

Lake Mead

National Recreation Area
National Park Service
U.S. Department of the Interior



WIRELESS TELECOMMUNICATION FACILITY PLAN and ENVIRONMENTAL ASSESSMENT



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SECTION I: PURPOSE OF AND NEED FOR THE PLAN

INTRODUCTION

This section describes why the National Park Service (NPS) has prepared this *Wireless Telecommunication Facility Plan and Environmental Assessment* for Lake Mead National Recreation Area and the plan's intent. It includes project setting, background and scope of the plan, planning direction and guidance, and identifies the issues and impact topics that were considered or dismissed. The environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council of Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1508.9) and NPS DO-12, *Conservation Planning, Environmental Impact Analysis and Decision Making*.

PROJECT AREA LOCATION

Lake Mead NRA is located in southeastern Nevada and northwestern Arizona (Figure 1). The park is approximately 1.5 million acres in size and includes both Lake Mead, formed by Hoover Dam, and Lake Mohave, formed by Davis Dam. This scope of this plan is park-wide and includes actions proposed in the park's developed areas of Katherine's Landing, Cottonwood Cove, and Willow Beach on Lake Mohave; and Boulder Beach, Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead (Figure 2).

PROJECT SETTING, BACKGROUND, AND SCOPE OF THE PLAN

Lake Mead NRA is approximately 1.5 million acres in size, with 87% of the area being land resources and the other 13% being water. The park receives roughly 8 million visitors annually. Much of the topography is quite rugged, and many areas are considered remote by any standard. The ability to provide park-wide cellular phone coverage, therefore, is not feasible. Since the greatest amount of visitor use is for water-based recreation, visitors, as well as employees and concessioners, tend to congregate in the developed areas. With this in mind, the greatest result for the effort is achieved by providing service in the developed areas, and this is the logic that has been used in developing the plan and formulating alternatives.

The *Clark County Conservation of Public Land and Natural Resources Act of 2002* designated wilderness areas in southern Nevada. Lake Mead NRA contains over 180,000 acres of designated wilderness and approximately 300,000 acres of proposed, potential, or recommended wilderness (Figure 3). All designated, proposed, potential, and recommended wilderness areas are managed to preserve the wilderness values. The *Wilderness Act of 1964* prohibits certain uses within wilderness areas, including structures and installations. Consistent with the *Wilderness Act of 1964*, NPS *Management Policies 2006*, and Lake Mead NRA resource management goals and objectives, this plan would not authorize placement of wireless telecommunication

facilities (WTFs) within any designated, proposed, potential, or recommended wilderness areas.

There are currently three existing permanent WTFs within the park, which are located at Overton Beach, Callville Bay, and an area in the River Mountains near Boulder Beach. In 1993, a 125 ft. WTF was constructed at Overton Beach and a 180 ft. WTF was constructed at the River Mountains site to improve communications in those areas. In 1994, a 45 ft. tower was constructed at Callville Bay to provide cellular service to the area. Mandatory upgrades required by the Federal Communications Commission (FCC) were completed in 2002 and resulted in the extension of the tower to its current height of 60 feet. In addition to these three permanent facilities, a mobile cellular tower was placed at the Callville Bay site in 2004. These facilities were allowed to be constructed in heavily developed areas in locations that minimize visual and other impacts.

Wireless coverage in other areas of the park is either minimal (if there are signals from nearby facilities outside the park boundary) or non-existent. The amount of coverage a single WTF can provide is determined by a number of factors, including tower height and the area's topography, but it is typically no more than a 10-mile radius under the best of circumstances. Thus, any plan of this nature must recognize the clear relationship between desired coverage levels and the number of structures needed or authorized.

Use of the developed areas for WTFs helps the park minimize the disturbance associated with the installation of new structures. All potentially acceptable sites would be in areas that are previously disturbed and have existing road access. In addition, utilities are already present, and connectivity to the WTF sites can be provided with relatively small effort.

The other major planning issue is the visual intrusion created by WTF sites. The *Lake Mead NRA General Management Plan (GMP)* identified outstanding view corridors within Lake Mead NRA that provide spectacular views of significant natural features. Consistent with the *GMP*, this plan would not place any WTFs within any outstanding view corridor. Wireless technology relies on line-of-sight for signal transmission. Therefore, WTFs must be taller than a site-specific minimum height to provide adequate service. By locating WTFs in developed areas, they would be in the vicinity of other man-made structures such as telephone poles and transmission lines, although none of these other structures achieve heights comparable to WTFs. Similar to tower number, tower height is another factor that determines the level of service that can be provided, and it is this factor on which the alternatives have been formulated.

PURPOSE AND NEED

The primary purpose of this plan is to enhance communications within high-use areas of the park and to improve emergency response, visitor satisfaction, and employees' and residents' contact with outlying areas. This plan intends to serve the interests of the public, concessioners, and NPS employees by accommodating applications to provide cellular service in developed areas within the park. Lake Mead NRA receives numerous

requests from Federal Communications Commission (FCC) licensees to construct cell towers within the park to enhance communication and to fulfill responsibilities associated with the FCC license. In addition, Lake Mead NRA receives letters and comments from the public requesting that cellular service be made available within the park for safety and enjoyment purposes.

The intent of this wireless telecommunication facility plan is to provide a proactive approach for determining potentially acceptable cellular sites within Lake Mead NRA that are consistent with the NPS Mission, Lake Mead NRA enabling legislation, existing park management documents, and future planning considerations. This plan would determine locations within the park where cellular service is desirable and appropriate, and ascertain the minimum tower height needed to provide the desired area coverage while minimizing impacts to park resources.

**Figure 1. Regional Map
Lake Mead National Recreation Area**

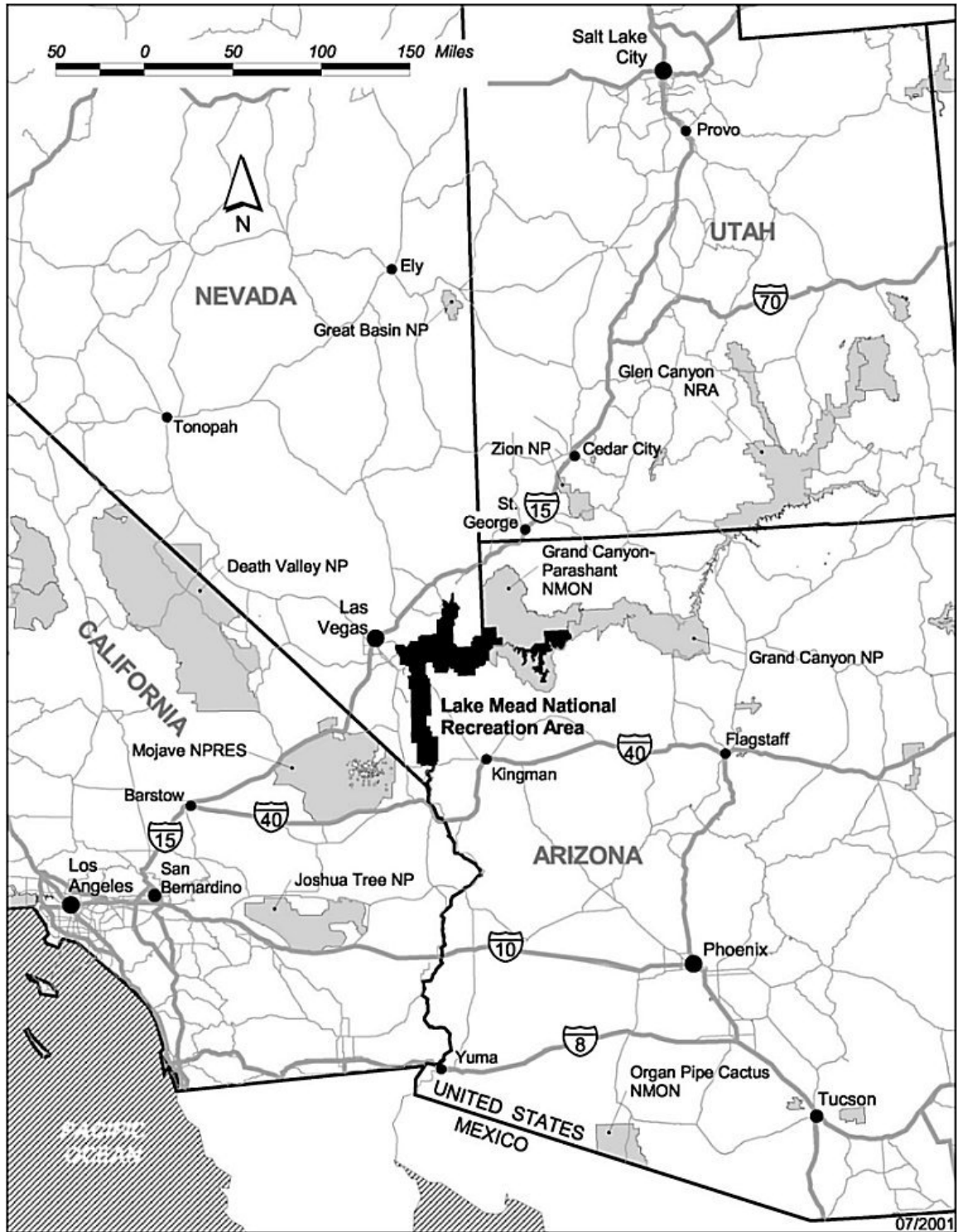
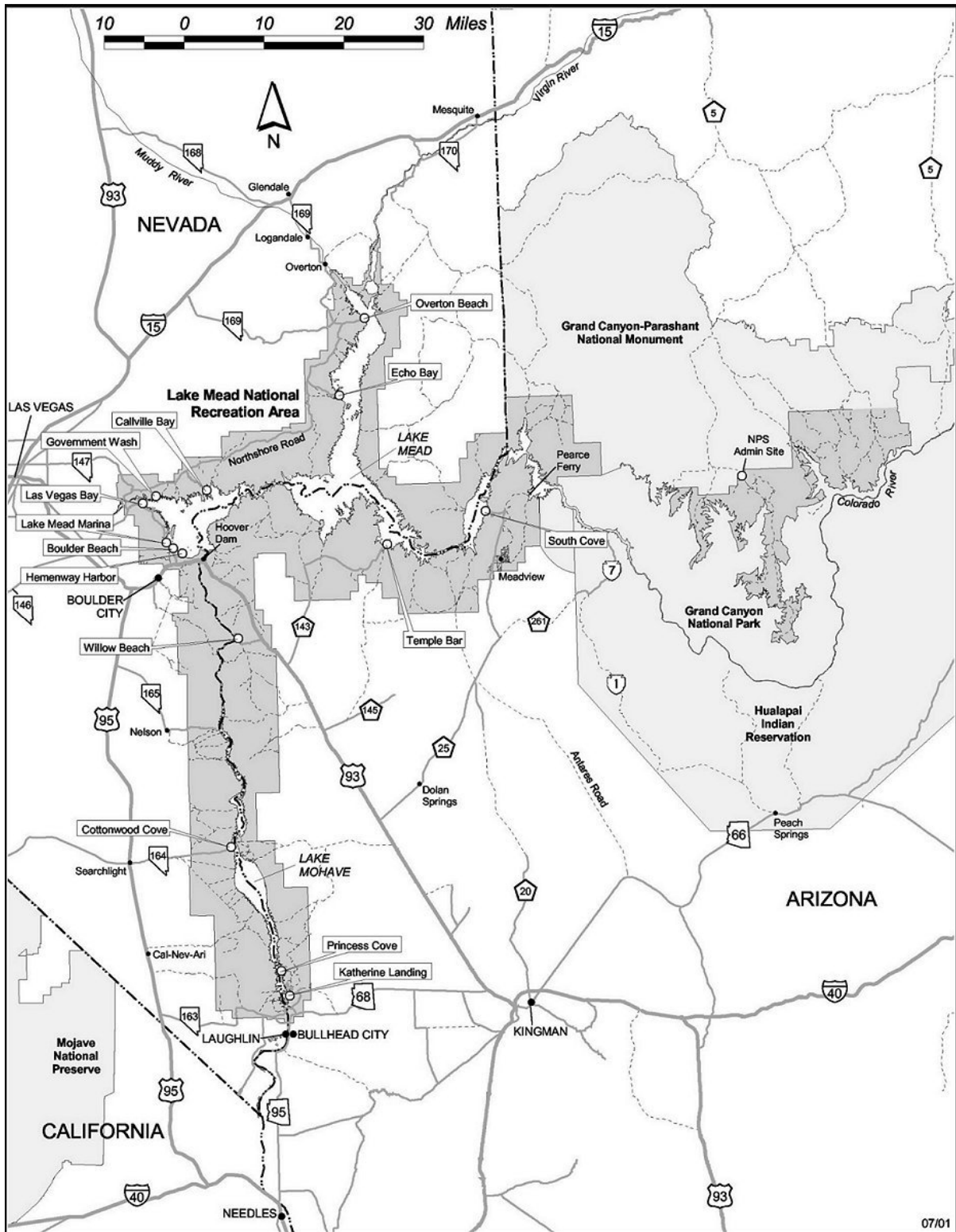
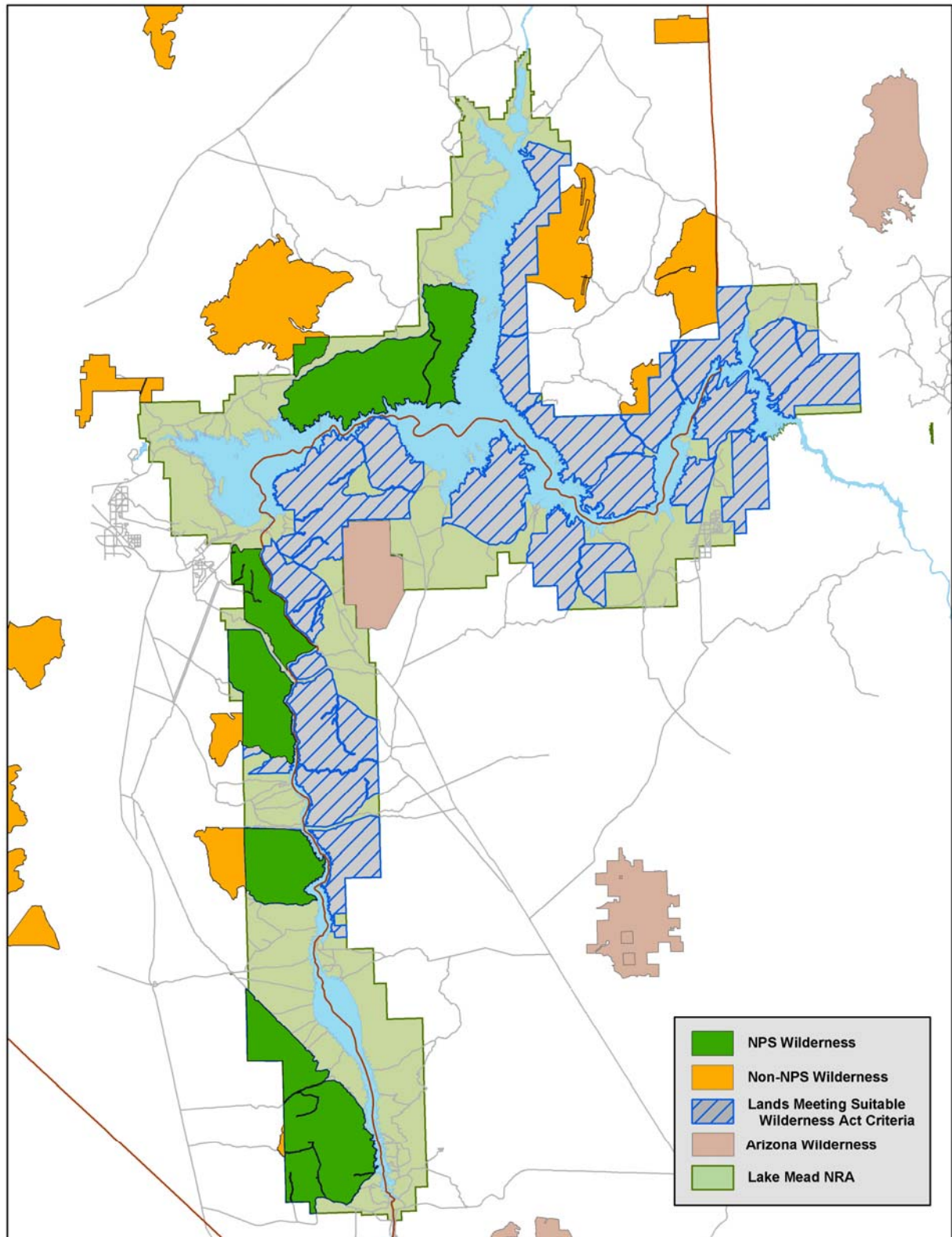


Figure 2. Area Map
Lake Mead National Recreation Area



**Figure 3. Wilderness Map
Lake Mead NRA**



PLANNING ISSUES AND IMPACT TOPICS

Issues are related to potential environmental effects of project alternatives and were identified by the project interdisciplinary team. Once issues were identified, they were used to help formulate the alternatives and mitigation measures. Impact topics based on substantive issues, environmental statutes, regulations, and executive orders (EOs) were selected for detailed analysis. A summary of the impact topics and rationale for their inclusion or dismissal is given below.

