

Lake Mead National Recreation Area
Arizona, Nevada

National Park Service
US Department of the Interior



Cottonwood Cove Road Improvements Project

ENVIRONMENTAL ASSESSMENT



APRIL 2023

**US DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE
LAKE MEAD NATIONAL RECREATION AREA**

**COTTONWOOD COVE ROAD IMPROVEMENTS PROJECT
ENVIRONMENTAL ASSESSMENT**

The National Park Service (NPS) has prepared this environmental assessment (EA) to evaluate the impacts of improving Cottonwood Cove Road in Lake Mead National Recreation Area (Lake Mead NRA or park), Clark County, Nevada. The proposed project would address the badly deteriorated roadway, correct deficiencies in the existing road, improve drainage to minimize life cycle costs related to frequent flood damage, and improve safety and accessibility for NPS staff and the public.

This EA presents one action alternative for managing Cottonwood Cove Road, as well as a no-action alternative to describe the current conditions and management activities. The EA describes the affected environment to be impacted by the alternatives and an analysis of environmental consequences from both alternatives. Under the no-action alternative, no improvements would be made to Cottonwood Cove Road, though routine maintenance would continue. Under the proposed action, modifications would be made to Cottonwood Cove Road to improve visitor experience, safety, accessibility, and park operations.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended. This EA has been prepared to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet the objectives of the proposal, 2) evaluates potential issues and impacts on the park's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts.

How to Comment

We invite you to comment on this Cottonwood Cove Road Improvements Project EA during the 30-day public review period. The NPS is also seeking comments on effects on historic properties from the proposed work in accordance with Section 106 of the National Historic Preservation Act.

The preferred method of providing comments is through the NPS's Planning, Environment, and Public Comment (PEPC) website for the park at: <http://parkplanning.nps.gov/LAKE>. You may also submit written comments to:

Lake Mead National Recreation Area
Compliance Office
Attn: Cottonwood Cove Road Project
601 Nevada Way
Boulder City, NV 89005

Please submit your written comments postmarked no later than 30 days from the posting of the availability of the EA, which will be posted on the PEPC website. Please be aware that your entire comment will become part of the public record. If you wish to remain anonymous, please clearly state that within your correspondence; however, the NPS cannot guarantee that personal information, such as email address, phone number, etc. will be withheld.

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
APE	Area of Potential Effects
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CFR	Code of Federal Regulations
EA	Environmental Assessment
ESA	Endangered Species Act
FHWA	Federal Highway Administration
IPaC	Information for Planning and Consultation
Lake Mead NRA/park	Lake Mead National Recreation Area
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NDW	Nevada Division of Wildlife
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
PBO	Programmatic Biological Opinion
PEPC	Planning, Environment, and Public Comment
RV	Recreational Vehicle
SHPO	State Historic Preservation Office
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
USC	United States Code
USFWS	US Fish and Wildlife Service

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

Background

Lake Mead National Recreation Area (Lake Mead NRA or the park) encompasses 142 miles of the Colorado River in northwestern Arizona (Mohave County) and southern Nevada (Clark County). 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 (figure 1). Lake Mead NRA provides plentiful opportunities for water-based recreation, including boating, swimming, sailing, kayaking, fishing, and other activities. Providing abundant opportunities for land- and water-based recreational pursuits is one of the park's fundamental values (NPS 2015a).

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA) Central Federal Lands, is proposing to rehabilitate Cottonwood Cove Road at Lake Mead NRA. Cottonwood Cove is located in Clark County, Nevada east of the city of Searchlight. This area provides a variety of recreational opportunities, including two campgrounds, a trailer home/recreational vehicle (RV) park, a marina and boat launch, a motel with a marina store and café, a fish cleaning station, a swim beach, and a picnic area. Cottonwood Cove Road provides the only access to these amenities. It is a two-lane, asphalt road that extends 13.5 miles from US Route 95 in Searchlight, Clark County, Nevada to Cottonwood Cove at the northern end of Lake Mohave. The current lanes on the road are insufficiently wide for large vehicles and trailers. The unpaved shoulders also result in vehicle wheels dropping from pavement to dirt and have resulted in accidents and rutting along the pavement's edge. This project would rehabilitate approximately 6.8 miles of Cottonwood Cove Road from the Cottonwood Cove Lake Mead NRA Entrance Station to the Cottonwood Cove Marina (figure 2). Two sections of the road are located within Lake Mead NRA and are maintained by the NPS. The remaining section of the road travels through the Piute Eldorado Valley Area of Critical Environmental Concern (ACEC), which is managed by the Bureau of Land Management (BLM); the portion of road within BLM lands is considered a county road and is maintained by Clark County (figure 2). This environmental assessment (EA) will cover the impacts of the project for both agencies.

Purpose of Action

The purpose of the project is to improve access and safety for visitors and NPS staff and better accommodate large vehicles and trailers traveling to the Cottonwood Cove Marina, boat launch, campgrounds, and RV resort. In its current condition, the road presents driver safety and environmental hazards.

Need for Action

The rehabilitation of Cottonwood Cove Road is needed to address the badly deteriorated roadway, correct deficiencies in the existing road, improve drainage to minimize life cycle costs related to frequent flood damage, and improve safety for NPS staff and the public. Under current conditions, water access to Lake Mead is becoming increasingly difficult, making safe and reliable access to Lake Mohave progressively more important for maintaining recreation opportunities at Lake Mead NRA.

Figure 1. Location of Lake Mead National Recreation Area and Cottonwood Cove Road

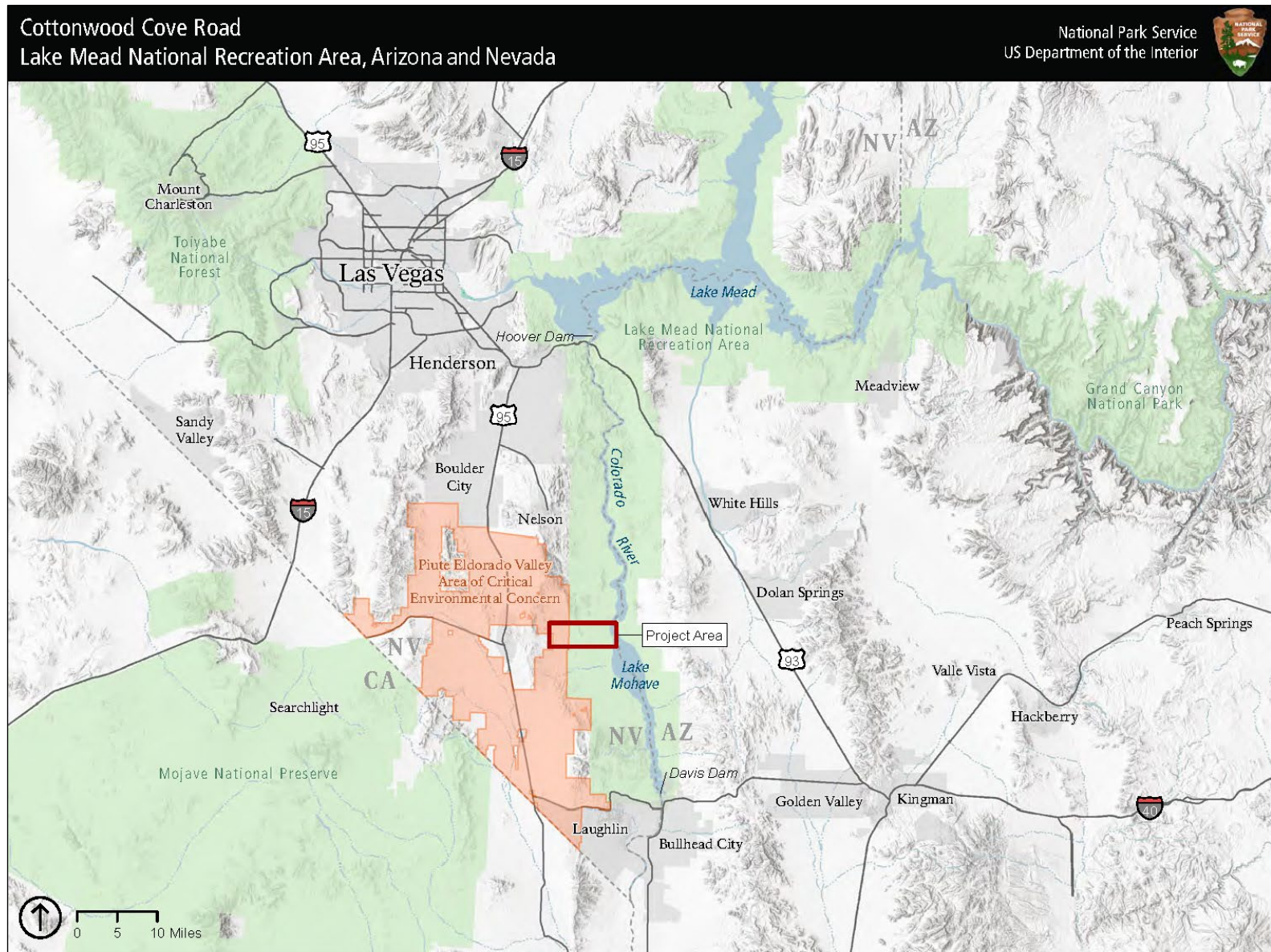
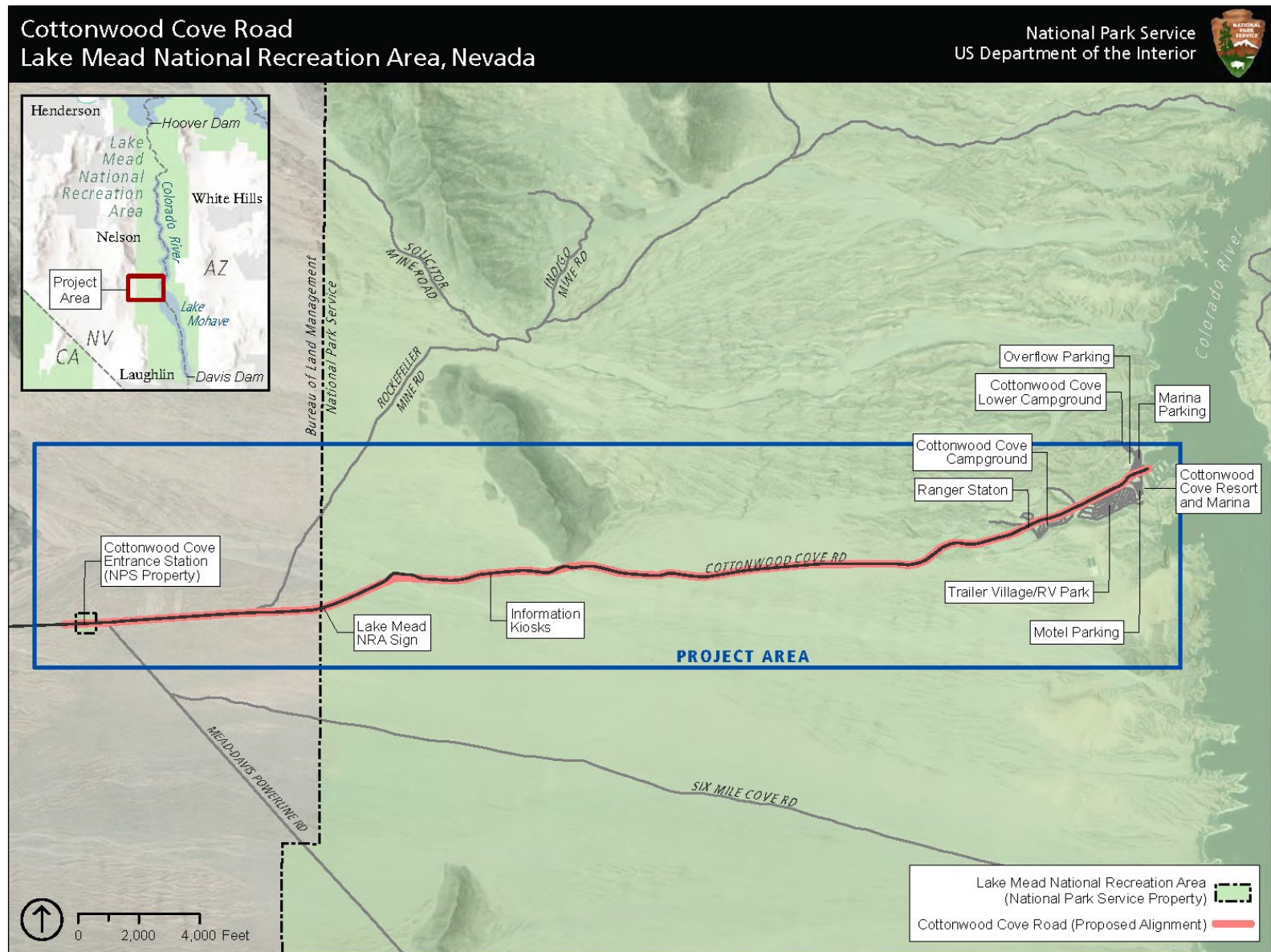


