alternative are added to the effects of other park native plant community restoration efforts, there would be a long-term beneficial cumulative impact on special status species populations and their habitat populations. There would be a long-term adverse cumulative impact on these species and their habitat when the effects of the other cumulative actions are added to the impacts of the no-action alternative, although the no-action alternative would add a discountable increment to this overall impact.

**Floodplains.** No new development would occur under the no-action alternative. Some overnight facilities would remain in the flash flood hazard areas as would much of the development area at Cottonwood Cove (see figure 3 in chapter 2). Flood protection under the no-action alternative would rely mainly on the existing system of earthen dikes and channels that provide various levels of flood protection, ranging anywhere from approximately 10- to 100-year flows but that do not convey the probable maximum flood (pmf) flows. The flood warning system at Cottonwood Cove, which was recently upgraded, would continue to provide nonstructural protection.

Flood depths at Cottonwood Cove would be approximately 6 to 7 ft during the probable maximum flood and 3 to 6 ft during the 100-year flood. At Katherine Landing estimated flood depths would be 3 to 8 ft during the probable maximum flood and 1 to 6 ft during the 100-year flood. The time between intense rainfall and subsequent flooding of the washes in the developed areas is relatively short, anywhere from approximately 80 minutes to potentially as little as 7 to 8 minutes. The possibility of injury or loss of

life and damage or loss of facilities would continue to exist for people and property in the floodplain during larger flood events. Flooding could impact visitor overnight facilities including camping areas, trailer village, motel, and National Park Service and concessioner housing, as well as day-use facilities including the store, restaurant, launch ramps, and parking areas. Consequently, the no-action alternative would continue to have the potential for long-term moderate to major adverse impacts on human life and property from flooding in both developed areas.

The natural floodplain values in both developed areas, such as natural flood flows, sedimentation processes, vegetation, or groundwater recharge have been highly altered by development. Under the no-action alternative, these conditions would continue, although this alternative would not measurably add to these impacts. Thus, this alternative would continue to have a long-term moderate adverse effect on floodplain values in the developed area.

*Cumulative effects* — The cumulative actions are not expected to alter floodplain values or the flood hazard in the developed areas. Therefore, there would be no cumulative impact.

*Conclusion* — There would continue to be a potential long-term moderate to major adverse impact on human life and property in the floodplain and a long-term moderate adverse impact on floodplain values because of the presence of facilities in the floodplain. The no-action alternative would not measurably add to these impacts. There would be no cumulative impact on floodplains.

## Cultural Resources

**Archeological Resources.** Under the no-action alternative, there would be no new impacts on archeological resources. All current facilities would remain in place. The concessioner would continue to operate the existing commercial services. The National Park Service would continue to operate the campgrounds, and would not establish any new facilities for day use. The NPS buildings and maintenance areas would be retained in their current locations. The existing flood control ditches and dikes would not be upgraded. Recommendations proposed by HDR,

Inc. regarding the redesign of flood control systems would not be enacted.

*Cumulative impacts* — Although other past, present, and reasonably foreseeable future actions may affect archeological resources in the area, the no-action alternative would have no impacts on archeological resources; and therefore, would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on archeological resources under the no-action alternative.

*Conclusion* — There would be no new impacts on archeological resources. There would be no cumulative impacts on archeological resources under the no-action alternative.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that the actions under the alternative 1 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on archeological resources because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

**Historic Structures.** Under the no-action alternative, there would be no new impacts on historic structures. To appropriately preserve and protect National Register listed or eligible historic structures, all stabilization and preservation efforts would continue to be undertaken in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (NPS 1995).

*Cumulative impacts* — Although other past, present, and reasonably foreseeable future actions may affect historic structures in the area, the no-action alternative would have no impacts on historic structures; and therefore, would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on historic structures under the no-action alternative.

*Conclusion* — There would be no new impacts on historic structures. There would be no cumulative impacts on historic structures under the no-action alternative.

*Section 106* — After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that the actions under the alternative 1 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on historic structures because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

**Cultural Landscapes.** Under the no-action alternative, there would be no new impacts on cultural landscapes. Significant landscape patterns and features (e.g., spatial organization, land-use patterns, circulation systems, topography, vegetation, buildings and structures, cluster arrangements, small-scale features, views and vistas, and archeological sites) would be protected, maintained, and unchanged from existing conditions.

*Cumulative impacts* — Although other past, present, and reasonably foreseeable future actions may affect cultural landscapes in the area, the no-action alternative would have no impacts on cultural landscapes; and therefore, would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on cultural landscapes under the no-action alternative.

*Conclusion* — There would be no new impacts on cultural landscapes. There would be no cumulative impacts on cultural landscapes under the no-action alternative.

*Section 106* — After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that the actions under the alternative 1 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on cultural landscapes because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

**Ethnographic Resources.** Under the no-action alternative, there would be no new impacts on ethnographic resources. All current facilities would remain in place. The ranger station and NPS housing and maintenance areas would be

retained in their current locations. The existing flood control ditches and dikes would not be upgraded. Significant landscape patterns and features would be protected, maintained, and unchanged from existing conditions.

*Cumulative impacts* — Although other past, present, and reasonably foreseeable future actions may affect ethnographic resources in the area, the no-action alternative would have no impacts on ethnographic resources and, therefore, would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts on ethnographic resources under the no-action alternative.

*Conclusion* — There would be no new impacts on ethnographic resources. There would be no cumulative impacts on ethnographic resources under the no-action alternative.

*Section 106* — After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that the actions under the alternative 1 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on ethnographic resources because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

### **Visitor Use, Experience, and Safety**

Under the no-action alternative, existing facilities (e.g., motels, campgrounds, marinas, trailer villages, picnic areas) and access points would remain and continue to be maintained, with only minimal changes that are currently underway as authorized by other plans.

Visitor conflicts that arise from congestion and frustration at access would persist and could increase in frequency if visitation levels rise. Law enforcement rangers would continue to address visitor conflicts on a case-by-case basis. These conflicts, however, have escalated to the point of physical altercations in the past and therefore not only reflect a diminished visitor experience but also threaten visitor and employee safety. These altercations occur more often at Katherine Landing than at Cottonwood Cove, and are result of the existing facilities and infrastructure being inadequate to accommodate the large number of

visitors during high use time. The implementation of the no-action alternative would result in moderate to major, long-term, and adverse impacts on visitor experience and safety.

Overnight accommodations would continue to see low levels of occupancy as there are no current projects to improve these facilities or services to better meet visitor needs. Campsites are generally too small and only a few have RV hookups. The long-term trailer village, which has the appropriate amenities to satisfy visitors, provides a reliable revenue stream but does not allow use for a large or diverse segment of visitors. Lack of changes to overnight accommodations would result in minor to moderate, long-term, and adverse impacts on visitor experience.

For Cottonwood Cove, authorized improvements include the construction of a new entrance station that would allow for increased visitor contact and dissemination of safety information, as well as the addition of picnic tables and shelters and the rehabilitation of campground restrooms. At Katherine Cove, these modifications include the replacement of campground restroom, removal of the picnic area restroom, and pavement overlay of the campground roads. Nearby, the road to Princess Cove would also be paved. These modifications would have minor, long-term, and beneficial impacts on visitor experience.

Any construction, removal, or rehabilitation activities and related effects associated with these improvements would have minor to moderate, short-term, and adverse impacts on visitor experience.

**Cumulative Impacts.** There are several reasonably foreseeable projects, separate from this plan, that could further impact visitor experience at Lake Mohave.

One proposal that would affect the visitor experience is the reconstruction of the Katherine Landing access road beginning at its intersection with the Davis Dam Highway and continuing to the boat launch ramp. Because of high visitation levels at Katherine Landing, this road is subject to heavy-traffic volumes and in its current state is narrow and poorly paved, with inadequate drainage. Each of these problems, with the exception of traffic volume, would be corrected

under the proposed reconstruction. These actions may partially mitigate visitor conflict issues by reducing tensions and frustrations that currently begin on this stretch of road. Despite the positive effects, however, the cumulative impact of these measures, when added to the lack of resolution of existing visitor conflicts, would perpetuate current moderate, long-term, and adverse impacts on visitor experience and safety.

The 2008 *Lake Mead NRA Wireless Telecommunication Facilities Plan* identified Cottonwood Cove as a suitable site for the construction of a new cellular tower in the future. Improved communications within the coverage area would directly benefit those who choose to use this technology while in the recreation area. Moreover, some visitors may be more content and have peace of mind knowing that they can use a cell phone to contact help in case of emergency, especially in remote areas that receive less visitation. Construction of cellular towers would provide moderate, long-term beneficial impacts on safety resulting from improved communication services and increased emergency response time. Effects to visitor experience would be minor, long-term, and could be either beneficial or adverse, depending on the visitor's views on the technology and its suitability to national parks.

Another potential development that may affect visitors to the Cottonwood Cove area is the proposed installation of up to 161 wind turbine generators in the area between the community of Searchlight (where the Cottonwood Cove access road begins) and the Lake Mead National Recreation Area. This development would have a moderate, long-term, and adverse impact on the viewshed experienced by visitors entering the park via Cottonwood Cove.

The Cottonwood Cove marina is also authorized to expand from approximately 300 slips to 484 slips, per the lake management plan. This increase, if undertaken, would provide increased accommodations for boat owners at this popular destination site. Visitation levels may show a slight increase, although would likely have only an imperceptible effect on congestion. This expansion would have minor, long-term, beneficial and adverse impacts on visitor experience.

The construction activities and related effects involved with these improvements would have minor to moderate, short-term, and adverse impacts on visitor experience. When combined with the impacts of the no-action alternative, there would be minor to moderate, long-term, beneficial and adverse impacts on visitor experience. The National Park Service's contribution to these impacts would be substantive.

**Conclusion.** Overall, the no-action alternative would have moderate to major adverse long-term effects on the visitor experience to Lake Mohave. There are currently significant issues (such as visitor conflicts and inadequate overnight accommodations) that affect the experience of a significant percentage of visitors that are not being fully addressed at present nor would be under the no-action alternative. There would be minor to moderate, long-term, beneficial, and adverse cumulative impacts on visitor experience under this alternative.

### Socioeconomic Environment

At Cottonwood Cove, the existing concession operation consists of a motel (25 rooms); trailer village (223 sites); short-term RV park (72 sites); marina (300 slips); dry storage; houseboat rentals; small boat rentals; a gift shop / convenience store; restaurant; marine and auto fuel service; and shower and laundry services. Over the past 6 years, total revenue has averaged \$6.3 million with houseboat rental and trailer village rentals comprising the largest shares of revenue.

At Katherine Landing, the existing concession operation consists of a motel (50 rooms); trailer village (104 sites); short-term RV Park (28 sites); marina (824 slips); dry storage; houseboat rentals; small boat rentals; retail store; restaurant and bar; marine and auto fuel service; and shower and laundry services. Over the past 6 years, total revenue has averaged \$6.5 million with moorage (marina), fuel sales, houseboat rental, and retail sales comprising the largest shares of total revenue.

**Socioeconomic Impacts Used for Analysis.** Impacts on the socioeconomic environment,

including the commercial operators in the recreation area and nearby communities were considered. Impacts are partly based on estimates in the "Revised Alternatives Analysis" for both Cottonwood Cove and Katherine Landing (Dornbusch 2011a, 2011b). The following impact topics were developed to analyze impacts in alternatives 2 and 3:

*Construction-related economic impacts* — It is assumed that construction in each alternative occurs over an initial 2- to 3-year period. There is no construction proposed under this alternative, so there would be no impacts on economic output, labor, or employment from construction activity.

*Visitor spending-related economic impacts* — New or modified concession services would include changes to marinas, lodging options, and other commercial services including food and beverage and retail sales. The \$6.3 million average annual spending figure (revenue) at Cottonwood Cove generates an estimated \$9.3 million in direct and indirect value added to the local economy annually. This spending supports approximately 57.3 concession-related jobs and generates \$1.8 million annually in concession labor income. The indirect spending effects support an estimated 27.5 additional jobs in the local economy and generate an additional \$880,000 in labor income.

The \$6.5 million average annual spending figure (revenue) at Katherine Landing generates an estimated \$9.6 million in direct and indirect value added to the local economy annually. This spending supports approximately 59.1 concession-related jobs and generates \$1.9 million annually in concession labor income. The indirect spending effects support an estimated 28.4 additional jobs in the local economy and generate an additional \$908,000 in labor income. See table 13 for more information on the visitor spending characteristics of the no-action alternative. Since this alternative represents the status quo, visitor spending would have no impact on the existing socioeconomic environment.

**TABLE 13. VISITOR SPENDING-RELATED ECONOMIC IMPACTS OF ALTERNATIVE 1**

	Cottonwood Cove	Katherine Landing
Average Revenue	\$6,300,000	\$6,500,000
Visitor Spending Value Added	\$9,324,000	\$9,620,000
Concession- related Jobs	57.3	59.1
Concession Labor Income	\$1,833,000	\$1,891,000
Indirect Jobs	27.5	28.4
Indirect Labor Income	\$880,000	\$908,000

*Impacts on other park concessions and local businesses* — These impacts on other marina concessioners were considered, but because of the long distances between marinas in the area, these impacts are expected to be minor. Impacts on lodging and retail establishments in nearby communities were also considered. There would be no impacts on other park concessions and local businesses under the no-action alternative.

**Cumulative Impacts.** Growth of the Laughlin/Bullhead City area, as well as the broader Clark County-Mohave County area, and other markets that attract recreation visitors to the recreation area (especially southern California), has the potential to increase use of concession facilities at Cottonwood Cove and Katherine Landing. However, when combined with the no-action alternative, the cumulative impact would be imperceptible on the socioeconomic environment of the region. The National Park Service’s contribution to this impact would be minimal.

**Conclusion.** Besides the ongoing direct and indirect economic impacts of visitor spending at both locations, there would be no additional impacts on socioeconomic resources from the no-action alternative. Cumulative impacts would be imperceptible on the socioeconomic environment of the region.

### Park Operations

Under the no-action alternative, the number of personnel in law enforcement, maintenance, natural and cultural resource management, and interpretive positions would remain at the present level.

The recreation area would not implement recommendations for improved flood control at Cottonwood Cove or Katherine Landing, so there would be no new construction for diversion dikes and channels. Maintenance staff would maintain existing flood control channels, and there would be no additional impact on maintenance staff.

Existing facilities at both Cottonwood Cove and Katherine Landing would be maintained. There would be minimal changes to roadways and NPS housing and maintenance areas would remain in the same locations. Existing ranger stations, information stations, and entrance stations would be maintained. There would be negligible impact on law enforcement, interpretive, and fee-collecting staff.

Some interpretive waysides would be enhanced or replaced. Existing picnic areas and day-use facilities would be maintained, as would informal and formal pedestrian trails. There would be no impact on maintenance and interpretive staff.

The number of volunteer sites at the Katherine Landing campground would be increased. Increased numbers of volunteers could reduce NPS staffing requirements.

Facilities at Princess Cove, Cabinsite Point, and North and South Arizona Telephone Coves would remain the same under this alternative.

**Cumulative Impacts.** The no-action alternative would have an imperceptible impact on park operations.

**Conclusion.** The impacts of insufficient recreation area staffing (at current levels) on operational needs would be adverse and long term. However, the no-action alternative would not impact park operations.

## IMPACT ANALYSIS OF ALTERNATIVE 2: IMPLEMENT PREVIOUS PLANNING PROPOSALS

### Natural Resources

**Native Plant Communities and Soils.** Most construction activities associated with rehabilitation, replacement, or redesign of facilities at both developed areas would occur

within areas and corridors previously disturbed by existing development and associated use and would have minimal additional impacts on soils or native vegetation. These areas contain a mixture of native and nonnative landscape plants. Some individual native plants or small remnant areas of Mohave desert scrub within the developed areas may be removed or trampled or desert soils compacted or disturbed in areas within and immediately surrounding these sites.

Desert shrub vegetation and soils would be lost or altered by construction of new visitor or park administrative facilities on currently undeveloped sites that would expand the overall development footprint. While portions of these new development sites have been impacted to some degree by visitor use or administrative roads, much of the impact would be new disturbance and permanent. Relocation of the National Park Service and concessioner housing, NPS maintenance area, and shoreline picnic area and parking at Cottonwood Cove and the NPS maintenance area at Katherine Landing would impact approximately 10 acres. Extension of utility lines and access road improvements to these sites would result in additional impacts along corridors 1,500 to 3,600 ft in length.

Alternative 2 would essentially maintain the existing road systems; however, approximately 8,200 ft of the access roads to North and South Telephone Coves would be relocated outside of the floodplains. This road construction would likely involve extensive grading and cut and fill work along the intervening ridge. Construction for the relocation would result in paving approximately 2 acres of desert shrub and desert wash communities. An additional indeterminate amount of acreage, dependent on the extent of excavation and fill work, would also be disturbed and revegetated.

Structural flood protection for both developed areas would include concrete-lined channels, reinforcement and extension of existing dikes, relocation of some sections of roads, low-water crossings, erosion protection, and a spillway to utilize the existing borrow pit at Katherine Landing as a detention basin. Approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing would be affected. Much of this disturbance to soils and vegetation associated with excavation, grading, and flood structure

construction would occur in areas previously disturbed by existing roads, channels, dikes, or other manmade facilities and uses.

Flood structures would also include construction of a new diversion dike and channel system in Ranger Wash, approximately 0.5 mile west of the Cottonwood Cove developed area. It is anticipated that cut sections for the upper Ranger Wash diversion will be through alluvium and that rock excavation would not be necessary. Construction would include a considerable amount of grading and cut and fill work (up to approximately 20 ft in height). Work would impact about 13 acres of currently undisturbed desert shrub and wash vegetation and soils. Although the local topography would be altered and the dikes and channels would likely be reinforced with riprap or gabions, surface restoration / revegetation of most of the disturbed area would occur. Construction access to the site would be provided via the wash bottom, where scouring during flood events would rework the soils in the wash compacted by construction equipment access.

Overall, vegetation and soils would be removed within the immediate footprint of new structures, roads, parking areas, trails, etc. Disturbance of desert soils and vegetation around the construction zones may result in changes in plant production and species composition, introduction and spread of nonnative plants and noxious weeds, compaction and loss of soil because of increased susceptibility of soils to wind and water erosion, reduced soil moisture and infiltration rates, and changes in soil temperatures and increased evaporation rates.

Implementation of construction mitigation measures (e.g., restricting equipment to within the project area boundaries, revegetation of disturbed areas, and use of best management practices to control erosion) would minimize the loss and enhance the reestablishment of native vegetation and desert soils. Mitigation measures such as pressure washing of construction equipment would reduce the risk of introducing new exotic species. Post-construction revegetation, monitoring, and treatment would also reduce the risk of spreading existing populations and introducing new exotic species.

Given the disturbance to soils and vegetation that has already occurred in most of the areas that would be impacted by proposed construction and visitor use and the application of appropriate mitigation measures to minimize additional impacts, the alteration of native plant species' populations and desert soil structure would be local and long-term adverse impacts are expected to be primarily minor. Development of new sites, road relocation, and construction of structural flood protection would result in greater disturbance to native plant communities and soils and would likely have long-term minor to moderate adverse impacts.

Some local beneficial effects to native plant communities and soil resources would also occur as the result of alternative 2. The replacement of existing invasive nonnative landscaping with native plantings as facilities are rehabilitated, replaced, or redesigned would remove sources of seeds and propagules that spread nonnative plant species to surrounding native plant communities. Existing exotic shoreline plants such as tamarisk would be removed and replaced with native plantings during development of the relocated picnic area in Ski Cove at Cottonwood Cove. Some currently disturbed sites (i.e., maintenance and picnic areas at Cottonwood Cove, picnic area and existing satellite parking lot C located at Katherine Landing, informal overflow parking area at Princess Cove, and dispersed camping in the adjacent wash) would be restored or partially restored. Enhanced interpretive and educational facilities and programs are expected to help educate and deter visitor caused impacts, such as social trailing or unintentional transport of exotics into the park.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the national recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate adverse impacts on soils and native plant communities because of construction and other activities and uses. However, long-term beneficial effects to native plant communities would be anticipated as a result of implementing the exotic plant management plan and fire management plan, both of which seek to restore native plant communities and control exotic plants. Alternative 2 would contribute both long-

term minor to moderate adverse impacts because of construction and expansion of day use and administrative areas, and long-term beneficial effects such as replacement of invasive nonnative landscaping with native plantings and restoration of some currently developed sites. The overall cumulative impact from past, present, and future actions in combination with the impacts of alternative 2 would result in a minor to moderate, long-term adverse cumulative effect on native plant communities and soils from development and use and long-term beneficial cumulative effects from native plant community restoration efforts and removal of invasive species.

*Conclusion* — Alternative 2 would primarily result in long-term, minor, adverse impacts on native plant communities and soils from facility construction and associated visitor use in previously disturbed areas. Approximately 46 acres of local, long-term minor to moderate adverse impacts would result from development of additional lands and construction of flood control structures. Local beneficial effects would also result from the selective removal of existing nonnative invasive species and restoration of some currently developed sites. Cumulative impacts on vegetation and soils from alternative 2 in conjunction with past, present, and future projects would result in long-term, minor to moderate, adverse cumulative effects from development and use and long-term beneficial cumulative effects from native plant community restoration efforts and removal of invasive species.

**Wildlife.** Wildlife populations and their habitats in the developed areas have been altered by past human actions. These areas have marginal habitat value. The rehabilitation, replacement, or redesign of facilities would primarily occur within existing areas of concentrated human use and development and not in areas of continuous, undisturbed habitat.

Construction of new facilities and road relocation on currently undeveloped sites would result in the additional loss or alteration of desert shrub communities, which provides habitat for species such as reptiles, birds, and small mammals. The overall development and use footprint of these developments would encompass approximately 7 acres at Cottonwood Cove and 5 acres at Katherine Landing. While portions of these new

development sites have been impacted to some degree by visitor use or administrative roads, most of the impact would be new disturbance and permanent.

Excavation, grading, and associated disturbance to construct flood control structures would permanently impact approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing, although much of this acreage has been previously disturbed by existing roads, channels, dikes, or other manmade facilities and uses. Approximately an additional 13 acres of currently undisturbed desert shrub and wash habitat would be impacted by a new diversion dike and channel system in Ranger Wash, although surface restoration and revegetation of most of this acreage would occur following construction.

Loss or fragmentation of habitat from proposed ground-disturbing activities and noise and visual intrusions associated with construction activity would affect wildlife species using these areas for foraging, nesting, and shelter and could result in direct loss of some individuals during construction activities. However, the majority of mammals, birds, and reptiles that are currently using habitat within or adjacent to these areas would be displaced to nearby habitat. Some may abandon nests or dens if construction occurred during critical phases of their breeding cycles. Generalist species like gulls, ravens, and coyotes would likely continue to be attracted to, and adapt to human habitation. Impacts should be minimized by the fact that planned projects would likely be implemented throughout multiple years and it is unlikely that at any one time, construction would be occurring in more than a few areas.

In addition to disturbance and loss of habitat from construction, new and existing facilities would accommodate larger numbers of visitors, which could increase disturbance to adjacent habitat. However, increased visitation is expected to primarily occur within the existing developed areas, which are currently degraded because of high disturbance levels from existing developments and human use. In general, wildlife would either become accustomed to human activity or relocate outside of the developed areas because of noise, visual intrusions, or habitat alteration. Local increased mortality to lizards and small mammals could occur from an increase in visitor traffic.