Issues and Impact Topics Identified for Further Analysis

The following relevant impact topics are analyzed in the EA and include issues related both to no action and to taking action.

Safety and Visitor Use and Experience: The availability of cell service could enhance safety by improving communication during emergency situations. Effects to visitor experience could be positive for those desiring this type of convenience, or negative for those who prefer a more primitive experience. Comments were received during the public scoping period that support this proposal to enhance safety capabilities, and visitor use and experience.

Visual Resources: WTFs require line-of-sight coverage so their functionality depends on towers that rise above natural landscape features. Since towers may be expected to be over 100 feet tall, impacts to scenic views are addressed.

Park Operations: The availability of cell service within the developed areas of Lake Mead NRA would facilitate park communications during emergencies or when land-based phone systems are not readily available. Comments were received during the public scoping period that support installation of WTFs to improve communications within the park and reduce government dispatch time.

Wildlife and Wildlife Habitat: New WTF sites, if constructed, would be located in marginal to low-quality habitat but could cause impacts to avian species.

Special Status Species: New WTF sites, if constructed, would be located in marginal to low-quality habitat, but the federally threatened desert tortoise is present in surrounding areas.

Soils and Vegetation: New WTF sites, if constructed, would be located in previously disturbed or developed areas in close proximity to existing roads and utilities, but would nevertheless result in some amount of permanent alteration of soils and vegetation.

Cultural Resources: New WTF sites, if constructed, would be located in developed or previously disturbed areas, but cultural resources may be present in surrounding areas.

Impact Topics Considered but Dismissed from Further Analysis

The following topics are not further addressed in this document because there are no potential effects to these resources, which are not in the project area or would be imperceptibly impacted: water resources; lightscapes; designated ecologically significant or critical areas; wild or scenic rivers; designated coastal zones; Indian Trust Resources; prime and unique agricultural lands; sites on the U.S. Department of the Interior's National Registry of Natural Landmarks; or sole or principal drinking water aquifers.

Although construction of WTFs and associated site preparation would temporarily increase dust and noise in localized areas, these effects are temporary and would disappear upon completion of the facilities. Dust abatement measures would be developed to minimize impacts to air quality during construction activities. Operational noise associated with WTFs would not appreciably increase the ambient noise of developed areas. Therefore, impacts to air quality and soundscapes are not further analyzed.

There would be no impacts to wilderness because all potentially acceptable cellular sites are located in developed areas, and no sites within or adjacent to wilderness would be considered, in accordance with the Wilderness Act of 1964.

In addition, there are no potential conflicts between the project and land use plans, policies, or controls (including state, local, or Native American) for the project area. The energy use associated with implementation of any of the alternatives is trivial relative to regional demands. There are no potential effects to local or regional employment, occupation, income changes, or tax base as a result of this project. The project area of effect is not populated and, per EO 12898 on Environmental Justice, there are no potential effects on minorities, Native Americans, women, or the civil liberties (associated with age, race, creed, color, national origin, or sex) of any American citizen. No disproportionate high or adverse effects to minority populations or low-income populations are expected to occur as a result of implementing any alternative.

RELATED LAWS, POLICIES, AND OTHER PLANNING AND MANAGEMENT DOCUMENTS

Related Laws and Policies

The NPS 1916 Organic Act directs the NPS to manage units “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 a manner as will leave them unimpaired for the enjoyment of future generations” (16 U.S.C. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “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” (16 U.S.C. § 1 a-1). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts. An action constitutes an impairment when its impacts “harm the integrity of park

resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources and values” (NPS *Management Policies* 2006 1.4.3).

NPS units vary based on their enabling legislation, natural and cultural resources, missions, and the recreational opportunities appropriate for each unit, or for areas within each unit. The 1964 enabling legislation for Lake Mead NRA (PL 88-639), established the recreation area “for the 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, consistent with applicable reservations and limitations relating to such area and with other authorized uses of the lands and properties within such area.” An action appropriate at Lake Mead NRA, as designated by the enabling legislation, may impair resources in another unit. This environmental assessment analyzes the context, duration, and intensity of impacts related to wireless telecommunication facilities, as well as the potential for resource impairment, as required by Director’s Order 12, *Conservation Planning, Environmental Impact Analysis and Decision Making*.

An August 10, 1995, Executive Memorandum from the President, directed the heads of all departments and agencies to facilitate access to Federal property for the purpose of siting mobile service antennas. On February 8, 1996, the President signed the Telecommunications Act of 1996 (47 U.S.C. 332). Section 704(c) of the Act required the Administration to develop procedures by which Federal departments and agencies may make available Federal properties, rights-of-way, and easements for wireless telecommunication services.

On March 14, 2007, the General Services Administration (GSA) issued a notice in the Federal Register of general procedures for implementing Section 704(c) of the Act. These general procedures, together with the Executive Memorandum, are applicable to all Executive Branch departments and agencies. Through their actions, Congress and the President have established a compelling Federal interest in promoting the efficient implementation of telecommunications technology.

The *Wilderness Act of 1964* established a National Wilderness Preservation System and set aside wilderness areas for “the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness.” Wilderness areas are to be protected and managed for the wilderness characteristics of undeveloped, untrammeled, natural, and outstanding opportunities for solitude or a primitive and unconfined type of recreation. The *Wilderness Act of 1964* also prohibits certain uses in wilderness including structures and installations. This plan is consistent with the *Wilderness Act of 1964* and Director’s Order #41: *Wilderness Preservation and Management*.

NPS Policies and Procedures

NPS *Management Policies* 2006 requires the analysis of potential effects of each alternative to determine if actions would impair park resources. To determine

impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS *Management Policies* 2006 1.4.4). The NPS must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment to the affected resources and values (NPS *Management Policies* 2006 1.4.3).

Director’s Order 53 (along with its implementing guidance in NPS Reference Manual 53, *Special Park Uses*) addresses procedures for permitting wireless telecommunication facilities in units of the National Park System. Such facilities are authorized with a right-of way permit and are subject to all terms and conditions associated with issuing rights-of-way in NPS units, including requirements of the National Environmental Policy Act.

Lake Mead NRA Planning and Management Documents

The 1986 *GMP* provided the overall management direction for Lake Mead NRA. 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. Although much of the 1986 plan is still applicable, the plan did not foresee the popularity of wireless telecommunication technology and did not account for it in the plan.

The 2003 *Lake Management Plan (LMP)* tiers from the 1986 *GMP* and provides additional and more specific guidance for the long-term management of Lakes Mead and Mohave, the associated shoreline, and the developed areas within the park to ensure the protection of park resources while allowing a range of recreational opportunities. This plan is consistent with the goals and objectives identified in the *LMP*.

The 2005 *General Management Plan Amendment (GMPA)* addressed low-water conditions and identified alternative locations for lake access facilities in accordance with the carrying capacities and water management zones set forth in the *LMP*.

SECTION II: DESCRIPTION OF ALTERNATIVES

INTRODUCTION

This chapter presents the range of alternatives considered to accomplish the objectives and goals of this plan. The no-action alternative and two action alternatives are presented. It is important to examine the no-action alternative, as it represents the existing conditions of the project area and provides a baseline on which to compare and contrast the action alternatives. The alternatives described include mitigation measures and monitoring activities proposed to minimize or avoid environmental impacts. This chapter also includes a discussion of alternatives that have been ruled out and justifications for their elimination. The section concludes with a comparison of the alternatives considered.

ALTERNATIVE A – NO ACTION

Under this alternative, the park would not authorize any new WTFs within the park boundary. The existing sites at Boulder Beach, Overton Beach, and Callville Bay would remain in operation as long as carriers continue to be interested in operating from those locations (Table 1, and Figures 3-5). Co-location by multiple carriers on the existing towers would be encouraged and approved until the towers were at full capacity. At that point, no additional service would be available from these sites. Carriers wishing to install new facilities would be advised to seek options outside the park. Due to the large size of the park, its rugged topography, and the distance from the park's developed areas to cities and towns, the park would receive little additional coverage from facilities located outside the park boundary. Under this alternative, there would be no cellular coverage in areas not currently receiving it.

TABLE 1. EXISTING CELL TOWER LOCATIONS

DEVELOPED AREA	SITE DESCRIPTION
River Mountains	The existing WTF site is located in the River Mountains within the Boulder Beach area. In 1993, a 180 ft. tower (195 ft. with antennas) was constructed and currently accommodates four carriers. Access to the site is from an existing gravel road near the Alfred Merritt Smith Water Treatment Facility.
Overton Beach	The existing WTF site is located on a ridge near the water tank at Overton Beach. The 125 ft. tower was constructed in 1993 and currently accommodates three carriers.
Callville Bay	The existing site is located on a ridge near the water tanks and NPS maintenance area and can be accessed from a paved NPS service road. This site currently consists of a 60-foot tower and a temporary mobile unit, and two carriers provide service.



Figure 4. River Mountains WTF Site



Figure 5. Overton Beach WTF Site



Figure 6. Callville Bay WTF Site

ELEMENTS COMMON TO ALTERNATIVES B AND C

Site Development

A number of factors were considered in determining potentially acceptable WTF sites within Lake Mead NRA that would have the least impact on natural, cultural, and historic resources. Potentially acceptable sites must be within a developed area, located on previously disturbed ground, in close proximity to an existing access road and utilities, and consistent with the 1986 *GMP* and other planning considerations. The NPS would consider proposals for new WTF construction at Boulder Beach, Echo Bay, and Temple Bar on Lake Mead; and Willow Beach, Cottonwood Cove, and Katherine's Landing on Lake Mohave. Consolidation of the existing site at Callville Bay, including construction of a new tower, would also be addressed. Redesign of the existing WTF sites at Overton Beach and in the River Mountains may be considered, as long as it was within the parameters established by this plan. The NPS would work with the telecommunication service provider to best determine a potentially acceptable site that meets both NPS criteria and the needs of the FCC licensee.

The footprint for each WTF site would be no larger than 50 x 50 feet to allow space for the tower and associated equipment shelters. The site should accommodate the co-location of three additional carriers. Carriers would be required to establish one common building to accommodate all equipment. In addition, space on the tower and in the building would be reserved for the NPS to install LAN (local area network connection), which would improve park communications.

Multiple carriers wishing to establish facilities in the same area would be encouraged to enter into joint ventures. New sites would be constructed so that they can easily accommodate co-location by multiple permittees. Permittees would co-locate their proposed WTF with other existing or proposed facilities, including those operated by other carriers.

Issuance of Permits, Installation, and Management

WTFs would be authorized with a right-of-way permit. Carriers wishing to install facilities within the park must submit an application for a right-of-way to the Superintendent. The application shall consist of:

- Standard Form 299 (Application for Transportation and Utility Systems and Facilities on Federal Lands)
- An application fee of \$250.00 required pursuant to 36 CFR Part 14
- Maps showing the “before” and “after” service levels and signal strength of the proposed WTF
- Maps showing all other WTF sites and their coverage operated by the applicant within a 15 mile radius
- Propagation maps from the applicant showing its proposed build-out of sites within a 15 mile radius of the proposed site over the next five years.
- A schematic site plan and elevations showing all equipment to be installed
- A realistic photo-simulation depicting what the proposed WTF would look like after installation

- A copy of the FCC license authorizing the applicant to provide wireless telecommunication services in the area
- A deposit payment determined by NPS for estimated administrative charges associated with the development of the permit

Upon receipt of the application, NPS staff would determine if the proposal is consistent with the standards defined in this plan. If not, NPS would consult with the applicant to discuss any needed modifications. Once the proposal is consistent with the park plan, the park would proceed with the processing of the application. Procedures for permitting are described in Director's Order 53 and the accompanying Reference Manual. All site-specific surveys, mitigation, and public involvement (including a Federal Register notice) would be completed prior to executing the permit. The permit would be prepared using the standard template for WTFs approved by the Pacific West Regional Office of the NPS.

ALTERNATIVE B – FACILITIES UP TO 125 FEET (MANAGEMENT PREFERRED ALTERNATIVE)

Under this alternative, the park could permit WTFs up to 125 feet tall in developed areas. Facilities meeting this requirement would be permissible at Boulder Beach, Echo Bay, Temple Bar, Willow Beach, Cottonwood Cove, and Katherine's Landing. At each location, the actual height of the tower constructed would be determined in consultation with the applicants and would be based on a demonstration of increasing operational benefit with added tower height (up to the allowed maximum).

The WTF located in the River Mountains would remain in operation as long as carriers continue to be interested in operating from that site. Under this alternative, this previously existing facility would be the only one in the park exceeding 125 feet in height. However, if replacement or redesign of the River Mountains site was needed, it would be done according to the parameters established by this plan. The Callville Bay site, which currently consists of a 60-foot tower and a temporary mobile unit, could be redesigned to accommodate a larger tower and eliminate the temporary unit, but no more than one tower would be authorized. The WTF at Overton Beach would remain in operation as long as carriers continue to be interested in operating from the site. If replacement or redesign of the Overton Beach site was needed, it would be done according to the parameters established by this plan.

Coverages provided by this alternative are shown in Figures 7- 12. The modeling process for determining coverages is provided in Appendix A.