Figure 2. Cottonwood Cove Road Improvements Project Area



Issues and Resource Topics Retained for Detailed Analysis

Identifying issues — potential problems, concerns, conflicts, obstacles, or benefits that would result if an action were implemented — is an important part of the environmental review process. It is standard practice to organize issues by resource impact topics. Impact topics for this proposed project have been identified based on federal laws and regulations; the NPS National Environmental Policy Act (NEPA) Handbook (NPS 2015b); NPS *Management Policies 2006*; and NPS knowledge of resources at the park.

Issues should be retained for consideration and discussed in detail if:

- The environmental impacts associated with the issue are central to the proposal or of critical importance.
- A detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives.
- The environmental impacts associated with the issue are a big point of contention among the public or other agencies.
- There are potentially significant impacts on resources associated with the issue.

Impact topics that are carried forward for further analysis are listed below.

Vegetation

Native plants and their habitat would be affected during construction and widening the road would result in a permanent loss of habitat. Construction equipment often harbors foreign soil or non-native plant material, which could introduce or spread non-native plants. The environmental impacts on native vegetation are analyzed, as a portion of the project occurs within Mojave desert tortoise (*Gopherus agassizii*) critical habitat.

Special-status Species (Mojave Desert Tortoise and Banded Gila Monster)

The Mojave desert tortoise is listed as a threatened species both federally and by the state of Nevada, and the banded Gila monster (*Heloderma suspectum cinctum*) is classified as a protected reptile in Nevada. Both species could occur within the project area, and a portion of the project area lies within designated critical habitat for Mojave desert tortoise. Detailed analyses of the potential effects on Mojave desert tortoise (including designated critical habitat) and banded Gila monster are necessary to understand the impacts of each alternative.

Migratory Birds

The US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) list identifies five migratory birds that need to be considered for the project specifically — bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), Clark's grebe (*Aechmophorus clarkii*), western grebe (*Aechmophorus occidentalis*), and Costa's hummingbird (*Calypte costae*) (USFWS 2023a). However, it should be noted that this list does not include all migratory birds that could be found in or near the project area. More than 130 bird species have been identified at Cottonwood Cove (Cornell 2023a) and most are protected under the Migratory Bird Treaty Act (MBTA). Migratory birds, including

the five species identified above, could be affected by project activities through loss of habitat and disturbance. Migratory birds face threats throughout their annual cycles; therefore, the impacts of the proposed action will be fully analyzed.

Cultural Landscapes and Historic Structures

The majority of the project area is within the Cottonwood Cove Developed Area Historic District. Cottonwood Cove Road, as well as additional historic buildings and structures, are contributing resources to the historic district. The proposed action would introduce non-historic elements to the historic landscape and alter the road, potentially affecting the historic integrity of the district.

Issues and Resource Topics Dismissed from Detailed Analysis

This section presents an overview of resource topics that were considered for full analysis during the development of the EA but were ultimately dismissed from further consideration for the following reasons: potential environmental impacts associated with the issue are not central to the proposal or of critical importance, and/or a detailed analysis of environmental impacts related to the issue is not necessary to make a reasoned choice between alternatives. In cases where impacts on a resource are not anticipated or expected to be minimal, the impact topics were dismissed. These resource topics and the reason(s) that further analysis was not warranted are presented in this section.

Air Quality

The 1963 Clean Air Act, as amended (42 United States Code [USC] § 7401 et seq.) requires federal land managers to protect air quality and to meet all federal, state, and local air pollution standards. Lake Mead NRA is subject to federal, state, and local air pollution standards. The US Environmental Protection Agency has established National Ambient Air Quality Standards (NAAQS). Current standards are set for sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter equal to or less than 10 microns in size, fine particulate matter equal to or less than 2.5 microns in size, and lead. Clark County, Nevada — where the proposed project is located — is currently in attainment for the criteria pollutants, with the exception of the Las Vegas area, which has a status of marginal nonattainment for the 2015 ozone NAAQS and is in maintenance for particulate matter equal to or less than 10 microns in size (USEPA 2021a, 2021b). Lake Mead NRA is designated as a Class II area, meaning that it is an area that can sustain a moderate increase in air pollutant concentrations without significant deterioration of the air quality.

Construction activities would generate emissions and fugitive dust through the use of construction vehicles and heavy equipment operation. The effects would be localized and temporary, lasting only for the duration of construction (approximately 9 months). Best management practices (BMPs) would be implemented to control fugitive dust (e.g., wetting soils to suppress dust, maintaining the existing vegetation to the extent possible, limiting speed limits on unpaved roads, and limiting demolition work in high-wind conditions), and a Dust Control Permit detailing the dust control activities and requirements would be obtained from the Clark County Division of Air Quality. Therefore, impacts on air quality would be reduced and would not measurably affect air quality in the park. For these reasons, air quality is dismissed from further analysis.

Water Resources

The NPS manages wetlands in accordance with Executive Order 11990, “Protection of Wetlands,” the Clean Water Act, the Rivers and Harbors Appropriation Act of 1899, and the procedures described in NPS Director’s Order 77-1: *Wetland Protection* (NPS 2002). An aquatic resources inventory was conducted in the project area in January 2020 to delineate wetlands and other waters of the United States. The area reviewed included approximately 50 feet on either side of the existing road centerline, as well as the proposed low water crossings with widths up to 250 feet (approximately 101 acres). The survey did not identify any wetlands in the area of review (FHWA 2020); therefore, a wetlands statement of findings is not required for this project.

Executive Order 11988, “Floodplain Management,” and NPS Director’s Order 77-2: *Floodplain Management* (NPS 2003), require an examination of impacts on floodplains and potential risk involved in placing facilities within floodplains. All federal agencies are required to avoid building permanent structures within the 100-year floodplain unless no other practical alternative exists. In the absence of such alternatives, agencies must modify actions to protect and enhance floodplain values and minimize degradation. The 2020 aquatic resources inventory identified nine ephemeral aquatic features, which are typical of arid fluvial systems and are tributaries to Lake Mohave (FHWA 2020). The park reviewed this information with the NPS Water Resources Division. The proposed action would rehabilitate Cottonwood Cove Road between the entrance station and the marina in the existing roadbed, except for two small areas where the road would be realigned (total of 0.4 mile or 2,200 linear feet). Implementation of the proposed action would not change the functions of the floodplain. Therefore, a floodplain statement of findings is not required for this project.

Lake Mohave from Willow Beach to Davis Dam in Nevada was listed as a Clean Water Act 303(d) impaired water for aquatic life due to temperature and requires a total maximum daily load (TMDL); however, Lake Mohave is listed as low priority and the TMDL has not been established yet (Nevada Division of Environmental Protection 2022). Impacts on water quality from construction of the action alternative could include erosion, discharge of fill material, runoff from contaminants, and spills from fuels and other liquids used during construction. However, these potential impacts would be localized and temporary, ceasing after construction is finished. In addition, BMPs (e.g., sediment traps, erosion check structures, containment pads for refueling activities, maintenance of equipment to be free of any fluid leaks) would be employed to avoid or reduce the potential for impacts on water resources.

Because construction activities could involve discharge of fill material to washes within the project area, the FHWA, on behalf of Lake Mead NRA, would coordinate with the US Army Corps of Engineers, Sacramento District as the design of the road improvements progresses to determine if Clean Water Act Section 401 certification and a Section 404 permit would be required. If a permit is deemed necessary, it would include stipulations protective of water quality. Similarly, the FHWA would coordinate with the Nevada Department of Environmental Protection to determine whether a Stormwater Pollution Prevention Permit would be necessary for the project. Because impacts on water resources would be localized, temporary, and mitigated using BMPs and potential permits would include stipulations protective of water resources, this topic has been dismissed from detailed analysis.

Wildlife

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 (NPS 2006). Wildlife species in the park include mammals, such as coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and black-tailed jackrabbit (*Lepus californicus*). Common reptiles found in desert scrub/shrub include coachwhip (*Masticophis flagellum*), desert iguana (*Dipsosaurus dorsalis*), common side-blotched lizard (*Uta stansburiana*), and speckled rattlesnake (*Crotalus mitchellii*) (NPS 2014). The sparse vegetation in the project area is used by a variety of birds including greater roadrunner (*Geococcyx californianus*), black-tailed gnatcatcher (*Polioptila melanura*), white-crowned sparrow (*Zonotrichia leucophrys*), and black phoebe (*Sayornis nigricans*) (Cornell 2023a). These species are common breeding or resident species in the park (NPS 2023a). Construction activities could adversely impact wildlife through injury or mortality, loss of habitat, and disturbance. However, the project area consists largely of desert scrub habitat, which is common throughout most of the park and inhabited by species common to this habitat. The proposed action would occur within a previously disturbed area and is located in habitat of diminished quality due to fragmentation from existing development. Wildlife displaced from the project area during construction would be expected to return to the area when construction is complete. Although some individuals would be adversely affected during construction activities, impacts on wildlife would be temporary and limited to the construction period. For these reasons, this topic was dismissed from detailed analysis.

Special-status Species (Other than Desert Tortoise and Banded Gila Monster)

Section 7 of the federal Endangered Species Act (ESA) requires that a federal agency consult with the USFWS and the National Marine Fisheries Service on any action that may affect endangered or threatened species or candidate species, or that may result in adverse modification of critical habitat. The USFWS publishes a list of special-status species segregated by each county in Nevada (USFWS 2023b) and the Nevada Division of Natural Heritage maintains a list of endangered, threatened, sensitive, rare, and at-risk plants and animals for the state (Nevada Department of Natural Heritage 2022).