Mitigation measures developed for minimizing impacts on soils and vegetation such as replanting areas with native species, pressure washing of construction equipment, etc., as described in chapter 2 would also aid in minimizing impacts on the quality of wildlife habitat. To reduce impacts on birds, land clearing, or other surface disturbance would be conducted outside the avian breeding season or have a qualified biologist survey the area prior to clearing. If a migratory bird nest were found with nestlings present, impacts would be avoided until birds fledged. In addition, enhanced interpretive and educational facilities and programs are expected to help deter visitor caused impacts on wildlife and wildlife habitat, such as social trailing, littering, and unauthorized collection of small animals.

Most actions would occur in areas extensively disturbed by existing development and associated use, and in areas that are typically avoided by most wildlife and that have marginal habitat value. Alternative 2 would result in temporary or permanent loss of approximately 46 acres of natural habitat, although the disturbed areas are small relative to the desert shrub and wash habitat found in the surrounding lands and park-wide. Individual projects would also likely be implemented periodically throughout multiple years and would not occur simultaneously. Mitigation measures would minimize damage during construction and replant areas as appropriate. Therefore, the adverse impact on wildlife would be long-term and minor, affecting individuals from wildlife populations in local areas, but not resulting in loss of population viability for these species.

Some local beneficial effects to wildlife habitat would occur as the result of alternative 2. The replacement of existing invasive nonnative landscaping and exotic shoreline plants with native plantings and the restoration of previously disturbed sites at Cottonwood Cove, Katherine Landing, and Princess Cove would improve local wildlife habitat conditions.

Impacts from in-water work for extension of the existing Katherine Landing lunch ramp, formalizing and paving the launch at North Telephone Cove, and general construction near the lakeshore could create increased runoff, turbidity, sedimentation, or introduction of pollutants (e.g., petroleum products from

construction equipment) to nearby aquatic environments. Noise and visual disturbances during construction could cause fish to move from the area of disturbance. Generally, these adverse impacts would be short-term and minor because of the small areas affected, the disturbing activities would be temporary, and mitigation measures would be used to minimize potential impacts. Lake substrates would be lost within the footprint of the in-water structures, although this area would be very limited, and impacts would be minor.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the national recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate adverse impacts on wildlife and wildlife habitat because of construction and other activities and uses. However, long-term beneficial effects would be anticipated as a result of implementing the exotic plant management plan and fire management plan, both of which seek to restore native habitat and control exotic plants. Management actions associated with the lake management plan would improve water quality and the lake's aquatic habitat through the reduction of the amount of waste fuels and human wastes in the lake.

The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 2 would result in a minor to moderate, long-term adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species. Alternative 2 would contribute long-term minor adverse impacts because of construction and expansion of day use and administrative areas, and long-term beneficial effects from replacement of invasive nonnative landscaping and shoreline exotics with native plantings and restoration of some currently developed sites.

*Conclusion* — Although alternative 2 would adversely impact approximately 46 acres of natural habitat, most impacts would occur in areas extensively disturbed by existing development and associated use. The adverse impacts on terrestrial wildlife would be long-term and minor,

affecting individuals from wildlife populations in local areas, but not resulting in loss of population viability for these species. Impacts from in-water work and from construction in or near the lakeshore would be short term and minor and would not adversely affect fish populations. The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 2 would result in a minor to moderate, long-term adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species.

**Threatened, Endangered, and Special Status Species.** There are no known spawning areas or nearby rearing ponds for razorback sucker or bonytail chub along the shoreline of either developed area. No impacts on spawning habitat are expected. As noted under the wildlife impact topic, impacts from in-water work for extension of the existing Katherine Landing lunch ramp, formalizing and paving the launch at North Arizona Telephone Cove, and general construction near the lakeshore could create increased runoff, turbidity, or sedimentation of Lake Mohave, which is critical habitat for both species. Adverse impacts would be short term and local because of the small areas affected, the disturbing activities would be temporary, and mitigation measures would be used to minimize potential impacts. Similar temporary impacts from increased shoreline recreation are expected to continue to occur in areas already heavily used by visitors. Loss of substrate within the footprint of new in-water structures would occur, although the area affected would be limited. These short- and long-term impacts, may affect, but would not be likely to adversely affect razorback sucker, bonytail chub, or their critical habitat.

Potential adverse impacts on the desert tortoises and banded Gila monster include temporary or permanent loss of suitable habitat from new development. Most impacts would occur on previously disturbed sites within the developed areas that are low quality habitat. Construction of new facilities on currently undeveloped sites would result in the permanent loss of approximately 7 acres at Cottonwood Cove and 3 acres at Katherine Landing. Construction of

flood-control structures would disturb approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing, although much of these areas have been previously disturbed. Approximately 13 additional acres of currently undisturbed desert shrub and wash habitat would be impacted by a new diversion dike and channel system in Ranger Wash, although surface restoration and revegetation of most of this acreage would occur following construction. There would be no disturbance to designated critical habitat for the desert tortoise.

Harassment from increased human activity, noise, and ground vibrations from construction or from removal to a safe location during construction would also likely occur. Desert tortoise and possibly Gila monster individuals on the ground or in burrows within the construction limits could be killed or injured. Eggs could be destroyed. Indirect effects related to capture or harassment by construction personnel and attraction of predators like ravens to the construction area because of trash accumulation could also occur. Mitigation would reduce the likelihood of these impacts while construction is occurring.

A 2010 programmatic biological opinion issued by the U.S. Fish and Wildlife Service for the threatened Mohave desert tortoise included infrastructure development and maintenance potentially associated with the development concept plan for Cottonwood Cove. Mitigation measures identified as part of the biological opinion would be implemented to minimize loss and long-term degradation and fragmentation of habitat, such as soil compaction, erosion, crushed vegetation, or introduction of nonnative invasive plants or weeds as a result of project activities. Protective measures for tortoise in all new construction projects would include pre-construction surveys, on-site monitoring, and removal of tortoises from harm's way, as well as all other measures identified in chapter 2. Any additional measures identified during project level consultation with the U.S. Fish and Wildlife Service would also be implemented. Any Gila monsters found within a construction area would also be relocated by a qualified biologist. With the implementation of mitigation, adverse impacts on desert tortoises and banded Gila monsters would be minimized.

Removal of invasive riparian species such as tamarisk in Ski Cove as part of the development of a picnic area would have minimal effect to riparian vegetation that may be used by migrating Southwestern willow flycatchers. Tamarisk are considered low-quality habitat and replacement landscape planting would include native species such as willow. Some flycatchers may potentially be displaced or avoid the area because increased recreational use in this cove may overlap spring and fall migration periods. This would affect a relatively small area of the shoreline and there are other available shoreline riparian areas, typically dominated by tamarisk, that provide migratory habitat. Consequently, these short-term adverse impacts may affect, but would not be likely to adversely affect Southwestern willow flycatchers.

Potential impacts on the Western burrowing owl include temporary or permanent loss of suitable habitat from new development and, since this is a ground-nesting bird, could include disturbance of breeding birds. Loss of individual burrowing owls including young is possible if construction occurs during the breeding season. Prior to construction, areas would be surveyed for nesting birds. Any nests would be avoided until the young fledge or collapsed while unoccupied prior to the nesting season. The individual areas impacted would be relatively small and the reproductive success of individual birds is not expected to be affected. Consequently, adverse impacts would include potential short-term disturbance from construction activities and long term local loss of habitat from new development.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the national recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term adverse impacts on threatened, endangered, and special status species because of construction and other activities and uses. However, long-term beneficial effects would be anticipated as a result of implementing the exotic plant management plan, fire management plan, and the lake management plan that would improve terrestrial and aquatic habitat in the park through restoration of native plant communities, control of exotic plants, and improvement of lake water quality.

The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 2 would result in an adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species. Alternative 2 would contribute local adverse impacts on desert tortoise, banded Gila monster, and burrowing owls because of construction and expansion of day use and administrative areas, and long-term beneficial effects from replacement of invasive nonnative landscaping and shoreline exotics with native plantings and restoration of some currently developed sites.

*Conclusion* — Alternative 2 may affect, but would not be likely adversely affect the Southwestern willow flycatcher, razorback sucker, bonytail chub, or their critical habitat. Alternative 2 would be likely to adversely affect the desert tortoise, banded Gila monster, and Western burrowing owls although impacts would be local. Potential impacts on the desert tortoise and banded Gila monster include temporary or permanent loss of suitable habitat from new development and incidental harassment and possibly loss of individuals from construction activities. There would be no disturbance to designated critical habitat for the desert tortoise. Potential impacts on Western burrowing owls would include short-term disturbance from construction activities and long-term local loss of habitat from new development. The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 2 would result in an adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species.

**Floodplains.** Alternative 2 would mitigate the flood danger to people and facilities at Cottonwood and Katherine Washes from floodwaters up to the 500-year flood with structural protection that includes systems of channels and dikes. At Cottonwood Cove, some overnight facilities (i.e., National Park Service and concessioner housing) would be relocated out of the floodplain. Sections of the access roads to North and South Telephone Coves would also be

relocated outside of the floodplains. The early warning detection system at Cottonwood Cove has been recently upgraded and a similar system would be installed in Katherine Wash to provide early identification and dissemination of warnings of an impending flood in this wash. A flood preparedness and evacuation plan would also be in effect. Signs would be developed and placed in strategic locations identifying flash flood zones and directing visitors and staff to move to higher ground.

Moving structures out of the floodplain would provide the greatest protection. Structural flood protection would be the next best protection method, and warning systems would provide the least protection. The proposed structural flood mitigation measures would protect in place all development with overnight occupancy from flood inundation up to the 500-year flood. The structural protection would also provide protection for day-use areas and facilities as well, with the exception of the where channeled flood waters would empty across parking areas, shorelines, and launch ramps into the lake. Nonstructural flood mitigation would further decrease the flood hazard risk to National Park Service and concessioner staff and visitors within the primary developed areas. At the North and South Telephone Coves, day-use areas would have signs to inform visitors of flood hazards and evacuation procedures and an evacuation plan would be in effect for these areas as well. The possibility of injury or loss of life and damage or loss of facilities would be substantially reduced under this alternative.

Protecting life and property in the floodplains is considered to be a higher priority than restoring natural floodplain values of these flash floodplains, which are the same qualities that endanger life and property. Thus, the natural floodplain values in both developed areas, such as natural flood flows, sedimentation processes, vegetation, or groundwater recharge have been and would continue to be highly altered by development. Construction of additional flood control structures that divert and channel flood flows would further alter these values, although most of these impacts would be to previously disturbed lands. Thus, this alternative would contribute minor to moderate additional adverse effects on floodplain values.

*Cumulative effects* — The cumulative actions are not expected to alter the flood hazard or floodplain values in the developed areas. Therefore, there would be no cumulative impacts on floodplains.

*Conclusion* — Alternative 2 would greatly reduce the flood hazard at both developed areas through the use of structural and nonstructural protection, resulting in a long-term substantial benefit to safety for people and property in the floodplains. There would be a long-term minor to moderate adverse impact on floodplain values because of construction of additional flood control structures that divert and channel flood flows. There would be no cumulative impact on floodplains.

## Cultural Resources

**Archeological Resources.** Alternative 2 proposes numerous actions involving ground disturbance in both developed areas and in the coves adjacent to Katherine Landing. Many of these proposed actions would take place in areas previously disturbed by construction, park operations, and visitor use. Reconfiguring traffic circulation patterns to reduce traffic congestion, consolidating intersections to streamline points of access, and increasing and delineating parking would most likely take place in previously disturbed locations. Providing better pedestrian connections through upgrading existing trails and constructing new trails and trailheads in the developed areas and the coves adjacent to Katherine Landing could impact archeological resources in undisturbed portions of the developed areas. However, recreation area staff would inventory these locations prior to ground disturbance and the trails would be sited to avoid sensitive or significant National Register resources.

At Cottonwood Cove, flash flood mitigation measures would generally occur in previously disturbed portions of the developed area. Upgrading existing diversion dikes, features (e.g., deflectors), and channels in the lower campground, Lower Access Road Wash, Upper Access Road Channel, Dry Boat Storage Channel, and the Ranger Wash Diversion would have little to no effect on archeological resources. Campground restoration proposed for the lower campground and surface restoration proposed for

Lower Access Road Wash would also occur in disturbed areas. Constructing new channels or extending existing channels could negatively impact archeological resources in undisturbed areas.

Under this alternative, the identified archeological sites in the Cottonwood Cove and Katherine Landing developed areas would be managed as though they were eligible for listing in the National Register. Ground-disturbing activities would be avoided in these site locations.

In areas where archeological resources have not been inventoried, archeological surveys would be conducted to inform site-specific planning and design for proposed construction. Newly inventoried archeological resources would be evaluated for National Register significance. In both developed areas and the coves adjacent to Katherine Landing, National Register eligible or listed archeological resources would be avoided to the greatest extent possible. Because National Register eligible or listed archeological resources would be avoided to the greatest extent possible, any adverse impacts would be absent or negligible, permanent, and confined to the area of disturbance. If National Register eligible or listed archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer(s), advisory council (as needed), and associated American Indian tribes.

*Cumulative impacts* — Past development and land-use patterns within the Cottonwood Cove and the surrounding region have damaged/destroyed both prehistoric and historic archeological resources. Similarly, development in the Laughlin, Nevada, and Bullhead City, Arizona, area, outside of Katherine Landing, has negatively impacted archeological resources within the region. Sites also have been damaged by illegal pot hunting, off-road vehicle traffic, development of approved backcountry roads, burro trampling, power line corridors, and cell phone / communication towers. These past, present, and foreseeable future activities and development have and could result in direct and indirect, long term/permanent, minor to major adverse impacts on archeological resources locally and regionally.

Many prehistoric and historic sites have been inundated by the impoundment of Lake Mohave

and have been subject to natural and motorized equipment-related water movement, sedimentation, and changing lake levels. These past, present, and foreseeable actions in and around the developed areas have resulted in direct, minor to major, long term/permanent, local and regional, adverse impacts on archeological resources.

In addition, some recreation area plans could result in adverse effects on archeological resources. Plant removal and revegetation carried out under the exotic plan management plan could adversely affect archeological resources if avoidance were not possible. Prescribed burns called for in the fire management plan could damage or destroy surface artifacts. Prior to any of these potentially ground-disturbing activities, the area(s) of potential effect would be surveyed and assessed for National Register significance (if not evaluated). Resources listed or eligible for listing would be avoided to the greatest extent possible.

Projects outside of the recreation area also could adversely affect archeological resources. The proposed Searchlight Wind Energy, LLC. project would entail the construction of an access road, overhead transmission line, two electrical substations, a switchyard, and an operations/maintenance building in addition to the wind turbines. If avoidance were not possible, there could be negative impacts on archeological resources. These past, present, and future activities and development could result in direct and indirect, long term/permanent, minor to major adverse impacts on local archeological resources.

As described above, implementation of alternative 2 would result in no or negligible adverse effects in the area of disturbance on archeological resources because sensitive resources would be avoided to the greatest extent possible. These impacts, in combination with the minor to major, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions would result in a permanent, moderate to major, adverse cumulative effect. The adverse effects of alternative 2, however, would potentially be an extremely small component of the adverse cumulative impact because sensitive resources would be avoided whenever possible.

*Conclusion* — Under alternative 2, ground-disturbing activities would be sited away from known National Register eligible archeological resources and would be avoided to the greatest extent possible resulting in no negligible, local adverse impacts. Cumulative impacts would be indirect and direct, long-term/permanent, minor to major, and adverse; NPS contributions would be potentially extremely small.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes that the actions under the alternative 2 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on archeological resources because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

**Historic Structures.** Under alternative 2, the proposed actions would have a range of impacts spanning from beneficial to adverse. At Cottonwood Cove, enhancing the campground amphitheater by rehabilitating the benches and adding landscaping would be a direct, long-term, beneficial impact for that portion of the campground because the structure's function and appearance would be improved. For both developed areas and the coves adjacent to Katherine Landing, the construction of new housing and building construction, relocated picnic areas and beach accesses, new parking areas, new trails, and new or upgrades to spur/access roads would have no adverse impacts on historic structures because these actions would be sited to avoid affecting structures. In both developed areas, the campgrounds would be retained with minimal changes (modified only for ADA compliance), which would result in no adverse to negligible adverse impacts on the campgrounds.

The proposed changes to the marinas (circulation, access, and parking) and pedestrian connections for both developed areas and the coves adjacent to Katherine Landing would have no effect on historic structures because they would not entail alterations to historic structures. The proposed flood mitigation measure for Cottonwood Cove, likewise, would have no effect on historic structures for the same reason. The installation of the early warning detection system in both

developed areas also would have no effect on historic structures. The use of sustainable design and character would be employed in ways that would be sympathetic to the existing architecture and would be employed in accordance to the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. This would result in no adverse effects because architectural features contributing to the significance of these structures would not be altered.

Some of the proposed actions could have adverse effects on historic structures. At Katherine Landing, expanding the restaurant and store, and removing the current ranger station and the amphitheater could have negative impacts. However, the National Register significance of these structures has not been assessed. Prior to any construction or remodeling, these structures would be evaluated for National Register significance. If any were found to be significant, implementation plans would be developed to avoid altering features contributing to the significance and integrity of the structures to the greatest extent possible and in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. This would result in long-term, direct, local, negligible to minor, adverse impacts on significant historic structures. If alterations to National Register eligible structures could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer(s) and advisory council (as needed).

Other actions would have adverse impacts that could range from minor to major in intensity. At Cottonwood Cove, the following structures are contributing elements to the Cottonwood Cove Developed Area Historic District:<sup>2</sup>

- NPS residences (201–203)
- ranger station
- campgrounds

<sup>2</sup> The Cottonwood Cove Historic District determination of eligibility identifies the Concessionaire Public Use Area (which includes the concessioner store, restaurant, motel, boat launch area/marina, and trailer village) as contributing to the historic district, and then states that the store, restaurant, motel, boat launch area/marina, and trailer village “will be noncontributing resources; however, they do not compromise the integrity of the area since they fulfill the intent of the Mission 66 plan for the area.” This apparent contradiction needs clarification.

- concessioner store
- restaurant
- motel
- boat launch area/marina
- trailer village
- utility building
- fire station
- access road

Converting the current ranger station to a campground office and expanding the motel, restaurant, dry storage, and marina have the potential for adversely impacting architectural features contributing to the significance of these structures. However, through sympathetic architectural design, the proposed expansions/remodeling could complement the original Mission 66 design and, with the exception of the ranger station, the structures' original Mission 66 functions would continue. This could result in long-term, negligible to minor, direct, local, adverse impacts on these structures. In contrast, removing the current NPS housing, fire station, and maintenance utility building would result in local, permanent, direct, major, adverse impacts on these structures because the architectural features contributing to their significance would be destroyed. Recreation area staff would consult with the appropriate state historic preservation officer, advisory council, and representatives from the NPS Pacific West Region's *Historic American Building Survey / Historic American Engineering Record / Historic American Landscape Survey* (HABS / HAER / HALS) to determine the appropriate documentation/mitigation strategy needed to reduce the intensity of adverse impacts on structures being removed.

At Katherine Landing, the duplex and single family residence and an amphitheater are extant Mission 66 features (NPS 2007). Although historic structures in the developed area have not been formally assessed for National Register significance, portions of the developed area have been proposed as contributing properties in a draft multiple-property Mission 66 National Register nomination (NPS 2007). The proposed removal of the campground amphitheater would be a direct, permanent, major adverse effect to a

historic structure potentially eligible for listing in the National Register. Should they be determined eligible, the residences and amphitheater should be evaluated for National Register significance. If found to be significant, the park staff would consult with regional HABS / HAER / HALS staff, advisory council (as needed), and the Arizona state historic preservation office to determine the appropriate level of documentation/mitigation strategy needed to reduce the intensity of adverse impacts.

Other historic structures in the developed areas, such as the Quartette Mine Railroad Grade at Cottonwood Cove and Katherine Mine Historic District at Katherine Landing, would not be affected by any of the actions proposed under alternative 2.

*Cumulative impacts* — Cumulative impacts on historic structures within and around both developed areas would be similar to those affecting archeological resources. Regional development and land-use practices have damaged or destroyed mining and other historic structures outside the recreation area. Many historic structures located along the original river banks of the Colorado River (e.g., the Klondike Mill and Aerial Ferry) are inundated and are subject to water movement, changing lake levels, sedimentation, and impacts from recreation use.

As described above, implementation of alternative 2 would result in some beneficial to minor adverse impacts on some historic structures, but it also would result in major, permanent, adverse impacts on some of the structures in the Cottonwood Cove developed area. Proposed changes to or removal of historic structures at Katherine Landing could have adverse impacts should any be determined eligible for listing in the National Register. These impacts, in combination with the minor to major, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions would result in a direct, permanent, moderate to major, adverse cumulative impacts on historic structures within the developed areas and region. The NPS contribution to these adverse impacts would be substantive because this alternative calls for the removal of structures contributing to a property determined eligible for listing in the National Register at Cottonwood Cove and structures potentially eligible at Katherine Landing.

*Conclusions* — Under alternative 2, structures contributing to the historic district (Cottonwood Cove) and structures potentially eligible for listing in the National Register (Katherine Landing) would be removed or altered/remodeled; resulting in permanent, direct, local, major adverse impacts on significant and potentially significant historic structures. Cumulative impacts would be direct, regional, long term/permanent, moderate to major, and adverse; NPS contributions would be substantial.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 2 would have *adverse effects* on historic structures in the Cottonwood Cove developed area and possibly the Katherine Landing developed area. Although the intensities of negative impacts could be reduced through mitigation under NEPA compliance, they would remain *adverse* under Section 106.

**Cultural Landscapes.** Under alternative 2, the proposed actions also would have a range of impacts cultural landscape features spanning from beneficial to adverse. At Cottonwood Cove, enhancements to the campground amphitheater would be a direct, long-term, beneficial impact because this contributing feature would be upgraded. In both developed areas, the campgrounds would be retained with minimal changes (ADA compliance), which would result in no adverse effect or long-term, direct, local to negligible, adverse impacts on the campgrounds.

Expanding the marina to 484 slips would slightly change the appearance of the marina, but would not impact the intended function of this portion of the developed. This would be a long-term, local, direct, and negligible impact on the Mission 66 landscapes.

For both developed areas, new housing, building construction/remodeling, and new parking areas would add new architectural elements that would intrude on the landscapes' original viewsheds and functions. Relocating picnic areas, beach accesses, amphitheater (Katherine Landing), and maintenance/fire facilities and removing structures that are contributing landscape elements would remove landscape fundamental

components and functions. Converting the ranger station to a campground office (Cottonwood Cove) and restructuring the trailer villages into short-term recreational vehicle campsites (Katherine Landing) would also alter the function of landscape components. Constructing new trails, reconfiguring traffic circulation, and constructing new or upgrading spur/access roads would alter the landscapes' designed circulation. These proposed actions would better serve visitors and improve safety. But from the perspective of the Mission 66 landscapes, these actions would have direct and indirect, local, moderate to major, long-term/permanent, adverse impacts on Cottonwood Cove and potentially at Katherine Landing.

Prior to implementing these actions, recreation area staff would consult with the appropriate state historic preservation officer, advisory council, and representatives from the NPS Pacific West Region's HABS / HAER / HALS staff to determine the appropriate level documentation/mitigation strategy needed to reduce the intensity of impacts on landscape features, and formalize that decision through a memorandum of understanding among the consulting parties. The mitigation strategy would be implemented prior to the new construction or structure removal. Collectively, the proposed actions would result in long-term, direct moderate to major adverse impacts on the determined eligible Mission 66 landscape at Cottonwood and the potentially eligible (undetermined) landscape at Katherine Landing.