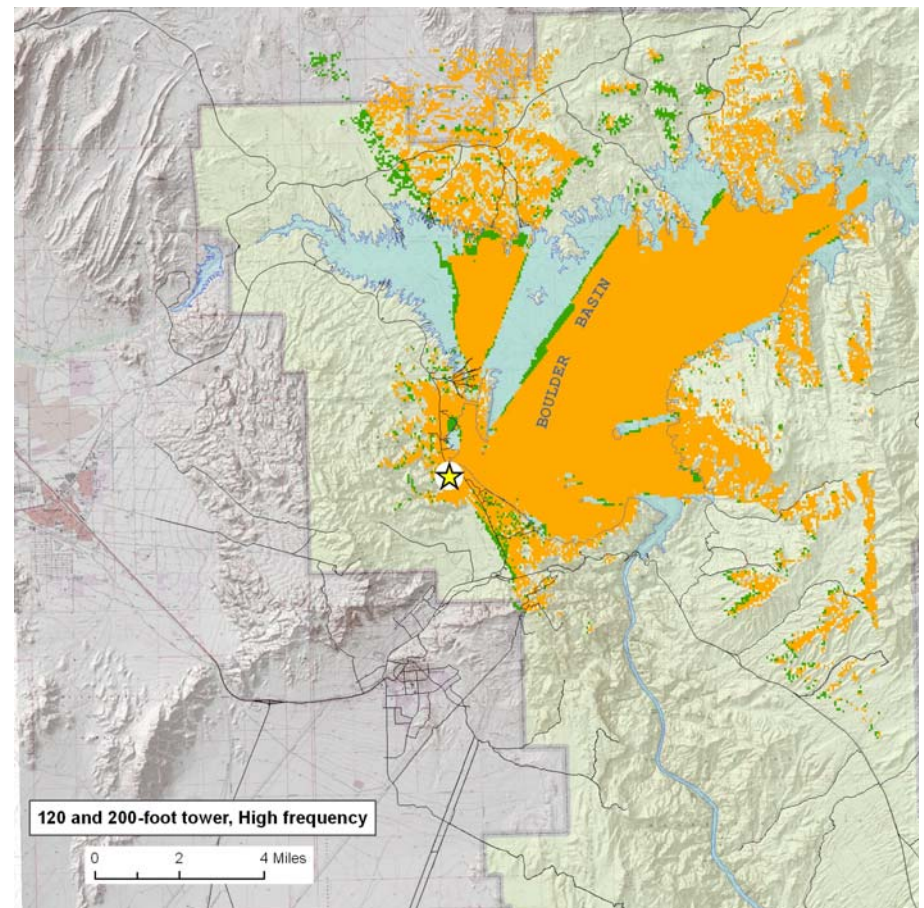
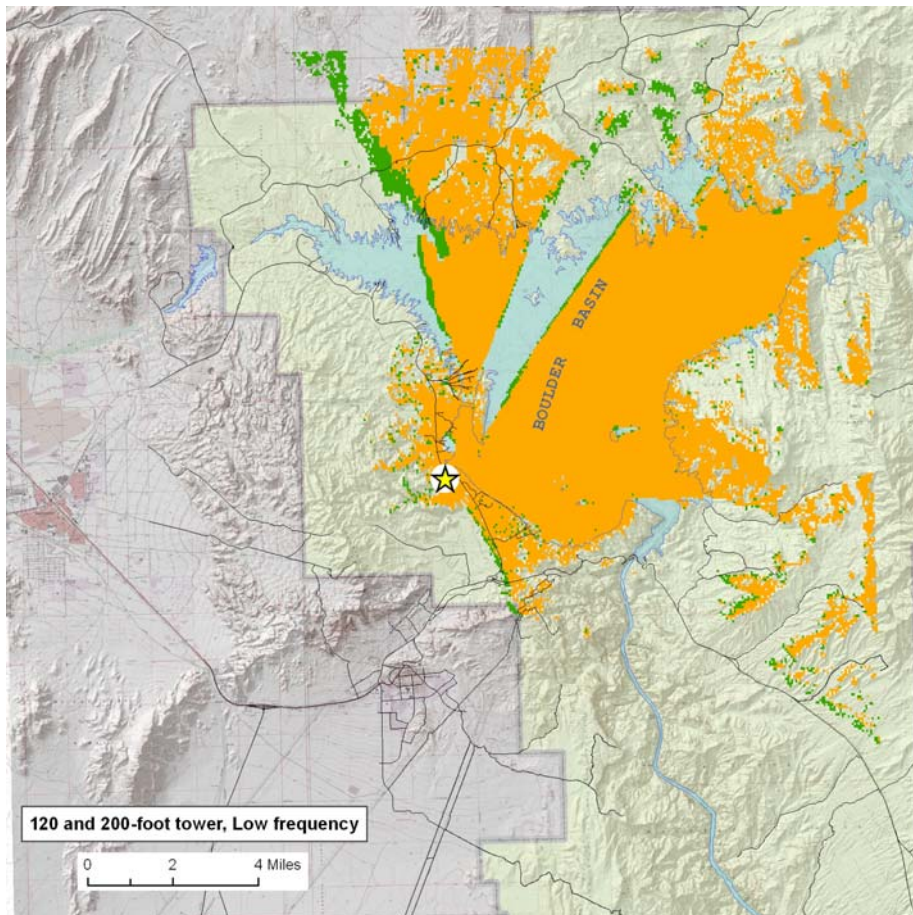


Figure 7. Potential coverage at high and low frequency for the Boulder Beach location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

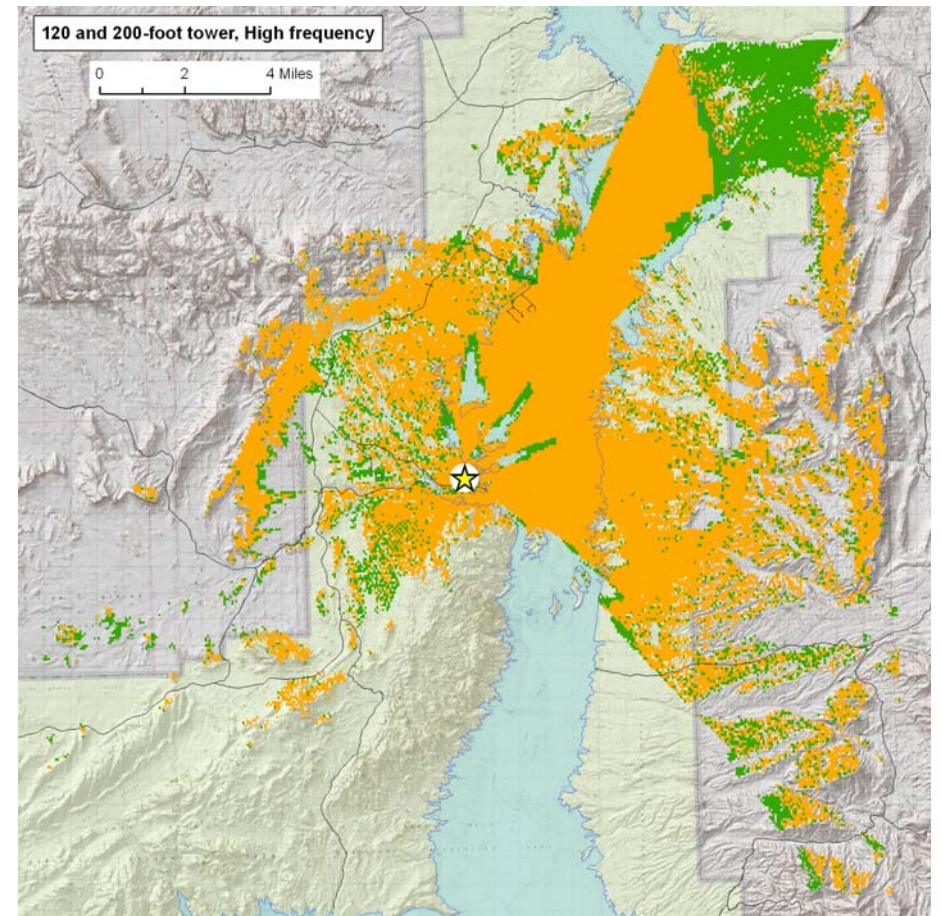
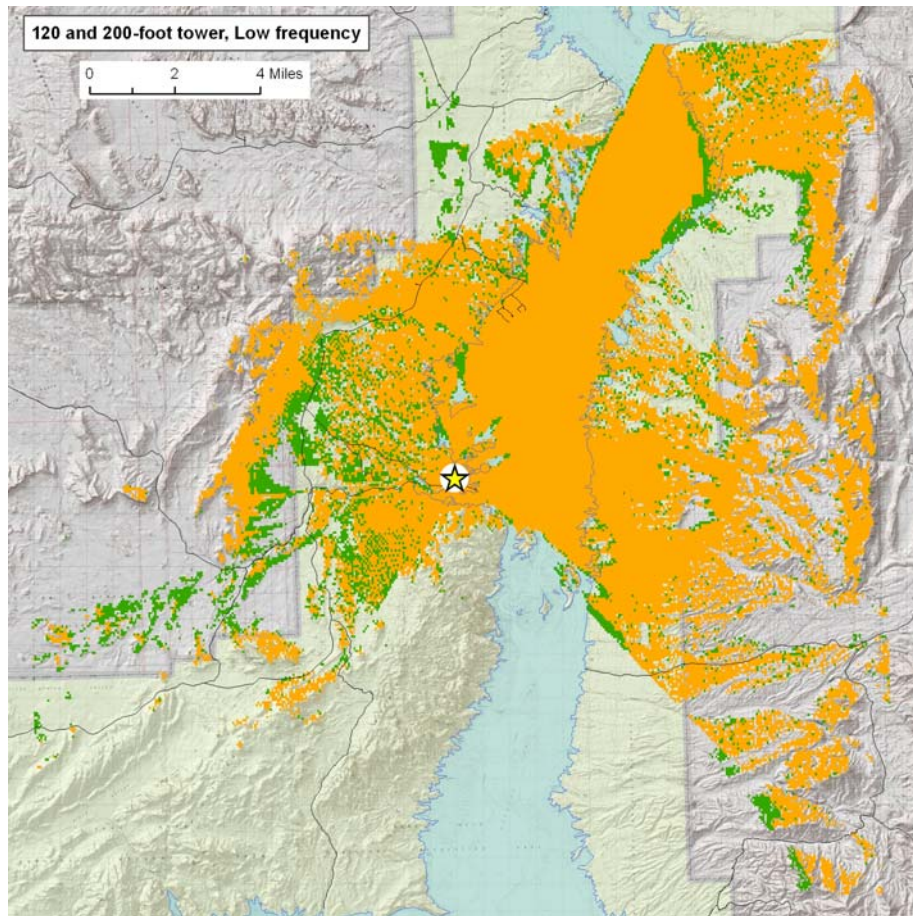


Figure 8. Potential coverage at high and low frequency for the Echo Bay location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

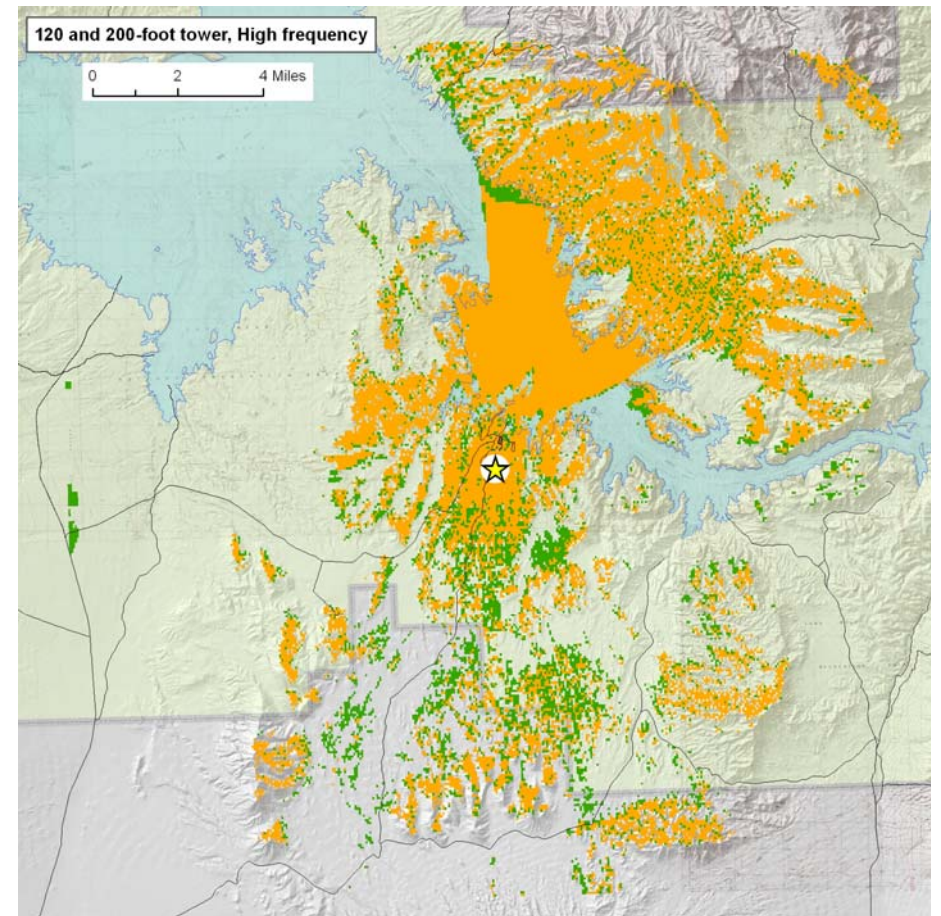
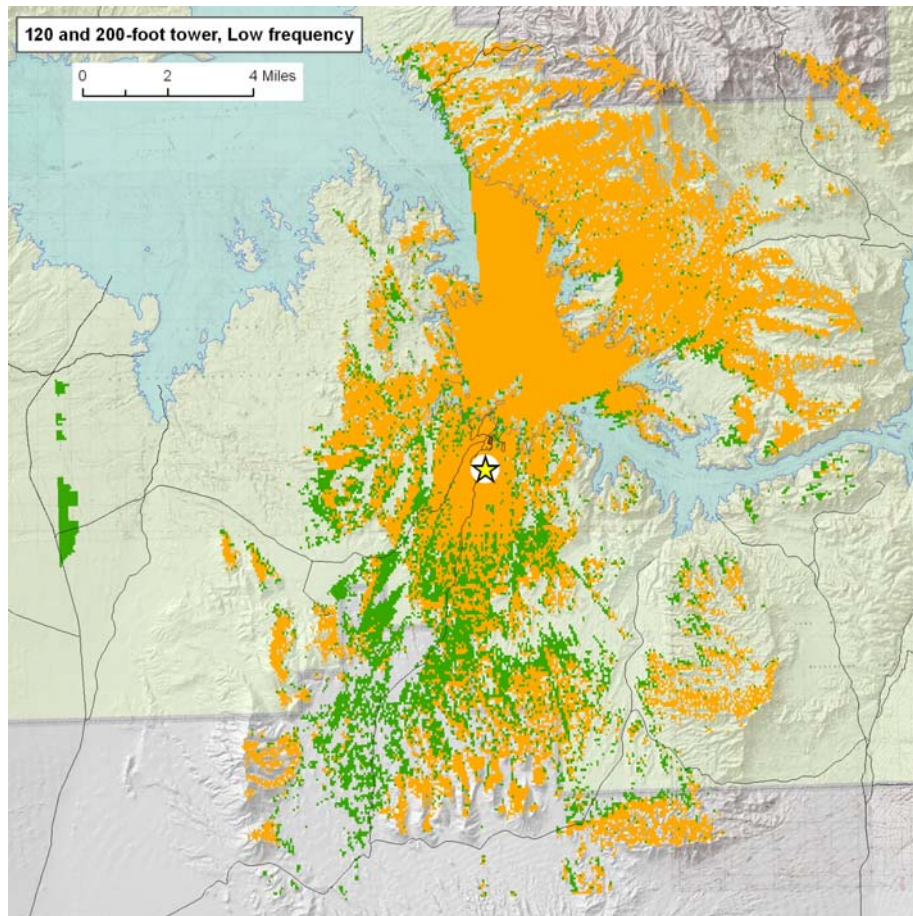