A review of the USFWS IPaC system (USFWS 2023a) noted federally listed species that could be present within or near the project area — Mojave desert tortoise (*Gopherus agassizii*, threatened), southwestern willow flycatcher (*Empidonax traillii extimus*, endangered), yellow-billed cuckoo (*Coccyzus americanus*, threatened), Yuma Ridgway's rail (*Rallus obsoletus yumanensis*, endangered), bonytail chub (*Gila elegans*, endangered), and razorback sucker (*Xyrauchen texanus*, endangered). The project area contains designated critical habitat for the desert tortoise, bonytail chub, and razorback sucker. The monarch butterfly (*Danaus plexippus*) is a candidate species, and the Mojave poppy bee (*Perdita meconis*) is proposed for listing under the ESA.

- Southwestern willow flycatcher is a federally endangered species and is also listed as endangered by the state of Nevada. The project area and surrounding areas do not contain suitable southwestern willow flycatcher habitat, which is dense riparian vegetation near surface water or saturated soils (NPS 2016). The proposed action would have *no effect* on southwestern willow flycatcher.
- Yellow-billed cuckoo is listed as federally threatened and sensitive by the state of Nevada. The habitat in the project area and surrounding areas is not suitable for yellow-billed cuckoo, which

prefers large, wooded riparian areas with canopy and shrub layers (USFWS 2017). The proposed action would have *no effect* on yellow-billed cuckoo.

- Yuma Ridgway's rail is listed as federally and state endangered. This rail species prefers freshwater marshes dominated by cattails or bulrushes. For nesting and foraging, a wet substrate, such as a mudflat or sandbar, with dense herbaceous or woody vegetation is required (USFWS 2022). The habitat within and near the project area is not suitable for Yuma Ridgway's rail, as it lacks the dense vegetation the rail requires. The proposed action would have *no effect* on Yuma Ridgway's rail.
- Bonytail chub and razorback sucker are federally and state listed as endangered species, and Lake Mohave is designated as critical habitat for these fish species. Impacts on water quality from construction of the action alternative could include erosion, discharge of fill material, runoff from contaminants, and spills from fuels and other liquids used during construction. However, these potential impacts would be localized and temporary, ceasing after construction is finished. BMPs for construction equipment would be followed to avoid exposure of the environment to risks, such as oil leaks and fuel spills. For example, all refueling of equipment would have spill containment pads in position before refueling activities, and equipment must be free of any fluid leaks (fuel, oil, hydraulic fluid, etc.) upon arrival at the work site and would be inspected at the beginning of each shift for leaks. Leaking equipment would be removed off-site for necessary repairs before the commencement of work. Erosion control measures would also be implemented to minimize impacts on water quality during construction activities. These measures could include sediment traps, erosion check structures, and/or weed-free fiber rolls or straw-filled wattles. Finally, any permits required would include protective stipulations, as discussed in the "Water Resources" section above. Given that the vast majority of the construction would be in upland areas, the equipment staging would be in an existing maintenance area, and mitigation measures and BMPs would be implemented to avoid water quality impacts, the proposed action would have *no effect* on bonytail chub and razorback sucker.
- The monarch butterfly is a migrating species that is a candidate for listing under the ESA. Peak migration through or near the project area occurs from September to November (Southwest Monarch Study 2018). Monarch butterflies rely on several species of milkweed (*Asclepias* spp.) to lay eggs in the summer months, and hatched larvae feed on milkweed leaves to mature. Preferred habitat includes narrow-leaved milkweed (*A. fascicularis*) and showy milkweed (*A. speciosa*) (Jepsen et al. 2015). The greatest vulnerability to this species includes the lack of or changes to overwintering habitat, loss of abundant milkweed species, and climate change (NPS 2023b). The overwintering habitat range is along the Pacific coast in California and in the central region of Mexico (Pelton et al. 2019). The project area does not have suitable monarch butterfly habitat for overwintering roosts, nor does it have flowering vegetation that would attract monarch butterflies. To the extent possible, vegetation would be removed outside of the peak migration period. If construction activities cannot occur outside the migratory season, a qualified biologist would survey the area before clearing. If monarch butterfly activity is found within the project area, activities that could result in impacts on butterflies would be avoided until the butterflies move through the area. For these reasons, the proposed action would have *no effect* on monarch butterfly.
- The Mojave poppy bee is listed as a critically imperiled species (NatureServe 2022a) in addition to being proposed for listing under the ESA. Although the Mojave poppy bee is known to occur

in Lake Mead NRA and adjacent BLM lands (Center for Biological Diversity 2018), the species' host plants — the Las Vegas bear-poppy (*Arctomecon californica*) and the Dwarf bear-poppy (*Arctomecon humilis*) (Center for Biological Diversity 2018) — do not grow in or near the project area. The proposed action would have *no effect* on Mojave poppy bee.

Other protected species in Nevada that could be present in the project area include one amphibian, one plant, and multiple bird and bat species. Peregrine falcon (*Falco peregrinus*) is also a state-listed endangered bird species and sticky buckwheat (*Eriogonum viscidulum*) is a critically endangered plant species. Nevada lists the relict leopard frog (*Lithobates onca*), Allen's big-eared bat (*Idionycteris phyllotis*), and fringed myotis (*Myotis thysanodes*) as protected species, and northern goshawk (*Accipiter gentilis*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis*), western red bat (*Lasiurus blossevillei*), and California leaf-nosed bat (*Macrotus californicus*) as sensitive species.

- Raptors (peregrine falcons and northern goshawk) could use the project area for foraging, but nesting habitat does not occur for either species in the project area. Although temporary adverse impacts would occur to these raptor species due to noise disturbance during construction, the impacts would be limited to the period of construction (approximately 9 months), localized to the project area, and minimized by the implementation of BMPs, such as the use of properly maintained construction equipment and turning off any idling equipment when not in use.
- Special-status bat species (Allen's big-eared bat, fringed myotis, Townsend's big-eared bat, western mastiff bat, western red bat, and California leaf-nosed bat) could occur within the project area. These bat species are nocturnal, roosting during the day and becoming active at night. Construction activities for the proposed action would be limited to daytime work; therefore, impacts on these bat species would be negligible.
- The critically endangered sticky buckwheat has been recorded in the park, but populations are associated with Lake Mead in the northern part of the park (Lower Colorado River Multi-Species Conservation Program 2021, The Nature Conservancy 2007).
- The project area does not contain habitat for the relict leopard frog, as this species is associated with streams, springs, and spring-fed wetlands (USFWS 2015).

The NPS would implement mitigation measures and BMPs to avoid or substantially reduce impacts on special-status species. For this reason, the species discussed in this section have been dismissed from detailed analysis.

Cultural Resources

Note: The NPS and BLM use different topic headings within NEPA documents for cultural resources. NPS documents cover the following subtopics: archeological resources, prehistoric/historic structures, historic districts and cultural landscapes, ethnographic resources, and museum collections. Topics explored by BLM documents include cultural resources (prehistoric or historic sites, objects, buildings, structures, and districts) and Native-American concerns (ethnographic resources and sacred sites). This document uses typical NPS naming conventions. Although these topics and subtopics are grouped differently by the two agencies, potential impacts on all cultural resources were explored by the inter-agency planning team.

Archeological Resources. Archeological resources are the remains of past human activity and records documenting the scientific analysis of these remains. Archeological features are typically buried but may extend above ground; they are commonly associated with Indigenous peoples but may be products of more contemporary society (NPS 1998).

Two surveys for archeological resources were conducted (2020 and 2022) by professionals meeting the qualification standards outlined in the Secretary of the Interior's Standards for and Guidelines for Archeology. Before the initial field survey, a records search of the park's cultural resources and the Nevada Cultural Resource Information System identified one previous archeological survey near the project area; however, none of the cultural resources identified in that survey area are located within the current project area. For the initial survey, the park identified the area of potential effects (APE) as the length of Cottonwood Cove Road from the entrance station to the marina and at least 10 meters on either side of the proposed edge of pavement and sidewalks, including a buffer around the proposed road realignments (approximately 83 acres). This archeological survey was conducted in 2020 with subsequent consultation with the Nevada State Historic Preservation Office (SHPO) in 2020 and 2021, but consultation was not completed. An additional archeological survey was conducted in 2022 to a distance of 40 meters from either side of the road corridor and areas of proposed realignment to allow for identification of adjacent resources. Although there were several isolated historic artifacts encountered in the active wash within and adjacent to the APE, no significant archeological resources were identified within the APE outside of the Cottonwood Cove Developed Area Historic District. Consultation with the Nevada SHPO and appropriate Tribal Nations for this additional survey is currently underway. In this document, archeological resources will not be carried forward for detailed analysis, based on the results of the two cultural resources surveys described above; however, as discussed in the "Resource Protection Measures" section in chapter 2, should unknown archeological resources be uncovered during construction, work would be halted in the discovery area and park staff would consult with the Nevada SHPO and Tribal Nations regarding treatment.

Ethnographic Resources. An ethnographic resource is defined by the NPS as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it (NPS 1998). Spirit Mountain, located near Lake Mohave and approximately 15 miles south of Cottonwood Cove, is important to peoples traditionally affiliated with the park; however, the proposed actions within the project area are not expected to impact any ethnographic resources. There is potential for a larger-scale ethnographic landscape surrounding the project area associated with Indigenous occupation. However, such evaluation of this broader landscape is outside the scope of this project. The current undertaking is limited in nature and will not introduce additional modern features that would further disrupt this potential precontact landscape. The park initiated consultation with 18 federally recognized Tribal Nations on March 3, 2022. The Hopi Tribe concurred with the determination of effect on March 15, 2022, and the Ak-Chin Indian Community responded on April 28, 2022, stating that it had no comments. The Cultural Manager for the Moapa Band of Paiutes responded on March 15, 2022, stating they had no questions or comments, but the Moapa Tribal Historic Preservation Officer (THPO) replied via email on March 31, 2022, requesting additional information related to the project and requested a site visit. The NPS responded to these questions via email on July 7, 2022 and conducted an in-person site visit with the Moapa THPO on September 6, 2022, as requested. No other responses were received from Tribal Nations for the initial survey. In this document, ethnographic resources will not be carried forward for full analysis; however, consultation with Tribal Nations for the additional 2022 survey is currently ongoing.

Socioeconomics

Neither the no-action nor the proposed action would change local or regional land use. These actions would also not appreciably affect local businesses outside the park or the concessionaire at Cottonwood Cove. Implementation of the proposed action would result in temporary closures during construction; however, a traffic management plan would be prepared specifically for this project, and access to Cottonwood Cove would be retained throughout construction with only short delays (up to 30 minutes). Construction would last approximately 9 months and would be scheduled outside of peak visitation periods. Once completed, road improvements would not result in substantial changes in visitation. Therefore, socioeconomics was dismissed from detailed analysis.