*Cumulative impacts* — Past, present, and foreseeable regional development and land-use practices outside of the developed areas will have little to no effect on the cultural landscapes. Past, present, and foreseeable future development outside Cottonwood Cove (Searchlight and the proposed Searchlight Wind Energy, LLC. project) lies well outside the boundaries of the developed area. In the Katherine Landing area, Laughlin/Bullhead City are encroaching the recreation area and could adversely impact the viewshed of the outer boundaries of the developed area. However, this would have little to no effect on the main core of the landscape. Because development would not impact the two developed areas, there would be no cumulative impacts on cultural landscapes under alternative 2.

*Conclusions* — Under alternative 2, Landscape components contributing to a determined eligible cultural landscape (Cottonwood Cove) and components potentially National Register eligible (Katherine Landing) would be removed, altered or remodeled, and/or visually impacted, resulting in permanent, long-term, local, direct, moderate to major adverse impacts. There would be no cumulative effect.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 2 would have *adverse effect* on cultural landscape in the Cottonwood Cove developed area and possibly the Katherine Landing developed area. Although the intensities of negative impacts would be reduced through mitigation under NEPA compliance, they would remain *adverse effect* under Section 106.

**Ethnographic Resources.** Ethnographic resources are often one in the same as archeological resources. Therefore, threats and impacts on these resources would be comparable. Moreover, the types of resources would generally be the same for both developed areas. Under alternative 2, the potential for negatively impacting ethnographic resources would be minimal. Any identified ethnographic resources in the developed areas would be managed as though they were eligible for listing in the National Register. Ground-disturbing activities and other proposed actions would be avoided in the locations of these sites to the greatest extent possible.

Many of the proposed actions proposed under alternative 2 would have little to no effect on ethnographic resources. Expanding the marinas at both developed areas would have an extremely remote potential for disturbing resources not already disturbed. Similarly, reconfiguring traffic circulation patterns to reduce congestions, consolidating intersections to streamline points of access, increasing and delineating parking, and most flashflood mitigation measures would most likely take place in previously disturbed locations. Providing better pedestrian connections through upgrading existing trails and constructing new trails and trailheads in the developed areas and the coves adjacent to Katherine Landing could impact

ethnographic resources in undisturbed portions of the developed areas. However, recreation area staff would inventory these locations prior to ground disturbance and the trails would be sited to avoid sensitive or National Register significant resources. Overall, these actions would have no effect or negligible, local, direct, and adverse effect because undisturbed resources would not be present or would be avoided.

In addition, ethnographic resources potentially existing in undisturbed areas outside the developed areas and coves adjacent to Katherine Landings would be inventoried (in conjunction with archeological resources), and assessed for National Register significance in consultation with the appropriate state historic preservation officer, tribal preservation officer, and/or culturally associated tribes. Ground-disturbing activities would be sited away from sensitive resources to the greatest extent possible. This would result in no or negligible adverse impacts on the areas of disturbance.

*Cumulative impacts* — Past development and land-use patterns have damaged or destroyed ethnographic resources within the developed areas and surrounding region. Ethnographic resources that have been inundated by the impoundment of Lake Mohave have and would continue to be subjected to impacts from water movement, changing lake levels, sedimentation, and recreation. These past actions have resulted in direct, minor to major, long-term/permanent, local and regional, adverse impacts on ethnographic resources.

In addition, actions called for in park plans like the exotic plan management plan and fire management plan could have adverse impacts on ethnographic resources if avoidance were not an option. These impacts have been and would continue to be direct, long-term/permanent, minor to major, and adverse.

Future projects outside of the recreation area could also adversely affect ethnographic resources. The proposed Searchlight Wind Energy, LLC. project would entail the construction of the wind farm infrastructure and the wind turbines. Again, if avoidance were not possible, there could be negative impacts in the form of visual and physical intrusions on ethnographic resources. These present and future

activities and development could result in direct and indirect, long-term/permanent, minor to major, adverse impacts on ethnographic resources locally and regionally.

As described above, implementation of alternative 2 would result in no or negligible permanent, adverse effects to ethnographic resources because sensitive resources would be avoided to the greatest extent possible. These impacts, in combination with the minor to major, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions would result in a permanent, moderate adverse cumulative effect. The adverse effects of alternative 2, however, would be a small component of the adverse cumulative impact.

*Conclusion* — Under alternative 2, ground-disturbing activities would be sited away from National Register eligible ethnographic resources resulting in no or negligible, local, adverse impacts. Cumulative impacts would be regional, permanent, direct, minor to major, and adverse; NPS contributions would be minimal.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 2 would have a *no adverse effect* on ethnographic resources because the National Park Service would avoid damaging these resources.

### **Visitor Use, Experience, and Safety**

Under alternative 2, various renovations and expansions would take place to facilities at both Cottonwood Cove and Katherine Landing.

At Cottonwood Cove, a second story would be added to the existing motel, thereby doubling the capacity of visitors. The number of marina slips would also be increased by almost 40% from current capacity. To better accommodate this increase, alternative 2 would improve access, circulation, and parking. The main access road east of the existing ranger station would be widened, adding a new launch/ready lane to reduce congestion at the launch point and expedite visitor access to the lake, therefore, also reducing conflicts and frustration among visitors. In addition, new pedestrian connections to areas of interest — such as along the shoreline, to and

from remote parking areas, and to both visitor service and remote beach areas — would increase convenience for visitors. It would also provide better access to less-frequented areas, which would distribute visitor use and further reduce crowding. Parking capacity would be increased in lower Cottonwood Wash to support the expansions and benefit visitors.

Additional measures that would be undertaken to provide for increased visitation include expansion the dry storage area and of the restaurant located at the marina. These changes would result in moderate to major, long-term, and beneficial impacts on visitor experience.

Other improvements to visitor experience at Cottonwood Cove would include a new visitor/ranger contact station near the launch site that disseminates important safety information to visitors. Orientation and interpretation services would also be added at the existing ranger station, and the amphitheater would be enhanced for use by potential interpretive programs. Because of the relatively small number of visitors who participate in interpretive programs, this would result in minor, long-term, and beneficial impacts on visitor experience and safety.

At Katherine Landing, the number of marina slips would not be increased, and the motel would be renovated but not expanded. The campground would also be rehabilitated but not expanded, in this case to accommodate ADA campsites. The only action that would increase overnight lodging capacity would be the addition of 22 new short-term RV sites, which would not result in a considerable intensification of crowding. In fact, the doubling of convenience store and restaurant capacity would reduce the sense of crowding felt by visitors at Katherine Landing, as would the extension of the courtesy dock and the low-water launch ramp. Overall, these actions would result in minor, long-term, and beneficial impacts on visitor experience.

The creation of the new short-term RV sites would be part of a gradual conversion of the long-term trailer village into solely short-term use. This would result in a corresponding shift in demographics as long-term users are replaced by visitors staying for shorter timeframes. This gradual elimination of the trailer village and corresponding upgrades to the accommodations

would provide more variety and increased opportunities of overnight accommodations available to all visitors. The result would be moderate, long-term beneficial impacts on visitor experience.

Alternative 2 would also institute various changes to the parking situation at Katherine Landing. Overall, parking would be better organized and delineated. Although parking capacity would not be increased, parking lots would be relocated closer to the lakeshore for the convenience of visitors. Access and circulation would be slightly modified in the vicinity of Cabinsite Road. These actions would result in moderate, long-term, and beneficial impacts on visitor experience.

Just as at Cottonwood Cove, this alternative would also create a new ranger / visitor contact station near the launch site. In addition visitors would see more wayside signs, which would replace the existing ranger station and would be placed at the Cabinsite Road junction as well. These actions would result in minor, long-term, and beneficial impacts on visitor experience and safety.

Unlike at Cottonwood Cove, the existing picnic area at Katherine Landing would be removed entirely and water access at that site would be discouraged. This would result in moderate, short-term, and adverse impacts on visitor experience until visitors readjusted their use patterns to other areas.

Visitor safety would be addressed at Cottonwood Cove with the relocation of the no-boat area to Ski Cove. By moving this area, highly used by swimmers, away from its current location near the boat launch at Cottonwood Cove, user group conflicts would be reduced and the safety of swimmers would be improved, resulting in moderate, long-term, and beneficial impacts on visitor experience and safety. The motel experience, however, would be affected by moderate, long-term, and adverse impacts because of the loss of the no-boat area directly adjacent to the facility.

Since relocation of the no-boat area would shift many visitors to the new area, the picnic area would also be relocated to Ski Cove. New paved access would be constructed on a spur road to the Ski Cove area and a new parking area would be

added to accommodate this increase in visitation, although the parking lot would likely not be close by and visitors may be required to walk a considerable distance to reach Ski Cove from their cars. In addition, more shelters, tables, and grills would be placed at the picnic area for use by visitors. This would result in moderate, long-term, beneficial, and adverse impacts on visitor experience.

**Cumulative Impacts.** There are several reasonably foreseeable projects, separate from these plans, that could further impact visitor experience at Lake Mohave.

One proposal that would affect the visitor experience is the reconstruction of the Katherine Landing access road beginning at its intersection with the Davis Dam Highway and continuing to the boat launch ramp. Because of high visitation levels at Katherine Landing, this road is subject to heavy traffic volumes and in its current state is narrow and poorly paved, with inadequate drainage. Each of these problems, with the exception of traffic volume, would be corrected under the proposed reconstruction. Combined with the improved parking situation and the extension of the courtesy dock and launch ramp, this would result in major, long-term, and beneficial impacts on visitor experience and safety.

The wireless telecommunication facilities plan identified Cottonwood Cove as a suitable site for the construction of a new cellular tower in the future. Improved communications within the coverage area would directly benefit those who choose to use this technology while in the recreation area. Moreover, some visitors may be more content and have peace of mind knowing that they can use a cell phone to contact help in case of emergency, especially in remote areas that receive less visitation. Construction of cellular towers would provide moderate, long-term, and beneficial impacts on safety resulting from improved communication services and increased emergency response time. Effects to visitor experience would be minor, long-term, and could be either beneficial or adverse, depending on the visitor's views on the technology and its suitability to national parks.

Another potential development that may affect visitors to the Cottonwood Cove area is the proposed installation of up to 161 wind turbine generators in the area between the community of Searchlight (where the Cottonwood Cove access road begins) and the Lake Mead National Recreation Area. This development would have a moderate, long-term, and adverse impact on the viewshed experienced by visitors entering the park via Cottonwood Cove.

The Cottonwood Cove marina is also authorized to expand from approximately 300 slips to 484 slips, per the lake management plan. This increase, if undertaken, would most likely increase visitation because of the increased capacity. The changes proposed under this alternative accommodate an increase in visitation, therefore, the result would be moderate, long-term, and beneficial impacts on visitors.

The construction activities and related effects involved with these improvements would have minor to moderate, short-term, and adverse impacts on visitor experience. When combined with the impacts of alternative 2, however, the overall experience of visitors to developed areas would have moderate, long-term, beneficial impacts.

**Conclusion.** Overall, the implementation of alternative 2 would result in minor to moderate, long-term, and beneficial impacts on visitor experience. There are some additional minor to moderate, short-term, and adverse impacts on visitor experience caused by construction activities associated with this alternative. Cumulative impacts on the overall experience of visitors to developed areas would have moderate, long-term, and beneficial.

### **Socioeconomic Environment**

Impacts on the socioeconomic environment, including the commercial operators in the recreation area and nearby communities were considered. Impacts are partly based on estimates in the "Revised Alternatives Analysis" for both Cottonwood Cove and Katherine Landing (Dornbusch 2011a, 2011b). The following impact topics were developed to analyze impacts in alternatives 2 and 3.

**Construction-related Economic Impacts.** These impacts on site-specific, local, and regional economic output and employment resulting from construction projects associated with each alternative. It is assumed that construction in each alternative occurs over an initial 2- to 3-year period.

*Cottonwood Cove* — Alternative 2 involves several changes to the concession operation at Cottonwood Cove. The marina would be expanded to 484 slips, and the dry storage area would be expanded to 500 spaces. A second story would be added to the waterfront motel, and it would double in size to 50 rooms. The restaurant would double in size and the fuel pumps would be relocated near the ranger station. The concessioner's maintenance area would be expanded, and concession housing would be expanded in the high bluff area. There would be no changes to the trailer village, short-term RV park, or the NPS campgrounds under this alternative.

Class C construction cost estimates for these changes to the concession total \$8 million in 2013 dollars (Dornbusch 2011a). The expansion of the marina (\$3 million) and the motel (\$2.9 million) are the two largest projects.

Given the large capital investment required to complete all of the proposed construction and development projects under alternative 2, a typical 10-year concession contract may not be financially feasible for a concessioner. Options such as longer contract terms or phasing in elements of alternative 2 over time may be necessary to ensure financial feasibility for a concessioner operating these services.

The \$8 million in construction spending proposed for Cottonwood Cove is projected to generate a total of \$10.2 million in direct and indirect value added to the local economy in the short term. An estimated 27.5 full-time equivalent jobs and \$2.7 million in labor income will be generated by construction in the short term (estimated to be a 3-year period).

*Katherine Landing* — Alternative 2 involves several changes to the concession operation at Katherine Landing. The marina docks would be replaced and the marina would be reconfigured to

accommodate a greater proportion of large (longer than 30 ft) slips. The motel would be renovated and a pool would be added. The short-term RV park would be expanded into the trailer village area, and the trailer village would gradually be removed over time. The convenience store and the restaurant would both be expanded, doubling their capacity. Concession housing would be replaced with permanent structures in the area near the concession maintenance facility. There would be no changes to the NPS campgrounds or the concessioner's maintenance area under alternative 2.

Class C construction cost estimates for these changes to the concession total \$12.3 million in 2013 dollars (Dornbusch 2011b). The replacement and reconfiguration of the marina (\$7.2 million), the expansion of the short-term RV park (\$2 million) and upgrades to employee housing (\$1.2 million) are the largest projects.

Given the large capital investment required to complete all of the proposed construction and development projects under alternative 2, a typical 10-year concession contract may not be financially feasible for a concessioner. Options such as longer contract terms or phasing in elements of alternative 2 over time may be necessary to ensure financial feasibility for a concessioner operating these services.

The \$12.3 million in construction spending is projected to generate a total of \$15.7 million in direct and indirect value added to the local economy in the short term. An estimated 42.3 jobs and \$4.2 million in labor income will be generated by construction in the short term (estimated to be a 3-year period). See table 14 for more information on the construction-related economic impacts of alternative 2.

**TABLE 14. CONSTRUCTION-RELATED ECONOMIC IMPACTS OF ALTERNATIVE 2**

	Cottonwood Cove	Katherine Landing
Construction Spending	\$8,000,000	\$12,300,000
Construction Value Added	\$10,240,000	\$15,744,000
Construction Jobs	27.5	42.3
Construction Labor Income	\$2,722,000	\$4,185,000

Overall, the impact of construction at both Cottonwood Cove and Katherine Landing is projected to be local, minor, short-term, and beneficial.

#### **Visitor Spending-related Economic Impacts.**

These impacts on site-specific, local, and regional economic output and employment resulting from changes to visitor spending associated with each alternative. New or modified concession services would include changes to marinas, lodging options, and other commercial services including food and beverage and retail sales.

*Cottonwood Cove* — Based on current occupancy rates and estimates of unmet demand, the expanded marina is projected to increase slip rental revenue by \$275,000 in 2013, and the expanded motel is projected to increase room revenue by \$308,000. The increased number of boats in the marina and guests staying at the hotel will lead to increased retail and food and beverage revenues. Gift shop/convenience store revenue is projected to increase by \$559,000 and restaurant revenue is projected to increase by \$184,000. Dry storage revenue is also projected to increase by \$59,000 in 2013, bringing the total projected increase in revenue in 2013 to approximately \$1.4 million (Dornbusch 2011a).

After subtracting additional expenses associated with these service expansions, annual concession profit is projected to increase by approximately \$200,000 annually.

The \$1.4 million annual increase in visitor spending (revenue) at Cottonwood Cove is projected to generate \$2.1 million in direct and indirect value added to the local economy annually. This spending is projected to support 12.7 additional full-time jobs for the concessioner and generate \$407,000 annually in labor income. The indirect spending effects are projected to support 6.1 additional jobs in the local economy and generate an additional \$195,000 in labor income.

*Katherine Landing* — Based on current slip occupancy rates and estimates of unmet demand, the reconfigured marina is projected to increase slip rental revenue by \$501,000 in 2013 dollars. The renovated motel is projected to increase revenue by \$34,000. Expansion of the short-term RV park and the removal of 10% of the existing

trailer village units will result in a net reduction of RV/trailer village revenue of \$22,000. The expansion of the retail store is projected to increase revenue by \$148,000, and the expansion of the restaurant is projected to increase revenue by \$46,000. The total projected increase in revenue is \$706,000 in 2013 dollars (Dornbusch 2011b).

After subtracting additional expenses associated with these changes in services, annual concession profit is projected to increase by approximately \$200,000 annually.

The \$706,000 annual increase in visitor spending (revenue) at Katherine Landing is projected to generate \$1 million in direct and indirect value added to the local economy annually. This spending is projected to support 6.4 additional full-time jobs for the concessioner and generate \$205,000 annually in labor income. The indirect spending effects are projected to support 3.1 additional jobs in the local economy and generate an additional \$99,000 in labor income. See table 15 for more information on visitor spending-related economic impacts of alternative 2.

**TABLE 15. VISITOR SPENDING-RELATED ECONOMIC IMPACTS OF ALTERNATIVE 2**

	<b>Cottonwood Cove</b>	<b>Katherine Landing</b>
Increased Revenue	\$1,400,000	\$706,000
Visitor Spending Value Added	\$2,072,000	\$1,044,880
New Concession Jobs	12.7	6.4
Concession Labor Income	\$407,000	\$205,000
Indirect Jobs	6.1	3.1
Indirect Labor Income	\$195,000	\$99,000

Overall, the impact of increased visitor spending at both Cottonwood Cove and Katherine Landing is projected to be local, negligible, long-term, and beneficial.

**Impacts on Other Park Concessions and Local Businesses.** These impacts on other marina concessioners were considered, but because of the long distances between marinas in the area, these impacts are expected to be minor. Impacts on

lodging and retail establishments in nearby communities were also considered.

The expanded motel at Cottonwood Cove could slightly reduce demand for motel style lodging in Searchlight and Cal-Nev-Ari. The expansion of the Cottonwood Cove marina would increase traffic through Searchlight and have a minor, beneficial impact on lodging, retail sales, and fuel sales in that community.

The expansion of the Cottonwood Cove marina and the reconfiguration of the Katherine Landing marina could shift some demand between both concessions, but the net effect would be negligible. Given the distance between these marinas and other similar concessions within recreation area, the impact on other concession operations will be negligible.

Overall, the impact of alternative 2 on other park concessions and local businesses is projected to be local, minor, long-term, and beneficial.

**Cumulative Impacts.** Growth in the surrounding communities and region is expected to support continued economic growth and increased visitation to the recreation area. Impacts from these actions in conjunction with alternative 2 would result in primarily beneficial but imperceptible effects on the Cottonwood Cove and Katherine Landing concessions and the economy of nearby communities and the region.

**Conclusion.** Construction and increased visitor spending would result in minor, short- and long-term, beneficial impacts for concession-operated facilities. Effects on local communities and the region would be beneficial, but negligible to minor because the park is a small part of the overall regional economy.

Impacts associated with spending and employment shifts would be expected to occur over the duration of concession contracts, the length of which would be 10 years with the potential for contract extensions or renewals. Short-term impacts would include construction spending, which would occur over an estimated 2 to 3 years. See table 16 for a summary of socioeconomic impacts of alternative 2. Cumulative impacts would be beneficial, but generally imperceptible.

## Park Operations

**Cottonwood Cove.** The marina and motel expansion at Cottonwood Cove would increase visitation to the area, impacting interpretive, maintenance, law enforcement and natural resources staff. While the concessioner would be responsible for the construction of the motel addition and the expansion of the marina, recreation area maintenance staff would monitor these projects.

TABLE 16. SUMMARY OF SOCIOECONOMIC IMPACTS OF ALTERNATIVE 2

	Construction	Visitor Spending	Population, Housing, and Equity	Concessions and Local Businesses
<b>Cottonwood Cove</b>				
Impact Type	Beneficial	Beneficial	Neutral	Beneficial
Impact Context	Local	Local	Local	Local
Impact Intensity	Minor	Negligible	Negligible	Minor
Impact Duration	Short Term	Long Term	Long Term	Long Term
Cumulative Impact	Imperceptible	Imperceptible	Imperceptible	Imperceptible
<b>Katherine Landing</b>				
Impact Type	Beneficial	Beneficial	Neutral	Beneficial
Impact Context	Local	Local	Local	Local
Impact Intensity	Minor	Negligible	Negligible	Minor
Impact Duration	Short Term	Long Term	Long Term	Long Term
Cumulative Impact	Imperceptible	Imperceptible	Imperceptible	Imperceptible

NPS construction projects at Cottonwood Cove under alternative 2 would include 9,300 linear feet (lf) of concrete channels for flood control, as well as low-flow road crossings and road realignment. Additional road improvements would be made to reconfigure circulation throughout the area. The main access road would be widened to include a new launch/ready lane. A new paved spur road would be created to the Ski Cove area. Parking capacity would be increased by a total of 392 spaces, and parking would be better organized and delineated throughout Cottonwood Cove. New picnic areas would be developed in Ski Cove, and new trails would be developed to areas of interest. A new visitor contact/ranger station would be built near the launch ramp. Campground restrooms would be rehabilitated, and the NPS housing and maintenance areas would be relocated. All of these construction and development projects would involve supervision and/or labor by recreation area maintenance staff.

The new maintenance area would provide a minor, beneficial impact on maintenance staff. Relocated area housing would provide a minor, beneficial impact on NPS staff living at Cottonwood Cove.

A new no-boat area in Ski Cove would require additional enforcement from area staff. The existing ranger station would be adapted into an orientation/interpretation center that may not require much staffing; however, the new visitor contact/ranger station near the launch ramp would attract an increased number of guests, requiring additional staffing.

**Katherine Landing.** At Katherine Landing, the gradual conversion of the trailer village to a short-term RV park (which would have significantly fewer spaces) would likely reduce demands on law enforcement personnel.

NPS construction projects at Katherine Landing under alternative 2 include rehabilitation of existing diversion dikes and construction of a new concrete channel along South Katherine Wash, a new paved access road from Cabinsite Road to the new NPS maintenance area, and the relocation of

parking closer to the lakeshore. A new paved access road would be constructed between North and South Arizona Telephone Coves, and a concrete two-lane launch ramp would be developed at North Arizona Telephone Cove. The NPS maintenance area would be relocated to the northwest of the developed area, the existing picnic area would be removed, the campground would be rehabilitated, the courtesy dock would be extended, and the existing launch ramp would be extended for low-water launching. The existing ranger station and visitor contact station would be converted to waysides, and a new modest ranger/visitor contact station would be created near the launch ramp. All of these construction and development projects would involve supervision and/or labor by area maintenance staff.

The new maintenance area would have a minor, beneficial impact on maintenance staff. Additional volunteer sites in the campground would be developed. More volunteers would reduce demands on NPS staff, providing a minor, beneficial impact.