Figure 9. Potential coverage at high and low frequency for the Temple Bar location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

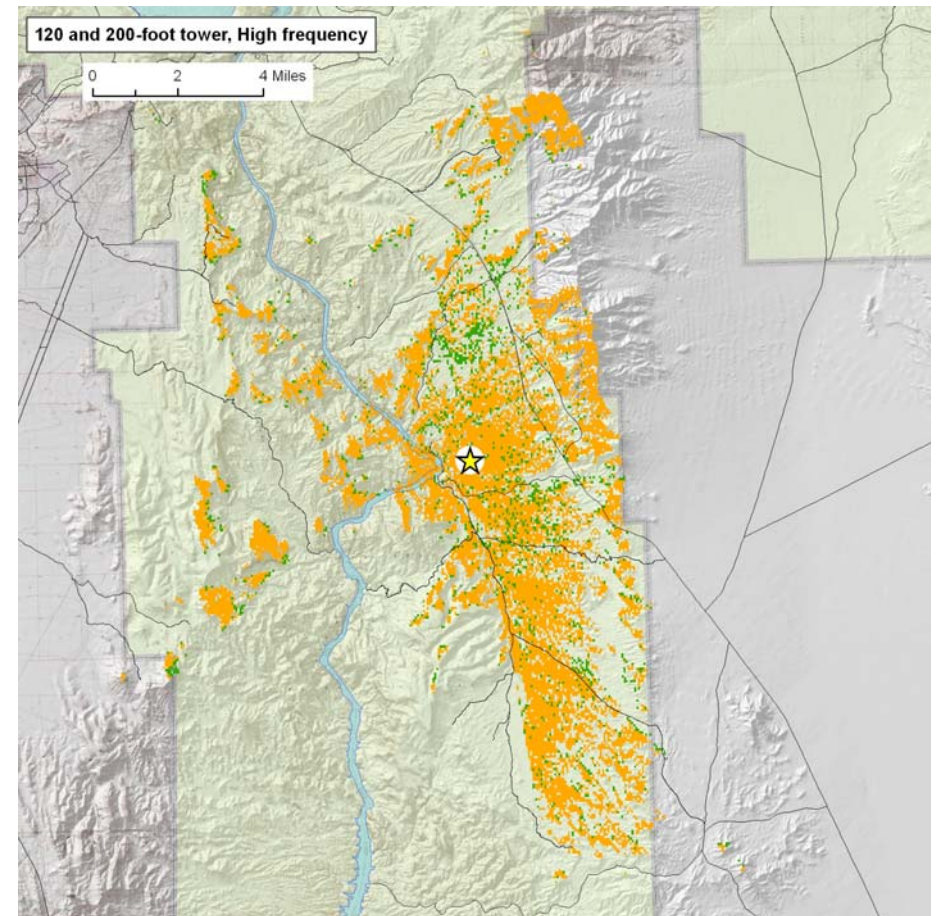
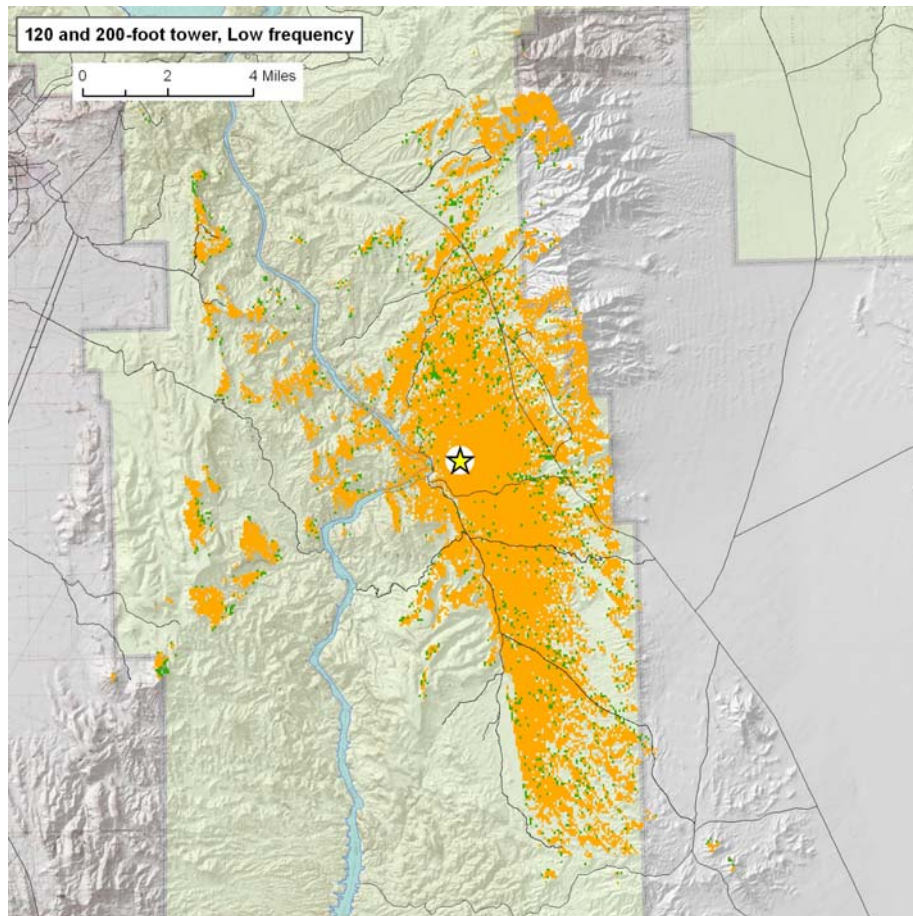


Figure 10. Potential coverage at high and low frequency for the Willow Beach location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

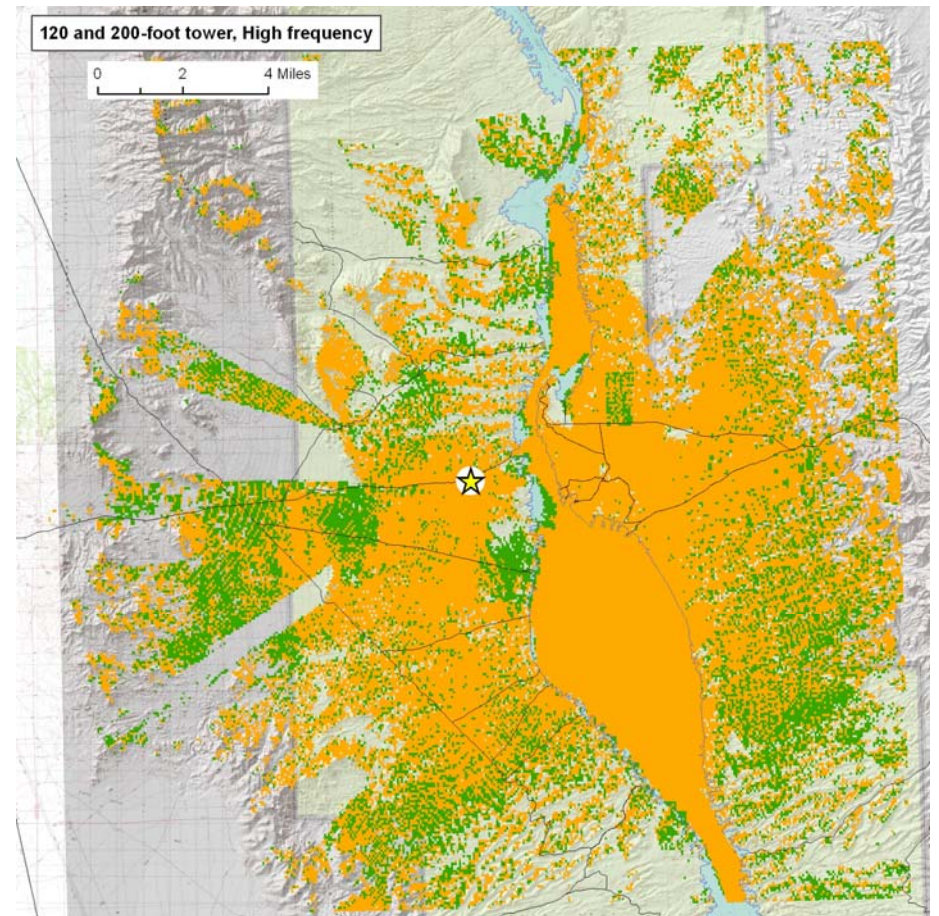
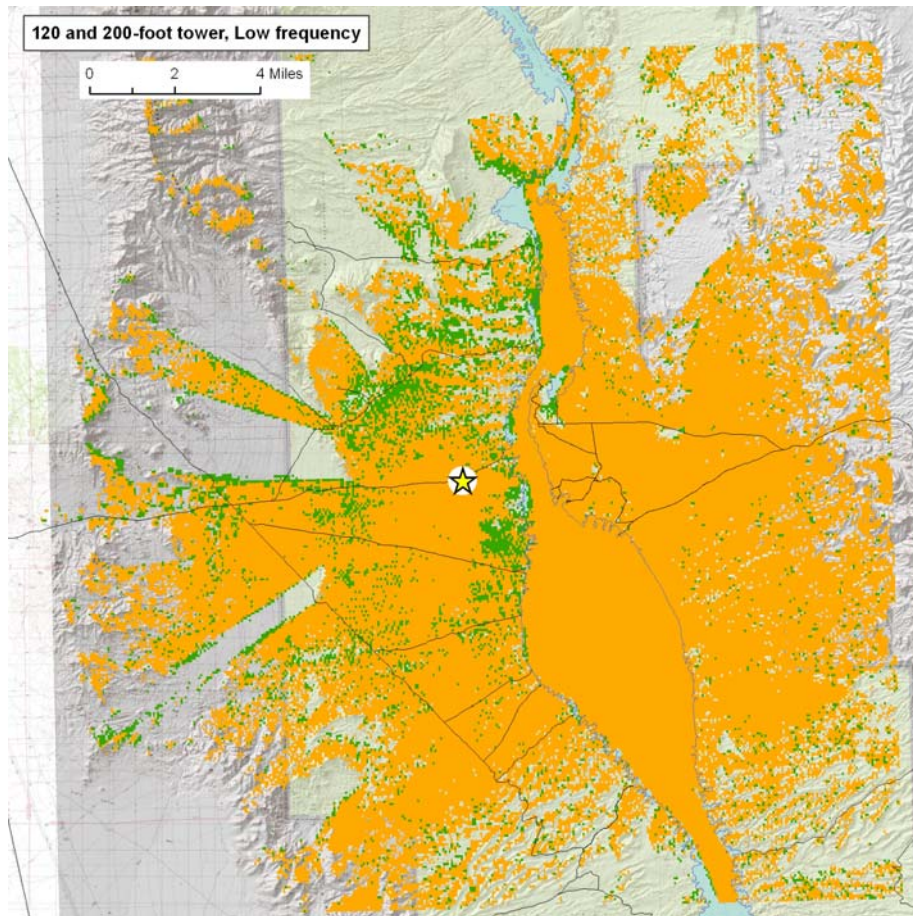


Figure 11. Potential coverage at high and low frequency for the Cottonwood Cove location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

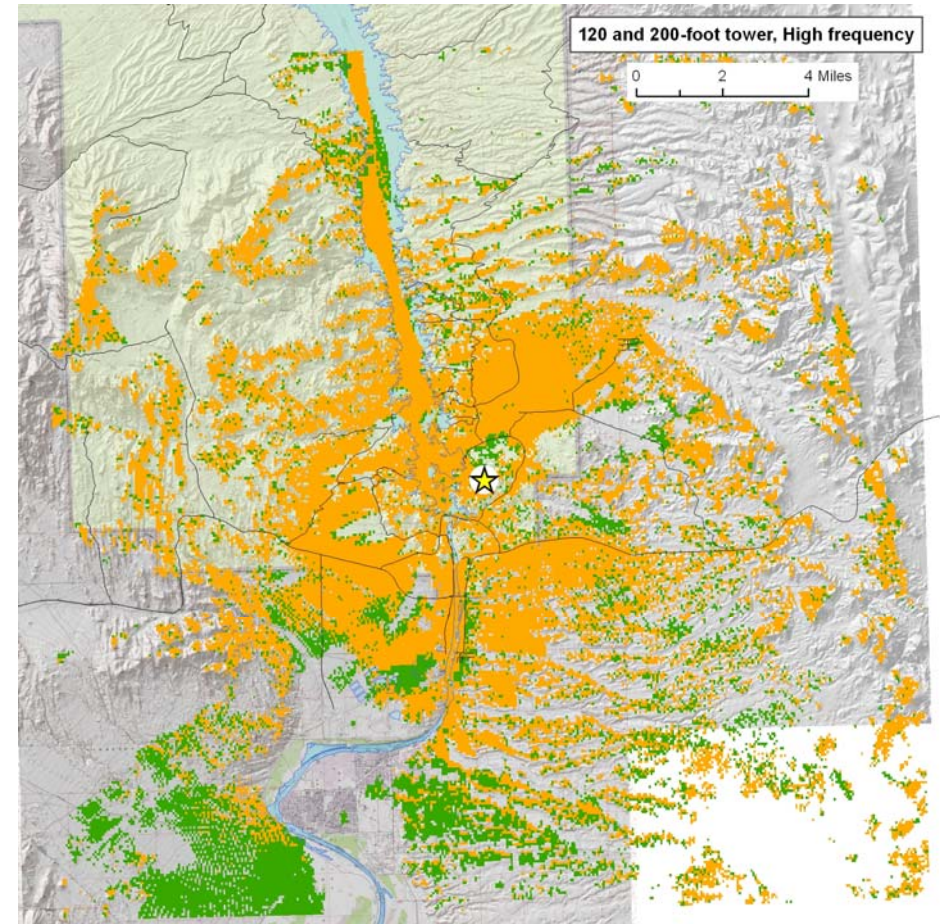
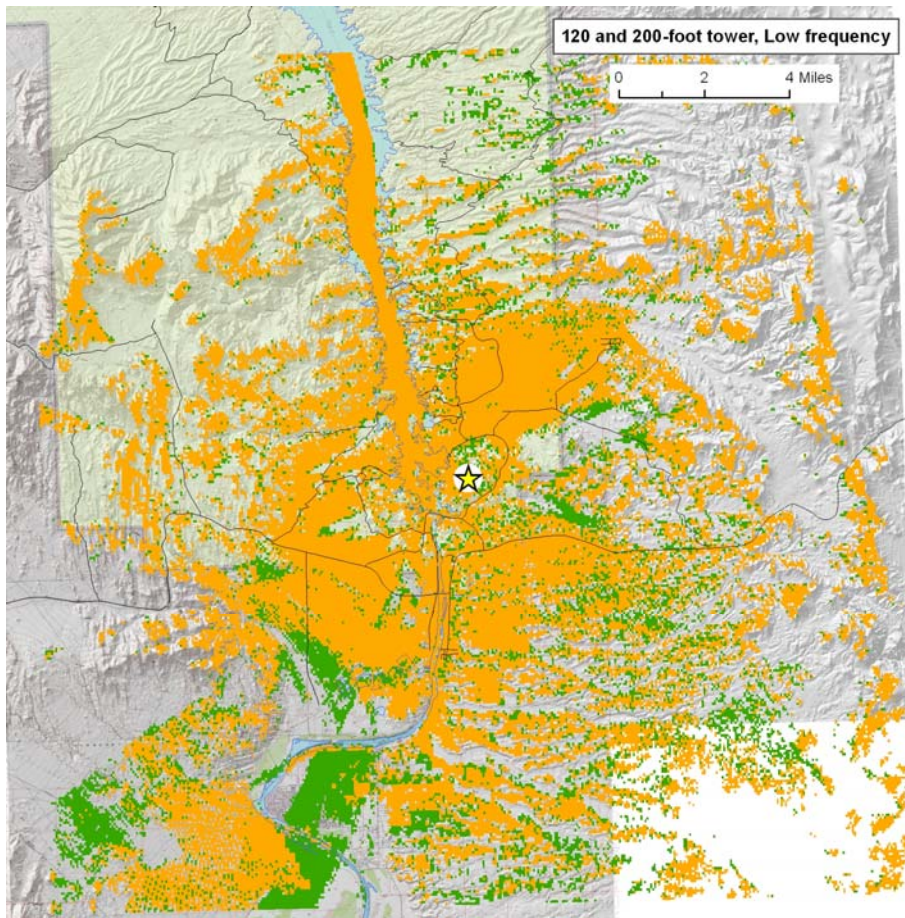


Figure 12. Potential coverage at high and low frequency for the Katherine's Landing location.