Visitor Use and Experience

Lake Mead NRA was the nation's first national recreation area. The purpose of the park is to provide for diverse public recreation, benefit, and use on Lakes Mead and Mohave and surrounding lands in a manner that preserves the ecological, geological, cultural, historical, scenic, scientific, and wilderness resources of the park (NPS 2015a). Over the past five years, visitation has ranged between 5 and 8 million visitors (NPS 2023c). Traffic counts at Cottonwood Cove Road over the last five years have ranged between 47,000 and 65,000 vehicles (NPS 2023d). The months with the highest visitation are May through September (NPS 2023d).

Climate change has been altering the way visitors experience the park. Since 2000, the water level of Lake Mead has dropped approximately 170 feet (Southern Nevada Water Authority 2022). This elevation drop can be attributed to a massive drought and extended wildfire season. Boating is a popular recreational activity at the park, but the conditions at Lake Mead are making water access difficult and uncertain. Cottonwood Cove at Lake Mohave provides visitors with opportunities for boating, swimming, sailing, kayaking, fishing, and other activities, and these opportunities will become more important as water availability and recreation opportunities at Lake Mead continue to be uncertain under current conditions. Although there would be short delays on the road, access would be retained during construction and construction would not be scheduled during heavy visitation periods. The proposed action would not change recreational activities in the project area.

Construction activities can present safety concerns to park staff and visitors. Measures to protect visitors and employees during construction activities would be implemented, such as development of a project-specific traffic management plan, use of a one-lane temporary traffic signal, and/or the use of flagger operations. Temporary traffic delays (15 to 30 minutes) may be required during construction. Once construction is complete, impacts on park staff and visitor safety would be beneficial, as Cottonwood Cove Road would provide safer ingress to and egress from the Cottonwood Cove area.

Noise would increase as a result of construction activities, equipment use, vehicular traffic, and construction crews. Noise generated from construction would be temporary, lasting approximately 9 months. Project-related construction noise would be minimized through BMPs, including limiting work to daylight hours in the project area to avoid night-time noise disruption and properly maintaining construction equipment to minimize noise. Following construction, the soundscape would be similar to existing conditions. The soundscape of the project area would not be noticeably altered in the long term. For these reasons, visitor use and experience was dismissed from detailed analysis.

CHAPTER 2: ALTERNATIVES

This chapter presents the no-action alternative, which describes the current conditions and management activities, and the proposed action, under which modifications would be made to Cottonwood Cove Road to improve visitor experience, safety, accessibility, and park operations. The chapter also describes other alternatives and alternative elements that were initially considered but dismissed from detailed analysis and presents mitigation measures for the action alternative.

No Action

Under the no-action alternative, Cottonwood Cove Road would remain in its current state with narrow lanes, unpaved shoulders, and deteriorating pavement conditions. The travel lanes would remain at 11-foot wide, which is inadequate for the large vehicles and trailers that use the road, and the shoulders would remain unpaved, resulting in the potential for accidents, as well as rutting along the edge of the pavement when vehicles' wheels drop off the pavement edge, as seen in the photographs to the right.

No portion of the roadway would be realigned to allow for a continuous speed along the road. From the entrance station to just before the ranger station, the speed limit is 45 miles per hour (mph), but drivers are warned via road signs to slow down before the two curves on this portion of the road. The speed limit in the developed area between the ranger station and the marina is posted as 25 mph.

The existing drainage features — three low water crossings at stations 112, 165, and 345 and the culvert at station 293 — would remain unchanged. Although these features are structurally sound, they provide inadequate drainage, which results in flooding of the roadway.

The entrance station, the monument at the park's boundary, the ranger station, and the marina and concessions area would remain in their existing conditions. Improvements to safety and accessibility would not be completed, and additional parking areas would not be constructed.



The park would continue to repair and clear the road of debris as needed, but the roadway conditions would continue to deteriorate.

Proposed Action (Preferred Alternative)

Approximately 6.8 miles of Cottonwood Cove Road would be rehabilitated and widened under the proposed action. The roadway improvements would include full-depth reclamation, shoulder widening, and asphalt concrete paving with minor drainage work and new/improved low-water crossings. Two portions of the roadway would be realigned to maintain a speed of 45 mph for the majority of the road (figure 3). Construction would take approximately 9 months and would likely be scheduled from September to May to avoid peak visitation. The following sections describe the actions that would occur under the proposed action, including the resource protection measures that would be implemented to avoid or reduce impacts on NPS and BLM resources.

Road Improvements

The section of roadway between stations 3 and 325 would be widened to 12-foot lanes with 3-foot paved shoulders for a total paved width of 30 feet. Within the developed area (between stations 325 and 368 from the ranger station to the marina), the road would be designed with a 24-foot pavement width with a curb and gutter on both sides and a 5-foot sidewalk on the right side.

Two sections of the road would be realigned to maintain a consistent 45 mph speed limit through the corridor and to improve safety by straightening the curves. The first section is between stations 105 and 120 and the second is between stations 164 and 170. The realigned sections total approximately 2,200 linear feet (0.4 mile total, approximately 1,500 and 700 linear feet, respectively). The existing roadway in these sections would be obliterated and restored to natural conditions. These realignments would allow drivers to maintain a speed limit of 45 mph for approximately 5.1 miles, from just after the entrance station to station 292 (see figure 3). From station 292 to 302 (approximately 0.2 mile), there would be a transition to 35 mph. The remainder of the road to the marina (1.5 miles) would retain the 25 mph speed limit.

The three existing low water crossings along the road at approximately stations 112, 165, and 345 would be improved and a fourth low water crossing would be installed at station 306. The low water crossing improvements would enhance cross drainage while allowing drivers to maintain a consistent speed and would result in a reduction of the water surface elevation during heavy rain events. The low water crossings would be concrete pavement with buried concrete barriers for integrity. Gabion mattresses (wire mesh containers to be filled with rocks) would provide bank stabilization on the upstream and downstream sides of the low water crossings.

The existing 30-inch culvert near station 293 that crosses Cottonwood Cove Road would remain in place and be lined and extended with a new 30-inch corrugated metal pipe. Extending the culvert would also allow for the road width to be expanded. Riprap would be installed at the culvert outlet to reduce the potential for scour.

Entrance Station Improvements

At the entrance station, the parking area would be microsurfaced to renew the road surface and seal minor cracks and other irregularities. Portions of the existing curb would be replaced, and gutters would be installed. Striping and pavement markings, including a crosswalk, would be painted and signs would be installed. This work would occur entirely within previously disturbed areas.

Lake Mead National Recreation Area Monument

At the monument at the Lake Mead NRA boundary (station 85), the pullout would be paved, a sidewalk would be constructed with an adjacent curb and gutter, pavement markings would be painted, and signs would be installed. This work would occur entirely within previously disturbed areas. The monument and the current unpaved pullout area are pictured to the left.



Ranger Station Improvements

The curb and gutter around the ranger station would be replaced, the parking lot would be microsurfaced, pavement markings would be painted, and signs would be installed. This work would occur entirely within previously disturbed areas.

Marina and Concession Area Improvements

Improvements to the existing parking area north of Cottonwood Cove Road (marina parking lot south, figure 4) would include repaving the parking area, installing curbing at the western extent of the parking area and around the islands at the end of rows of parking, installing wheelstops, installing signs and painting pavement markings, including parking spaces, a crosswalk, and boat wipe down stalls. This work would occur entirely within previously disturbed areas.

An overflow parking area would be constructed adjacent to the marina parking lot south and south of the Cottonwood Cove Lower Campground (overflow parking, figure 4). A U-shaped area of approximately 1 acre would be paved and pavement markings would be painted. Additionally, a parking area south of the road near the Cottonwood Cove Resort (motel parking lot north, figure 4) would be formalized by paving the area (approximately 1.4 acres), installing curbing, and painting pavement markings. These parking areas would represent newly paved areas, but they are previously disturbed by vehicle use and barren of vegetation.

The Cottonwood Cove Resort parking lot (motel parking lot south, figure 4) would also be improved. The parking lot would be repaved, and a valley gutter (a depression that is designed to collect and divert rainwater into a storm drain) installed to help with drainage to a culvert pipe. Signs would be installed, and pavement markings would be painted. A block fence constructed of concrete masonry units would be installed along the western edge of the parking lot to separate it from the RV park. This work would occur entirely within previously disturbed areas.