The existing ranger station and visitor contact station would be converted to waysides, and a new modest ranger/visitor contact station would be created near the launch ramp. Overall staffing for these sites would likely be similar to the no-action alternative.

Cabinsite Point would be closed to boat launching. This might require additional monitoring and could have a minor, adverse effect on law enforcement.

**Cumulative Impacts.** On a site-specific basis, these proposed changes will have a noticeable impact on park operations. Several facilities would be relocated or reconfigured, and area staff would have increased responsibilities related to monitoring new no-boat zones and launch areas.

**Conclusion.** Overall, alternative 2 would increase demands on NPS staff at both Cottonwood Cove and Katherine Landing.

## **IMPACT ANALYSIS OF ALTERNATIVE 3: ENHANCE VISITOR EXPERIENCE AND PARK OPERATIONS (PREFERRED)**

### **Natural Resources**

**Native Plant Communities and Soils.** Similar to alternative 2, most construction activities associated with rehabilitation, replacement, or redesign of facilities at both developed areas would occur within or adjacent to previously disturbed areas and currently developed sites and would have minimal additional impacts on soils or native vegetation that is a mixture of native and nonnative plants. Some individual native plants or small remnant areas of Mohave desert scrub may be removed or trampled or desert soils compacted or disturbed in areas surrounding these construction sites.

Desert shrub vegetation and soils would be lost or altered by construction of new visitor or park administrative facilities on currently undeveloped sites that would expand the periphery of the overall development footprint. While portions of these new development sites have been impacted to some degree by visitor use or administrative roads, much of the impact would be new disturbance. Addition of a shoreline picnic area and parking at Ski Cove, development of a trail along the lakeshore to connect these facilities to Cottontail Cove, expansion of the maintenance area at Katherine Landing, and construction of a helipad at Princess Cove would impact approximately 3 acres. Extension of utility lines and access road to Ski Cove would result in additional impacts along a corridor that is estimated at 1,500 ft in length. There would also be an undetermined amount of new disturbance to vegetation and soils from development of lake access trails, which would be minimized by strategic location and design.

Alternative 3 includes redesign of the internal road circulation at both developed areas. Most of the impacts associated with these actions are expected to affect previously disturbed lands and impacts on native plant communities would be minor.

American threefold, a species of interest to the recreation area, may occur along rocky slopes and

washes near the shoreline between Katherine Landing and Princess Cove. Expansion of facilities at Cabinsite Point or South Telephone Cove and development of lakeshore trails could result in the destruction of individual plants. To avoid impact on plants, areas would be surveyed to allow siting of facilities outside of any populations.

Impacts because of the construction of flood control structures would be the same as under alternative 2, impacting approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing with much of the disturbance to soils and vegetation occurring in areas previously disturbed by existing roads, channels, dikes, or other man-made facilities and uses. Approximately an additional 13 acres of currently undisturbed desert shrub and wash vegetation and soils would be impacted by the construction of a new diversion dike and channel system in Ranger Wash west of Cottonwood Cove. Although the local topography would be altered, surface restoration/revegetation of most of the disturbed area would occur. Construction access to the site would be provided via the wash bottom, where scouring during flood events would rework the soils in the wash compacted by construction equipment access.

Overall, vegetation and soils would be removed within the immediate footprint of new structures, roads, parking areas, trails, etc. Disturbance of desert soils and vegetation around the construction zones may result in impacts such as changes in plant production and species composition, introduction and spread of nonnative plants and noxious weeds, compaction and loss of soil because of increased susceptibility of soils to wind and water erosion, reduced soil moisture and infiltration rates, and changes in soil temperatures and increased evaporation rates.

Implementation of mitigation measures during construction such as erosion controls and revegetation would minimize the loss and enhance the reestablishment of native vegetation and desert soils. As under alternative 2, an increase in the amount of disturbed ground would increase the potential for the spread or introduction of exotic vegetation, although alternative 3 would result in slightly fewer acres of new ground disturbance. Mitigation measures such as pressure washing of construction equipment would reduce the risk of introducing new exotic species. Post-

construction revegetation, monitoring, and treatment would also reduce the risk of spreading existing populations and introducing new exotic species.

Given the disturbance to soils and vegetation that has already occurred in most of the areas that would be impacted by proposed construction and visitor use and the application of appropriate mitigation measures to minimize additional impacts, the alteration of native plant species' populations and desert soil structure would be local and long-term adverse impacts are expected to be primarily minor. Development of new sites, road relocation, and construction of structural flood protection would result in greater disturbance to native plant communities and soils and would likely have long-term minor to moderate adverse impacts.

Some local beneficial effects to native plant communities and soil resources would also occur as the result of alternative 3. The replacement of existing invasive nonnative landscaping with native plantings as facilities are rehabilitated, replaced, or redesigned would remove a source of seeds and propagules that spread nonnative plant species to surrounding native plant communities. Existing exotic shoreline plants such as tamarisk would be removed during development of the new picnic area in Ski Cove and development of visitor facilities near the Katherine Landing shoreline. Some currently disturbed sites (i.e., maintenance area at Cottonwood Cove and existing satellite parking lot C located at Katherine Landing) would also be restored or partially restored. Enhanced interpretive and educational facilities and programs are expected to help educate and deter visitor caused impacts, such as social trailing or other vegetation damage.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate adverse impacts on soils and native plant communities because of construction and other activities and uses. However, long-term beneficial effects to native plant communities would be anticipated as a result of implementing the exotic plant management plan and fire management plan, both of which seek to restore native plant communities

and control exotic plants. Alternative 3 would contribute both long-term minor to moderate adverse impacts because of construction and expansion of visitor day use and administrative areas, and long-term beneficial effects from replacement of invasive nonnative landscaping with native plantings and restoration of some currently developed sites. The overall cumulative impact from past, present, and future actions in combination with the impacts of alternative 3 would result in a minor to moderate, long-term adverse cumulative effect on native plant communities and soils from development and use and long-term beneficial cumulative effects from native plant community restoration efforts and removal of invasive species.

*Conclusion* — Alternative 3 would primarily result in minor, long-term adverse impacts on native plant communities and soils from facility construction and associated visitor use that would affect previously disturbed areas. Approximately 37 acres of local, long-term, minor to moderate, and adverse impacts would result from development of additional lands and construction of flood control structures. Local beneficial effects would also result from the selective removal of existing nonnative invasive species and restoration of some currently developed sites. Cumulative impacts on vegetation and soils from alternative 3 in conjunction with past, present, and future projects would result in long-term, minor to moderate, adverse cumulative effects from development and use and long-term beneficial cumulative effects from native plant community restoration efforts and removal of invasive species.

**Wildlife.** Wildlife populations and their habitats in the developed areas have been altered by past human actions. These areas have marginal habitat value. Similar to alternative 2, the rehabilitation, replacement, or redesign of facilities would primarily occur within existing areas of concentrated human use and development and not in areas of continuous, undisturbed habitat.

Construction of new facilities on currently undeveloped sites would result in the additional loss or alteration of desert shrub communities, which provides habitat for species such as reptiles, birds, and small mammals. The overall development and use footprint of these

developments would encompass approximately 2 acres at Cottonwood Cove and 4 acres at Katherine Landing. While portions of these new development sites have been impacted to some degree by visitor use or administrative roads, most of the impact would be new disturbance and permanent.

Impacts from construction of flood control structures would be the same as for alternative 2. Approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing would be disturbed. Much of this acreage has been previously disturbed by existing roads, channels, dikes, or other man-made facilities and uses. Approximately 13 acres of currently undisturbed desert shrub and wash habitat would be impacted by a new diversion dike and channel system in Ranger Wash. Surface restoration and revegetation of most of this acreage would occur following construction.

Loss or fragmentation of habitat from proposed ground-disturbing activities and noise and visual intrusions associated with construction activity would affect wildlife species using these areas for foraging, nesting, and shelter and could result in direct loss of some individuals during construction activities. However, the majority of mammals, birds, and reptiles that are currently using habitat within or adjacent to these areas would be displaced to nearby habitat. Some may abandon nests or dens if construction occurred during critical phases of their breeding cycles. Generalist species like gulls, ravens, and coyotes would likely continue to be attracted to, and adapt to human habitation. Impacts should be minimized by the fact that planned projects would likely be implemented throughout multiple years and it is unlikely that at any one time, construction would be occurring in more than a few areas.

In addition to disturbance and loss of habitat from construction, new and existing facilities would accommodate larger numbers of visitors, which could increase disturbance to adjacent habitat. However, increased visitation is expected to primarily occur within the existing developed areas, areas currently degraded because of high-disturbance levels from existing developments and human use. In general, wildlife would either become accustomed to human activity or relocate outside of the developed areas because of noise, visual intrusions, or habitat alteration. Local

increased mortality to some wildlife such as lizards and small mammals could occur from increase in visitor traffic.

Mitigation measures developed for minimizing impacts on soils and vegetation such as replanting areas with native species, pressure washing of construction equipment, etc., as described in chapter 2, would also aide in minimizing impacts on the quality of wildlife habitat. To reduce impacts on birds, land clearing or other surface disturbance would be conducted outside the avian breeding season or a qualified biologist would survey the area prior to clearing. If a migratory bird nest were found with nestlings present, impacts would be avoided until birds fledge. In addition, enhanced interpretive and educational facilities and programs are expected to help deter visitor caused impacts on wildlife and wildlife habitat, such as social trailing, littering, and unauthorized collection of small animals.

Most actions would occur in areas extensively disturbed by existing development and associated use. Areas that are typically avoided by most wildlife and that have marginal habitat value. Alternative 3 would result in temporary or permanent loss of up to approximately 37 acres of natural habitat, although the disturbed areas are small relative to the desert shrub and wash habitat found in the park and region. Individual projects would also likely be implemented periodically throughout multiple years and would not occur simultaneously. Mitigation measures would minimize damage during construction and replant areas as appropriate. Therefore, the adverse impact on wildlife would be long term and minor, affecting individuals from wildlife populations in local areas, but not resulting in loss of population viability for these species.

The replacement of existing invasive nonnative landscaping and exotic shoreline plants with native plantings and the restoration of previously disturbed sites at Cottonwood Cove and Katherine Landing would improve local wildlife habitat conditions. Thus, some local beneficial effects to wildlife habitat would occur as the result of alternative 3.

Impacts from in-water work for construction of new fishing piers at both developed areas, potential improvement of existing launch ramps, as well as from general construction near the

lakeshore could create increased runoff, turbidity, sedimentation, or introduction of pollutants (e.g., petroleum products from construction equipment) to nearby aquatic environments. Noise and visual disturbances during construction could cause fish to move from the area of disturbance. Generally, these adverse impacts would be short term and minor because of the small areas affected, the disturbing activities would be temporary, and mitigation measures would be used to minimize potential impacts. Heavy shoreline recreational use during periods of high use can also temporarily cause similar local, minor impacts. Lake substrates would also be lost within the footprint of the in-water structures, although this area would be very limited, and impacts would be minor. Consequently, these impacts would not be large enough to adversely affect fish populations. Increased sport fishing may occur with the addition of a fishing piers and improved shoreline trailheads and trails that accommodate access by fishermen, but it is expected that NPS monitoring and the AZGFD and NDOW regulation of the fisheries would prevent adverse impacts on the recreation area's fish populations.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate adverse impacts on wildlife and wildlife habitat because of construction and other activities and uses. However, long-term beneficial effects would be anticipated as a result of implementing the exotic plant management plan and fire management plan, both of which seek to restore native plant communities and control exotic plants. Management actions associated with the lake management plan would improve water quality and the lake's aquatic habitat through the reduction of the amount of waste fuels and human wastes in the lake.

The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 3 would result in a minor to moderate, long-term adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive

species. Alternative 3 would contribute both long-term minor adverse impacts because of construction and expansion of day-use areas, and long-term beneficial effects from replacement of invasive nonnative landscaping and shoreline exotics with native plantings and the restoration of some currently developed sites.

*Conclusion* — Alternative 3 would result in temporary or permanent loss of approximately 37 acres of terrestrial habitat. The adverse impact on wildlife would be long term and minor, affecting individuals from wildlife populations in local areas, but not resulting in loss of population viability for these species. Impacts from in-water work and from construction near the lakeshore would be short term and minor and would not adversely affect fish populations. The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 3 would result in a minor to moderate, long-term adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species.

**Threatened, Endangered, and Special Status Species.** There are no known spawning areas or rearing ponds for razorback sucker or bonytail chub along the shoreline of either developed area. No impacts on spawning habitat are expected. As noted in the "Wildlife" section above, impacts from in-water work for potential improvement of existing lunch ramps and government dock construction at Katherine Landing and construction of new fishing piers at both developed areas as well as from general construction near the lakeshore could create increased runoff, turbidity, or sedimentation of Lake Mohave, which is critical habitat for both species. Adverse impacts would be short term and local because of the small areas affected, the disturbing activities would be temporary, and mitigation measures would be used to minimize potential impacts. Similar temporary impacts from increased shoreline recreation are expected to continue to occur in areas already heavily used by visitors. Loss of substrate within the footprint of new in-water structures would occur, although the area affected would be limited. Enhancement of fishing opportunities may result in a slight

increased risk of taking a listed fish, however, the potential would be low and information on the presence of native species would continue to be posted at the developed areas. Overall, impacts would be short term and long term, and not likely to adversely affect razorback sucker, bonytail chub, or their critical habitat.

Potential impacts on the desert tortoise and banded Gila monster include temporary or permanent loss of suitable habitat from new development. Most impacts would occur on previously disturbed sites within the developed areas that are low-quality habitat. Construction of new facilities on currently undeveloped sites would result in the permanent loss of approximately 2 acres at Cottonwood Cove and 4 acres at Katherine Landing. Construction of flood control structures would permanently impact an approximately 9 acres at Cottonwood Cove and 12 acres at Katherine Landing, although much of this acreage has been previously disturbed by existing roads, channels, dikes, or other man-made facilities and uses.

Approximately 13 acres of currently undisturbed desert shrub and wash habitat would be impacted by a new diversion dike and channel system in Ranger Wash, although surface restoration and revegetation of most of this acreage would occur following construction. There would be no disturbance to designated critical habitat for the desert tortoise.

Harassment from increased human activity, noise, and ground vibrations from construction or from removal to a safe location during construction would also likely occur. Desert tortoise and possibly Gila monster individuals on the ground or in burrows within the construction limits could be killed or injured. Eggs could be destroyed. Indirect effects related to capture or harassment by construction personnel and attraction of predators like ravens to the construction area because of trash accumulation could also occur. Mitigation would reduce the likelihood of these impacts while construction is occurring.

A 2010 programmatic biological opinion issued by the U.S. Fish and Wildlife Service for the threatened Mojave desert tortoise included infrastructure development and maintenance potentially associated with the development concept plan for Cottonwood Cove. Mitigation measures identified as part of the biological

opinion would be implemented to minimize loss and long-term degradation and fragmentation of habitat, such as soil compaction, erosion, crushed vegetation, or introduction of nonnative invasive plants or weeds as a result of project activities. Protective measures for tortoise in all new construction projects would include pre-construction surveys, on-site monitoring, and removal of tortoises from harm's way, as well as all other measures identified in chapter 2. Any additional measures identified during project level consultation with the U.S. Fish and Wildlife Service would also be implemented. Any Gila monsters found within a construction area would also be relocated by a qualified biologist. With the implementation of mitigation, adverse impacts on desert tortoises and banded Gila monsters would be minimized.

Removal of invasive riparian species such as tamarisk in Ski Cove and Cottontail Cove as part of the development of a picnic area and the redevelopment of the shoreline at Katherine Landing would have minimal effect to riparian vegetation that may be used by migrating Southwestern willow flycatchers. Tamarisk is considered low-quality habitat and landscape planting would include native species such as willow. Some flycatchers may potentially be displaced or avoid the area because increased recreational use in these coves may overlap spring and fall migration periods. This would affect a relatively small area of the shoreline and there are other available shoreline riparian areas, typically dominated by tamarisk, that provide migratory habitat. Consequently, these short-term adverse impacts may affect, but would not be likely to adversely affect Southwestern willow flycatchers.

Potential impacts on the Western burrowing owl include temporary or permanent loss of suitable habitat from new development and, since this is a ground-nesting bird, could include disturbance of breeding birds. Loss of individual burrowing owls including the young is possible if construction occurs during the breeding season. Prior to construction, areas would be surveyed for nesting birds. Any nests would be avoided until the young fledge or collapsed while unoccupied prior to the nesting season. The individuals areas impacted would be relatively small and the reproductive success of individual birds is not expected to be affected. Consequently, adverse impacts would include potential short-term disturbance from

construction activities and long-term, local loss of habitat from new development.

*Cumulative effects* — As described for the no-action alternative, there are several actions in and outside of the recreation area that would contribute to cumulative effects. These past, present, and reasonably foreseeable future actions would have short- and long-term, minor to moderate adverse impacts on threatened, endangered, and special status species because of construction and other activities and uses. However, long-term beneficial effects would be anticipated as a result of implementing the exotic plant management plan, fire management plan, and the lake management plan that would improve terrestrial and aquatic habitat in the recreation area through restoration of native plant communities, control of exotic plants, and improvement of lake water quality.

The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 3 would result in a long-term adverse cumulative effect from development and use and a long-term beneficial cumulative effect from wildlife habitat restoration efforts and removal of invasive species. Alternative 3 would contribute both short- and long-term adverse impacts on desert tortoise, banded Gila monster, and burrowing owls because of construction and expansion of day use and administrative areas, and long-term beneficial effects from replacement of invasive nonnative landscaping and shoreline exotics with native plantings and restoration of some currently developed sites.

*Conclusion* — Alternative 3 may affect, but would not be likely to adversely affect the Southwestern willow flycatcher, razorback sucker, bonytail chub, or their critical habitat. Alternative 3 would be likely to adversely affect the desert tortoise, banded Gila monster, and Western burrowing owls although impacts would be local. Potential impacts on the desert tortoise and banded Gila monster include temporary or permanent loss of suitable habitat from new development and incidental harassment and possibly loss of individuals from construction activities. There would be no disturbance to designated critical habitat for the desert tortoise. Potential impacts on Western burrowing owls would include short-term disturbance from construction activities and long-term, local loss of habitat from new

development. The overall cumulative impact on lands in and around the developed areas from past, present, and future actions in combination with the impacts of alternative 3 would result in an adverse cumulative effect from development and use and long-term beneficial cumulative effects from wildlife habitat restoration efforts and removal of invasive species.

**Floodplains.** Similar to alternative 2, the flood danger to people and facilities in Cottonwood Cove and Katherine Washes from floodwaters up to the 500-year flood would be mitigated with structural protection that includes systems of channels and dikes. The early warning detection system at Cottonwood Cove has been recently upgraded and a similar system would be installed in Katherine Wash to provide early identification and dissemination of warnings of an impending flood in these washes. A flood preparedness and evacuation plan would also be in effect. Signs would be developed and placed in strategic locations identifying flash flood zones and directing visitors and staff to move to higher ground.

The proposed structural flood mitigation measures would protect in place all development with overnight occupancy from flood inundation during the 500-year flood. The structural protection would also provide protection for the day-use areas and facilities as well with the exception of the where channeled flood waters would empty across parking areas and launch ramps into the lake. Nonstructural flood mitigation would further decrease the flood hazard risk to the National Park Service and concessioner staff and visitors within the primary developed areas. At the North and South Telephone Coves, day-use areas would have signs to inform visitors of flood hazards and evacuation procedures.

Protecting life and property in the floodplains is considered to be a higher priority than restoring natural floodplain values of these flash floodplains, which are the very qualities that endanger life and property. Thus, the natural floodplain values in both developed areas, such as natural flood flows, sedimentation processes, vegetation, or groundwater recharge have been and would continue to be highly altered by development. Construction of additional flood

control structures that divert and channel flood flows would further alter floodplains above and through the developed areas as would paving of the parking area in lower North and South Telephone Cove wash. However, most of these new impacts would be to previously disturbed lands. Thus, this alternative would have a long-term minor to moderate adverse effect on floodplain values.

*Cumulative impacts* — The cumulative actions are not expected to alter the flood hazard or floodplain values in the developed areas. Therefore, there would be no cumulative impacts.

*Conclusion* — Alternative 3 would greatly reduce the flood hazard at both developed areas through the use of structural and nonstructural protection, resulting in a long-term substantial benefit to safety for people and property in the floodplain. There would be a long-term minor to moderate adverse impact on floodplain values because of construction of additional flood control structures that divert and channel flood flows. There would be no cumulative impact on floodplains.

## Cultural Resources

**Archeological Resources.** Alternative 3 also proposes ground disturbance in both developed areas and in the coves adjacent to Katherine Landing. At Cottonwood Cove, ground-disturbing activities would include the construction of a spur road, restrooms, and picnic facilities at Ski Cove; construction of a new road along the southern edge of the developed area; addition of a boat launch lane; and alteration to many existing structures. At Katherine Landing and the adjacent coves, major ground-disturbing activities would include expanding the access road to three lanes; construction, enhancement, and/or reconfiguring roads within the developed areas; the removal of some existing structures and construction of new structures/waysides. Many of these proposed actions would take place in areas previously disturbed by construction, park operations, and visitor use.

Expanding the marina, reconfiguring traffic circulation, and upgrading/constructing new trails would have the same low probability of negatively impacting archeological sites in the developed areas and coves as described under alternative 2.

At Cottonwood Cove, flashflood mitigation measures and campground restoration activities described under alternative 2 would also take place under alternative 3 and would have the same low potential for negatively impacting archeological resources.

As with alternative 2, the prehistoric and historical archeological site recorded in and around Cottonwood Cove and the prehistoric and historic archeological sites recorded in the Katherine Landing developed areas would be managed as though they were eligible for listing in the National Register. Ground-disturbing activities would be avoided in these site locations.

In areas where archeological resources have not been inventoried, archeological surveys would be conducted to inform site-specific planning and design for proposed construction. Newly inventoried archeological resources would be evaluated for National Register significance. In both developed areas and the coves adjacent to Katherine Landing, National Register eligible or listed archeological resources would be avoided to the greatest extent possible. Therefore, any adverse impacts would be absent or negligible, permanent, and confined to the area of disturbance. If National Register eligible or listed archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer(s), advisory council (as needed), and associated American Indian tribes.

*Cumulative impacts* — Cumulative impacts on archeological resources under alternative 3 would be the same as those for alternative 2. As detailed under alternative 2, past, present, and foreseeable future impacts entail

- regional development around the developed areas in Searchlight (Cottonwood Cove) and Laughlin/Bullhead City area (Katherine Landing)
- pot hunting, off-road vehicle traffic, development of approved backcountry roads, burro trampling, power line corridors, and cell phone / communication towers
- inundation and recreation-related wave action and changing lake levels

- recreation area revegetation and fire management plans
- proposed Searchlight Wind Energy, LLC. project

These past, present, and future activities and development could result in direct and indirect, long-term/permanent, minor to major adverse impacts on archeological resources locally and regionally.

As described above, implementation of alternative 3 would result in no or negligible adverse impacts that would be permanent, and confined to areas of disturbance because sensitive archeological resources would be avoided to the greatest extent possible. These impacts, in combination with the minor to major, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions would result in a permanent, moderate to major, adverse cumulative impacts. The adverse effects of alternative 3, however, would potentially be an extremely small component of the adverse cumulative impact because sensitive resources would be avoided whenever possible.