- 120-foot tower coverage, superimposed on 200-foot coverage
- 200-foot tower coverage

ALTERNATIVE C – FACILITIES UP TO 200 FEET

Under this alternative, the park could permit WTFs up to 200 feet tall in developed areas. Facilities meeting this requirement would be permissible at Boulder Beach, Echo Bay, Temple Bar, Willow Beach, Cottonwood Cove, and Katherine's Landing. At each location, the actual height of the tower constructed would be determined in consultation with the applicants and would be based on a demonstration of increasing operational benefit with added tower height (up to the allowed maximum).

The WTFs located in the River Mountains and at Overton Beach would remain in operation as long as carriers continue to be interested in operating from that site. If replacement or redesign of these sites was needed, it would be done according to the parameters established by this plan. The Callville Bay site, which currently consists of a 60-foot tower and a temporary mobile unit, could be redesigned to accommodate a larger tower and eliminate the temporary unit, but no more than one tower would be authorized.

Coverages provided by this alternative are shown in Figures 6-12. The modeling process for determining coverages is provided in Appendix A.

MITIGATION AND MONITORING COMMON TO ALTERNATIVES B AND C

Mitigation measures are specific actions designed to minimize, reduce, or eliminate impacts of alternatives and to protect Lake Mead NRA resources and visitors. Monitoring activities are actions to be implemented during or following construction. The following mitigation related to constructing and operating WTFs would be implemented under each action alternative, and are assumed in the analysis of effects for each alternative.

- To minimize impacts to soils and vegetation, new WTF sites would be located only in previously disturbed areas. These areas will have approved access routes, so that no new roads will need to be constructed. Utilities will be available nearby so that connections can be made to the WTF with minimal disturbance.
- To prevent the introduction and spread of non-native plant species, construction equipment would be pressure-washed prior to working in the recreation area.
- During construction of WTFs, a biologist will be on site to ensure that no wildlife (including the federally threatened desert tortoise) has wandered into the project area. If wildlife is present, construction will not commence until the animals have vacated the area.
- To minimize impacts to birds, structures will be designed, in accordance with U.S. Fish and Wildlife Service (USFWS) guidelines, so that there is no need for guy wires (which increase collisions) or lights (which cause disorientation).
- Dust abatement measures would be developed to minimize impacts to air quality during construction activities.
- To ensure that there are no cultural resources in the project area, all sites will be surveyed prior to construction. If any archaeological resources are found, the NPS will consult with the State Historic Preservation Office (SHPO) to determine

their significance. If the sites are significant and determined eligible for the National Register of Historic Places (NRHP), all necessary steps will be taken to avoid them during project activities.

- To minimize the visual impact of WTF sites, structures will be painted an appropriate color, possibly using non-reflective paints or anodized coatings, to help them blend with the surrounding landscape and to minimize light reflection. The design of the buildings and related structures shall, to the extent possible, use materials, colors, textures, screening, landscaping, and native vegetation that will blend them into the natural setting and surrounding buildings.
- Security lighting, if needed, will be downshielded to keep light within the boundaries of the site. Signage will be limited to providing radio frequency safety and emergency contact information.
- Only monopoles and lattice towers will be considered. Towers mimicking natural features will not be considered, as they do not blend in well with the sparsely vegetated desert topography.
- Proposed WTFs must be designed and operated to minimize noise or other undesirable impacts from cooling equipment or generators. Maximum allowable noise level at the exterior of a proposed WTF is 60 dB.
- Applicants must coordinate ground based telecommunications requirements with the appropriate utility company to determine whether the power needed to operate the WTF is available. Power supporting NPS facilities will not be compromised as a result of constructing and operating a WTF.
- New utility services for proposed WTFs shall be underground or placed in at-grade conduits along previously disturbed corridors.
- No proposed WTF or combination of facilities may produce at any time power densities in any area that exceeds the current FCC standard for human exposure at the point of closest public access. WTFs must comply with all current and future FCC adopted standards regarding human health and safety.
- To prevent disruption of other communication operations, carriers will operate their cellular facilities within the approved FCC frequencies assigned to them, and in compliance with all applicable laws, including but not limited to applicable FCC rules, regulations, and guidelines.
- All safety standards applicable to WTF construction, operation, and maintenance must be adhered to.
- Towers no longer in use or determined to be obsolete will be removed within 90 days of cessation of use, and the site must be restored to its original condition or the condition specified by Lake Mead NRA resource specialists.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER EVALUATION

The action alternatives analyzed in this EA are based on height restrictions for new communication towers and were selected to provide adequate coverage without unnecessary environmental impact. An alternative limiting towers to 100 feet was rejected because it would not allow for effective co-location among different carriers. In order to minimize the number of towers that need to be constructed, carriers are

encouraged to share facilities, but each additional carrier requires additional height for signal transmission. Since the benefits of constructing shorter towers can be quickly negated by the proliferation of new towers to serve other carriers, this alternative was dismissed from analysis.

An alternative allowing towers to exceed 200 feet in height was also dismissed from analysis. At this height, towers would have a severe impact on scenic viewsheds as they would rise significantly higher than anything else on the landscape. In addition, towers of this size must have lighting for aviation safety purposes, and lighted towers can disrupt the orientation of migrating birds. Such towers may also require guy wires, which increase the risk of bird collisions.

In addition to the locations presented in this document, the NPS has received proposals from cellular companies for site development near Las Vegas Bay and a site adjacent to Northshore Road. Las Vegas Bay was considered but dismissed because use in the area has decreased since drought conditions forced the 2002 emergency relocation of the marina to Hemenway Harbor. Even if the water level rises, sedimentation that has occurred in the bay would make it impossible for the marina to relocate back to its original location. Additionally, Las Vegas Bay is in close proximity to the communities of Henderson and Lake Las Vegas, and cell coverage could improve as a result of tower placement outside of the park or from alternate areas proposed in this plan. The request for a site adjacent to Northshore Road was considered but dismissed. Although a cell tower at this location would provide service to visitors traveling along the northern park roadway, there would be considerable impacts to the viewshed on this scenic drive. In addition, emergency call boxes are available along Northshore Road for safety-related issues.

CONSULTATION, COORDINATION, AND PERMIT REQUIREMENTS

The park will conduct informal consultation with the U.S. Fish and Wildlife Service to obtain their concurrence that any proposed action authorized under the preferred alternative is not likely to adversely affect threatened or endangered species or their critical habitat.

As stated above, the park will consult with the SHPO if archaeological resources are discovered in the project area.

Air quality permits, if required, will be the responsibility of the contractor installing the facilities.

Any new WTFs constructed within the park must be authorized under a right-of-way permit. Prior to any construction or co-location, wireless carriers must obtain a right-of-way permit from the National Park Service and comply with all terms and conditions therein.

The EA will be distributed to federal, state, and local agencies and to interested members of the public for a 30-day review period.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote NEPA, as expressed in Section 101 of NEPA. This alternative will satisfy the following requirements:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all generations safe, healthful, productive, and esthetically 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 or unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and,
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The Council on Environmental Quality states that 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 (46 FR 18026 – 46 FR 18038).” According to NPS NEPA Handbook (DO-12), through identification of the environmentally preferred alternative, the NPS decision-makers and the public are clearly faced with the relative merits of choices and must clearly state through the decision-making process the values and policies used in reaching final decisions.

Alternative B is the environmentally preferable alternative because overall it would best meet the requirements in Section 101 of NEPA. Alternative B is consistent with NEPA criteria two, three, four, and five. Providing cellular service in developed areas of the park would enhance communications for more effective park and concessioner operations, visitor use and enjoyment, and emergency response to assure a safe, healthful, and esthetically pleasing surrounding. Alternative B would provide an environment that supports diversity and variety of individual choice by allowing cellular technology in high-use areas, while still preserving the opportunity for escape from everyday technology in more remote areas of the park. Limiting WTF construction to locations that have been previously disturbed, and restricting the height of the tower to below 125 feet, would attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, jeopardizing park resources, or other undesirable or unintended consequences. The Preferred Alternative would meet the goals of the project

and would achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

Unlike Alternative B, the no-action alternative does not fully meet the goals of the project or NEPA criteria two, three, four, and five, because the benefits from improved communications, for effective park operations, concessions operations, emergency response, and visitor use and enjoyment would not be fully realized. Similar to the Preferred Alternative, Alternative C would maintain the park's ability to provide for visitor use and enjoyment and efficient park operations. However, the additional height of the towers allowed by Alternative C would create greater impacts to park resources with little additional benefit.

COMPARISON OF IMPACTS

Table 2 summarizes the potential long-term impacts of the proposed alternative. Short-term impacts are not included in this table, but are analyzed in the Environmental Consequences section. Impact intensity, context, and duration are also defined in the Environmental Consequences section.

Table 2. Comparison of Long-Term Impacts from the Alternatives Considered

IMPACT TOPIC	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C
Safety, Visitor Use, and Experience	Minor adverse effects	Beneficial effects; minor adverse effects possible	Beneficial effects; minor adverse effects possible
Visual Resources	No impacts	Moderate adverse impacts	Moderate to major adverse impacts
Park Operations	Minor adverse impacts	Beneficial effects	Beneficial effects
Wildlife and Wildlife Habitat	No impacts	Moderate impacts	Moderate impacts
Special Status Species	No impacts	Not likely to adversely affect	Not likely to adversely affect
Soils and Vegetation	No impacts	Minor impacts	Minor impacts
Cultural Resources	No impacts	Potentially minor impacts	Potentially minor impacts

SECTION III: AFFECTED ENVIRONMENT

INTRODUCTION

This section provides a description of the existing environment in the project area and the resources that may be affected by the alternatives under consideration. Detailed descriptions of the environment and existing use at Lake Mead NRA are found in the *Lake Mead NRA Lake Management Plan and Final Environmental Impact Statement* (2002), *Lake Mead NRA Resource Management Plan* (NPS 2000a), *Lake Mead NRA General Management Plan* (NPS 1986), and on the Internet at <http://www.nps.gov/lame>.

SOILS AND VEGETATION

The majority of Lake Mead NRA is characterized by generally north-south trending mountain ranges separated by broad, shallow valleys. The lakeshore areas are generally characterized by flat, broad slopes with numerous desert washes leading to various points into Lake Mead. Desert creosote-bursage shrub communities and desert wash communities typically surround the developed areas. Within the developed areas, soils have been permanently altered by the constructions of roads, parking areas, launch ramps, and buildings. Landscape plants include native species such as cottonwoods and willows, as well as non-natives such as palms, oleander, and eucalyptus. Native soils and plant species remain on the peripheries of the developed areas, although human use and disturbance has often altered the soil and allowed for invasion by less desirable weedy plant species.

WILDLIFE AND WILDLIFE HABITAT

The desert, riparian, and aquatic ecosystems present at Lake Mead NRA provide habitat for a rich diversity of animal species. For birds alone, the park's checklist includes over 360 species, although some are quite rare for this area. Developed areas, in which the habitat has been altered to suit human needs, typically only support a small subset of the park's wildlife. Opportunistic predators and scavengers are 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 most desert-dwelling species. Common species to see in these locations include mammals such as coyotes, rabbits, and ground squirrels; birds such as Gambel's quail, morning doves, and ravens; and reptiles including various snake and lizard species.

SPECIAL STATUS SPECIES

The park is home to several federally or state protected species, as well as other plants and animals considered rare or sensitive. No sensitive plants occur in the disturbed areas where WTFs are being considered. Among the animal species, most avoid developed areas, although the desert tortoise (federally listed as threatened) is occasionally seen in or near these areas during its active season.

CULTURAL RESOURCES

Archeologists have identified a series of Native American cultures that have occupied Lake Mead NRA and adjacent areas in southern Nevada and Western Arizona over the last 12,000 to 13,000 years. These cultures have been divided into discrete time periods based on various criteria, i.e. changes in technology, the types of animal and plant foods used, or the migration of peoples into and out of the area. Occupation of the area dates back to the end of the late Pleistocene around 12,000 to 13,000 years ago.

The Spanish and later the Mexicans were the first whites to explore the area. During the Spanish/Mexican period (1500s to 1840s) trade routes were established between the population centers in New Mexico and the colonies in California. Some of these trade routes passed through Southern Nevada. The Mormons were the first to establish permanent white settlements in Southern Nevada. These included Las Vegas, St. Thomas, and Callville, the latter two of which were inundated by Lake Mead. During the late 1800s and early 1900s, the prosperity of these communities and others in the area was determined by the boom and bust cycles of the mining and ranching industries that formed the economic base of the area.

The construction of Hoover Dam in the 1930s dramatically changed the landscape of southern Nevada and Western Arizona. It brought thousands of people to the area, put Las Vegas on the map, and helped develop the area's current economy based on recreation and tourism.

VISUAL RESOURCES

The park'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 *GMP* identified outstanding view corridors within Lake Mead NRA that provide spectacular views of significant natural features.

VISITOR USE AND EXPERIENCE, SOCIOECONOMIC RESOURCES, AND PARK OPERATIONS

Lake Mead and Lake Mohave offer a variety of recreational opportunities and are what attract most of the visitors to the park. Lake Mead NRA visitors include boaters, swimmers, fishermen, hikers, photographers, roadside sightseers, backpackers, and campers. Recreation visits in 2006 totaled just over 8 million and represent a substantial contribution to the area's economy. The majority of park visitation occurs during the summer months and involves water-based recreation. However, visitation is increasing in the spring and fall as visitors discover the backcountry regions of the recreation area through hiking and travel on the approved road system.