Figure 3. Proposed Action

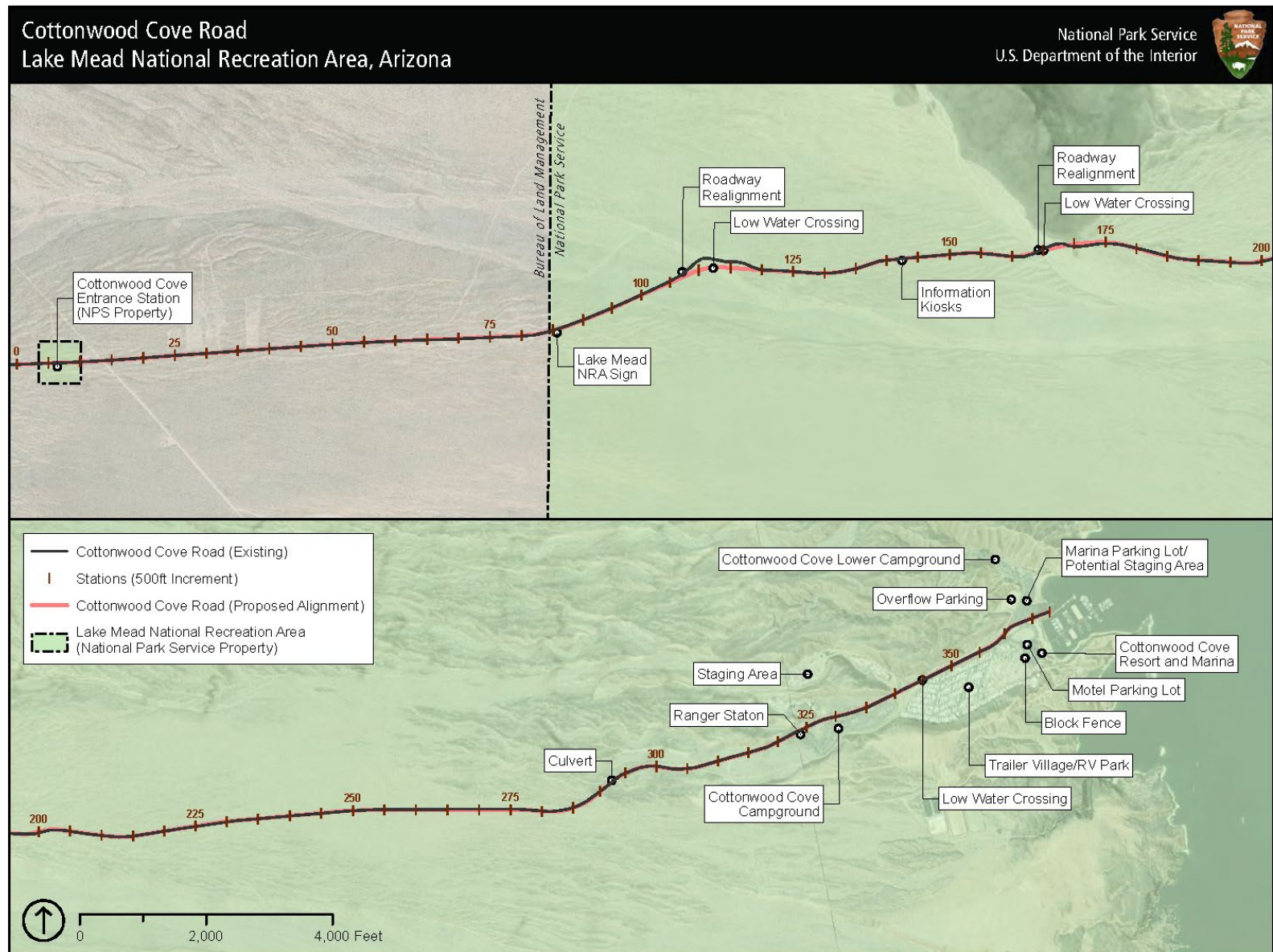
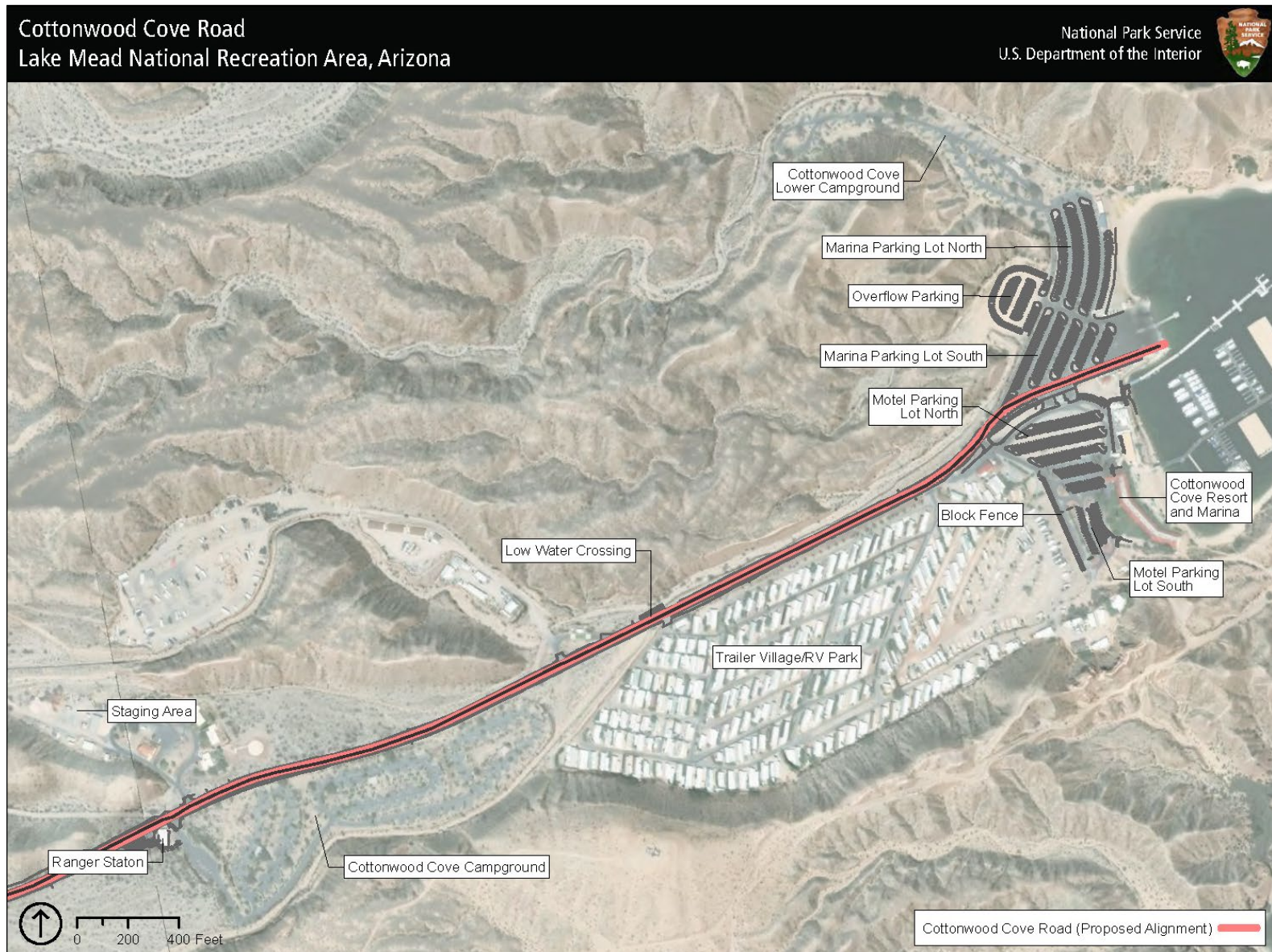


Figure 4. Proposed Changes to the Cottonwood Cove Marina Area



Staging Area

One construction staging area of approximately 100 feet by 150 feet would be established at station 325 (see figure 4), which is an existing NPS maintenance facility parking and storage area. Depending on the time of year and visitation, the main parking lot may also be used for equipment storage. No additional disturbance would be required for use of either of the proposed staging areas, as they are previously disturbed areas with a gravel or pavement ground cover and are currently used for parking and/or storage.

Accessibility

In conformance with applicable laws and regulations, specifically the Architectural Barriers Act of 1968 (Public Law 90-480), the Rehabilitation Act of 1973 (Public Law 93-112), and the 1984 Uniform Federal Accessibility Standards (49 Code of Federal Regulations [CFR] 31528), specific parking areas in parking lots, curb cuts, sidewalks, and all other facilities associated with this project would be physically accessible.

Construction Schedule and Sequencing

The NPS anticipates the use of federal funding for construction, and the timing of this project would be subject to funding availability. The construction would last approximately 9 months. The sequencing of construction would be as follows: clearing and grubbing, roadway excavation and full-depth reclamation, paving, and widening 6.8 miles of roadway, signing, and stripping.

Resource Protection Measures

To avoid, minimize, or mitigate impacts related to the action alternative, the NPS would implement mitigation measures and BMPs. These measures incorporate the regulatory requirements for the Clean Air Act (33 USC §1251 et seq.), Clean Water Act (33 USC 1251 et seq.), Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.), the Native American Graves Protection and Repatriation Act of 1990 (43 CFR 10), Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712), NPS *Management Policies 2006* and others for natural and cultural resource management. Subject to the final design and approval of plans by relevant agencies, resource protection measures would include, but would not be limited to, the items listed in table 1.

Table 1. Mitigation Measures and Best Management Practices Associated with the Proposed Action

Topic	Resource Protection Measure	Authority	Responsible Party
General	A traffic management plan would be prepared specifically for this project. Cottonwood Cove Road would continue to remain open during construction, so visitors could still access the marina, campgrounds, motel, and other facilities. One-lane temporary signal operation and/or use of flagger operations may be required for the duration of the project with an allowance for 15- to 30-minute delays during construction.	NPS <i>Management Policies 2006</i> , Section 8.2.5	FHWA
General	Project-related construction noise would be minimized using BMPs, including limiting work to daylight hours in the project area to avoid night-time noise disruption, properly maintaining construction equipment to minimize noise, and turning off any idling equipment when not in use.	NPS <i>Management Policies 2006</i> , Section 4.9	FHWA
General	Erosion control measures would be implemented to minimize impacts on water quality during construction activities. These measures could include sediment traps, erosion check structures, and/or weed-free fiber rolls or straw-filled wattles.	Clean Water Act NPS <i>Management Policies 2006</i> , Section 4.6.3	FHWA
General	Fugitive dust plumes would be reduced to the extent possible using water sprayed on the soil during earth-disturbing activities. Water used during road construction would be pumped from Lake Mohave, stored in a tank on the boat ramp or other location close to the water's edge, and hauled by truck. Other measures could include maintaining the existing vegetation to the extent possible, limiting speed limits on unpaved roads, and limiting demolition work in high-wind conditions. The FHWA, on behalf of Lake Mead NRA, would coordinate with the Clark County Division of Air Quality to obtain a Dust Control Permit detailing the dust control activities and requirements.	Clean Air Act Nevada Revised Statute 445B.500 NPS <i>Management Policies 2006</i> , Section 4.7.1	FHWA
General	Concrete and asphalt batch plants are located outside the park. The contractor would use existing commercial sources of concrete and asphalt.	Clean Air Act Nevada Administrative Code 445B.305	FHWA
General	FHWA would coordinate with the Nevada Department of Environmental Protection to determine whether a Stormwater Pollution Prevention Permit would be necessary for the project.	Clean Water Act	FHWA

Topic	Resource Protection Measure	Authority	Responsible Party
General	FHWA, on behalf of Lake Mead NRA, would coordinate with the Nevada Department of Environmental Protection and the US Army Corps of Engineers, Sacramento District to determine if Clean Water Act Section 401 certification and a Section 404 permit would be required. If a permit is deemed necessary, it would include stipulations protective of water quality.	Clean Water Act	FHWA
General	BMPs for construction equipment would be followed to avoid exposure of the environment to risks, such as oil leaks and fuel spills. For example, all refueling of equipment would have spill containment pads in position before refueling activities; and equipment must be free of any fluid leaks (e.g., fuel, oil, hydraulic fluid) upon arrival at the work site and would be inspected at the beginning of each shift for leaks. Leaking equipment would be removed off-site for necessary repairs before the commencement of work. Waste leaks, spills, or releases would be reported immediately to the NPS. The NPS or the project proponent would be responsible for spill material removal and disposal to an approved off-site landfill.	<i>NPS Management Policies 2006</i> , Section 9.1.6.2	FHWA
Vegetation	Desert soil would be stored as near its original location as possible to minimize vegetation impacts and potential compaction and erosion of bare soils. Replacement of the desert soil would include spreading, scarification, mulching, and seeding and/or planting species native to the immediate area. As necessary, desert soil replacement techniques would be used to re-establish desert crust surface and minimize impacts from invasive plant species.	<i>NPS Management Policies 2006</i> , Section 4.8.2.4	FHWA
Vegetation	Construction equipment would be pressure-washed and inspected before each entry into the park and the Piute Eldorado Valley ACEC. Sterilized construction materials (e.g., topsoil, hay bales) would be used to minimize introduction or spread of unwanted plant species.	Executive Order 13751, "Safeguarding the Nation from the Impacts of Invasive Species"	FHWA
Vegetation	Following construction, disturbed areas adjacent to the road would be restored to natural conditions to the extent possible. Revegetation work would use desert soil conserved along the corridor and native species from genetic stocks originating in Lake Mead NRA and Piute Eldorado Valley ACEC. Revegetation efforts would also attempt the reconstruction of the natural spacing, abundance, and diversity of native plant species.	Executive Order 13751, "Safeguarding the Nation from the Impacts of Invasive Species"	FHWA