*Conclusion* — Under alternative 3, ground-disturbing activities would be sited away from known National Register eligible archeological resources and would be avoided to the greatest extent possible resulting in no to negligible, local, adverse impacts. Cumulative impacts would be indirect and direct, long-term/permanent, minor to major, and adverse; NPS contributions would be potentially extremely small.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 3 for both developed areas and the coves adjacent to Katherine Landing would have *no adverse effect* on archeological resources because adverse impacts on resources listed or eligible for listing in the National Register would be avoided.

**Historic Structures.** Under alternative 3, the proposed actions also would have a range of impacts spanning from beneficial to adverse. At Cottonwood Cove, enhancing the campground amphitheater by rehabilitating the benches and

adding landscaping would be a direct, long-term, beneficial impact for that portion of the campground because the structure's function and appearance would be enhanced. Retaining the lower campground at Cottonwood Cove would also be a direct, long-term, beneficial impact because it would preserve the configuration of this historic district contributing element. For both developed areas and the coves adjacent to Katherine Landing, new building construction, relocated picnic areas and beach accesses, new parking areas, new trails/trailheads, and new or upgrades to spur/access roads would have no adverse impacts on historic structures because these actions would be sited to avoid affecting structures.

The changes to the marinas (circulation, access, and parking) and pedestrian connections for both developed areas and the adjacent coves would have no effect on historic structures because they would not entail alterations to historic structures. The proposed flood mitigation measure for Cottonwood Cove, likewise, would have no effect on historic structures for the same reason. The installation of the early warning detection system in both developed areas also would have no effect on historic structures. The use of sustainable design and character would be employed in ways that would be sympathetic to the existing architecture and would be employed in accordance to the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. This would result in no adverse effects or negligible long-term effects because architectural features contributing to the significance of these structures would not be altered.

Some of the proposed actions *could* have adverse effects on historic structures. At Katherine Landing, redeveloping the restaurant and store into a combined visitor /commercial services center, replacing the motel with a parking lot, removing the existing picnic facilities and amphitheater, rehabilitating campgrounds, converting the trailer village into a recreational vehicle campground, and constructing cabins/park models in the lower campground could have negative impacts. However, the National Register significance of these structures has not been assessed. Prior to any removal, construction, or remodeling, the affected structures would be evaluated for National Register significance. If any were found to be

significant, implementation plans would be developed to avoid altering features contributing to the significance and integrity of the structures to the greatest extent possible and in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. If alterations to National Register eligible structures could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer(s) and advisory council (as needed).

Other actions would have adverse impacts that could range from minor to major in intensity. As noted at Cottonwood Cove, the following structures are contributing elements to the Cottonwood Cove Developed Area Historic District:<sup>3</sup>

- NPS residences (201–203)
- campgrounds/trailer village
- ranger station
- concessioner store
- restaurant
- motel
- boat launch area/marina
- trailer village
- utility building
- fire station
- access road

Reconfiguring the upper campgrounds to accommodate RV campers and house volunteers, redesigning the trailer village as a RV campground, and establishing a combined visitor/commercial services center would alter architectural and design features contributing to the significance of these structures. This would be particularly true for the upper campgrounds because the Mission 66 character-defining, herringbone pattern of the campground would be significantly altered. However, retaining the

original configuration of one of the campground loops would lessen some of the adverse impacts on this contributing feature. Converting the trailer village into a RV campground and the combined visitor/commercial services center would have adverse impacts that could be mitigated through the use of architectural and design elements that harmonize with the original Mission 66-defining features. These actions would result in local, permanent, direct, minor to moderate, and adverse impacts on these structures because the architectural features contributing to their significance would be altered. Recreation area staff would consult with the appropriate state historic preservation officer, advisory council, and representatives from the NPS Pacific West Region's HABS / HAER / HALS staff to determine the appropriate documentation/mitigation strategy needed to reduce adverse impacts on structures.

As with alternative 2, the Katherine Landing duplex and single-family residence and an amphitheater are extant Mission 66 features (NPS 2007). Although historic structures in the developed area have not been formally assessed for National Register significance, portions of the developed area have been proposed as contributing properties in a draft multiple-property, Mission 66, National Register nomination (NPS 2007). The proposed redevelopment of the store and restaurant into a combined visitor/commercial services center, removal of original picnic facilities and the amphitheater, removal of the motel, and upgrading some campground loops to accommodate RV campers would have a direct, local, permanent, and major adverse effect to historic structures potentially eligible for listing in the National Register. Should they be determined eligible, recreation area staff would consult with regional HABS / HAER / HALS staff, the Arizona State Historic Preservation Office, and advisory council (as needed) to determine appropriate level documentation/mitigation strategy needed to reduce adverse impacts.

Other historic structures in the developed areas, such as the Quartette Mine Railroad Grade at Cottonwood Cove and Katherine Mine Historic District at Katherine Landing, would not be affected by any of the actions proposed under alternative 3.

<sup>3</sup> The Cottonwood Cove Historic District determination of eligibility identifies the Concessionaire Public Use Area (which includes the concessioner store, restaurant, motel, boat launch area/marina, and trailer village) as contributing to the historic district, and then states that the store, restaurant, motel, boat launch area/marina, and trailer village "will be noncontributing resources"; however, they do not compromise the integrity of the area since they fulfill the intent of the Mission 66 plan for the area." This apparent contradiction needs clarification.

*Cumulative impacts* — Cumulative impacts on historic structures within and around both developed areas would be similar to those affecting archeological resources. Regional development and land-use practices have damaged or destroyed mining and other historic structures outside the recreation area. Many historic structures located along the original river banks of the Colorado River (e.g., the Klondike Mill and the Aerial Ferry) are inundated and are subject to water movement, changing lake levels, and impacts from recreation use.

As described above, implementing alternative 3 would result in some beneficial impacts on the amphitheater, but it would also result in moderate to major, permanent, direct, and local adverse impacts on National Register eligible structures in Cottonwood Cove. Proposed changes to or removal of historic structures in Katherine Landing could have adverse impacts should any be determined eligible for listing in the National Register. These impacts, in combination with other regional past, present, or foreseeable future the adverse impacts of would result in a direct, permanent, moderate to major, adverse cumulative effect to historic structures. The NPS contribution to these adverse cumulate impacts would be substantive because this alternative calls for the removal or alteration of structures contributing to a property determined eligible for listing in the National Register at Cottonwood Cove and structures potentially eligible at Katherine Landing.

*Conclusions* — Under alternative 3, structures contributing to the historic district (Cottonwood Cove) and structures potentially eligible for listing in the National Register (Katherine Landing) would be removed or altered/remodeled; resulting in permanent, direct, local, moderate to major, and adverse impacts. Cumulative impacts would be direct, regional, long-term/permanent, moderate to major, and adverse; NPS contributions would be substantial.

*Section 106* — After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 3 would have an *adverse effects* on historic structures in the Cottonwood Cove developed area and possibly the Katherine

Landing developed area. Although the intensities of negative impacts could be reduced through mitigation under NEPA compliance, they would remain adverse under Section 106.

**Cultural Landscapes.** Under alternative 3, the proposed actions also would have a range of impacts spanning from beneficial to adverse. At Cottonwood Cove, enhancements to the campground amphitheater would be a direct, long-term, and beneficial impact because this contributing feature would be upgraded. Preserving the present configuration of the Cottonwood Cove lower campground and retaining the ranger station would also be beneficial effects because they would preserve the integrity of these landscape-contributing elements.

For both developed areas, new housing, building construction/remodeling, new parking areas, and reconfigured vehicle circulation patterns would add new architectural and circulation elements that would intrude on the landscapes' original viewshed and function. At Cottonwood Cove, redesigning the trailer village as a RV campground would alter the appearance and somewhat change the function of the landscape component. Adding an additional structure adjacent to the motel and converting the restaurant and store into a combined visitor/commercial services center would add visual intrusions and alter the appearance and original Mission 66 functions of these structures. Sympathetic architecture and design that harmonized with Mission 66 landscape features could reduce the intensities of these impacts. Rehabilitating the upper campground to accommodate RV campers and volunteer staff would greatly compromise the character-defining herringbone design of the Mission 66 campground. Retaining one of the historic loops in its original configuration would somewhat lessen the negative impacts on landscape features. Collectively, these proposed actions would have direct and indirect, local, moderate to major, long-term/permanent, and adverse impacts on the cultural landscape at Cottonwood Cove.

Expanding the marina to 484 slips would slightly change the appearance of the marina, but would not impact the intended function of this portion of the developed area or significantly alter its

appearance. This would be a long-term, local, direct, and negligible impact on the Mission 66 landscapes. In contrast, reconfiguring the circulation patterns, streamlining intersections, increasing parking, and adding new pedestrian connections (trails and trailheads) would alter the cultural landscapes' appearance and functions and would result in the moderate to major adverse impacts similar to those described under alternative 2.

Although the actions proposed under alternative 3 for Cottonwood Cove would better accommodate contemporary visitor uses and needs, they would result in adverse effects on features contributing to the significance of the Mission 66 cultural landscape. Recreation area staff would consult with the appropriate state historic preservation officer, advisory council, and representatives from the NPS Pacific West Region's HABS / HAER / HALS staff to determine the appropriate level documentation/mitigation strategy needed to reduce the intensity of impacts on landscape features, and formalize that determination through a memorandum of understanding among the consulting parties.

At Katherine Landing, several of the actions proposed under this alternative could have adverse impacts. The developed area is potentially eligible for listing in the National Register as a Mission 66 designed cultural landscape and/or a contributing component to a multiple property Mission 66 National Register nomination under development. Many actions would remove/alter the appearance of structures and features potentially contributing to the landscape, change the structure's/feature's original Mission 66 function, alter designed circulation patterns, and/or introduce visual intrusion into the landscape's viewshed. Notable among these are the proposed

- removal of the motel, original picnic facilities, and campground amphitheater
- remodel of the restaurant and store into a combined visitor/commercial services center
- rehabilitation of the existing ranger station into office space for the campground, and conversion of the trailer village into a RV campground

- construction of cabins in the campground area
- redesign of campground loop D to accommodate volunteer court and large RV campers, and the addition of a laundry/shower facility
- addition of a new administrative loop road

While many of these actions would improve, enhance, and update the developed area to meet contemporary visitor uses and needs, they could result in long-term, direct, local, moderate to major, adverse effects to features contributing to a potentially significant Mission 66 cultural landscape. To accommodate the need for change, recreation area staff would need to consult with the Arizona state historic preservation officer and National Park Service HABS / HAER / HALS staff to assess whether the developed area would be determined eligible for listing in the National Register. If determined eligible, recreation area staff and the consulting parties would develop a memorandum of understanding containing mitigation strategies designed to appropriately document Mission 66 landscape features prior to any remodeling, removal, or alteration of existing structures or addition of new landscape features.

*Cumulative impacts* — Past, present, and foreseeable regional development and land-use practices outside of the developed areas will have little to no effect on the cultural landscapes. Ongoing and proposed development outside Cottonwood Cove (Searchlight and the proposed Searchlight Wind Energy, LLC. project) lies well outside the boundaries of the developed area. In the Katherine Landing area, Laughlin/Bullhead City are encroaching on the recreation area and could adversely impact the viewshed of the outer boundaries of the developed area. However, this would have little to no effect on the main core of the landscape. Because this development would not impact the two developed areas, there would be no cumulative impacts on cultural landscapes.

*Conclusions* — Under alternative 3, landscape components contributing to a determined eligible cultural landscape (Cottonwood Cove) and components potentially eligible (Katherine Landing) would be removed, altered or remodeled, and/or visually impacted. This would

result in local, permanent, direct, major, and adverse impact on cultural landscape features. There would be no cumulative impacts.

*Section 106* — After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 3 would have *adverse effects* on cultural landscape in the Cottonwood Cove developed area and possibly the Katherine Landing developed area. Although the intensities of negative impacts could be reduced through mitigation under NEPA compliance, they would remain adverse effect under Section 106.

**Ethnographic Resources.** As with the other alternatives, ethnographic resources are often one in the same as archeological resources. Therefore, threats and impacts on these resources would be comparable. The types of resources would generally be the same for both developed areas. Under alternative 3, the potential for negatively impacting ethnographic resources would be minimal within the developed areas. Any identified ethnographic resources in the developed areas would be managed as though they were eligible for listing in the National Register. Ground-disturbing activities and other proposed actions would be avoided in the locations of these sites to the greatest extent possible.

Expanding the marinas, reconfiguring traffic circulation, and implementing other flashflood mitigation measures described under alternative 2, would be the same under alternative 3 and would have the same low potential for negatively impacting ethnographic resources.

In addition, ethnographic resources potentially existing in undisturbed areas outside the developed areas and coves adjacent to Katherine Landings would be inventoried (in conjunction with archeological resources), and assessed for National Register significance in consultation with the appropriate state historic preservation officer, tribal preservation officer, and/or culturally associated tribes. Ground-disturbing activities would be sited away from sensitive resources to the greatest extent possible.

Ethnographic resources that are *not* archeological resources could include mountains and vistas, and other physical features that these serve as important landmarks and wayfinding aids punctuating traditional and pilgrim routes throughout the Colorado River valley. These resources continue to play important ceremonial functions among contemporary tribes (Cleland 2011). Visual intrusions development, might intrude upon traditional viewsheds.

The National Park Service would avoid impacts on these sensitive resources through proper siting, site-specific planning, and design. Because National Register eligible or listed ethnographic resources would be avoided to the greatest extent possible; any adverse impacts would be absent or negligible, permanent, and confined to the area of disturbance or intrusion.

If National Register eligible or listed ethnographic resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer(s) and associated American Indian tribes.

*Cumulative impacts* — Past development and land-use patterns have damaged or destroyed ethnographic resources within the developed areas and surrounding region. Ethnographic resources that have been inundated by the impoundment of Lake Mohave have and would continue to be subjected to impacts from water movement, changing lake levels, sedimentation, and recreation. These past actions have resulted in direct, minor to major, long-term/permanent, and local and regional adverse impacts on ethnographic resources.

In addition, actions called for in-park plans like the exotic plan management plan and fire management plan could have adverse impacts on ethnographic resources if avoidance were not an option. These impacts have been and would continue to be direct, long-term/permanent, minor to major, and adverse.

Future projects outside of the recreation area could also adversely affect ethnographic resources. The proposed Searchlight Wind Energy, LLC. project would entail the construction of the wind farm infrastructure and the wind turbines. Again, if avoidance were not possible, there could be negative impacts in the

form of visual and physical intrusions on ethnographic resources (e.g., vistas). These present and future activities and development could result in direct and indirect, long-term/permanent, and minor to major, adverse impacts on ethnographic resources locally and regionally.

As described above, implementation of alternative 3 would result in no adverse effect or negligible to minor, permanent, and adverse effects to ethnographic resources because sensitive resources would be avoided to the greatest extent possible. These impacts, in combination with the minor to major, permanent, adverse impacts of other past, present, and reasonably foreseeable future actions would result in a permanent, moderate to major, and adverse cumulative impacts. The adverse effects of alternative 3, however, would potentially be an extremely small component of the cumulative adverse impact.

*Conclusion* — Under alternative 3, ground-disturbing activities would be sited away from National Register eligible ethnographic resources, resulting in no or negligible, local, adverse impacts. Cumulative impacts would be regional, permanent, direct, minor to major, and adverse; NPS contributions would be minimal.

*Section 106* — After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR Part 800.5), the National Park Service concludes that the actions under the alternative 3 would have *no adverse effect* on ethnographic resources because the National Park Service would avoid damaging these resources.

### **Visitor Use, Experience, and Safety**

Under alternative 3, the preferred alternative, the existing motel at Cottonwood Cove would be expanded to double the current capacity and the facility would be renovated in such a way as to make it more suitable for conferences and retreats in the hope of better meeting visitor needs and bringing in more business. Additional “premier” accommodations would also be constructed including rental cabins and RV sites that accommodate larger vehicles. This increased range of overnight facilities would better reflect visitor preferences and would enhance the visitor experience. The marina would also be expanded

to 484 slips, the upper campground would be rehabilitated, and the lower campground would become day use only in the summer but would operate as a campground for the winter season. Because of these actions, visitors would experience major, long-term, and beneficial impacts.

To improve circulation and to reduce congestion at Cottonwood Cove, a new paved access loop road would be constructed to prove an alternate route to the motel, and would include a spur to the Ski Cove area. A new launch/ready lane would also be created from the campground to the launch ramp. This would significantly improve the visitor experience and reduce conflicts and wait times. Parking capacity would also be increased by converting portions of the short-term recreational vehicle and trailer village to expand the marina parking. By reducing congestion and improving circulation, visitor frustration and conflicts will decrease and result in major, long-term, and beneficial impacts on visitor experience.

Other improvements to visitor experience at Cottonwood Cove would include a rehabilitated and enhanced commercial services facility that would combine the retail stores and restaurant and would also incorporate some visitor information and educational/interpretive exhibits into its design. This consolidation of visitor services would have moderate, long-term, and beneficial impacts on visitor experience.

Visitors would also experience expanded day-use areas. The existing no-boat areas to the north of launch ramp and in front of the hotel would remain, but new no-boat areas would be created at both Ski and Cottontail Coves. Additionally, a new fishing pier would be constructed adjacent to, but separate from, the no-boat area to the north of the launch ramp. New pedestrian connections to areas of interest would be installed between the fishing pier and Cottontail Cove. The existing picnic area would be enhanced and expanded, adding additional shelters, tables, and grills and configuring individual and group sites. The same type of picnic area would also be designed at Ski Cove to provide for the new no-boat area users there. This expansion of day-use areas would have moderate, long-term, and beneficial impacts on visitor experience.

Overnight accommodation at Katherine Landing would change significantly. The motel would be removed entirely, yet this type of accommodation can readily be found just outside the boundary of the recreation area. Additional “premier” accommodations would be constructed, including rental cabins and RV sites. The campground and long-term trailer village would both be converted into cabins and RV sites, and although the number of sites would be reduced to retain the current footprint, upgrades would be made to accommodate larger vehicles and hookups. Some tent camping sites would be retained, and the amphitheater would be relocated to the campground. This diversification of accommodations, and the improvements that would be made, would better meet the needs of current visitors and would result in major, long-term, and beneficial impacts on visitor experience.

Circulation would also be improved around Katherine Landing. The existing two-lane access road to the entrance station would be widened, turnouts would be paved, and the right-turn lanes would be extended back to Cabinsite Road. The extension of the right-turn lane in particular would improve traffic circulation for those going to satellite sites such as Princess Cove, as well as improve safety by minimizing backups. Although parking capacity would not increase, lots would be relocated closer to the lakeshore to improve convenience. This would be made possible by converting the motel site into parking spaces close to the launch ramp and marina. The parking area to the north of the access road would be expanded to serve the marina, picnic area, amphitheater, and combined commercial services / visitor contact facility. These changes would result in major, long-term, and beneficial impacts on both visitor experience and safety by greatly reducing the causes of visitor conflict and improving the accessibility of high-use areas.

Similar to Cottonwood Cove, alternative 3 at Katherine Landing would also include a rehabilitated and enhanced facility that combines commercial services with some elements of education/interpretation and visitor information. The store and restaurant site, as well as part of the picnic area, would be redesigned to include not only commercial services but also a point of visitor contact with interpretive components such as waysides.

Day-use areas would also be expanded, including a new picnic area along the waterfront (although physically separated to discourage water access) and new picnic areas that would be integrated into the existing fishing point. The trail system would also be expanded and enhanced, with formal trailheads at Fisherman’s Trail and Lakeview Trail. A new Lakeshore Trail along the waterfront would be developed, and possibly an additional short trail to access Princess Cove from Katherine Landing. These expansions would result in minor to moderate, long-term, and beneficial impacts on visitor use.

**Cumulative Impacts.** There are several reasonably foreseeable projects, separate from this plan that could further impact visitor experience at Lake Mohave.

One proposal that would affect the visitor experience is the reconstruction of the Katherine Landing access road beginning at its intersection with the Davis Dam Highway and continuing to the boat launch ramp. Because of high visitation levels at Katherine Landing, this road is subject to heavy traffic volumes and in its current state is narrow and poorly paved, with inadequate drainage. Each of these problems, with the exception of traffic volume, would be corrected under the proposed reconstruction. Combined with the improvements that would be made to circulation and access at Katherine Landing in alternative 3, this would result in major, long-term, and beneficial impacts on visitor experience and safety.

The wireless telecommunication facilities plan identified Cottonwood Cove as a suitable site for the construction of a new cellular tower in the future. Improved communications within the coverage area would directly benefit those who choose to use this technology while in the recreation area. Moreover, some visitors may be more content and have peace of mind knowing that they can use a cell phone to contact help in case of emergency, especially in remote areas that receive less visitation. Construction of cellular towers would provide moderate, long-term, and beneficial impacts on safety resulting from improved communication services and increased emergency response time. Effects to visitor experience would be minor, long-term, and could be either beneficial or adverse, depending on the

visitor's views on the technology and its suitability to national parks.

Another potential development that may affect visitors to the Cottonwood Cove area is the proposed installation of up to 161 wind turbine generators in the area between the community of Searchlight (where the Cottonwood Cove access road begins) and the Lake Mead National Recreation Area. This development would have a moderate, long-term, and adverse impact on the viewshed experienced by visitors entering the park via Cottonwood Cove.

The Cottonwood Cove marina is also authorized to expand from approximately 300 slips to 484 slips, per the lake management plan. This increase, if undertaken, would most likely increase visitation because of the increased capacity. The changes proposed under this alternative accommodate an increase in visitation, therefore, the result would be moderate, long-term, and beneficial impacts on visitors.

The construction activities and related effects involved with these improvements would have minor to moderate, short-term, and adverse impacts on visitor experience. When combined with the impacts of alternative 3, there would be moderate to major, long-term, beneficial impacts on visitor experience.

**Conclusion.** Overall, the implementation of alternative 3 would result in moderate to major, long-term, and beneficial impacts on visitor experience and safety. The main issues affecting visitor use, experience, and safety — congestion, circulation, access, parking, and overnight accommodations — would be all addressed in this alternative in reasonable and effective ways that would significantly improve current conditions. By resolving the causes of visitor conflict and by meeting the needs of overnight visitors, the changes would be readily apparent to all visitors and the effects would be felt in a positive manner.

### Socioeconomic Environment

Impacts on the socioeconomic environment, including the commercial operators in the recreation area and nearby communities were considered. Impacts are partly based on estimates in the "Revised Alternatives Analysis" for both Cottonwood Cove and Katherine Landing

(Dornbusch 2011a, 2011b). The following impact topics were developed to analyze impacts in alternatives 2 and 3.

**Construction-related Economic Impacts.** These impacts on site-specific, local, and regional economic output and employment resulting from construction projects associated with each alternative. It is assumed that construction in each alternative occurs over an initial 2- to 3-year period.

*Cottonwood Cove* — Alternative 3 involves several changes to the concession operation at Cottonwood Cove. As in alternative 3, the marina would be expanded to 484 slips. The motel would double in size to 50 rooms, and a 4,000 square foot conference/retreat space would be added to the motel. The trailer village would be removed and replaced with a new short-term RV park and new rental cabins. The upper campground would be rehabilitated and operated by the concessioner, while the lower campground would feature renovated group sites and restrooms. A new combined commercial services/visitor contact facility would be constructed near the site of the existing restaurant, and would include an expanded restaurant and retail store. Concessioner housing would be relocated to part of the existing upper campground area. The concessioner's maintenance area would be expanded.

Class C construction cost estimates for these changes to the concession total \$15.6 million in 2013 dollars (Dornbusch 2011a). The expansion of the motel/conference center (\$2.9 million), marina (\$3 million), construction of the short-term RV park (\$2.8 million), new commercial services building (\$1.8 million), and campground (\$1.8 million) are the largest projects.