There are several major developed areas in the park: Boulder Beach, Las Vegas Bay, Callville Bay, Echo Bay, Overton Beach, and Temple Bar on Lake Mead; and Willow Beach, Cottonwood Cove, and Katherine's Landing on Lake Mohave. Water, power, and phone systems are available at all areas. With the exceptions of Overton Beach and Las Vegas Bay, all areas provide launch ramps for boats, marinas, and food service. Some

areas also offer campgrounds, formal lodging, and other visitor services. Each area also serves as a base for maintenance and park protection operations. Under the WTF plan, actions may occur at all of these areas except Las Vegas Bay, where no action is needed.

Boulder Beach Area

The Boulder Beach developed area is situated on Lake Mead and receives the highest visitation of all the developed areas, exceeding 2 million people in 2006. Some of the facilities and services offered in the Boulder Beach area include the Alan Bible Visitor Center; ranger station; boating education facility; two marinas with boat rentals, restaurants, and general stores; a ferry cruise operation; hotel; Nevada Department of Wildlife (NDOW) fish hatchery; Southern Nevada Water Authority Facility; SCUBA, sailboat, and special events beaches; shoreline fishing; campgrounds; NPS housing area and maintenance facility; long-term trailer village; and numerous overlooks, trails, and picnic areas. A 180 ft. cell tower is located in the River Mountains and provides coverage to some parts of the Boulder Beach area.

Callville Bay

The Callville Bay developed area is situated on Lake Mead and receives heavy visitation during the summer months. In 2006, visitation exceeded 632,000. In February 2007, half of the marina slips that were at Overton Beach were relocated to this area. Some of the facilities and services offered in the Callville Bay area include a ranger station; marina and boat rentals; restaurant; general store; NPS and concessioner housing; campground; picnic area; and launch ramp. A WTF provides cellular service to area users.

Echo Bay

Echo Bay is situated on the Overton Arm of Lake Mead and attracted over 200,000 people in 2006. This area could see an increase in visitation in response to the termination of services previously offered at Overton Beach. Some of the facilities and services offered at Echo Bay include a ranger station; marina and boat rentals; restaurant; motel; NPS and concessioner housing; campground; picnic area; launch ramp; and trailer village.

Overton Beach

Overton Beach is the northernmost developed area of the park and is situated on the Overton Arm of Lake Mead. In February 2007, low water levels resulted in the relocation of marina slips to Callville Bay and Temple Bar. Although concessioners are no longer providing services at this location, NPS facilities (except for the launch ramp) are still operational. A WTF at this location provides cellular service to area users.

Temple Bar

Temple Bar is the eastern most developed area of the park and is situated on Lake Mead near the boundary with Grand Canyon National Park. Visitation to this area in 2006 was nearly 75,000. In February 2007, half of the marina slips that were at Overton Beach were relocated to this area. An increase in visitation is expected as a response to the relocation and the rapid development occurring on adjacent lands. Some of the facilities

and services currently offered include a ranger station; marina and boat rentals; general store; restaurant; motel; cabin rentals; NPS and concessioner housing; campground; trailer village; swim area; launch ramp; and picnic area.

Willow Beach

Willow Beach serves primarily as a day-use lake access point and provides boat access to northern Lake Mohave and the Black Canyon area south of Hoover Dam. Visitation to this area in 2006 was over 120,000 and is expected to increase in response to completion of the Hoover Dam Bypass in 2010 and planned development on adjacent lands. Some of the facilities and services currently offered in the Willow Beach area include a ranger station; a USFWS fish hatchery; marina and boat rentals; general store and snack bar; NPS, USFWS, and concessioner housing; shoreline fishing; launch ramp; and picnic area.

Cottonwood Cove

Cottonwood Cove is located on Lake Mohave and attracts many visitors from California, Arizona, and Nevada. Visitation in 2006 was nearly 265,000. Some of the facilities and services offered at Cottonwood Cove include a ranger station; marina with boat rentals; general store; restaurant; motel; NPS and concessioner housing; trailer village; campgrounds; swim beach; shoreline fishing; launch ramp; and picnic area.

Katherine's Landing

Katherine's Landing is located at the southern extent of Lake Mohave and is near Laughlin, Nevada and Bullhead City, Arizona. This area attracts many visitors from Arizona and California during the summer months and on holidays. Visitation in 2006 was over 950,000. Facilities and services offered in the Katherine's Landing area include a ranger station; visitor center; marina and boat rentals; general store; restaurant; NPS and concessioner housing; motel; SCUBA, sailboarding, and swim beaches; shoreline fishing; campground; cabin sites; trailer village; picnic area; and launch ramps.

SECTION IV: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section presents the likely beneficial and adverse effects to the natural and human environment that would result from implementing the alternatives under consideration. This section describes short-term and long-term effects, direct and indirect effects, cumulative effects, and the potential for each alternative to result in unacceptable impacts or impairment of park resources. Interpretation of impacts in terms of their duration, intensity (or magnitude), and context (local, regional, or national effects) are provided where possible.

METHODOLOGY

In describing potential environmental impacts, it is assumed that the mitigation identified in the *Mitigation and Monitoring* section of this EA would be implemented under any of the applicable alternatives, as identified in each mitigation criterion. Impact analyses and conclusions are based on NPS staff knowledge of resources and the project area, review of existing literature, and information provided by experts in the NPS or other agencies. Any impacts described in this section are based on preliminary design of the alternatives under consideration. Effects are quantified where possible; in the absence of quantitative data, best professional judgment prevailed.

Impacts are characterized as negligible, minor, moderate, or major, according to definitions provided for each impact topic below. In addition, the following terms may also be used in characterizing impact type:

- *Localized Impact*: The impact occurs in a specific site or area. When comparing changes to existing conditions, the impacts are detectable only in the localized area.
- *Direct Effect*: The effect is caused by the action and occurs at the same time and place.
- *Indirect Effect*: The effect is caused by the action and may occur later in time or be farther removed in distance, but is still reasonably foreseeable.
- *Short-Term Effect*: The effect occurs only during or immediately after implementation of the alternative.
- *Long-Term Effect*: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

In the absence of quantitative data concerning the full extent of actions under a proposed alternative, best professional judgment prevailed.

IMPAIRMENT ANALYSIS

In addition to determining the environmental consequences of the alternatives, NPS *Management Policies* 2006, requires the analysis of potential effects to determine if actions would impair park resources. Under the NPS Organic Act and the General Authorities Act, as amended, the NPS may not allow the impairment of park resources and values except as authorized specifically by Congress. The NPS must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment to the affected resources and values (NPS *Management Policies* 2006 1.4.3).

Impairment to park resources and values has been analyzed within this document. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is necessary to fulfill specific purposes identified in the enabling legislation or proclamation of the park; is the key to the cultural or natural integrity of the park or to opportunities for enjoyment of the park; or is identified as a goal in the park's general management plan or other relevant NPS planning document. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot be reasonably further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

Impairment may result from NPS activities in managing the recreation area, visitor activities, or from activities undertaken by concessioners, contractors, and others operating in the recreation area. In this "Environmental Consequences" section, a determination on impairment is made in the conclusion statement of the applicable resource impact topics for each alternative. The NPS does not analyze recreational values, visitor use and experience (unless impacts are resource based), socioeconomic values, health and safety, or park operations in terms of impairment.

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS will apply a standard that offers greater assurance that impairment will not occur. NPS *Management Policies* 2006 (1.4.7.1) requires that park managers evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable. Unacceptable impacts are impacts that fall short of impairment, but are still not acceptable within a particular park's environment.

Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. For the purposes of this analysis, an unacceptable impact is an impact that individually or cumulatively would:

- be inconsistent with a park's purposes or values;
- impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process;
- create an unsafe or unhealthful environment for visitors or employees;
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values; or,
- unreasonably interfere with:
 - park programs or activities;
 - an appropriate use;
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park; or,
 - NPS concessioner or contractor operations or services.

CUMULATIVE EFFECTS

Cumulative effects are the direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7). Guidance for implementing NEPA (Public Law 91-190, 1970) requires that federal agencies identify the temporal and geographic boundaries within which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. This includes potential actions within and outside the recreation area boundary. The geographical boundaries of analysis vary depending on the impact topic and potential effects. While this information may be inexact at this time, major sources of impacts have been assessed as accurately and completely as possible, using all available data.

Specific projects or ongoing activities with the potential to cumulatively affect the resources (impact topics) evaluated for the project are identified in this document and described in the following narrative. Some impact topics would be affected by several or all of the described activities, while others could be affected very 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 park currently receives about 8 million visitors per year. With the predicted increases in population in the local and surrounding areas, visitation can be expected to increase in the coming years. To accommodate the visitors, and to maintain and improve its existing facilities, the park is undertaking numerous development projects. In the immediate future, the park will replace the water and wastewater distribution systems at 8 of the developed areas as the current systems are old, deteriorated, and unreliable.

Redevelopment projects are planned for Willow Beach and Callville Bay. Development concept plans will be prepared for Katherine's Landing and Cottonwood Cove.

SAFETY, VISITOR USE AND EXPERIENCE

Criteria and Thresholds for Impact Analysis

NPS *Management Policies* 2006 states that the enjoyment of the park's resources is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitor enjoyment.

Part of the purpose of Lake Mead NRA 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.

Public scoping input and observation of visitation patterns, combined with an assessment of what is available to visitors under current management, were used to estimate the effects of the actions in the various alternatives of this document. The impact on the ability of the visitor to safely experience a full range of Lake Mead NRA resources was analyzed by examining resources and objectives presented in the park's significance statement.

Impact Indicators, Criteria, and Methodology: The potential for change in visitor experience proposed by the alternatives was evaluated by identifying projected increases or decreases in use of the areas impacted by the proposal, and determining how these projected changes would affect the desired visitor experience. The impact assessment for safety focused on the number of potential individuals impacted and the severity of the impact. The thresholds of change for the intensity of an impact to safety, visitor use and experience are defined as follows:

- *Negligible impacts:* Safety is not affected, or the effects are at low levels of detection and do not have an appreciable effect on visitor or employee health and safety. The visitor 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.
- *Minor impacts:* The effect is detectable but does not have an appreciable effect on health and safety. Changes in visitor use and experience are detectable, although the changes are slight. Some visitors are aware of the effects associated with the alternative, but the effects are slight and not noticeable by most visitors.
- *Moderate impacts:* The effects are readily apparent and result in substantial, noticeable effects to health and safety on a local scale. Changes in visitor use and experience are readily apparent to most visitors. Visitors are aware of the

effects associated with the alternative and might express an opinion about the changes.

- *Major impacts:* The effects are readily apparent and result in substantial, noticeable effects to health and safety on a regional scale. Changes in visitor use and experience 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.

Alternative A

Under this alternative, there would be no additional cellular coverage in the park. Visitors would be able to utilize the technology only to the extent that it is currently available. Many areas of the park would remain without this service. In developed areas, some visitors may consider the lack of service to be an inconvenience. In more remote areas, some visitors may be uncomfortable not having the ability to use a mobile phone in case of emergency. For those individuals who are not heavily dependent on this technology, there would be no impacts from the no-action alternative. There would be no change to safety under this alternative, and emergency response time may continue to be delayed if incidents requiring assistance occur in areas where there is no cell coverage.

Cumulative Effects: Impacts to safety, visitor use, and experience are directly related to the number of visitors using the recreation area. Therefore, as the number of visitors increases, impacts associated with a lack of this technology may be expected to increase over time.

Conclusion: Under Alternative A, the experience of visitors expecting the convenience and sense of security sometimes provided by cell phones would be adverse, with the intensity depending on the individual and the nature of the incident. There would be no impacts to visitor use and experience of individuals who are not heavily dependent on this technology. Safety aspects, including emergency notification and response, would remain unchanged under this alternative.

Alternative B

Under this alternative, up to seven additional WTFs up to 125 feet tall could be built in developed areas, expanding coverage within the park. Existing WTFs could be replaced or redesigned. Since the greatest amount of visitor use is for water-based recreation, and the developed areas provide lake access, the majority of visitors tend to congregate in these areas. A large percentage of the public uses cellular phones for communication purposes. Improved communications within the coverage area would directly benefit those who utilize this technology. Safety is improved with greater communication ability, and 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. Visitors who prefer a more primitive experience may oppose the proliferation of cellular towers and may be bothered by the presence of the technology.

Cumulative Effects: The park currently receives about 8 million visitors per year. With the predicted increases in population and tourism in the local and surrounding areas, visitation can be expected to increase in the coming years. Numerous projects are occurring within the park to accommodate visitors and to improve and maintain existing facilities. Some of these projects include replacing the water and wastewater distribution systems at 8 of the developed areas; relocating marina facilities on Lake Mead to maintain water-based facilities in spite of decreasing water levels; constructing the River Mountains Loop Trail in the Boulder Basin; and implementing redevelopment projects scheduled for Willow Beach and Callville Bay. If implemented, this alternative would enhance the communication capabilities within developed areas where visitors congregate.

Conclusion: Under this alternative, there would be a moderate, beneficial effect to safety resulting from improved communication services. Effects to visitor experience would be minor and could be either beneficial or adverse, depending on the visitor's views on the technology and its suitability to national parks.

Alternative C

Under this alternative, up to seven additional WTFs up to 200 feet tall could be built in developed areas. Existing WTFs could be replaced or redesigned. Although the taller towers would provide slightly more coverage than under alternative B, the difference is not appreciable, and the impacts to Safety and Visitor Use and Experience are the same as those described under Alternative B.

Cumulative Effects: Cumulative effects would be the same as those describe under Alternative B.

Conclusion: Under this alternative, there would be a moderate, beneficial effect to safety resulting from improved communication services. Effects to visitor experience would be minor and could be either beneficial or adverse, depending on the visitor's views on the technology and its suitability to national parks.

VISUAL RESOURCES

Criteria and Thresholds for Impact Analysis

Laws, Regulations, and Policies: The enabling legislation of Lake Mead NRA specifically addresses the preservation of the scenic features of the area. The NPS manages the natural resources of the park, including highly valued associated characteristics such as scenic views, to maintain them in an unimpaired condition for future generations (NPS *Management Policies* 2006).

The intent of this analysis is to identify how each alternative would affect the overall visual resource of the area. The assessment of potential visual impacts involves a subjective judgment concerning the degree of landscape modification allowable before a threshold of impact is exceeded. Human preference for landscape types or characteristics is not uniform across cultures and populations, but there are common preferences among

visitors to federal lands, and natural-looking landscapes are thought to be the most appealing.

In determining impacts on the visual resource, the NPS considered the visual sensitivity of the area and the level of visual obtrusion each alternative would have on the existing landscape. Visual sensitivity is dependent on the ability of the landscape to absorb the potential impact and the compatibility of the change with the overall visual character of the area. Absorption relates to how well the facility will blend into the landscape. Compatibility considers the character of the visual unit and how much contrast is created by the facility. The level of visual obtrusion the facility has on the landscape is based on attributes such as form, line, and color.