Topic	Resource Protection Measure	Authority	Responsible Party
Vegetation	Following revegetation, restored areas would be monitored and managed to prevent colonization by nonnative invasive species. Park biologists would conduct post-construction, early detection/rapid response invasive plant surveys along the road corridor for 2 years after construction is complete.	Executive Order 13751, "Safeguarding the Nation from the Impacts of Invasive Species"	NPS
Special-status species – Mojave desert tortoise	An authorized desert tortoise biologist or environmental monitor would be on-site during construction activities to ensure that construction activities would not harm desert tortoises. Potential authorized biologists would complete the qualifications form (USFWS 2009) and submit it to the USFWS for review and approval as appropriate. The authorized biologist would be responsible for approving monitors or other personnel that may assist the biologist.	ESA	FHWA
Special-status species – Mojave desert tortoise, Banded Gila monster	All on-site personnel would receive awareness training for desert tortoise and banded Gila monster before entering the job site to include identification, biology, legal status and definition of take (desert tortoise), consequences of a bite (Gila monster), measures to minimize effects of project activities, and reporting requirements.	ESA Nevada Revised Statute 503.584 - 503.589	NPS
Special-status species – Mojave desert tortoise Banded Gila monster	All areas to be disturbed would have boundaries staked or flagged before beginning the activity, and all disturbance and project activities would be confined to the staked/flagged areas. Disturbance outside staked/flagged areas would be prohibited.	ESA	FHWA
Special-status species – Mojave desert tortoise, Banded Gila monster	Before surface-disturbing activities, an authorized biologist would survey the area to ensure that no live tortoises, active tortoise burrows, or Gila monsters are present. If a tortoise is found on the project site, all work would cease until the authorized biologist can take appropriate action to prevent harm to the tortoise. This includes relocating the tortoises outside the project area and excavating the burrows according to USFWS-approved protocols. If signs of Gila monster are identified within the project area, mitigation measures to avoid impacts on the Gila monster would be employed, including restricting construction to periods of inactivity (typically November through March) to the extent possible, relocating any Gila monsters found within the project area to other suitable habitat, and limiting vehicle use to existing or designated routes.	ESA Nevada Revised Statute 503.584 - 503.589	FHWA/NPS

Topic	Resource Protection Measure	Authority	Responsible Party
Special-status species – Mojave desert tortoise	All project vehicles would be driven at speeds within posted speed limits on existing roads and would not exceed 20 mph within project boundaries. Any tortoise observed in harm's way on a paved road would be moved off the road in the direction it was moving in accordance with USFWS-approved tortoise handling procedures. All tortoise observations on roads would be reported to NPS biologists to be included in the annual report. Handling of tortoises would be done by a qualified biologist or NPS resource management staff. Handling of tortoises by any other personnel would only occur if the tortoise were in eminent danger.	ESA	FHWA/NPS
Special-status species – Mojave desert tortoise	All project personnel would exercise caution when commuting to the project area and obey speed limits to minimize any chance of the inadvertent injury or mortality of species encountered on roads leading to and from the project site. All desert tortoise observations, including mortalities, would be reported directly to an authorized biologist, the NPS, and the USFWS.	ESA	FHWA
Special-status species – Mojave desert tortoise, Banded Gila monster Migratory birds	Open features that could entrap or injure tortoises, Gila monsters, birds, or other wildlife would be capped or covered, temporarily fenced, and/or escape ramps would be installed. Any excavated holes left open overnight would be covered and/or fencing would be installed to prevent wildlife access to the open holes. Any construction pipe, culvert, or similar structure would be inspected for wildlife before the material is moved, buried, or capped. These actions would be performed by construction personnel (all of which would have awareness training) and could be verified by an onsite biologist.	ESA Nevada Revised Statute 503.584 - 503.589 MBTA	FHWA
Special-status species – Mojave desert tortoise	A litter control program would be implemented to avoid attracting ravens or other opportunistic predators to the project area.	ESA	FHWA
Special-status species – Mojave desert tortoise	To avoid introducing non-native species into the area, all construction equipment would be pressure-washed and inspected before use in Lake Mead NRA and the Piute Eldorado Valley ACEC. No imported topsoil or hay bales would be used on the project site.	ESA	FHWA
Special-status species – Mojave desert tortoise	Any vehicle or equipment on the right-of-way within desert tortoise habitat would be checked underneath for tortoises before moving, regardless of the amount of time the vehicle or equipment was idle. If a desert tortoise is observed, an authorized biologist would be contacted.	ESA	FHWA

Topic	Resource Protection Measure	Authority	Responsible Party
Special-status species – Banded Gila monster	Any Gila monster encounters during project construction would be reported immediately to the Nevada Division of Wildlife (NDW).	Nevada Revised Statute 503.584 - 503.589	FHWA
Special-status species – Banded Gila monster	Live Gila monsters found in harm's way on the construction site would be captured and detained in an appropriate environment by a qualified biologist trained in handling venomous reptiles until an NDW biologist can arrive for documentation purposes. Written information identifying mapped capture location, date, time, and circumstances (e.g., biological survey or construction) and habitat description (vegetation, slope, aspect, substrate) would be provided to NDW.	Nevada Revised Statute 503.584 - 503.589	BLM/FHWA
Special-status species – Banded Gila monster	<p>In the event a Gila monster is injured during project activities, it would be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. NDW would be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass would be immediately frozen and transferred to NDW with a complete written description of the circumstances, habitat, and mapped location.</p> <p>Should NDW's assistance be delayed, biological or equivalent acting personnel on site should detain the Gila monster out of harm's way until NDW personnel can respond. The Gila monster should be detained until NDW biologists have responded. Should NDW not be immediately available to respond for photo-documentation, a digital camera would be used to take photographs of the Gila monster <i>in situ</i> at the location of the live encounter or dead salvage. The pictures would be provided to NDW and would include: 1) encounter location (landscape overview with Gila monster in clear view), 2) a clear overhead shot of the entire body with a ruler next to it for scale, and 3) a clear, overhead close-up of the head.</p>	Nevada Revised Statute 503.584 - 503.589	BLM/FHWA
Special-status species – Mojave desert tortoise, Banded Gila monster	Signs would be added to warn drivers that they are approaching an area where they could encounter wildlife, especially desert tortoise.	ESA Nevada Revised Statute 503.584 - 503.589	FHWA

Topic	Resource Protection Measure	Authority	Responsible Party
Special-status species – Monarch butterfly Migratory birds	<p>To the extent possible, vegetation removal would occur:</p> <ul style="list-style-type: none"> – outside of monarch migration season (between December and August) – outside breeding season for most birds (between September and February) – outside Costa’s hummingbird nesting season (between July and December) <p>If construction activities cannot occur outside these seasons, a qualified biologist would survey the area no more than five days before clearing. If monarch butterfly activity is found within the project area, impacts would be avoided until the butterflies move through the area. If any active nests (those containing eggs or young) are found during surveys, an appropriately sized buffer area would be established (e.g., plastic fencing) and would be avoided until the young birds fledge.</p>	ESA	FHWA/NPS
Cultural resources	Two tribal monitors would be on-site during construction activities to ensure that construction activities would not harm cultural resources.	NHPA	NPS/Tribal Nations
Cultural resources	A Tribal representative would provide a pre-construction blessing and cultural sensitivity training to all operation employees and contractors, including identification and notification protocols. This training would be coordinated by the NPS.	NHPA	NPS/Tribal Nations
Cultural resources	Should unknown archeological resources be uncovered during construction, work would be halted in the discovery area, and Lake Mead NRA or BLM staff (whichever agency is appropriate depending on the location of the resource) would consult with the Nevada SHPO and Tribal Nations according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990. Construction would not resume until authorized to do so by the agency’s lead archeologist.	NHPA Native American Graves Protection and Repatriation Act	NPS/BLM/ FHWA

Topic	Resource Protection Measure	Authority	Responsible Party
Cultural resources	Cut and fill slopes will be rounded at the tops and superficially contoured to minimize unnatural-looking straight lines and angles and to match the surrounding natural landscape of the area. The NPS would select materials that would be compatible with historic materials in terms of design, color, and texture; blend into the Cottonwood Cove Developed Area Historic District and landscape; and be in accordance with the Secretary of Interior Standards for preservation. Rocks disturbed during construction, exposed culvert ends, and flared end sections would be treated with a varnish to match local soil colors to reduce visibility to visitors. Metal items like guardrails and signposts would have a natural-colored metal or be stained/painted to match the surrounding colors.	NHPA	NPS/FHWA

Alternatives and Alternative Elements Considered but Dismissed

During the initial design process for this project, the NPS considered other options to improve Cottonwood Cove Road. The following alternatives were considered for project implementation but were dismissed from further analysis because these options did not individually meet NPS objectives for creating a safer roadway while protecting the natural resources of the park.

- **Maintain Existing Alignment** – The NPS considered using the existing roadway to avoid deviating into previously undisturbed areas. This alternative was eliminated because it would not adequately address roadway safety concerns including sight distance, steep grades, and substandard curve geometry.
- **Maximum Realignment** – The NPS considered an option that would realign Cottonwood Cove Road between stations 105 and 120 and stations 158 to 180. This alternative would address issues with multiple curves at a major arroyo crossing and in the vicinity of Black Mountain (also an arroyo crossing). This option was eliminated because of the increased environmental impacts associated with realigning longer sections of the road through previously undeveloped habitats.
- **Replacement of the Culvert** – The NPS considered replacing the culvert at station 293; however, the culvert is approximately 15 feet below grade and replacement would require either a full roadway closure or a detour route. This element would have large impacts on visitor use and experience and socioeconomics if the road were closed for an extended period to accommodate the replacement; it would also have considerable impacts on natural resources if a detour were to be considered. For these reasons, this element was eliminated from consideration.

During civic engagement, commenters suggested adding solar lighting and more information kiosks along Cottonwood Cove Road. The planning team considered these suggestions, but they were ultimately dismissed. Adding lighting along Cottonwood Cove Road could be precedent-setting for the park — other park roads do not have lighting, and this would be a large departure from existing conditions throughout the park. Additionally, lighting structures and new information kiosks would add to the items that park maintenance staff have to track and repair.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing condition of resources retained for analysis that could be impacted by implementing the alternatives — vegetation, special-status species (Mojave desert tortoise and banded Gila monster), migratory birds, and cultural landscapes — as well as a description of the potential impacts. The descriptions of the resources provided in this chapter serve as an account of the baseline conditions within the project area. The impacts of all actions proposed under the no-action alternative and the proposed action/preferred alternative were considered. Resource protection measures are part of the proposed action, as presented in chapter 2. Where appropriate, the resource protection measures for adverse impacts are also described and incorporated into the evaluation of impacts. These impact analyses and conclusions are generally based on a review of existing literature, studies, and research performed by park staff, information provided by experts within the NPS, BLM, FHWA, and other agencies and institutions, professional judgment, park staff expertise and insights, and public input. Because the specific methods used to assess impacts for each resource may vary, these methods are described under each impact topic.

Scenario for Cumulative Impact Analysis

Cumulative impacts are defined as “effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR 1508.1(g)(3)). To determine potential cumulative impacts, past, present, and foreseeable future actions and trends were identified in or near the project area. Cumulative impacts are considered for the no-action alternative and the proposed action/preferred alternative, by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions and trends and are presented at the end of each impact topic discussion. Table 2 shows the projects considered in the cumulative impact analysis for each resource.