Given the large capital investment required to complete all of the proposed construction and development projects under alternative 3, a typical 10-year concession contract may not be financially feasible for a concessioner. Options such as longer contract terms or phasing in elements of alternative 3 over time may be necessary to ensure financial feasibility for a concessioner operating these services.

The \$15.6 million in construction spending is projected to generate a total of \$20 million in direct and indirect value added to the local economy in the short term. An estimated 53.6 full-time equivalent jobs and \$5.3 million in labor income will be generated by construction in the short term (estimated to be a 3-year period).

*Katherine Landing* — Alternative 3 involves several changes to the concession operation at Katherine Landing. The marina docks would be replaced and the marina would be reconfigured to accommodate a greater proportion of large (longer than 30 ft) slips. The motel and trailer village would be removed, and the concessioner would construct and operate a new campground featuring upgraded RV spaces and cabins.

The existing restaurant and retail store would be demolished and replaced with a new commercial services facility with expanded space for each of these services. Concessioner housing would be consolidated at the current site of the trailer village, and the concessioner's maintenance area would be expanded.

Class C construction cost estimates for these changes to the concession total \$16.7 million in 2013 dollars (Dornbusch 2011b). The replacement and reconfiguration of the marina (\$7.2 million), development of the upgraded campground, cabins and short-term RV park (\$3.2 million), new employee housing (\$3 million), and the new commercial services facility (\$2.9 million) are the largest projects.

Given the large capital investment required to complete all of the proposed construction and development projects under alternative 3, a typical 10-year concession contract may not be financially feasible for a concessioner. Options such as longer contract terms or phasing in elements of alternative 3 over time may be necessary to ensure financial feasibility for a concessioner operating these services.

The \$16.7 million in construction spending is projected to generate a total of \$21.4 million in direct and indirect value added to the local economy in the short term. An estimated 57.4 full-time equivalent jobs and \$5.7 million in labor income will be generated by construction in the short term (estimated to be a 3-year period). See

table 17 for more information on construction-related economic impacts of alternative 3.

**TABLE 17. CONSTRUCTION-RELATED ECONOMIC IMPACTS OF ALTERNATIVE 3**

	Cottonwood Cove	Katherine Landing
Construction Spending	\$15,600,000	\$16,700,000
Construction Value Added	\$19,968,000	\$21,376,000
Construction Jobs	53.6	57.4
Construction Labor Income	\$5,307,000	\$5,681,000

Overall, the impact of construction at both Cottonwood Cove and Katherine Landing is projected to be local, minor, short-term, and beneficial.

#### **Visitor Spending-related Economic Impacts.**

These impacts on site-specific, local, and regional economic output and employment resulting from changes to visitor spending associated with each alternative. New or modified concession services would include changes to marinas, lodging options, and other commercial services including food and beverage and retail sales.

*Cottonwood Cove* — Based on current occupancy rates and estimates of unmet demand, the expanded marina is projected to increase slip rental revenue by \$275,000 in 2013, and the expanded motel is projected to increase room revenue by \$318,000. The new commercial services facility is projected to increase retail and food and beverage revenue by \$748,000. Revenue from new cabins is projected to be \$140,000, and campground revenue is projected to be \$164,000. The closure of the trailer village will result in a loss of \$978,000 in revenue. The net increase in revenue in 2013 is projected to be \$666,000 (Dornbusch 2011a).

After subtracting additional expenses associated with these changes to services, annual concession profit is projected to increase by approximately 100,000 annually.

The \$666,000 annual increase in visitor spending (revenue) at Cottonwood Cove is projected to generate \$986,000 in direct and indirect value added to the local economy annually. This spending is projected to support 6.1 additional full-time jobs for the concessioner and generate

\$194,000 annually in labor income. The indirect spending effects are projected to support 2.9 additional jobs in the local economy and generate an additional \$93,000 in labor income.

*Katherine Landing* — Based on current slip occupancy rates and estimates of unmet demand, the reconfigured marina is projected to increase slip rental revenue by \$501,000 in 2013 dollars. The removal of the motel is projected to decrease revenue by \$336,000. Development of the campground, RV park, and cabins and the removal of the trailer village units will result in a net increase in revenue of \$254,000. The removal of the fuel pumps will reduce revenue by \$103,000. The total projected net increase in revenue is \$315,000 in 2013 dollars (Dornbusch 2011b).

After subtracting additional expenses associated with these changes in services, annual concession profit is projected to increase by approximately \$100,000 annually.

The \$315,000 annual increase in visitor spending (revenue) at Katherine Landing is projected to generate \$466,000 in direct and indirect value added to the local economy annually. This spending is projected to support 2.9 additional full-time jobs for the concessioner and generate \$92,000 annually in labor income. The indirect spending effects are projected to support 1.4 additional jobs in the local economy and generate an additional \$44,000 in labor income.

See table 18 for more information on the visitor spending-related economic impacts of alternative 3.

**TABLE 18. VISITOR SPENDING-RELATED ECONOMIC IMPACTS OF ALTERNATIVE 3**

	Cottonwood Cove	Katherine Landing
Increased Revenue	\$666,000	\$315,000
Visitor Spending Value Added	\$986,000	\$466,000
New Concession Jobs	6.1	2.9
Concession Labor Income	\$194,000	\$92,000
Indirect Jobs	2.9	1.4
Indirect Labor Income	\$93,000	\$44,000

Overall, the impact of increased visitor spending at both Cottonwood Cove and Katherine Landing is projected to be local, negligible, long-term, and beneficial.

**Impacts on Other Park Concessions and Local Businesses.** These impacts on other marina concessioners were considered, but because of the long distances between marinas in the area, these impacts are expected to be minor. Impacts on lodging and retail establishments in nearby communities were also considered.

The expanded motel at Cottonwood Cove could slightly reduce demand for motel style lodging in Searchlight and in Cal-Nev-Ari. The expansion of the Cottonwood Cove marina would increase traffic through Searchlight and have a minor, beneficial impact on lodging, retail sales, and fuel sales.

The expansion of the Cottonwood Cove marina and the reconfiguration of the Katherine Landing marina could shift some demand between both concessions, but the net effect would be negligible. Given the distance between these marinas and other similar concessions within the recreation area, the impact on other concession operations will be negligible.

Overall, the impact of alternative 3 on other park concessions and local businesses is projected to be local, negligible, long-term, and beneficial.

**Cumulative Impacts.** Concession operations at Cottonwood Cove and Katherine Landing would benefit from increased services and facilities. Growth in the surrounding communities and region is expected to support continued economic growth and increased visitation to the recreation area. Impacts from these actions in conjunction with the alternative 3 would result in primarily beneficial effects on the Cottonwood Cove and Katherine Landing concessions and the economy of nearby communities and the region. From the standpoint of the region as a whole, the impact of alternative 3 relative to the cumulative impact on the socioeconomic environment would be imperceptible.

**Conclusion.** Construction and increased visitor spending would result in minor, short- and long-term, beneficial impacts for concession-operated facilities. Effects on local communities and the

region would be beneficial, but negligible to minor because the recreation area is a small part of the overall regional economy.

Impacts associated with spending and employment shifts would be expected to occur over the duration of concession contracts, the length of which would be 10 years with the potential for contract extensions or renewals. Short-term impacts would include construction spending, which would occur over an estimated 2 to 3 years. See table 19 for a summary of socioeconomic impacts of alternative 3.

**Unavoidable Adverse Impacts and Irreversible and Irrecoverable Impacts.**

There are no anticipated unavoidable adverse impacts or irreversible and irretrievable impacts on the socioeconomic environment from any of the elements of any of the alternatives.

**Park Operations**

**Cottonwood Cove.** The marina and motel expansion at Cottonwood Cove would increase visitation to the area, impacting interpretive, maintenance, law enforcement, and natural resources staff. The removal of the trailer village at Cottonwood Cove would likely reduce demands on law enforcement staff. The redevelopment of the upper campground, to be managed by the concessioner, will eliminate NPS campground staffing. While the concessioner would be responsible for the construction of the motel addition and the expansion of the marina, area maintenance staff would monitor these projects.

As in alternative 2, flood mitigation construction projects would include construction of 9,300 lf of concrete channels, low-flow road crossings, and road realignment. Additional road improvements would be made to reconfigure circulation throughout the area. The main access road would be widened to include a new launch/ready lane. A new paved spur road would be created to the Ski Cove area, and a new paved loop road would provide an alternate route to the motel area. Parking capacity would be increased by a total of 392 spaces, and parking would be better organized and delineated throughout Cottonwood Cove. New day-use areas, including picnic areas, would be developed in both Ski Cove and Cottontail Cove. Pedestrian connections would be developed to both of these coves as well as to a new fishing pier in Cottonwood Cove. A new visitor contact facility would be located in the combined commercial services facility on the current site of the store/restaurant. NPS maintenance staff will be involved in all of these projects.

The proposed new no-boat areas in Ski Cove and Cottontail Cove would require additional monitoring and enforcement.

The existing helipad, ranger station, and fire station would be relocated and combined into a law enforcement / emergency service center near the existing ranger station. This new center would likely have a minor, beneficial impact on NPS operations at Cottonwood Cove.

TABLE 19. SUMMARY OF SOCIOECONOMIC IMPACTS OF ALTERNATIVE 3

	Construction	Visitor Spending	Population, Housing, and Equity	Concessions and Local Businesses
<b>Cottonwood Cove</b>				
Impact Type	Beneficial	Beneficial	Neutral	Beneficial
Impact Context	Local	Local	Local	Local
Impact Intensity	Minor	Negligible	Negligible	Minor
Impact Duration	Short Term	Long Term	Long Term	Long Term
Cumulative Impact	Imperceptible	Imperceptible	Imperceptible	Imperceptible
<b>Katherine Landing</b>				
Impact Type	Beneficial	Beneficial	Neutral	Beneficial
Impact Context	Local	Local	Local	Local
Impact Intensity	Minor	Negligible	Negligible	Minor
Impact Duration	Short Term	Long Term	Long Term	Long Term
Cumulative Impact	Imperceptible	Imperceptible	Imperceptible	Imperceptible

NPS housing would be rehabilitated; this would have a minor, beneficial impact on recreation area staff. A new employee picnic facility would be built near the entrance station on County Road 164, which would also have a minor, beneficial impact.

**Katherine Landing.** The demolition of the motel and the expansion of the campground/RV park would net out in terms of visitors and have a neutral impact on park operations. The removal of the trailer village would reduce demands on law enforcement personnel.

NPS construction projects at Katherine Landing under alternative 3 include rehabilitation of existing diversion dikes and construction of a new concrete channel along South Katherine Wash, a new paved access road from Cabinsite Road to the new NPS maintenance area, a new paved loop serving administrative areas, the widening of the existing paved access road to the entrance station, and the relocation of parking closer to the lakeshore. A new picnic area and enhanced trail system, including a new Lakeshore Trail, would be developed.

A new paved access road would be constructed between North and South Arizona Telephone Coves, and paved, formalized parking areas would be developed at North Arizona Telephone Cove and Princess Cove. All of these construction and development projects would involve supervision and/or labor by area maintenance staff.

A combined commercial services/visitor contact facility would likely increase the need for interpretive staffing, as a greater number of visitors would visit this facility as compared to the current ranger station.

The campground would be operated by concessioner, reducing the need for campground employees. The existing ranger station would be converted to a campground office for the concessioner. Law enforcement/emergency functions would be located in consolidated offices near the NPS maintenance area along with interpretation/maintenance offices. This consolidation of services would likely have a minor, beneficial impact on NPS operations. Existing NPS housing would be rehabilitated,

providing a minor, beneficial impact on recreation area staff.

A helipad for emergency evacuations would be developed at Princess Cove. This will improve the efficiency of rescue services in the more remote areas. North Arizona Telephone Cove would be closed to motorized launching, but boats would be allowed to continue to beach there. This might require additional monitoring by law enforcement staff. A picnic area would be developed at North Arizona Telephone Cove with tables, grills, and shelters.

**Cumulative Impacts.** On a site-specific basis, these proposed changes will have a noticeable impact on park operations. Several facilities will be relocated or reconfigured, and area staff would have reduced responsibilities related to the campground, and increased responsibilities related to monitoring new no-boat zones and launch areas.

**Conclusion.** Overall, alternative 3 would increase demands on NPS staff at both Cottonwood Cove and Katherine Landing, although certain NPS responsibilities would be shifted to the concessioner.

### Unavoidable Adverse Impacts

Unavoidable adverse impacts are the environmental consequences of an action that cannot be avoided either by changing the nature of the action or through mitigation if the action is taken. Therefore, these environmental consequences would remain throughout the duration of the action.

All action alternatives (alternatives 2 and 3) would result in unavoidable adverse impacts on the vegetation; soils; wildlife habitat; and threatened, endangered, and special status species. These adverse impacts would be primarily minor and would not have adverse effects beyond the local area. The no-action alternative would continue to have adverse effects associated with public health and safety because of the potential dangers associated with the flash flooding.

Under alternatives 2 and 3, the potential for unavoidable adverse impacts on archeological and ethnographic resources would be very small

because these resources would be avoided to the greatest extent possible. The remodeling and/or removal of structures and cultural landscape features called for under these alternatives would have a substantial potential for the unavoidable loss of historic fabric of structures determined eligible for the National Register at Cottonwood and those potentially eligible at Katherine Landing. Similarly, the removal of design landscape plantings, reworking of traffic circulation, revamping of the herringbone campgrounds (alternative 3), and other alterations to the designed landscapes would have considerable potential for unavoidable adverse impacts on historic structures and the cultural landscapes in the developed areas. Mitigation through documentation would lessen the intensity of these unavoidable impacts.

Under the no-action alternative, the existing footprint for construction and visitor use in both developed areas and the coves adjacent to Katherine Landing would remain the same. No historic structures would be removed or remodeled. The campgrounds and cultural landscape plantings, circulation, viewshed, and other cultural landscape features would remain the same. This would result in no unavoidable adverse impact on cultural resources.

### **Irreversible and Irrecoverable Commitment of Resources**

This determination identifies whether the proposed action or alternative would result in effects or impacts that could not be changed over the long term or would be permanent. An effect on a resource would be irreversible if the resource could not be reclaimed, restored, or otherwise returned to conditions that existed before the disturbance. An irretrievable commitment of resources involves the effects on resources that once gone, cannot be replaced or recovered (NPS 2000).

For all alternatives, the materials and energy used for facility improvements or maintenance would be irretrievably lost. The funds expended for labor and materials for facility improvements and maintenance would be irreversibly and irretrievably committed. New site development would cause the irretrievable commitments to soil, vegetation, and wildlife habitat resources. This

impact would be reduced with implementation of mitigation measures.

Under alternatives 2 and 3, there would be a small potential for the irreversible/irrecoverable loss of archeological and ethnographic resources because these resources would be avoided to the greatest extent possible. Alternative 2 would have some potential for the irreversible/irrecoverable loss of historic structures and cultural landscape features because some structures would be remodeled/removed, there would be minor modifications to the campgrounds, traffic circulation would be changed, designed landscape plantings would be removed, and other features contributing the cultural landscapes would be altered. Under alternative 3, the potential these irreversible/irrecoverable losses would be greater because there would be more extensive changes to the cultural landscapes in the developed areas.

Under the no action alternative, there would be a small potential for the irreversible/irrecoverable loss of archeological and ethnographic resources because the current areas of disturbance would largely go unchanged. The potential commitment of resources for historic structures and the cultural landscape would be limited the loss of historic fabric and landscape features resulting from routine maintenance.

### **Relationship of Short-term Uses and Long-term Productivity**

The intent of this determination is to identify whether the proposed action would trade off the immediate use of the land or resources for any long-term management possibilities, adversely affecting the productivity of the resources in the recreation area. This determination also discloses whether the proposed action or alternatives would be a sustainable action that could continue over the long term without causing environmental problems.

None of the alternatives would result in substantial loss of natural resources or ecosystems in the recreation area as a consequence of their implementation. Actions proposed under the alternatives would not result in widespread loss of long-term productivity because the areas impacted are relatively small in size and low in productivity compared with the remaining

unaffected areas within the recreation area. The extent of impacts on natural resources, such as soils and vegetation, that would be removed because of construction or visitor use is local and

would not adversely affect the overall quality and productivity of the Mohave desert ecosystem within the recreation area.

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CONSULTATION *and*  
COORDINATION

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## CHAPTER 5: CONSULTATION AND COORDINATION

The National Park Service conducted both internal and external scoping with appropriate park staff, agencies, American Indian tribes, concessioners, and the public. This scoping process was used to define the project purpose and need, identify issues and impact topics, and to outline alternative actions.

### PUBLIC INVOLVEMENT

Initial NPS planning team meetings were held with Lake Mead National Recreation Area staff and concessioners from the Forever Resorts at Cottonwood Cove and Seven Crown Resorts at Katherine Landing in late October and early November 2007, to identify current operational issues and concerns.

The formal public scoping process for the development concept plans for Cottonwood Cove and Katherine Landing was initiated on August 13, 2008, with the publication of the Notice of Intent to prepare an environmental impact statement in the *Federal Register*. The *Federal Register* notice was also posted on the NPS Planning, Environment, and Public Comment (PEPC) website. The public comment period extended to October 14, 2008.

In September 2008, a scoping press release was sent to television stations, newspapers, magazines, and radio stations in southern Nevada, Arizona, and southern California announcing a series of public scoping meetings in the area inviting the public to share their ideas concerns, and future visions for enhancing the Cottonwood Cove and Katherine Landing areas of Lake Mohave. During that time a flyer was made available at the recreation area notifying the public of the *Draft Cottonwood Cove and Katherine Landing Development Concept Plans/ Environmental Impact Statement (DCPs/EIS)* and a newsletter describing the process and outlining an initial list of issues to be addressed by the planning process was posted to the Lake Mead NRA website and on the PEPC website and over 400 copies were distributed to the public. The scoping comment period extended from September 11, 2008, to November 15, 2008.

Three public meetings using the open house format were held between October 27 and October 29, 2008 in Bullhead City, Arizona; Searchlight, Nevada; and Boulder City, Nevada. A total of 65 people attended the public meetings, including individuals, one business, and representatives from Laughlin City Manager's Office, Searchlight Town Advisory Board, Clark County Comprehensive Planning, Bureau of Reclamation, Colorado River Heritage Greenway Trails, Lake Mohave Boat Owners Association, Cottonwood Cove Trailer Owners Association, Forever Resorts, and Seven Crown Resorts. Comments were recorded on flip charts at the meetings. In addition, approximately 110 public comment letters and comments posted to the PEPC website were also received. The most frequent input were letters from trailer owners at Cottonwood Cove expressing support for including the trailer village in part of the plan. The public also identified a variety of issues and concerns on topics such as marina and launch ramp conditions, congestion, provision of nonmotorized visitor / no-boat opportunities, enhancement of visitor facilities and services, and protection of the Cottonwood Cove viewshed and motel character. The Laughlin Chamber of Commerce provided a copy of a 2003 report outlining a range of issues and recommendations for improving the lower Lake Mohave area.

A flyer further soliciting public input was distributed in September 2009. Twenty-seven responses were posted to the PEPC website. A second newsletter was mailed out and posted on the PEPC website describing the key issues and different options or actions that could be taken to address the identified issues. The public comment period for this newsletter extended from March 11, 2010 to July 31, 2010. During the public comment period, eight comments were received through the PEPC website. The comments ranged from concerns on the trailer village to area trails.

### AGENCY CONSULTATION

#### American Indian Tribes

There are numerous Yuman-speaking Indian tribes with interest in this area of Lake Mead

National Recreation Area. Letters and newsletters were sent to these tribes to inform them of the planning process and to invite their input. Tribal consultation has also been conducted through participation and sharing of project updates by the park's American Indian liaison during routine government-to-government consultation meetings. Consultation will continue with the American Indian tribes throughout the planning and implementation of the development concept plans to ensure that any potential concerns are addressed.

### **U.S. Fish and Wildlife Service**

In accordance with Section 7 of the Endangered Species Act, consultation letters were sent from the National Park Service to the U.S. Fish and Wildlife Service in September 2008. The USFWS Arizona Ecological Services provided comments during the scoping meetings and in response to newsletter 2. The U.S. Fish and Wildlife Service referenced the biological opinion issued for the 2003 *Lake Mead NRA Lake Management Plan / Final Environmental Impact Statement*), which included critical habitat for the Southwestern willow flycatcher, bonytail chub, razorback sucker, and desert tortoise. The U.S. Fish and Wildlife Service also recommended that the Yuma clapper rail, bald eagle, and Gila monster be addressed. Based on the Migratory Bird Treaty Act of 1918, U.S. Fish and Wildlife Service also suggested that land clearing or other surface disturbances be conducted outside the avian breeding season or a qualified biologist survey of the area be conducted prior to any clearing. They wished to remain involved with the project. Their primary concerns in responses to newsletter 2 were for potential effects of changes in marina locations, boat launch ramps, and other infrastructure that could affect the razorback sucker, bonytail chub, and critical habitat for both species in Lake Mohave.

A programmatic biological opinion issued by the U.S. Fish and Wildlife Service in February 2010 included an evaluation of potential effects on the threatened Mohave desert tortoise (*Gopherus agassizii*) and its designated critical habitat from programmatic activities in the Lake Mead National Recreation Area in Clark County, Nevada. Programmatic activities addressed in that document included infrastructure development and maintenance as part of the implementation of

a development concept plan for Cottonwood Cove. The programmatic biological opinion is in effect for a 10-year period. The general terms and conditions that are included in that document would be implemented as part of the proposed actions to minimize the effects and incidental take of desert tortoise. Additional project-specific terms and conditions may be identified based on the specifics of any individual project and will be determined during project-level consultation with the U.S. Fish and Wildlife Service. Specific projects associated with the implementation of a development concept plan for Cottonwood Cove would be appended to the programmatic biological opinion.

### **Nevada and Arizona State Historic Preservation Officer**

Scoping letters were sent to the Nevada and Arizona State Historic Preservation Offices on September 24, 2008. Newsletter updates have been sent to these offices as part of an ongoing agency coordination and public involvement during the project. To continue coordination, the draft development concept plans will be submitted to the Nevada and Arizona State Historic Preservation Offices for comment.

### **Arizona and Nevada State Natural Resources Agencies**

In addition to consultation with federal agencies, the National Park Service sent letters to the Arizona Game and Fish Department and the Nevada State Department of Wildlife to gather species information and additional concerns regarding the planning process.

The Arizona Game and Fish Department provided input that they wished to be actively involved as a stakeholder and cooperating agency in the conservation planning and environmental impact analysis process for the development concept plans. They also wanted to be kept informed about the planning process.

The Nevada State Department of Wildlife provided written input and participated in one of the public meetings. They also indicated that the state was interested in ensuring accessibility and security of their vessels and equipment, avoiding impacts on aquatic habitats essential to the

razorback sucker, and increasing available areas for shoreline angling access by no-boat users.