The thresholds of change for the intensity of an impact on the visual resource are defined as follows:

- *Negligible impacts:* The impact is at the lower level of detection and causes no measurable change. The facility does not dominate the landscape and is essentially imperceptible. The ability of the landscape to absorb the facility is very high, and the change is compatible with the existing visual character of the area.
- *Minor impacts:* The impact is slight but detectable, and the change is small. The facility is subordinate to the surrounding landscape and is relatively low in dominance. The ability of the landscape to absorb the facility is high, and the change is compatible with the existing visual character of the area. If mitigation is needed to offset adverse effects, it is simple and likely to be successful.
- *Moderate impacts:* The impact is readily apparent and the change attracts attention and alters the view, and the dominance of the facility on the landscape is high. The ability of the landscape to absorb the impact is low, and the change is moderately compatible with the existing visual character of the area. Mitigation measures are necessary to offset adverse effects and are likely to be partially successful.
- *Major impacts:* The impact is severe, and the change is highly noticeable. The facility dominates the landscape. The ability of the landscape to absorb the impact is very low, and the impact has very little compatibility with the overall visual character of the area. Extensive mitigation measures are needed to offset adverse effects, and their success is not guaranteed.
- *Impairment:* The impact occurs within an extremely visually sensitive area. The impact is not compatible with the overall visual character of the area, the landscape is unable to absorb the impact, and mitigation measures are unsuccessful in alleviating the impact. The impact contributes substantially to the degradation of the overall scenic quality to the point that the park's

purpose cannot be fulfilled, and resource degradation precludes the enjoyment of future generations.

Alternative A

Under this alternative, no additional WTFs would be constructed, so there would be no new impacts to visual resources.

Cumulative Effects: There are no cumulative effects to visual resources under Alternative A.

Conclusion: There is no effect on visual resources under Alternative A.

Alternative B

By locating WTFs in developed areas, they would be in the vicinity of other man-made structures such as buildings, marinas, water towers, telephone poles, and transmission lines, although none of these other facilities achieve heights comparable to WTFs. To minimize the visual impact of WTF sites, only monopoles and lattice towers would be considered. Structures would be painted an appropriate color to help them blend with the surrounding landscape and to minimize light reflection. The maximum allowable height under this alternative is 125 feet, but for each site only the minimum height needed to achieve the desired coverage would be authorized. Carriers would be required to provide a justification of tower height as part of the application process, including a defensible demonstration of how shorter structures would compromise project objectives.

WTFs would be located in areas with existing infrastructure, so their presence would be moderately compatible with the surrounding areas. However, the towers would be readily apparent due to their height, and thus would create a visual obtrusion that does not presently exist. This long-term impact may occur in each of seven project areas.

Cumulative Effects: Natural viewsheds are subject to human influences both in the park and in the surrounding area. Within the park, new facilities are planned for developed areas, rights-of-way impinge on the landscape, and bridge over Black Canyon to bypass Hoover Dam is currently being constructed. Outside the park, land continues to be developed as growth in southern Nevada continues. This alternative would make a slight contribution to these effects.

Conclusion: Impacts to visual resources would be moderate under this alternative, but due to the placement of WTFs in developed areas in the presence of other man-made structures, impacts would not be unacceptable and would not constitute impairment.

Alternative C

By locating WTFs in developed areas, they would be in the vicinity of other man-made structures such as buildings, marinas, water towers, telephone poles, and transmission lines, although none of these other structures achieve heights comparable to WTFs. To minimize the visual impact of WTF sites, only monopoles and lattice towers would be considered. Structures would be painted an appropriate color to help them blend with the

surrounding landscape and to minimize light reflection. The maximum allowable height under this alternative is 200 feet, but for each site only the minimum height needed to achieve the desired coverage would be authorized. Carriers would be required to provide a justification of tower height as part of the application process, including a defensible demonstration of how shorter structures would compromise project objectives.

Due to the greater heights of WTFs that are allowable under this alternative, towers could be extremely noticeable by visitors and their presence could dominate the landscapes. Although moderately compatible with the surrounding area, taller towers would create a greater visual obtrusion relative to Alternative B. Therefore, under this alternative, impacts to visual resources would be moderate at best and potentially major depending on the height authorized. This long-term impact may occur in each of seven project areas.

Cumulative Effects: Cumulative effects would be the same as those describe under Alternative B.

Conclusion: Impacts to visual resources would be moderate to major under this alternative, but due to the placement of WTFs in developed areas in the presence of other man-made structures, impacts would not be unacceptable and would not constitute impairment.

PARK OPERATIONS

Criteria and Thresholds for Impact Analysis

Park operations refer to the ability of the park to adequately protect and preserve vital park resources and to provide for an enjoyable visitor experience. Operational efficiency is influenced not only by park staff, but also by the adequacy of the existing infrastructure used in the day to day operation of the park. Analysis of impacts to park operations must consider (1) employee and visitor health and safety, (2) the park's mission to protect and preserve resources, and (3) existing and needed facilities and infrastructure. The thresholds for defining the intensity of impacts to park operations are defined as follows:

- *Negligible impacts:* Park operations are not affected, or the effects are at low levels of detection and do not have an appreciable effect on park operations.
- *Minor impacts:* The effect is detectable and likely short-term, but is of a magnitude that does not have an appreciable effect on park operations. If mitigation is needed to offset adverse effects, it is simple and likely to be successful.
- *Moderate impacts:* The effects are readily apparent, likely long-term, and result in a substantial change in park operations in a manner noticeable to staff and to the public. Mitigation measures are necessary to offset adverse effects and are likely to be successful.

- *Major impacts:* The effects are readily apparent, long-term, and result in a substantial change in park operations in a manner noticeable to staff and the public. Changes are markedly different from existing operations. Extensive mitigation measures are needed to offset adverse effects, and their success is not guaranteed.

Alternative A

Currently, park radios are the primary means of communication among park personnel working in the field, and radio repeaters at strategic locations in the park enable communication from most locations, including those that are very remote. However, radios may not be effective for communicating with concessioners, outside entities, or office-based park staff who do not have access to radios. In such cases, phones (either cellular or land-based) become important. In addition, radios are not an available option for visitors, who may rely on cell phones to contact park staff to report incidents or emergencies. Under the no-action alternative, cell phones would remain an option in areas where service is currently available, but their use would not be expanded to other areas.

Cumulative Effects: As visitation increases and people become increasingly dependent on cell phones in the absence of other forms of communication, impacts to park operations can be expected to increase.

Conclusion: Although other forms of communication are often available, the lack of expanded cell phone coverage would have a minor adverse effect on park operations.

Alternative B

Under this alternative, up to seven additional WTFs up to 125 feet tall could be built in developed areas. Existing WTFs could be replaced or redesigned. Cell phone coverage would be expanded, and cell phone use would become a viable option at all of the park's developed areas. This would result in greater communication options, which would have beneficial effects on park operations, including those related to law enforcement, maintenance, and concessions management. Visitors would have a greater ability to contact park staff to report incidents or emergencies. In addition, Alternative B addresses letters and comments received from the public requesting that cellular service be made available within the park for safety and enjoyment purposes.

Cumulative Effects: Expansion of cell phone coverage could have additional benefits in light of recent and predicted changes to park operations. Low lake levels recently forced a marina to vacate its location at Overton Beach, an area that receives cell phone service. A portion of the marina was moved to Temple Bar, which does not currently have the service. Increased visitation at Temple Bar could make the service more valuable as operations in that area expand. Echo Bay will also likely see increased visitation now that the Overton marina has moved, and coverage in this area is spotty. In addition, the completion of the Hoover Dam Bypass Bridge, scheduled for 2010, would make the eastern area of the park more easily accessible and may increase visitation to both Willow Beach and Temple Bar.

Conclusion: The expansion of cell phone coverage under Alternative B would have moderate beneficial effects to park operations.

Alternative C

Under this alternative, up to seven additional WTFs up to 200 feet tall could be built in developed areas. Existing WTFs could be replaced or redesigned. Although the taller towers would provide slightly more coverage than under alternative B, the difference is not appreciable, and the impacts to Park Operations are the same as those described under Alternative B.

Cumulative Effects: Cumulative effects would be the same as those described under Alternative B.

Conclusion: The expansion of cell phone coverage under Alternative C would have moderate beneficial effects to park operations.

WILDLIFE AND WILDLIFE HABITAT

Criteria and Thresholds for Impact Analysis

Laws, Regulations, and Policies: The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the NPS 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 maintain 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 and the Nevada Department of Wildlife.

Impact Indicators, Criteria, and Methodology: The impacts to wildlife were evaluated in terms of impacts to individual animals and wildlife habitat. Specific localized impacts were estimated based on knowledge garnered from similar past activities and from consulting wildlife research and survey information.

The following are standards used by the NPS in interpreting the level of impact to wildlife:

- *Negligible impacts:* No species of concern are present; no impacts or impacts with only temporary effects are expected.
- *Minor impacts:* Nonbreeding animals of concern are present, but only in low numbers. Habitat is not critical for survival; other habitat is available nearby. Occasional flight responses by wildlife are expected, but without interference

with feeding, reproduction, or other activities necessary for survival. Mortality of species of concern is not expected.

- *Moderate impacts:* Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or winter; mortality or interference with activities necessary for survival is expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park.
- *Major impacts:* Breeding animals are present in relatively high numbers, and/or wildlife is present during particularly vulnerable life stages. Habitat targeted by actions has a history of use by wildlife during critical periods, but there is suitable habitat for use nearby. Few incidents of mortality could occur, but the continued survival of the species is not at risk.
- *Impairment:* The impact contributes substantially to the deterioration of natural resources to the extent that the park's wildlife and habitat no longer function as a natural system. Wildlife and its habitat are affected over the long-term to the point that the park's purpose is not fulfilled, and the resource cannot be experienced and enjoyed by future generations.

Alternative A

Under this alternative, no additional WTFs would be constructed, so there would be no new impacts to wildlife and wildlife habitat.

Cumulative Effects: There would be no cumulative effects on wildlife or wildlife habitat under Alternative A.

Conclusion: Alternative A would have no effect on wildlife or wildlife habitat and no impairment would result.

Alternative B

Under this alternative, up to seven WTF sites could be constructed at developed areas within the park. At a maximum, this would result in the permanent alteration of 0.4 acres of land to site the facilities. This would be a negligible impact to wildlife since the previously disturbed areas already provide poor to marginal habitat. During construction, a NPS resource manager would be on site to ensure that no wildlife is present in the immediate project area, so there would be no direct harm to individual animals.

However, there would be short-term, minor, adverse effects to wildlife as nearby animals are disrupted by the increased noise and activity associated with installing the facilities.

After completion of construction, impacts to birds are possible through direct collision with the towers. The USFWS recommends that towers be kept under 200 feet, so that guy wires (which increase collisions) and lighting (which causes disorientation) are not needed. Under this alternative, WTFs would not exceed 125 feet, and lights and guy

wires would not used. However, occasional collisions are still possible, resulting in moderate adverse impacts to wildlife.

Cumulative Effects: Construction of communication towers is growing at an exponential rate. Bird mortality can result from towers constructed for radio, television, cellular phones, public safety, wireless data, and government dispatch operations. In addition, bird mortality may occur from collisions with wind generators, electric transmission and distribution lines, glass windows, aircraft, and automobiles. Other human-related threats to birds include oil and contaminant spills, pesticide poisonings, predation by domestic cats, introductions of exotic species, and habitat loss and/or degradation.

There are currently four WTFs (including one mobile unit) within the 1.5 million acres comprising Lake Mead NRA. This alternative could result in construction of seven new towers (including a redesign of the facilities at Callville Bay). When factoring in the numerous towers being constructed on lands adjacent to the park and throughout the region, it would be unlikely that construction of seven additional WTFs in the park would have appreciable cumulative impacts on birds and wildlife.

Conclusion: Since birds may occasionally collide with towers in spite of design features and mitigation aimed at reducing this probability, there could be long-term moderate impacts to wildlife under this alternative. There would be no unacceptable impacts or impairment to wildlife or wildlife habitat as a result of implementing Alternative B.

Alternative C

Under this alternative, up to seven WTF sites could be constructed at developed areas within the park. At a maximum, this would result in the permanent alteration of 0.4 acres of land to site the facilities. This would be a negligible impact to wildlife since the previously disturbed areas already provide poor to marginal habitat. During construction, a NPS resource manager would be on site to ensure that no wildlife is present in the immediate project area, so there would be no direct harm to individual animals. However, there would be short-term, minor, adverse effects to wildlife as nearby animals are disrupted by the increased noise and activity associated with installing the facilities.

After completion of construction, impacts to birds are possible through direct collision with the towers. The USFWS recommends that towers be kept under 200 feet, so that guy wires (which increase collisions) and lighting (which causes disorientation) are not needed. Under this alternative, WTFs would not exceed 200 feet, and lights and guy wires would not used. However, occasional collisions are still possible, resulting in moderate adverse impacts to wildlife. Since the maximum height of towers under this alternative is 75 feet higher than under Alternative B, collisions and mortality may be more likely. However, under both alternatives, tower height will always be restricted to the minimum necessary to provide the necessary coverage (as determined through consultation with the providers and based on a demonstration of increasing operational benefit with added height).

Cumulative Effects: Cumulative effects would be the same as those described under Alternative B.

Conclusion: Since birds may occasionally collide with towers in spite of design features and mitigation aimed at reducing this probability, there could be long-term moderate impacts to wildlife under this alternative. There would be no unacceptable impacts or impairment to wildlife or wildlife habitat as a result of implementing Alternative C.

THREATENED AND ENDANGERED SPECIES

Criteria and Thresholds for Impact Analysis

Laws, Regulations, and Policies: Section 7 of the Endangered Species Act mandates that all federal agencies determine how to use their existing authorities to further the purposes of the 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 2006 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 (4.4.2.3). It sets the direction to meet the obligations of the Act. *NPS Management Policies 2006* also directs the NPS 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 *General Management Plan* designated 1,050,030 acres, or 70 percent of the NRA, as natural zones. Areas with known or potential habitat for rare, threatened, or endangered species were further protected by placement in the environmental protection or outstanding natural feature subzone of the natural zone. Management of these zones focuses on the maintenance of isolation and natural process, and restoration of natural resources.

Impact Indicators, Criteria, and Methodology: The Endangered Species Act defines the terminology used to assess impacts to listed species as follows:

- *No effect:* The appropriate conclusion when the action agency determines that its proposed action would not affect a listed species or designated critical habitat.
- *Is not likely to adversely affect:* The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on the best judgment, a

person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

- *Is likely to adversely affect:* The appropriate finding if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action “is likely to adversely affect” the listed species. If incidental take is anticipated to occur as a result of the proposed action, an “is likely to adversely affect” determination should be made.
- *Is likely to jeopardize listed species/adversely modify critical habitat – (Impairment):* The appropriate conclusion when the action agency or the U.S. Fish and Wildlife Service identifies situations in which the proposed action is likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat.

Alternative A

Under this alternative, no new WTFs would be constructed, so there would be no impacts on threatened or endangered species, or any other species of special concern.

Cumulative Effects: There are no cumulative effects to threatened and endangered species under this alternative.

Conclusion: Alternative A would have no effect on threatened or endangered species and no impairment would occur.

Alternative B

Although the federally threatened desert tortoise is present in the surrounding areas, tortoises are rarely found in previously disturbed habitat in the vicinity of park developments. WTF sites would only be authorized in previously disturbed habitat that is unoccupied by desert tortoises. However, a tortoise could wander into an area where a WTF is being constructed if the site has not been made inaccessible by fencing or other means. Therefore, as a precaution, a NPS Resource Manager would be on site during construction of the WTFs to ensure that no tortoises are harassed or harmed by project activities. If a tortoise is found on the project site, all work will cease until the animal has vacated the area. Therefore, this alternative is not likely to adversely affect the desert tortoise.

Cumulative Effects: Since the desert tortoise is not expected to be adversely affected, and since no other federally protected species occur in the project area, there would be no cumulative impacts to threatened and endangered species.

Conclusion: Implementation of Alternative B is not likely to adversely affect the desert tortoise. There would be no unacceptable impacts or impairment to threatened or endangered species from Alternative B.