Table 2. List of Past, Ongoing, and Potential Future Actions and Trends

Project/ Trend	Description	Resources Affected
Cottonwood Cove Flood Diversion Structure	The park recently constructed a flood diversion structure north of Cottonwood Cove Road to protect the Cottonwood Cove developed area from the effects of flash flooding, most notably the risks to the life and safety of visitors and staff within the developed area. The structure is approximately 0.5-mile long and located approximately 0.3-mile north of Cottonwood Cove Road and 1 mile upstream from the developed area. The structure is comprised of a channel and an earthen berm, created from the earth removed for the channel. Riprap was placed to protect the earthen structure from erosion and scour, and the structure is lined with soil cement.	Vegetation Special-status species Migratory birds Cultural landscape

Project/ Trend	Description	Resources Affected
Replace and Realign Cottonwood Cove Sewer Force Main	The sewer force main at Cottonwood Cove that runs from the lift station to the wastewater treatment lagoons was replaced. The total length of the new line is approximately 3,970 linear feet, and it was installed parallel to the old line. The new line was installed in previously disturbed areas (paved/unpaved roads and a disturbed corridor in the developed area). The existing line was abandoned in place.	Vegetation Migratory birds Special-status species
Construct New Water Well at Cottonwood Cove	A secondary water well was constructed within the Cottonwood Cove developed area to supplement the existing primary and backup wells that supply potable water to the Cottonwood Cove developed area. The existing wells are located south of the marina and the new well was drilled in the same area at a 16-inch diameter and a 170-foot depth. Approximately 0.25 acre was temporarily impacted during construction, with approximately 0.02 acre being permanently impacted.	Vegetation Special-status species Migratory birds Cultural landscape
Replace Cottonwood Cove Water Well Supply Line	The water supply line from water wells to the water treatment plant at Cottonwood Cove was replaced to ensure compliance with all state and federal regulations, guidelines, and BMPs were met, as well as health, life, and safety needs. The new water well supply line is 6 inches in diameter and approximately 7,349 linear feet. The new line was placed parallel to the existing line within a previously disturbed area (unpaved road). It serves as the water supply line for Cottonwood Cove.	Vegetation Special-status species Migratory birds
Piute Eldorado Valley ACEC Management Plan	The Piute Eldorado Valley ACEC was designated in 1998 to protect the federally threatened Mojave desert tortoise. BLM has developed a management plan for the Piute-Eldorado Valley ACEC. Through the recommended activities of the management plan, BLM aims to develop and monitor conservation actions that would preserve the species and maintain and restore habitat, including implementing Mojave desert tortoise recovery tactics, addressing ecological trends affecting the ecoregion, trying to offset these impacts where possible, and implementing conservation actions for the areas.	Vegetation Special-status species Migratory birds
Climate Change	The resources within the park and the Piute Eldorado Valley ACEC are being affected by climate change through increasing temperatures and changing precipitation patterns. Modeling for the Mojave Desert predicts fewer winter rains and snowpack and greater potential for flash floods and monsoonal-type storms in the summer. Summer storms increase the potential for lightning strikes and fires, which could affect air quality and the potential for the spread of invasive (non-native) annual grasses. Taken in context, climate change is likely to alter ecosystems, resulting in changes to vegetation communities, habitats available for species, and the experience of park visitors (NPS 2018).	Vegetation Special-status species Migratory birds Cultural landscape

Vegetation

Affected Environment

The Cottonwood Cove Road corridor follows a natural sloping grade along a broad bajada between the southern end of the Eldorado Mountain range to the west and Lake Mohave to the east. Soils are comprised mostly of well-drained sandy, gravelly sediments, and igneous alluvium. The vegetation communities bordering the existing Cottonwood Cove Road include creosote bush shrubland, semi-desert wash woodland/scrub, and semi-desert scrub shrublands.

A bajada is a broad slope of debris spread along the lower slopes of mountains by descending streams, found in arid or semiarid climates.

Creosote bush shrubland is the dominant habitat within Lake Mead NRA, covering nearly half of the land within Lake Mead NRA (Salas 2016). It is also the dominant habitat within the Paiute Eldorado Valley ACEC, comprising approximately 66% of the ACEC (BLM 2022). This vegetation community consists of a sparse to intermittent shrub layer with a sparse to open herbaceous layer and trees are sparse if present. The characteristic species of creosote bush shrubland habitat is creosote bush (*Larrea tridentata*). Other common species in this habitat type include white bursage (*Ambrosia dumosa*), and brittlebush (*Encelia farinosa*) (Salas 2016).

There are small portions of semi-desert wash woodland/scrub and semi-desert scrub shrublands adjacent to the road as well. Semi-desert wash woodland/scrub habitat can be found on channel beds and channel bottoms where flooding is infrequent between elevations of 500 to 4,850 feet. This habitat contains an open to continuous tree canopy with a sparse to continuous shrub understory (Salas 2016). Semi-desert scrub shrubland habitat is typically found on rocky slopes and alluvial fans. This habitat has sparse to open shrub and herbaceous layers, typically without a tree layer (Salas 2016).

Field visits to the project area in 2020 noted creosote-bursage as the predominant vegetation community along the road corridor, intermixed primarily with brittlebush, cheesebush (*Hymenoclea salsola*), and a notable presence of teddybear cholla (*Cylindropuntia bigelovii*). Other species noted include rubber rabbitbrush (*Ericameria nauseosa*), prickly pear (*Opuntia* sp.), bristly fiddleneck (*Amsinckia tessellata*), desert trumpet (*Eriogonum inflatum*), cheeseweed (*Ambrosia salsola*), coyote melon (*Cucubita palmata*), dodder (*Cuscuta* sp.), banana yucca (*Yucca baccata*), and mistletoe (*Phoradendron* sp.) (FHWA 2020).

The habitat adjacent to the road corridor has been disturbed by a variety of actions, including maintenance activities after flood events, creation of flood control dikes, creation of access points to existing rights-of-ways by utility companies, and illegal off-road travel. Over the years, the drainage infrastructure that runs along much of the roadway has been maintained and enhanced in some areas to accommodate heavier water flows after rain events.

The developed areas near the marina, campgrounds, and trailer village contain exotic vegetation, including date palm (*Phoenix dactylifera*), California fan palm (*Washingtonia filifera*), saw palmetto (*Serenoa repens*), oleander (*Nerium oleander*), eucalyptus (*Eucalyptus* sp.), and redstem filaree (*Erodium cicutarium*) (Salas 2016; FHWA 2020).

Environmental Trends and Planned Actions

Rising temperatures, decreasing precipitation, and increasing evaporation suggest a drying climate with an increased likelihood of extended drought conditions and an increased incidence of wildfires (NPS 2015c). These changes could result in habitat degradation and loss throughout the Mojave Desert. Vegetation communities are likely to shift as dominant woody vegetation dies and non-native annual grasses become established. This is because non-native species are more tolerant of conditions, such as greater carbon dioxide concentrations, atmospheric nitrogen deposition, and winter rain (Archer and Predick 2008).

In addition to changes from climate change, past and ongoing actions have effects on the vegetation communities of Lake Mead NRA. Actions that adversely affect vegetation are those that involve ground disturbance, removal of native vegetation, and the potential for subsequent establishment of invasive exotic plants. Past development projects at the park near the Cottonwood Cove developed area, including the flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects, have resulted in permanent adverse impacts on vegetation through removal of native plants and soils. Construction temporarily affected additional acreage, and colonization of invasive species is a potential after any disturbance event. Of these projects, the flood diversion structure resulted in the largest impacts, as it occurs in previously undeveloped habitat northwest of the Cottonwood Cove developed area. The water and sewer line replacements were placed beneath previously paved and unpaved roads or disturbed corridors, and the new water well resulted in small temporary and permanent impacts due to the small footprint needed for a well. The park implemented resource protection measures to reduce adverse impacts on vegetation, but these projects contributed long-term adverse effects on the vegetation at the park. The Piute Eldorado Valley ACEC Management Plan focuses on the conservation of the desert tortoise and its habitat and has a beneficial effect on vegetation on BLM lands.

Impacts Assessment

In this section, the impacts on vegetation from the two alternatives are analyzed. The analysis considered that changes in plant community size, integrity, or continuity could occur as a result of the implementation of the alternatives. Construction activities associated with the proposed action could result in impacts on the vegetation community through vegetation and soil removal, soil compaction, trampling, disturbance, and spread of nonnative species.

Impacts of the No-Action Alternative on Vegetation

Under the no-action alternative, there would be no construction activities, but routine maintenance activities, such as repairing asphalt pavement and clearing the road of debris, would continue. Impacts on vegetation communities from visitor activities would continue to occur. Vegetation along Cottonwood Cove Road frequently is trampled by vehicles leaving the roadway, resulting in bare soils along the roadway. However, the no-action alternative would not result in new impacts on vegetation within the project area.

Cumulative Impacts: Under the no-action alternative, vegetation within the project area would remain unchanged; therefore, this alternative would not contribute to cumulative impacts when considered with the ongoing and future projects occurring near the project area.

Impacts of the Proposed Action/Preferred Alternative on Vegetation

Impacts on the vegetation communities would occur from rehabilitating Cottonwood Cove Road, improving the existing low water crossings, installing an additional low water crossing, improving an existing culvert, and paving the pullout at the Lake Mead NRA monument and two parking areas at the marina. Use of the staging areas and proposed improvements at the marina would not result in new impacts on vegetation because these areas are previously disturbed, with all staging activities occurring in areas that are already paved or gravel. All areas to be disturbed would have boundaries staked or flagged before beginning the activity to limit the area of disturbance.

Long-term adverse impacts on vegetation would occur from the rehabilitation of Cottonwood Cove Road between the entrance station and the Cottonwood Cove Marina, the realignment of two small portions of the road between stations 105 and 120 and stations 164 and 170, and from placement of gabion mattresses. The widening and realignment would result in permanent adverse impacts of approximately 6.9 acres, as soils and vegetation would be permanently removed. Placement of revetment mattresses for erosion control would also result in a loss of native vegetation (an additional 0.9 acre). Cottonwood Cove Road currently does not have paved shoulders, and much of the area adjacent to the road has been disturbed by vehicles that leave the roadway, resulting in areas of unvegetated soil adjacent to the existing road. Therefore, the permanent loss of approximately 7.8 acres from the improved road and revetment mattresses is a conservative estimate.

Construction would require soil and vegetation removal and disturbance from cut and fill, resulting in temporary removal of approximately 15.9 additional acres of vegetation. These impacts would be temporary, as this area would be rehabilitated and revegetated following construction. However, vegetation removal and soil disturbance can facilitate the spread of nonnative invasive plant species, ultimately degrading the native vegetation communities. To minimize the risk of invasive species being introduced or spread, all construction vehicles would be washed and inspected before use in the project area and no hay bales would be used on the project site.

To minimize potential impacts, the areas to be disturbed would be staked or flagged before the onset of construction, and disturbance outside staked/flagged areas would be prohibited. Most work for the rehabilitation and realignment of the road would occur within the direct limits of disturbance; however, a buffer of 5 feet was used to account for any indirect impacts from the use of construction equipment. Impacts within these buffers would occur from potential trampling of vegetation and compaction of soils during roadway construction. Compacted soils often become devoid of vegetation, as the soil's ability to hold and conduct water, nutrients, and air necessary for plant root growth is affected (University of Minnesota 2018). Soil compaction can also increase erosion, which removes topsoil, reduces levels of soil organic matter, and contributes to the breakdown of soil structure (US Department of Agriculture 1996). Assuming a 5-foot buffer on either side of the construction footprint for the proposed project rehabilitation, an additional 8.0 acres of vegetation could be indirectly impacted.