### **INDIVIDUAL CONSULTATION**

The following people were contacted for information and assistance in identifying issues, developing alternatives, and analyzing impacts:

Colleen Carter  
General Manager, Cottonwood Cove Resort  
Interview at Cottonwood Cove on May 13,  
2010

Roxanne Dey  
Concessions Management Specialist, Lake  
Mead National Recreation Area  
Interview at Katherine Landing on May 12,  
2010

Horace Schuler  
General Manager, Lake Mohave Resort  
Interview at Katherine Landing on May 12,  
2010

## CONSULTATION LETTERS AND RESPONSES

# United States Department of the Interior



## NATIONAL PARK SERVICE

LAKE MEAD NATIONAL RECREATION AREA  
601 NEVADA WAY  
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:  
LAME (137227)

September 24, 2008

Mr. Don Klima  
Director, Office of Federal Agency Programs  
Advisory Council on Historic Preservation  
1100 Pennsylvania Ave, Suite 809  
Washington, D.C. 20004

Subject: Scoping Notice - Preparation of Development Concept Plans / Environmental Impact Statement for Cottonwood Cove and Katherine Landing at Lake Mead National Recreation Area and the Use of the NEPA Process for Section 106 Purposes

Dear Mr. Klima:

The National Park Service is preparing development concept plans (DCPs) and accompanying environmental impact statement for the Cottonwood Cove and Katherine Landing developed areas on Lake Mohave within Lake Mead National Recreation Area. The purpose of the DCPs is to revisit the implementation strategies identified in the 1986 General Management Plan and 2003 Lake Management Plan for the national recreation area. Each DCP will provide an integrated plan for development with site specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in both previous plans.

Although planning is in the preliminary stages, we believe that eventual implementation of the project could affect properties included in or that may be eligible for inclusion in the National Register of Historic Places. In accordance with the Advisory Council on Historic Preservation regulations, 36 CFR Part 800: *Protection of Historic Properties*, the National Park Service is required to comply with Section 106 of the National Historic Preservation Act of 1966 (as amended). This scoping notice serves to officially initiate Section 106 consultation with your office. Section 106 consultations have also been initiated with the Nevada State Historic Preservation Officer, Arizona State Historic Preservation Officer, and associated Indian tribes and scoping is underway with other federal and state agencies and interested publics.

In addition, in accordance with 36 CFR Part 800.8(c): *Use of the NEPA process for Section 106 purposes*, this letter also serves to notify your office of our intention to use the NEPA process for all subsequent Section 106 consultation on this project.

We look forward to your participation in this planning process and will continue to seek your input during various stages of the process. A copy of the scoping newsletter has been enclosed to provide some additional information on the planning process and preliminary issues.

We would appreciate any preliminary input you may have by November 15, 2008. Comments can be sent to:

Lake Mead National Recreation Area  
ATTN: DCP-EIS  
601 Nevada Way  
Boulder City, NV 89005

If you have questions about the project or would like more information please contact Jim Holland, Park Planner, at 702-293-8986 or by email at [jim\\_holland@nps.gov](mailto:jim_holland@nps.gov).

Sincerely,



William K. Dickinson  
Superintendent

Enclosure

CC:  
Holland, LAME  
Boyles, LAME  
Jackson-Retondo, PWR  
Koch, PWR  
Rideout, DSC -DC

# United States Department of the Interior



## NATIONAL PARK SERVICE

LAKE MEAD NATIONAL RECREATION AREA  
601 NEVADA WAY  
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:

LAME (137227)

September 24, 2008

Mr. Ronald M. James  
State Historic Preservation Officer  
Nevada Office of Historic Preservation  
100 North Stewart Street  
Carson City, NV 89701

Subject: Scoping Notice - Preparation of Development Concept Plans / Environmental Impact Statement for Cottonwood Cove and Katherine Landing at Lake Mead National Recreation Area and the Use of the NEPA Process for Section 106 Purposes

Dear Mr. James:

The National Park Service is preparing development concept plans (DCPs) and accompanying environmental impact statement for the Cottonwood Cove and Katherine Landing developed areas on Lake Mohave within Lake Mead National Recreation Area. The purpose of the DCPs is to revisit the implementation strategies identified in the 1986 General Management Plan and 2003 Lake Management Plan for the national recreation area. Each DCP will provide an integrated plan for development with site specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in both previous plans.

Although planning is in the preliminary stages, we believe that eventual implementation of the project could affect properties included in or that may be eligible for inclusion in the National Register of Historic Places. In accordance with the Advisory Council on Historic Preservation regulations, 36 CFR Part 800: *Protection of Historic Properties*, the National Park Service is required to comply with Section 106 of the National Historic Preservation Act of 1966 (as amended). This scoping notice serves to officially initiate Section 106 consultation with your office. Scoping has also been initiated with the other federal and state agencies, associated Indian tribes, and interested publics.

In addition, in accordance with 36 CFR Part 800.8(c): *Use of the NEPA process for Section 106 purposes*, this letter also serves to notify your office of our intention to use the NEPA process for all subsequent Section 106 consultation on this project.

We look forward to your participation in this planning process and will continue to seek your input during various stages of the process. A copy of the scoping newsletter has been enclosed to provide some additional information on the planning process and preliminary issues.

We would appreciate any preliminary input you may have by November 15, 2008. Comments can be sent to:

Lake Mead National Recreation Area  
ATTN: DCP-EIS  
601 Nevada Way  
Boulder City, NV 89005

If you have questions about the project or would like more information please contact Jim Holland, Park Planner, at 702-293-8986 or by email at [jim\\_holland@nps.gov](mailto:jim_holland@nps.gov).

Sincerely,



William K. Dickinson  
Superintendent

CC:  
Holland, LAME  
Boyles, LAME  
Jackson-Retondo, PWR  
Koch, PWR  
Rideout, DSC -DC

# United States Department of the Interior



## NATIONAL PARK SERVICE

LAKE MEAD NATIONAL RECREATION AREA  
601 NEVADA WAY  
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:

LAME (137227)

September 24, 2008

Mr. James Garrison  
Arizona State Historic Preservation Officer  
Arizona State Parks  
1300 West Washington  
Phoenix, Arizona 85007

Subject: Scoping Notice - Preparation of Development Concept Plans / Environmental Impact Statement for Cottonwood Cove and Katherine Landing at Lake Mead National Recreation Area and the Use of the NEPA Process for Section 106 Purposes

Dear Mr. Garrison:

The National Park Service is preparing development concept plans (DCPs) and accompanying environmental impact statement for the Cottonwood Cove and Katherine Landing developed areas on Lake Mohave within Lake Mead National Recreation Area. The purpose of the DCPs is to revisit the implementation strategies identified in the 1986 General Management Plan and 2003 Lake Management Plan for the national recreation area. Each DCP will provide an integrated plan for development with site specific guidance for the extent, type, and location of facilities and services that is consistent with the management direction and intent established in both previous plans.

Although planning is in the preliminary stages, we believe that eventual implementation of the project could affect properties included in or that may be eligible for inclusion in the National Register of Historic Places. In accordance with the Advisory Council on Historic Preservation regulations, 36 CFR Part 800: *Protection of Historic Properties*, the National Park Service is required to comply with Section 106 of the National Historic Preservation Act of 1966 (as amended). This scoping notice serves to officially initiate Section 106 consultation with your office. Scoping has also been initiated with the other federal and state agencies, associated Indian tribes, and interested publics.

In addition, in accordance with 36 CFR Part 800.8(c): *Use of the NEPA process for Section 106 purposes*, this letter also serves to notify your office of our intention to use the NEPA process for all subsequent Section 106 consultation on this project.

We look forward to your participation in this planning process and will continue to seek your input during various stages of the process. A copy of the scoping newsletter has been enclosed to provide some additional information on the planning process and preliminary issues.

We would appreciate any preliminary input you may have by November 15, 2008. Comments can be sent to:

Lake Mead National Recreation Area  
ATTN: DCP-EIS  
601 Nevada Way  
Boulder City, NV 89005

If you have questions about the project or would like more information please contact Jim Holland, Park Planner, at 702-293-8986 or by email at [jim\\_holland@nps.gov](mailto:jim_holland@nps.gov).

Sincerely,



William K. Dickinson  
Superintendent

Enclosure

CC:  
Holland, LAME  
Boyles, LAME  
Jackson-Retondo, PWR  
Koch, PWR  
Rideout, DSC -DC



"Managing and conserving natural, cultural, and recreational resources"

In reply refer to SHPO-2008-1638  
More information required

October 15, 2008

William K. Dickinson Superintendent  
National Park Service  
Lake Mead National Recreation Area  
601 Nevada Way  
Boulder City, NV 87005

**Janet Napolitano**  
Governor

**State Parks  
Board Members**

**Chair  
William C. Scalzo**  
Phoenix

**Arlan Colton**  
Tucson

**Reese Woodling**  
Tucson

**Tracey Westerhausen**  
Phoenix

**William C. Cordasco**  
Flagstaff

**Larry Landry**  
Phoenix

**Mark Winkleman**  
State Land  
Commissioner

**Kenneth E. Travous**  
Executive Director

**Arizona State Parks**  
1300 W. Washington  
Phoenix, AZ 85007

Tel & TTY: 602.542.4174  
www.azstateparks.com

800.285.3703 from  
(520 & 928) area codes

General Fax:  
602.542.4180

Director's Office Fax:  
602.542.4188

RE: Preparation of Development Concept Plans/Environmental Impact Statement for Cottonwood Cove and Katherine Landing at Lake Mead National Recreation Area and the Use of the NEPA Process for Section 106 Purposes  
NPS – LAME (137227)  
**SHPO-2008-1638** (37927)

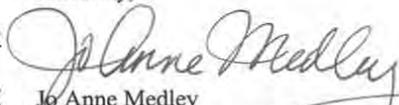
Dear Mr. Dickinson:

Thank you for informing us about the above referenced federal undertaking.

We look forward to continuing consultation pursuant to Section 106 of the National Historic Preservation Act and implementing regulations at 36 CFR 800. We understand that the agency intends to use the NEPA process for Section 106 purposes.

We appreciate your continued cooperation with our office in complying with the requirements of historic preservation.

Sincerely,

  
Jo Anne Medley  
Compliance Specialist/Archaeologist  
State Historic Preservation Office



# APPENDIXES

BACK OF DIVIDER

# APPENDIX A: LEGISLATION



Public Law 88-639  
88th Congress, S. 653  
October 8, 1964

## An Act

78 STAT. 1037.

To provide an adequate basis for administration of the Lake Mead National Recreation Area, Arizona and Nevada, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That, in recognition of the national significance of the Lake Mead National Recreation Area, in the States of Arizona and Nevada, and in order to establish a more adequate basis for effective administration of such area for the public benefit, the Secretary of the Interior hereafter may exercise the functions and carry out the activities prescribed by this Act.

Lake Mead  
National Recreation  
Area.  
Administration.

SEC. 2. Lake Mead National Recreation Area shall comprise that particular land and water area which is shown on a certain map, identified as "boundary map, RA-LM-7060-B, revised July 17, 1963", which is on file and which shall be available for public inspection in the office of the National Park Service of the Department of the Interior. An exact copy of such map shall be filed with the Federal Register within thirty days following the approval of this Act, and an exact copy thereof shall be available also for public inspection in the headquarters office of the superintendent of the said Lake Mead National Recreation Area.

Boundaries.

Filing with  
Federal Register.

The Secretary of the Interior is authorized to revise the boundaries of such national recreation area, subject to the requirement that the total acreage of that area, as revised, shall be no greater than the present acreage thereof. In the event of such boundary revision, maps of the recreation area, as revised, shall be prepared by the Department of the Interior, and shall be filed in the same manner, and shall be available for public inspection also in accordance with the aforesaid procedures and requirements relating to the filing and availability of maps. The Secretary may accept donations of land and interests in land within the exterior boundaries of such area, or such property may be procured by the Secretary in such manner as he shall consider to be in the public interest.

Boundary revision.

Donations of  
land.

In exercising his authority to acquire property by exchange, the Secretary may accept title to any non-Federal property located within the boundaries of the recreation area and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary, notwithstanding any other provision of law. The properties so exchanged shall be approximately equal in fair market value: *Provided*, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize the values of the properties exchanged.

Property acquisition.

Establishment or revision of the boundaries of the said national recreation area, as herein prescribed, shall not affect adversely any valid rights in the area, nor shall it affect the validity of withdrawals heretofore made for reclamation or power purposes. All lands in the recreation area which have been withdrawn or acquired by the United States for reclamation purposes shall remain subject to the primary use thereof for reclamation and power purposes so long as they are withdrawn or needed for such purposes. There shall be excluded from the said national recreation area by the Secretary of the Interior any property for management or protection by the Bureau of Reclamation, which would be subject otherwise to inclusion in the said recreation area, and which the Secretary of the Interior considers in the national interest should be excluded therefrom.

Property exclusion.

SEC. 3. The authorities granted by this Act shall be subject to the following exceptions and qualifications when exercised with respect

Hualapai Indian  
lands.

78 STAT. 1040.

to any tribal or allotted lands of the Hualapai Indians that may be included within the exterior boundaries of the Lake Mead National Recreation Area:

(a) The inclusion of Indian lands within the exterior boundaries of the area shall not be effective until approved by the Hualapai Tribal Council.

(b) Mineral developments or use of the Indian lands shall be permitted only in accordance with the laws that relate to Indian lands.

(c) Leases and permits for general recreational use, business sites, home sites, vacation cabin sites, and grazing shall be executed in accordance with the laws relating to leases of Indian lands, provided that all development and improvement leases so granted shall conform to the development program and standards prescribed for the Lake Mead National Recreation Area.

(d) Nothing in this Act shall deprive the members of the Hualapai Tribe of hunting and fishing privileges presently exercised by them, nor diminish those rights and privileges of that part of the reservation which is included in the Lake Mead Recreation Area.

Recreational purposes.

SEC. 4. (a) Lake Mead National Recreation Area shall be administered by the Secretary of the Interior for general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop, and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistently with applicable reservations and limitations relating to such area and with other authorized uses of the lands and properties within such area.

Activities.

(b) In carrying out the functions prescribed by this Act, in addition to other related activities that may be permitted hereunder, the Secretary may provide for the following activities, subject to such limitations, conditions, or regulations as he may prescribe, and to such extent as will not be inconsistent with either the recreational use or the primary use of that portion of the area heretofore withdrawn for reclamation purposes:

(1) General recreation use, such as bathing, boating, camping, and picnicking;

(2) Grazing;

(3) Mineral leasing;

(4) Vacation cabin site use, in accordance with existing policies of the Department of the Interior relating to such use, or as such policies may be revised hereafter by the Secretary.

Hunting, fishing, trapping.

SEC. 5. The Secretary of the Interior shall permit hunting, fishing, and trapping on the lands and waters under his jurisdiction within the recreation area in accordance with the applicable laws and regulations of the United States and the respective States: *Provided*, That the Secretary, after consultation with the respective State fish and game commissions, may issue regulations designating zones where and establishing periods when no hunting, fishing, or trapping shall be permitted for reasons of public safety, administration, or public use and enjoyment.

Regulations.

SEC. 6. Such national recreation area shall continue to be administered in accordance with regulations heretofore issued by the Secretary of the Interior relating to such areas, and the Secretary may revise such regulations or issue new regulations to carry out the purposes of this Act. In his administration and regulation of the area, the Secretary shall exercise authority, subject to the provisions and limitations of this Act, comparable to his general administrative authority relating to areas of the national park system.

October 8, 1964

- 3 -

Pub. Law 88-639

78 STAT. 1041.

The superintendent, caretakers, officers, or rangers of such recreation area are authorized to make arrests for violation of any of the regulations applicable to the area or prescribed pursuant to this Act, and they may bring the offender before the nearest commissioner, judge, or court of the United States having jurisdiction in the premises.

Arrests.

Any person who violates a rule or regulation issued pursuant to this Act shall be guilty of a misdemeanor, and may be punished by a fine of not more than \$500, or by imprisonment not exceeding six months, or by both such fine and imprisonment.

Violations.

Sec. 7. Nothing in this Act shall deprive any State, or any political subdivision thereof, of its civil and criminal jurisdiction over the lands within the said national recreation area, or of its rights to tax persons, corporations, franchises, or property on the lands included in such area. Nothing in this Act shall modify or otherwise affect the existing jurisdiction of the Hualapai Tribe or alter the status of individual Hualapai Indians within that part of the Hualapai Indian Reservation included in said Lake Mead National Recreation Area.

Jurisdiction.

Sec. 8. Revenues and fees obtained by the United States from operation of the national recreation area shall be subject to the same statutory provisions concerning the disposition thereof as are similar revenues collected in areas of the national park system with the exception, that those particular revenues and fees including those from mineral developments, which the Secretary of the Interior finds are reasonably attributable to Indian lands shall be paid to the Indian owner of the land, and with the further exception that other fees and revenues obtained from mineral development and from activities under other public land laws within the recreation area shall be disposed of in accordance with the provisions of the applicable laws.

Revenues and fees.

Sec. 9. A United States commissioner shall be appointed for that portion of the Lake Mead National Recreation Area that is situated in Mohave County, Arizona. Such commissioner shall be appointed by the United States district court having jurisdiction thereover, and the commissioner shall serve as directed by such court, as well as pursuant to, and within the limits of, the authority of said court.

Mohave County, Ariz. Appointment of commissioner.

The functions of such commissioner shall include the trial and sentencing of persons committing petty offenses, as defined in title 18, section 1, United States Code: *Provided*, That any person charged with a petty offense may elect to be tried in the district court of the United States, and the commissioner shall apprise the defendant of his right to make such election, but shall not proceed to try the case unless the defendant, after being so apprised, signs a written consent to be tried before the commissioner. The exercise of additional functions by the commissioner shall be consistent with and be carried out in accordance with the authority, laws, and regulations, of general application to United States commissioners. The provisions of title 18, section 3402, of the United States Code, and the rules of procedure and practice prescribed by the Supreme Court pursuant thereto, shall apply to all cases handled by such commissioner. The probation laws shall be

62 Stat. 831.

Probation laws.

Pub. Law 88-639

- 4 -

October 8, 1964

78 STAT. 1041.

applicable to persons tried by the commissioner and he shall have power to grant probation. The commissioner shall receive the fees, and none other, provided by law for like or similar services.

Appropriation.

SEC. 10. There are hereby authorized to be appropriated not more than \$1,200,000 for the acquisition of land and interests in land pursuant to section 2 of this Act.

Approved October 8, 1964.

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LEGISLATIVE HISTORY:

HOUSE REPORT No. 1039 accompanying H. R. 4010 (Comm. on Interior & Insular Affairs).

SENATE REPORT No. 380 (Comm. on Interior & Insular Affairs).

CONGRESSIONAL RECORD:

Vol. 109 (1963): Aug. 2, considered and passed Senate.

Vol. 110 (1964): Aug. 3, considered and passed House, amended, in lieu of H. R. 4010.

Sept. 28, Senate concurred in House amendment.

## APPENDIX B: SUMMARY OF CONSERVATION MEASURES AND TERMS AND CONDITIONS FOR FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife Service (USFWS) issued a programmatic biological opinion, dated October 7, 2002 (USFWS 2002a), concerning the potential effects of the *2003 Lake Mead National Recreation Area Lake Management Plan / Final Environmental Impact Statement for the Lake Mead National Recreation Area* to the desert tortoise and its critical habitat, the Southwestern willow flycatcher, the bonytail chub and its critical habitat, and the razorback sucker and its critical habitat. The conservation measures included in the 2005 biological opinion for the Southwestern willow flycatcher, bonytail chub, and razorback sucker applicable to Lake Mohave are included in the following information. Those portions of the 2002 biological opinion (USFWS 2005) for the desert tortoise and its critical habitat were superseded by the programmatic biological opinion dated February 3, 2010 (USFWS 2010). The general terms and conditions that are included in the 2010 programmatic biological opinion are summarized below.

A biological and conference opinion for the Lower Colorado River Multi-Species Conservation Program was issued in 2005. NPS actions covered under the biological and conference opinion include riparian habitat restoration, fishery management, and boating access. The specific NPS actions included that are relevant to the *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement* are the construction of new fishing docks and possibly associated fish-habitat structures and the maintenance and improvements of existing boats ramps. The general and specific conservation measures to avoid and minimize the effects of implementing the covered activities would be carried out.

Additional project-specific measures and terms and conditions may be identified based on the specifics of any individual project and will be determined during project-level consultation with the U.S. Fish and Wildlife Service. The National Park Service would submit the appropriate project-specific documentation that addresses the

effects of individual projects and request the proposed project be appended to the appropriate programmatic biological opinion to fulfill NPS consultation requirements.

The following measures, terms, and conditions would be implemented as applicable to any individual action included in the development concept plans.

### RAZORBACK SUCKER AND BONYTAIL CHUB

- Surveys at the nine coves known to have spawning razorbacks at Lake Mohave and the two areas known at Lake Mead will continue. Surveys in Lake Mohave for bonytail chub will continue. The National Park Service cooperates in these surveys, but is not the prime funding source for the work.
- Boat use of coves identified as native fish spawning areas during the spawning period will be monitored. If boat use increases dramatically or if the Native Fish Work Group recommends action, closures of the coves to boat use during the spawning period will be implemented. Areas adjacent to razorback sucker grow-out ponds on Lake Mohave will also be monitored. If vandalism to the ponds is documented, closures will be implemented.
- Information about native fish in the lakes will be provided at marinas and with houseboat and other boat rentals. Information will encourage boaters not to use the spawning areas during the spawning season.
- For the expansion of Cottonwood Cove Marina on Lake Mohave, razorback sucker surveys will begin this winter to assess any use of the expansion area. The site will also be added to the annual surveys during the breeding season.
- All marinas will operate under the *Lake Mead National Recreation Area Best Management Practices, Watercraft and Marina Operations*

*and Dry Boat Storage and Boat Repair Services* or subsequent revised versions of the document. This document provides for management that reduces the risk of toxic spills into the lakes by fueling or other marina operations.

## **SOUTHWESTERN WILLOW FLYCATCHER**

- Surveys in known occupied habitats of the flycatcher by the National Park Service, Bureau of Reclamation, and contractors will continue. Surveys of potential habitats will be initiated by the National Park Service.
- If breeding pairs are found, closures to restrict land and lake access by recreationists to the sites will be put in place.

## **DESERT TORTOISE**

- An authorized desert tortoise biologist will be on-site at all times for the duration of the project.
- Tortoise-proof fencing will be installed around the perimeter of the work area. Once exclusion fencing is installed, an authorized biologist (Authorized Biologist) would survey the area to ensure that no desert tortoises or active burrows are present within the fenced area.
- A desert tortoise education program will be presented to all personnel on-site during construction.
- All areas to be disturbed will have boundaries flagged before beginning the activity, and all disturbance and project activities would be confined to the flagged areas.
- Before surface-disturbing activities, an authorized desert tortoise biologist will conduct a clearance survey to locate and remove tortoises using techniques providing full coverage of all areas.
- All burrows located within areas proposed for disturbance, whether occupied or vacant, will be excavated by an authorized biologist and collapsed or blocked to prevent desert tortoise re-entry.