Alternative C

The impacts to threatened and endangered species from Alternative C are the same as those described under Alternative B.

Cumulative Effects: Cumulative effects would be the same as those described under Alternative B.

Conclusion: Implementation of Alternative C is not likely to adversely affect the desert tortoise. There would be no unacceptable impacts or impairment to threatened or endangered species from Alternative C.

SOILS AND VEGETATION

Criteria and Thresholds for Impact Analysis

Laws, Regulations, and Policies: Soil resources would be protected by preventing or minimizing adverse potentially irreversible impacts on soils, in accordance with NPS *Management Policies* 2006. NPS-77 specifies objectives for each management zone for soil resources management. These management objectives are defined as: (1) natural zone: preserve natural soils and the processes of soil genesis in a condition undisturbed by humans; (2) cultural zone: conserve soil resources to the extent possible consistent with maintenance of the historic and cultural scene and prevent soil erosion wherever possible; (3) park development zone: ensure that developments and their management are consistent with soil limitations and soil conservation practices; and, (4) special use zone: minimize soil loss and disturbance caused by special use activities, and ensure that soils retain their productivity and potential for reclamation.

Zones within the recreation area have been designated in the Lake Mead NRA General Management Plan, which provides the overall guidance and management direction for Lake Mead NRA.

The NPS Organic Act directs the park to conserve the scenery and the natural objects unimpaired for future generations. NPS *Management Policies* 2006 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, the NPS will seek to ensure that such removals will not cause unacceptable impacts to native resource, natural processes, or other park resources.

Exotic species, also referred to as non-native or alien, are not a natural component of the ecosystem. They are managed, up to and including eradication, under the criteria specified in NPS *Management Policies* 2006 and NPS-77.

Impact Indicators, Criteria, and Methodology: The following impact thresholds were established for impacts to soils and vegetation.

- *Negligible impacts:* Impacts have no measurable or perceptible changes in soil structure or plant community size, integrity, or continuity. Impacts occur in a relatively small area.
- *Minor impacts:* Impacts are measurable or perceptible, but localized in a relatively small area. The overall soil structure and viability of the plant community is not affected.
- *Moderate impacts:* Impacts are localized and small in size, but cause a permanent change in the area's soil structure or plant community (e.g. plant diversity, abundance, or distribution).
- *Major impacts:* Impact to the soil structure or plant community are substantial, highly noticeable, and permanent.
- *Impairment:* For this analysis, impairment is considered a permanent change in soils and vegetation in a large portion of the park, affecting the resource over the long-term to the point that the park's purpose cannot be fulfilled, and resource degradation precludes the enjoyment of future generations.

Alternative A

Under this alternative, no additional WTFs would be constructed, and no impacts to soils and vegetation would result.

Cumulative Effects: There would be no cumulative effects to soils and vegetation from Alternative A.

Conclusion: Alternative A would have no effect on soils or vegetation and no impairment would occur.

Alternative B

Under this alternative, up to seven new WTF sites could be constructed. Potential WTF sites would be sited within developed areas in close proximity to other structures and would have existing road access and utilities nearby. WTFs would be constructed in previously disturbed areas, and sites would be no larger than 50 feet by 50 feet. Approximately 2,500 sq. ft. (0.06 acre) of land would be altered at each site, resulting in 17,500 sq. ft. (0.4 acre) of disturbance for seven sites. Grading of existing access roads and minor road improvements may be needed to provide safe access to WTF sites. To the greatest extent practicable, trenching to existing electrical and telephone utilities would be restricted to existing corridors and other previously disturbed areas.

WTFs would be constructed in areas devoid of vegetation, or in previously disturbed areas with minimal vegetation and surrounded by habitat supporting populations of more

abundant plant species. Revegetation is not expected to be necessary, although plants may be used to screen ground-based equipment. To prevent the spread of non-native plant species, construction equipment would be pressure-washed and inspected by a NPS Resource Manager prior to working in the park.

Cumulative Effects: Soils and vegetation in the developed areas of Lake Mead have been previously impacted by the establishment of park facilities and concessioner operations. Other impacts are occurring as the park adapts operations to accommodate the declining lake level. Additional impacts are anticipated from the proposed park-wide water and sewer system replacement and from redevelopment projects at Willow Beach and Callville Bay. However, current and future activities (including potential WTF sites) are largely restricted to areas already disturbed and thus do not have an appreciable effect on the integrity of the park's soils and vegetation as a whole.

Conclusion: Since construction of WTFs would utilize previously disturbed areas for equipment and access, Alternative B would result in minor long-term adverse impacts to soils and vegetation. There would be no unacceptable impacts and no impairment to soils and vegetation from implementation of Alternative B.

Alternative C

The ground area needed for the taller towers allowed under Alternative C is the same as that needed for the smaller towers allowed under Alternative B. Therefore, impacts to soils and vegetation under Alternative C are the same as those described under Alternative B.

Cumulative Effects: Cumulative effects would be the same as those described under Alternative B.

Conclusion: Since construction of WTFs would utilize previously disturbed areas for equipment and access, Alternative C would result in minor long-term adverse impacts to soils and vegetation. There would be no unacceptable impacts and no impairment to soils and vegetation from implementation of Alternative C.

CULTURAL RESOURCES

Criteria and Thresholds for Impact Analysis

Laws, Regulations, and Policies: Numerous legislative acts, regulations, and NPS policies provide direction for the protection, preservation, and management of cultural resources on public lands. Further, these laws and policies establish what must be considered in general management planning and how cultural resources must be managed in future undertakings resulting from the approved plan regardless of the final alternative chosen. Applicable laws and regulations include the NPS Organic Act (1916), the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (1992, as amended), the National Environmental Policy Act of 1969, the National Parks and Recreation Act of 1978, the Archeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the Curation of Federally Owned and Administered

Archeological Collections (1991). Applicable agency policies relevant to cultural resources include Chapter 5 of NPS *Management Policies* 2006 and the *Director's Order 28: Cultural Resource Management Guideline* (NPS 1998).

The National Historic Preservation Act of 1966 (NHPA; 16 USC 470, et seq.) requires in section 106 that federal agencies with direct or indirect jurisdiction over undertakings take into account the effect of those undertakings on properties that are listed on, or eligible for listing on, the National Register of Historic Places. Section 110 of the act further requires federal land managers to establish programs in consultation with the state historic preservation office to identify, evaluate, and nominate properties to the national register. This act applies to all federal undertakings or projects requiring federal funds or permits.

Impact Indicators, Criteria, and Methodology: Impacts on cultural resources were assessed based on existing conditions, current regulations, and likely development trends. The inventory of archaeological resources in the park is largely incomplete. Under Section 106 of the National Historic Preservation Act (NHPA), only historic resources that are eligible or are listed on the National Register of Historic Places are considered for impacts. For purposes of assessing impacts, all unrecorded resources and unevaluated structures and landscapes are considered potentially eligible for listing on the National Register of Historic Places. An impact to a property occurs if a proposed action would alter in any way the characteristic that qualifies it for inclusion on the register.

Under the Advisory Council's regulations a determination of either *adverse effect* or *no adverse effect* must also be made for affected, National Register eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g. diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance, or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

For the purposes of this document, the level of impacts to cultural resources was defined by the following criteria:

- *Negligible impacts:* No potentially eligible or listed properties are present; there are no direct or indirect impacts. For purposes of Section 106, the determination would be *no effect*.
- *Minor impacts:* Potentially eligible or listed properties are present; there are no direct impacts that diminish the integrity of the property, or impacts with only temporary effects are expected. For purposes of Section 106, the determination would be *no adverse effect*.

- *Moderate impacts:* Potentially eligible or listed properties are present; indirect impacts may occur or, in the case of structures, activity is limited to rehabilitation conducted in a manner that preserves the historical and architectural value of the property. For purposes of Section 106, the determination would be *no adverse effect*.
- *Major impacts:* Potentially eligible or listed properties are present; direct impacts include physical destruction, damage, or alteration of all or part of a property. A property is isolated from its setting, or there is alteration of the character of a property's setting when that character contributes to its eligibility. Visual, audible, or atmospheric elements are introduced that are out of character with the property or alter its setting. Neglect of a property results in its deterioration or destruction (36 CFR 800.5). For purposes of Section 106, the determination would be *adverse effect*.
- *Impairment:* There is loss, destruction, or degradation of a cultural property, resource, or value to the point that it negatively affects the park's purpose, and the resource cannot be enjoyed by future generations. For purposes of Section 106, the determination would be *adverse effect*.

Alternative A

Under the no-action alternative, no new WTFs would be constructed, so there would be no impacts to cultural resources.

Cumulative Effects: There would be no cumulative effects on cultural resources from the No-Action Alternative.

Conclusion: There would be no effect on cultural resources and no impairment would occur under Alternative A.

Alternative B

Potentially acceptable sites have identified in previously disturbed locations within the developed areas, so the potential for cultural resources to be present is anticipated to be very low. Nevertheless, all sites would be surveyed prior to construction. If any archeological resources are found, the NPS will consult with the SHPO to determine their significance. If the sites are significant and determined eligible for the NRHP, all necessary steps will be taken to avoid them during project activities. WTFs will not be authorized on sites where impacts to cultural resources cannot be avoided or effectively mitigated. If archaeological resources are discovered during construction, all work will cease and the park archaeologist will be contacted to determine an appropriate course of action. Therefore, no impacts to cultural resources are anticipated.

Cumulative Effects: Since cultural resources will be avoided or protected, there are no cumulative effects under Alternative B.

Conclusion: In the unlikely event that cultural resources are present near WTF sites, there would be no impacts that diminish their integrity, so any potential effects would be minor. There would be no unacceptable impacts and no impairment to cultural resources.

Alternative C

Impacts to cultural resources under Alternative C are the same as those described under Alternative B.

Cumulative Effects: Since cultural resources will be avoided or protected, there are no cumulative effects under Alternative C.

Conclusion: In the unlikely event that cultural resources are present near WTF sites, there would be no impacts that diminish their integrity, so any potential effects would be minor. There would be no unacceptable impacts and no impairment to cultural resources.

SECTION V: COORDINATION AND CONSULTATION

A press release announcing a 30-day public scoping period was posted on the park website and issued to area media on March 31, 2006 (Appendix B). Responses supported the development of a WTF plan and were in favor of improved cellular coverage in the recreation area.

A press release announcing a 30-day public review period for the environmental assessment is sent to various federal and state agencies, individuals, businesses, and organizations on the park's mailing list. The press release is also posted at the Alan Bible Visitor Center and the visitor center at Katherine's Landing. Notification is also published on the Lake Mead NRA website (<http://www.nps.gov/lame>) and on the NPS Planning, Environment, and Public Comment website at <http://parkplanning.nps.gov>.

Lake Mead NRA's mailing list is comprised of 195 federal and state agencies, individuals, businesses, and organizations. The environmental assessment will be distributed to those individuals, agencies, and organizations likely to have an interest in this project. Entities on the park mailing list that do not receive a copy of the environmental assessment will receive a letter notifying them of its availability and methods of accessing the document. Copies of the environmental assessment are available at area libraries, including: Boulder City Library, Clark County Community College (North Las Vegas), Clark County Library, Las Vegas Public Library, Mohave County Library (Kingman, AZ), Sunrise Public Library (Las Vegas), University of Arizona Library (Tucson, AZ), University of Nevada- Las Vegas James R. Dickinson Library, Meadview Community Library, Moapa Valley Library (Overton, NV), Mesquite Library, Mohave County Library (Lake Havasu City, AZ), Laughlin Library, Searchlight Library, and Washington County Library (St. George, UT). Comments on this document will be accepted during the 30-day review period.

Individuals and organizations can request the environmental assessment in writing, by phone, or by e-mail. Requests should be directed to:

National Park Service, Lake Mead NRA
Attention: Compliance Office
601 Nevada Way
Boulder City, Nevada 89005
Telephone: (702) 293-8956

SECTION VI: LIST OF PREPARERS

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SECTION VII: REFERENCES

U.S. Public Laws, Codes, Federal Regulations, Statutes, and Acts

All U.S. Public Laws, Codes, Federal Regulations, and Statutes can be found at the Office of the Federal Register, U.S. Government Printing Office, Washington, DC. Many can be found on the Internet at <http://www.gpo.gov>.

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APPENDIX A: MODELING WIRELESS COVERAGE

Cellular coverage in Lake Mead NRA was modeled using a combination of two computer programs: one for calculating the coverages, and another for depicting these coverages in conjunction with other detailed map data. The first program used, RFCAD v. 2.4, is designed for modeling the propagation of radio waves (the type used by cell phones). For each existing and potential cell tower location, several site-specific parameters (tower height, output power, antenna type, transmitting frequency, receiver height above ground, type of modeling algorithm, radius of area to be modeled) were entered into the model before running it. Because the coverage of cell phones can be heavily influenced by obstacles and different surfaces (buildings, terrain, vegetation, etc), a proprietary elevation dataset was used in RFCAD as a background for running the model. The elevation data has a horizontal resolution of 3 arc-seconds, which means the model produces “pixels” that measure approximately 90 meters north-south by 75 meters east-west.

At each potential tower site, the model was run using the following parameters:

Maximum tower height: 200 feet

Minimum tower height: 125 feet

Transmitting power (aka, Effective Radiated Power, or ERP): 300 Watts

High frequency transmission: 1990MHz

Low-frequency transmission: 800MHz

Antenna type: Omni (transmits horizontally in 360 degrees)

Propagation distance: 10miles

After a propagation model was run for each tower configuration, the output was exported to a file format compatible with ArcGIS Desktop v.9.1, a suite of Geographic Information System (GIS) programs. Using the mapping program ArcMap, the model output was overlaid with other data such as park roads, water bodies, terrain, and tower locations. By switching back and forth between the output results of the different propagation models for each area, it is possible to compare and contrast them in terms of effective coverage area.

APPENDIX B: SCOPING PRESS RELEASE



National Park Service (NPS)

Lake Mead National
Recreation Area

601 Nevada Way
Boulder City, NV 89005

702.293.8947 phone
702.293.8936 fax

Lake Mead National Recreation Area (NRA) News Release
For Immediate Release: March 31, 2006
Release: 7-06
Roxanne Dey - 702.293.8947

Lake Mead NRA Proposes Wireless Telecommunication Facility Plan

Lake Mead (NRA) receives numerous inquiries from wireless telecommunication companies seeking to develop sites within the park to provide cellular phone service. Currently, there are four companies doing business at three existing cell towers located within the park, but demand is increasing. Officials at Lake Mead NRA are proposing to develop a plan to address the park's future needs.

The proposed wireless telecommunication facility plan would be used to determine the level of wireless coverage appropriate for the park, to identify suitable locations for new facilities, and to develop a strategy for addressing future requests from wireless companies.

Wireless telecommunication companies are required to obtain a right-of-way permit to do business in a national park. In addition, all requirements of the National Environmental Policy Act must be satisfied before any new facilities can be constructed on federal land. Completion of a park-wide plan would help satisfy these requirements and facilitate timely responses to future requests.

An environmental assessment will be prepared to identify and evaluate potential alternatives, including no action, for the proposed plan. Officials at Lake Mead NRA are seeking public input on alternatives, issues, and impacts to be addressed in the environmental assessment. Written comments, which must be received by April 30, 2006, should be sent to: Superintendent, Lake Mead National Recreation Area, Attention Compliance Office, 601 Nevada Way, Boulder City, Nevada 89005.

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