- All located desert tortoises and desert tortoise eggs will be relocated off-site to 300 to 1,000 ft into adjacent undisturbed habitat.
- The on-site biologist will record each observed or handled desert tortoise.
- Project activities that may endanger a desert tortoise will cease if a tortoise is found on a project site.
- All trenches and other excavations with side slopes steeper than a 1-ft rise to 3-ft length will be immediately backfilled, fenced, covered or constructed with escape ramps at each end of the trench and every 1,000 ft in between (at a minimum). If a desert tortoise is discovered within a trench, all activity associated with that trench will cease until an authorized biologist has removed the tortoise.
- Trash and food items would be disposed of properly in predator-proof containers with resealing lids.
- No imported topsoil (desert soil) or hay bales would be used during the projects, in an effort to avoid introduction of nonnative plant species or inappropriate genetic stock of native plant species. The contractor will be required to pressure-wash all equipment before being allowed into Lake Mead National Recreation Area. Reclaimed areas will be monitored to ensure establishment and spread of only native species. In areas of temporary disturbance, revegetation may be required at the discretion of NPS resource managers, and would consist solely of native plants and/or seeds.
- If blasting is required, a 200-ft-radius area around the blasting site will be surveyed by an authorized biologist for desert tortoises prior to blasting and appropriate measures implemented to protect tortoises.
- Vehicles will not exceed 20 miles-per-hour (mph) on access roads. Authorized desert tortoise biologists and/or approved monitors will ensure compliance with speed limits during construction.
- Any vehicle or equipment on the right-of-way within desert tortoise habitat will be checked

underneath for tortoises before moving. If a desert tortoise is observed, an authorized biologist will be contacted.

- All fuel, transmission or brake fluid leaks, or other hazardous materials, will not be drained onto the ground or into drainage areas. Waste leaks, spills, or releases will be reported immediately to National Park Service. The National Park Service or the project proponent will be responsible for spill material removal and disposal to an approved off-site landfill. Servicing of construction equipment will take place only at a designated area.
- No pets will be permitted in any project construction area.
- Any construction pipe, culvert, or similar structure will be inspected for tortoises before the material is moved, buried, or capped.
- Only water or an alternative substance approved by the National Park Service will be used as a dust suppressant. Water application shall avoid pooling of water on roadways.
- Any areas of water discharge will be designed to exclude potential predatory species of desert tortoises.
- Payment of remuneration fees for compensation of the loss of desert tortoise habitat as a result of the proposed project will be made. The National Park Service will require a receipt of payment from each designated utility prior to issuing the Notice to Proceed.
- Desert tortoises shall be handled in accordance with National Park Service-approved protocols.

**APPENDIX C: FLOODPLAIN STATEMENT OF FINDINGS**  
**COTTONWOOD COVE AND KATHERINE LANDING DEVELOPMENT**  
**CONCEPT PLANS / ENVIRONMENTAL IMPACT STATEMENT**  
**LAKE MEAD NATIONAL RECREATION AREA**

Recommended: \_\_\_\_\_ Date  
William Dickinson, Superintendent  
Lake Mead National Recreation Area

Concurred: \_\_\_\_\_ Date  
William Jackson, Chief  
Water Resources Division

Approved: \_\_\_\_\_ Date  
Christine Lehnertz, Regional Director  
Pacific West Region

## INTRODUCTION

In May 1977, Executive Order (EO) 11988, “Floodplain Management,” required the National Park Service (NPS) and other federal agencies to evaluate the likely impacts of actions in floodplains. The objectives of the executive order are to avoid to the extent possible the long-term and short-term adverse impacts associated with occupancy, modification, or destruction of floodplains and to avoid indirect support of development and new construction in such areas wherever there is a practicable alternative. NPS Director’s Order 77-2, Floodplain Management Procedural Manual provides NPS policies and procedures for complying with EO 11988. The purpose of this Floodplain Statement of Findings (SOF) for Executive Order 11988 is to present the rationale for the location of development at Cottonwood Cove and Katherine Landing in the floodplains, describe the amount of risk associated with the sites, and describe associated flood mitigation actions.

## PROPOSED ACTION

The preferred alternatives in the development concept plans (DCPs) for Cottonwood Cove and Katherine Landing would retain and improve both developed areas consistent with the management direction established in the 1986 *Lake Mead National Recreation Area General Management Plan / Environmental Impact Statement* and the 2003 *Lake Mead National Recreation Area Lake Management Plan*. A number of facilities including overnight accommodations /residences are proposed to remain or be replaced within the probable maximum floodplains (pmf). Some of these structures at Cottonwood Cove are contributing elements to a Mission 66 historic district determined to be eligible in the National Register of Historic Places in 2006.

The following actions would occur within the probable maximum floodplains at Cottonwood Cove:

- redevelop the trailer village site for short-term overnight visitor accommodations
- retain and allow expansion of the motel

- retain a portion of the upper campground for visitors and redevelop remainder of the campground for volunteer sites and employee housing
- convert lower campground to summer day use and continue operation as a campground during the winter season
- enhance existing picnic area
- construct combined visitor contact / commercial services facility on the site of the existing store/café
- increase parking capacity per the lake management plan and construct new loop road and ready lane
- maintain launch ramp
- retain NPS housing, maintenance, and emergency service facilities
- expand existing concession maintenance area

The following actions would occur at Katherine Landing within the probable maximum floodplains:

- remove the motel and redevelop area for visitor parking
- retain visitor parking east of the motel
- maintain launch ramp
- convert portion of trailer village to short-term campground
- retain NPS maintenance area and consolidate NPS offices and operations
- retain dry boat storage
- maintain day-use areas at North and South Arizona Telephone Cove

## SITE AND FLOOD HAZARD DESCRIPTION

Cottonwood Cove and Katherine Landing are two of the major developed areas on Lake Mohave.

The majority of development is located near the shoreline of the lake within Cottonwood Wash and North and South Katherine Washes, but for Katherine Landing the *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement* includes shoreline day-use areas in South and North Arizona Telephone Cove washes. The development sites in the wash bottoms are encompassed by the intervening ridges between the drainages. Consequently, there is limited, nonflood prone, developable land that provides access to the lake. As a result, almost all facilities at Cottonwood Cove and many of those at Katherine Landing are within the probable maximum floodplain.

Both developed areas accommodate a wide variety of recreational activities and provide public launch facilities and commercial marina services, as well as other public use and support facilities. As such, the natural floodplain values have been largely altered by existing development and use.

Desert washes drain from the surrounding mountain ranges across broad bajadas at their base and down into the lake. The washes are subject to flash flooding caused by intense thunderstorms over their drainages. The following washes/basins were identified for the purposes of calculating flood flows at both developed areas. Estimated flood depths at Cottonwood Cove are approximately 6 to 7 feet (ft) during the probable maximum floodplains and 3 to 6 ft during the 100-year flood. At Katherine Landing, estimated flood depths are approximately 3 to 8 ft during the probable maximum floodplains and 1 to 6 ft during the 100-year flood. The warning time, or time from the onset of rainfall until the maximum flood flows reach various facilities, varies between approximately 42 minutes for Ranger Wash to 8 minutes for the Dry Boat Storage basin at Cottonwood Cove. At Katherine Landing, warning times vary between approximately 7 minutes at the Dry Boat Storage Wash to 33 minutes at the motel in South Katherine Wash. Warning times for South and North Arizona

Telephone Coves are approximately 51 and 79 minutes. See tables C-1 and C-2 for summaries of peak runoffs at Cottonwood Cove and Katherine Landing.

Existing flood protection consists of earthen dikes and channels that provide various levels of flood protection, ranging from approximately 10- to 100-year flows but that do not convey the pmf flows. At Cottonwood Cove, rain gauges located upstream of the developed area are used to monitor rainfall in real-time. An automated system consisting of flash flood hazard monitoring and warning equipment is in place to notify the public in the developed area of flood danger. All hydrologic data and siren activation/deactivation capability is also available at the emergency dispatch center in Boulder City, Nevada.

**TABLE C-1. SUMMARY OF PEAK RUNOFF – COTTONWOOD COVE**

Wash/Channel	100-year Peak (cfsa)	pmf Peak (cfs)
Ranger Residence	1,900	8,400
Upper Access Road	600	2,500
Dry Boat Storage	150	600
Lower Access Road	2,200	11,000
Lower Boat Storage	125	500
Upper Campground	400	1,800

cfs = cubic feet per second.

**TABLE C-2. SUMMARY OF PEAK RUNOFF – KATHERINE LANDING**

Wash/Channel	100-year Peak (cfs)	pmf Peak (cfs)
North Katherine Wash	230	1,500
South Katherine Wash	950	6,500
Dry Boat Storage Wash	350	1,730
South Arizona Telephone Cove Wash	1,400	8,150
North Arizona Telephone Cove Wash	4,500	25,500

## JUSTIFICATION FOR THE USE OF FLOODPLAIN

Cottonwood Cove and Katherine Landing were developed where drainages enter the Colorado River/lower Lake Mohave in order to provide recreation-related facilities. These developed areas were historically the only accessible point to lower Lake Mohave above Davis Dam. As such, they were logical locations to provide recreation-related facilities. Facilities were developed over time that included overnight and day-use facilities, as well as boat launches and marinas. Both Cottonwood Cove and Katherine Landing were established prior to the 1964 enabling legislation formally establishing Lake Mead National Recreation Area and well before issuance of EO 11988 providing guidance for federal actions in floodplain locations.

Facilities have to be located in the floodplains and retain public access, services, and support facilities. There are no adequate developable flood-free areas near the lakeshore because of the nature of the terrain that is comprised of washes and intervening ridges. The preferred alternative for the Cottonwood Cove and Katherine Landing development concept plans includes actions necessary for the preservation of public access to Lake Mohave, improvements to visitor use and experience, and to protect historic resources. Therefore, although the facilities must be located within the floodplains, the protection of people and property is a major objective for the plans.

## FLOOD MITIGATION MEASURES

The preferred alternative for each developed area would minimize potential hazards to human life and property within the probable maximum floodplains through a combination of structural and nonstructural measures. An improved system of diversion dikes and channels would be constructed to convey 500-year flows through the developed areas in Cottonwood Wash and North and South Katherine Washes (see figures 5, 8, and 11 at the end of chapter 2). Flood warning signs would be posted at North and South Telephone Coves. An early warning detection system similar to the one at Cottonwood Cove would be installed at Katherine Landing to augment the structural flood protection system. Flood evacuation

planning would be developed that would direct emergency actions and evacuations in the event of flooding.

Beginning in the early 1980s, a series of flood studies at both developed areas were prepared. In 2004, studies were completed to review and update the past flood mitigation recommendations (HDR 2004a, 2004b). Conceptual designs of the proposed structural flood protection were refined based on field observations, aerial survey data, and engineering judgment. Previous hydrologic calculations were used for flow estimates (NPS 1982). Hydraulic design criteria were also identified to provide the engineering background supporting the structural flood control components. Further updating of the hydrologic and hydraulic analysis and refinement of the design would occur as part of the future stages of the project design process.

The proposed structural flood protection would include the following elements.

### Cottonwood Cove

- Diversion dike needed upstream of the developed area to intercept and redirect a majority of flood flows into parallel wash north of developed area
- Maintenance and reinforcement of the existing diversion dikes
- 9,300 linear feet (lf) of concrete channels (up to 52 ft top width)
- Deflector wall and concrete swale outlet at lake
- Low-flow road crossings and road realignment

### Katherine Landing

- Rehabilitate existing diversion dike (upstream of the developed area) that directs flows from North Katherine Wash around the developed area into South Telephone Cove Wash
- Raise, extend, and rehabilitate existing diversion dike, directing flows into South Katherine Wash

- New concrete channel (up to 65 ft top width) along South Katherine Wash extends from borrow pit (proposed sediment basin) to beginning of launch ramp
- Low-flow road crossings

## **SUMMARY**

The National Park Service has determined that there is no practicable alternative to maintaining development at Cottonwood Cove and Katherine

Landing within the floodplains. This determination was based on the decision to continue to maintain both developed areas as primary visitor use sites on Lake Mohave that provide lake access and provision for overnight and day-use facilities. Although these facilities are within areas subject to flooding, the proposed flood mitigation measures would reduce the risk to life or property. Structural flood protection would be designed to convey floods up to the 500-year floodplain. Early warning/detection systems, flood warning signs, and evacuation plans would also be implemented.

## ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
AZGFD	Arizona Game and Fish Department
BMP	best management practices
CEQ	Council on Environmental Quality
DCPs	development concept plans
dps	double parking space
ESA	Endangered Species Act
EIS	environmental impact statement
GMP	general management plan
HABS / HAER / HALS	Historic American Building Survey / Historic American Engineering Record / Historic American Landscape Survey
LMP	lake management plan
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NPS	National Park Service
NRA	National Recreation Area
CFR	Code of Federal Regulations
PEPC	Planning, Environment, and Public Comment
PL	public law
pmf	probable maximum flood
sps	single parking space
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

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## PLANNING TEAM

### NATIONAL PARK SERVICE LAKE MEAD NATIONAL RECREATION AREA

#### Project Team

William Dickinson	<i>Superintendent</i>
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Jim Holland	<i>Park Planner</i>
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Jennifer Haley	<i>Chief of Visitor Services</i>
Bruce Nyhuis	<i>Assistant Chief of Maintenance – Special Projects</i>
Michael Boyles	<i>Environmental Compliance Branch Chief</i>
Steve Daron	<i>Park Archeologist</i>
Mary Hinson	<i>Chief Park Ranger</i>
Dirk Murphy	<i>District Ranger</i>

#### Other Staff

Dan Rose	<i>Maintenance Leader</i>
Jesse Hinojosa	<i>Deputy Director of Maintenance</i>
David Hughey	<i>Maintenance Worker</i>
Greg Oakleaf	<i>Park Ranger – Interpretation</i>
Linda Escalera	<i>Maintenance Worker</i>
Robin White	<i>Park Ranger – Interpretation</i>
Leisa Cook	<i>Concession Specialist</i>

#### DENVER SERVICE CENTER

Michele D’Arcy	<i>(former) Project Manager</i>
Nancy Doucette	<i>Visitor Use Management Specialist</i>
Jim Corbett	<i>Visual Information Specialist</i>
Tom Gibney	<i>Landscape Architect</i>
Greg Jarvis	<i>Project Manager</i>
Leslie Peterson	<i>Cultural Resource Specialist</i>
Elaine Rideout	<i>Natural Resource Specialist</i>

## **PACIFIC WEST REGION**

### **Consultants**

Dornbush Associates  
RED, Inc. Communications

### **PUBLIC OFFICIALS, AGENCIES, AND ORGANIZATIONS RECEIVING A COPY OF THIS DOCUMENT**

The National Park Service is circulating the *Draft Cottonwood Cove and Katherine Landing Development Concept Plans / Environmental Impact Statement* to the agencies and organizations listed below. A limited number of copies of the plan are available upon request by interested individuals. Copies of the document are also available for review at the park and on the internet at <http://parkplanning.nps.gov/apis/>.

### **Federal Agencies**

Bureau of Indian Affairs, Western Regional Office  
Bureau of Indian Affairs, Eastern Nevada Agency  
Bureau of Land Management, Arizona State Office  
Bureau of Land Management, Arizona Strip Field Office  
Bureau of Land Management, Kingman Resource Center  
Bureau of Land Management, Lake Havasu Field Office  
Bureau of Land Management, Las Vegas District Office  
Bureau of Land Management, National Training Center  
Bureau of Land Management, Nevada State Office  
Bureau of Land Management, Phoenix Field Office  
Bureau of Land Management, Safford Field Office  
Bureau of Land Management, Tucson Field Office  
Bureau of Land Management, Yuma Field Office  
Bureau of Reclamation, Lower Colorado Dams Project Office  
Bureau of Reclamation, Lower Colorado Region  
Death Valley National Park  
Environmental Protection Agency, Las Vegas EMS Laboratory  
Environmental Protection Agency, Region IX  
Federal Highway Administration  
Grand Canyon National Park  
Grand Canyon - Parashant National Monument  
Natural Resources Conservation Service  
Toiyabe National Forest  
U.S. Army Corps of Engineers, Sacramento  
U.S. Army Corps of Engineers, St. George  
U.S. Army Corps of Engineers, Los Angeles District- Los Angeles Office  
U.S. Army Corps of Engineers, Los Angeles District- Phoenix Office  
U.S. Fish & Wildlife Service, Las Vegas  
U.S. Fish & Wildlife Service, Arizona Ecological Service  
U.S. Fish & Wildlife Service, Desert National Wildlife Range  
U.S. Fish & Wildlife Service, Fish & Wildlife Enhancement- Portland  
U.S. Fish & Wildlife Service, Fish & Wildlife Enhancement, Reno Field Station  
U.S. Fish & Wildlife Service, Flagstaff Ecological Services  
U.S. Geological Survey, Henderson

## **State Agencies**

Arizona Game & Fish Department, Kingman  
Arizona Game & Fish Department, Attn: Development Branch Chief  
Arizona Game & Fish Department, Boating Education Coordinator  
Arizona Game & Fish, Attn: Habitat Branch Chief  
Arizona Game & Fish Department, Region II- Flagstaff  
Colorado River Commission  
Nevada Division of Environmental Protection, Las Vegas  
Nevada Division of Environmental Protection, Mr. Glen Gentry  
Nevada Division of Environmental Protection, Ms. Icycl Mulligan  
Nevada State Historic Preservation Office  
Nevada State Museum and Historical Society  
State of Nevada, Department of Administration- State Clearinghouse  
State of Nevada, Department of Conservation & Natural Resources  
State of Nevada, Department of Transportation- Las Vegas  
State of Nevada, Department of Transportation- Carson City  
State of Nevada, Department of Wildlife  
State of Nevada, Division of Forestry  
State of Nevada, Division of Historic Preservation and Archaeology  
State of Nevada, Division of State Parks  
State of Nevada, Land Use Planning Advisory Committee  
State of Nevada Natural Heritage Program, Attn: Mr. Glenn H. Clemmer  
State of Utah, Department of Natural Resources  
Valley of Fire State Park

## **City and County Agencies**

Boulder City Chamber of Commerce  
City of Boulder City, City Council Offices  
City of Boulder City, Community Development & Planning  
City of Boulder City, Office of the City Manager  
City of Boulder City, Office of the Mayor  
City of Bullhead City, Office of the Mayor  
City of Henderson, City Manager's Office  
City of Henderson, Department of Public Works  
City of Henderson, Office of the Mayor  
City of Henderson, Parks and Recreation Department  
City of Henderson, Planning Department  
City of Kingman, Office of the Mayor  
City of Las Vegas, City Council Chambers  
City of Las Vegas, Community Planning & Development  
City of Las Vegas, Department of Public Works  
City of Las Vegas, Office of the Mayor  
City of Las Vegas, Parks & Leisure Activities  
City of North Las Vegas, City Council Offices  
City of North Las Vegas, City Manager's Office  
City of North Las Vegas, Community Planning & Zoning  
City of North Las Vegas, Office of Economic Development  
City of North Las Vegas, Office of the Mayor  
Clark County, Community & Economic Development  
Clark County Comprehensive Planning  
Clark County Conservation District  
Clark County, Office of the County Manager

Clark County Commissioners  
Clark County Museum  
Community Association of Meadview  
Las Vegas Chamber of Commerce  
Las Vegas Historic Preservation Office  
Meadview Civic Association  
Mesquite Chamber of Commerce  
Moapa Valley Chamber of Commerce  
Mohave County, Kingman  
Regional Transportation Commission  
Commission on Tourism- Southern Nevada

### **Lake Mead NRA Concessioners**

General Manager, Black Canyon/ Willow Beach River Adventures  
General Manager, Cottonwood Cove Resort  
General Manager, Temple Bar Marina  
Operations Manager, Lake Mead Ferry Service  
General Manager, Las Vegas Boat Harbor  
General Manager, Callville Bay Resort  
General Manager, Lake Mohave Resort  
General Manager, Echo Bay Resort  
General Manager, Lake Mead RV Village

### **Elected Officials**

Nevada Elected Officials  
Honorable Shelley Berkley, US Representative  
Honorable John Ensign, US Senator  
Honorable Dean Heller, US Representative  
Honorable Brian Sandoval, Governor of Nevada  
Honorable Joe Heck, US Representative  
Honorable Harry Reid, US Senator

### **Arizona Elected Officials**

Honorable Jeff Flake, US Representative  
Honorable Trent Franks, US Representative  
Honorable Raul Grijalva, US Representative  
Honorable David Schweikert, US Representative  
Honorable Ron Barber, US Representative  
Honorable Jon Kyl, US Senator  
Honorable John McCain, US Senator  
Honorable Jan Brewer, Governor- State of Arizona  
Honorable Ed Pastor, US Representative  
Honorable Paul Gosar, US Representative  
Honorable Ben Quayle, US Representative

### **Libraries and Newspapers**

Arizona Republic  
Boulder City Library  
Clark County Community College, North Las Vegas  
Clark County Library, Las Vegas  
Laughlin Library

Las Vegas Public Library  
Meadview Community Library  
Mesquite Library  
Moapa Valley Library, Overton  
Mohave County Library, Kingman  
Mohave County Library, Lake Havasu City  
Searchlight Library  
Sunrise Public Library, Las Vegas  
The Arizona Daily Sun  
University of Arizona Library, Tucson  
University of Nevada- Las Vegas  
Washington County Library, St. George  
James I. Gibson Library, Henderson  
Sahara West Library, Las Vegas  
Green Valley Library, Henderson

### **Non-Governmental Organizations**

Archeo-Nevada Society  
Arizona Preservation Foundation  
Arizona Wilderness Coalition  
Arizona Wildlife Federation  
Boulder City Museum and Historical Association  
Defenders of Wildlife  
Desert Bighorn Council  
Desert Research Institute  
Desert Tortoise Council  
East LV Citizen's Advisory Council  
Environmental Defense Fund  
Fraternity of the Desert Bighorn  
Friends of Classic Las Vegas  
Friends of Nevada Wilderness  
Grand Canyon Trust  
Las Vegas Jeep Club  
Maricopa Audubon Society  
Metropolitan Water District  
Nevada Archaeological Association  
Nevada Wildlife Federation  
Nevada Wilderness Project  
Northern Wild Sheep and Goat Council  
Partners In Conservation, Elise McAllister  
Partners in Parks  
Preservation Association of Clark County  
Preserve Nevada  
Red Rock Audubon Society  
Sierra Club- Las Vegas  
Sierra Club- Grand Canyon Chapter  
Sierra Club- Flagstaff  
Sierra Club- Southern Nevada Field Office  
Sierra Club- Toiyabe Chapter  
Southern Nevada Environmental Forum  
Southern Utah Wilderness Alliance  
The Nature Conservancy- Great Basin Field Office  
The Nature Conservancy- Southern Nevada Project

The Wilderness Society  
The Wilderness Society CA/NV  
Wilderness Watch  
Southern Nevada Water Authority, William Rinne  
Southern Nevada Water Authority, Marcus Jensen

**American Indian Tribes (Federally Recognized)**

Ak-Chin Indian Community of the Maricopa (Ak Chin) Indian Reservation  
Colorado River Indian Tribes of the Colorado River Indian Reservation  
Fort Mojave Indian Tribe  
Gila River Indian Community of the Gila River Indian Reservation  
Havasupai Tribe of the Havasupai Reservation  
Hopi Tribe of Arizona  
Hualapai Indian Tribe of the Hualapai Indian Tribe Reservation  
Kaibab Band of Paiute Indians of the Kaibab Indian Reservation  
Koosharem Band of Paiutes, Indian Peaks Band of Paiutes, and Shivwits Band of Paiutes  
Las Vegas Paiute Tribe of Paiute Indians of the Las Vegas Colony  
Moapa Band of Paiute Indians of the Moapa Indian Reservation  
Navajo Nation  
Paiute Indian Tribe of Utah (Cedar City Band of Paiutes, Kanosh Band of Paiutes)  
Quechan Tribe of the Fort Yuma Reservation  
Salt River Pima-Maricopa Indian Community of the Salt River Reservation  
Yavapai-Prescott Tribe of the Yavapai Reservation  
Zuni Tribe of the Zuni Reservation

**Non-Federally Recognized American Indian Tribe**

Pahrump Paiute Tribe

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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