Prior to construction, desert soil would be salvaged and plant seeds would be collected by the park; plants would also be salvaged to the extent possible. The park would use the seeds to grow plants in its nursery to prepare for revegetation following construction. The soils, plants, and seeds would be used to restore areas that were temporarily disturbed during construction, helping to stabilize soils and reduce impacts from construction activities. To avoid introduction of nonnative species, no imported topsoil would be used for restoration efforts. Disturbed areas include cut and fill areas needed for construction of the road and the 5-foot buffers used for movement of equipment during construction (approximately 23.9 acres).

The areas of the existing road between stations 105 and 120 and stations 164 and 170 where the road would be realigned would also be restored following construction, totaling approximately 1 acre. These road sections would be demolished, the asphalt would be removed. Following construction, the soils of all disturbed areas would be de-compacted, and the areas restored using the salvaged soils, plants, and seeds, and maintained in natural conditions, resulting in a beneficial impact on the vegetation communities within this area. Following revegetation, the restored areas would be monitored and managed to prevent colonization by nonnative invasive species.

Although individual plants could be lost, the proposed action would not have population-level impacts on vegetation communities. The majority of the project area has been previously disturbed, and the desert scrub-shrub habitats present in the project area are the most abundant habitats in the park. The impacts from the proposed action represent impacts on a small portion of similar habitat available throughout the park. When considering the small area that would be permanently lost and the amount of habitat that would be rehabilitated following construction, the impacts on the vegetation within the project area would be minor.

Cumulative Impacts: As discussed in the “Environmental Trends and Planned Actions” section above, desert vegetation communities could be affected by a changing climate. Past actions in the project area (e.g., flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects) have had adverse effects on the vegetation in the Cottonwood Cove area due to removal of native soils and vegetation and the potential for the spread of nonnative species; however, these projects have minimal adverse impacts on the desert scrub vegetation of the park as a whole. The Piute Eldorado Valley ACEC Management Plan focuses on the conservation of the desert tortoise and its habitat and provides beneficial effects on the vegetation communities on BLM lands.

The proposed action would contribute temporary and permanent vegetation impacts from construction and operation of the improved Cottonwood Cove Road. However, the incremental impacts of this alternative would not make a substantial contribution to the impacts on vegetation from other ongoing and future projects.

Conclusion for Vegetation

Under the no-action alternative, treatment of vegetation would remain the same as current conditions, and vegetation communities within the project area would be unchanged; the no-action alternative would not result in new impacts on vegetation and would not contribute to cumulative impacts on vegetation.

The proposed action would require the removal of soils and vegetation to complete construction activities to rehabilitate and realign Cottonwood Cove Road within the project area. Creosote bush shrubland, semi-desert wash woodland/scrub, and semi-desert scrub shrublands vegetation within an area of approximately 7.8 acres would be permanently lost and an additional 23.9 acres would be susceptible to temporary impacts from soil and vegetation removal and disturbance, trampling, and soil compaction during construction activities. Following construction, the disturbed areas would be revegetated with soils and plants salvaged during construction. Additionally, the removed existing roadbed within the areas that would be realigned would be restored (a total of approximately 1.0 acre), resulting in a net permanent impact of approximately 6.8 acres. The proposed action would have an impact on individual plants but would not have population-level effects. When considering the amount of vegetation that would be impacted and the area that would be restored, the proposed action would affect a small amount of vegetation compared to the amount of vegetation communities available within the park and the Piute

Eldorado Valley ACEC. The proposed action would not contribute significantly to the future trends on vegetation on NPS or BLM lands.

Special-status Species

Affected Environment

Mojave Desert Tortoise. Lake Mead NRA provides important habitat for the desert tortoise, which is federally and state listed (Nevada) as threatened. The Mojave population of the desert tortoise occurs in the Mojave and Sonoran deserts north and west of the Colorado River in southwestern Utah, southern Nevada, southeastern California, and northwestern Arizona (USFWS 2021a).

The desert tortoise is a large herbivorous reptile. It has a domed, greenish-tan to dark brown shell and sturdy legs that have claw-like scales that aid in digging burrows. Desert tortoises can grow up to 15 inches long (USFWS 2011). The Mojave population is most active during the spring when plants are most abundant with additional activity in late summer monsoons (August to September). Desert tortoises retreat into burrows for the remainder of the year to avoid extreme weather conditions and conserve water and energy. Tortoises require loose soil to excavate burrows below rocks, boulders, or vegetation and also use rock crevices. They eat a variety of annual and perennial grasses, forbs, and succulents (USFWS 2011).

This species occurs throughout Lake Mead NRA in Mojave desert scrub habitats away from the shoreline areas. Tortoise populations in the park are generally low density, with scattered high-density areas. The developed areas of the park are in marginal habitat with low tortoise densities (NPS 2014). The Piute Eldorado Valley ACEC was designated to protect the Mojave desert tortoise and its habitat and has one of the largest areas of high-density desert tortoise habitat known in Nevada (BLM 2022).

Most habitat for the Mojave population of the desert tortoise within Lake Mead NRA south of Hoover Dam is protected by wilderness or critical habitat designations. Critical habitat for the Mojave population of the desert tortoise was designated in 1994. The USFWS identified biological and physical features that are essential to the desert tortoise's conservation, including sufficient space to support viable populations within each recovery unit and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality. All of the project area within the Piute Eldorado Valley ACEC occurs within the designated critical habitat, and the portion of the project area within the park from the western boundary to approximately the ranger station is also within the critical habitat.

Desert tortoise presence/absence surveys were conducted in June 2020 along the length of the road corridor, including the two sections of the corridor that would be realigned under the proposed action. Results of the survey included one Condition Class 4 burrow (a burrow that is in good condition and could be used by a desert tortoise) that showed no obvious signs of tortoise use. There was also a depression area along the corridor, which could have been created by a tortoise, but there were no other observable tortoise signs within the vicinity.

Banded Gila Monster. The Gila monster is classified as a protected reptile in Nevada. The banded Gila monster is the subspecies that occurs in Clark County in Nevada. The banded Gila monster is a slow moving and venomous reptile that has bead-like scales that alternate in pink or orange and black bands across the body. It has a large head and a short fat tail (Arizona-Sonoran Desert Museum 2008). It is one of the largest lizard species native to the American southwest (Beck 1990).

This species is found primarily below 5,000 feet elevation, and its geographic range approximates that of the desert tortoise. Banded Gila monsters frequently use lower slopes of mountains and nearby plains. They will use and are occasionally encountered out in gentler terrain of alluvial fans. Gila monsters are diurnal and are active from March to November (NDW 2022). Although they are diurnal, they spend most of their time underground, typically only emerging to hunt and find mates (NDW 2022). The project area contains suitable habitat for the banded Gila monster.

Environmental Trends and Planned Actions

Desert-inhabiting wildlife species already live close to the limits of their physiological tolerances. A shift in vegetation communities from climate change could alter the amount of suitable habitat in a specific area for wildlife species, influencing their distribution. Desert reptiles, such as desert tortoises and Gila monsters, can generally avoid high temperatures by shifting activity periods, seeking shelter below vegetation, and burrowing in crevices and burrows. However, modeling indicates that the increased duration and intensity of drought conditions may reduce suitable desert tortoise habitat by nearly 66% in the Mojave Desert (Barrows 2011). Warming temperatures could also produce a shift in the sex ratio of reptile eggs, resulting in a higher frequency of male hatchlings (Barrows 2011).

Desert tortoise populations have been declining throughout their range due to urban development, disease, off-road vehicle disturbance, construction activities, mining, and livestock grazing. Habitat fragmentation from urbanization is a continuing problem. Gila monsters face similar threats, as well as illegal collection (NatureServe 2022b). The park and the Piute Eldorado Valley ACEC provide large areas of protected, continuous habitat for these two species. Within the project area, they are currently at risk of injury or death from traffic on Cottonwood Cove Road and potential harassment by visitors.

In addition to changes from climate change and ongoing threats, past and ongoing actions could have effects on these special-status species. Actions that have affected Mojave desert tortoise and banded Gila monster include facility construction and maintenance — the flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects. These actions have resulted in adverse impacts on Mojave desert tortoise and banded Gila monster, including changes to potentially suitable habitat, with the flood diversion structure project having the largest potential impact on desert tortoise and Gila monster habitat.

These projects all occur outside of the designated critical habitat for the tortoise. Presence/absence surveys to date have not identified any tortoises within the area of disturbance for that project. A Programmatic Biological Opinion (PBO) was issued by the USFWS to the NPS in 2010 and renewed in 2017. The PBO evaluated the potential effects on the threatened Mojave desert tortoise and the designated critical habitat from programmatic activities in Lake Mead NRA. These activities include infrastructure development and maintenance as part of the implementation of a development concept plan for Cottonwood Cove. The park initiated additional consultation with the USFWS for the flood diversion project on June 3, 2019 through a request to append the flood mitigation project to the PBO. A biological opinion (BO) was issued on June 18, 2019.

The other projects — sewer force main replacement, water well installation, and water well supply line replacement — are located much closer to the developed area, which has lower quality habitat for desert tortoise and banded Gila monster.

The Piute Eldorado Valley ACEC Management Plan benefits these special-status species, as it takes measures to preserve the Mojave desert tortoise and maintain and restore habitat. This plan has beneficial impacts on the desert tortoise, including its habitat on BLM lands. Because the preferred habitats of Mojave desert tortoises and banded Gila monsters overlap, the plan also benefits Gila monster.

Impacts Assessment

In this section, the impacts on Mojave desert tortoise and banded Gila monster from the two alternatives are analyzed. The analysis of these species considered the potential direct impacts on the animals, as well as the impacts on suitable habitat within the project area, as described in the previous vegetation section. Construction activities associated with the proposed action could result in impacts on special-status species through habitat removal, disturbance, and physical harm. Because the Mojave desert tortoise and the banded Gila monster use the same habitat within the project area, the analysis of impacts is combined in this section.

Both the NPS and the BLM have PBOs issued by the USFWS for the desert tortoise:

- *Lake Mead National Recreation Area and Tule Springs Fossil Beds National Monument Programmatic Biological Opinion* (File No. 84320-2009-F-0145 R001), issued in 2010 and renewed in 2017
- *Programmatic Biological Opinion for Bureau of Land Management Activities Adversely Affecting 17 Listed Species and Critical Habitats* (File No. 08ENVS00-2019-F-0153 SNDO), issued in 2020

The NPS PBO included an evaluation of potential effects on the threatened Mojave desert tortoise and its designated critical habitat from programmatic activities in Lake Mead NRA, such as infrastructure development and maintenance as part of the implementation of a development concept plan for Cottonwood Cove. The BLM PBO was issued for effects on threatened and endangered species and their critical habitat that may occur because of actions proposed by the BLM, Southern Nevada District Office.

The NPS initiated consultation for this project with the USFWS on September 29, 2020 through a request to append the Cottonwood Cove Road improvements project to its PBO, and the USFWS issued a BO on November 18, 2020. The NPS reinitiated consultation with the USFWS on February 7, 2023 to update project impacts and include critical habitat impacts that may occur on NPS and BLM lands. Consultation with the USFWS is ongoing.

Impacts of the No-Action Alternative on Special-status Species

The no-action alternative would not appreciably change the current conditions in the project area. Existing impacts on Mojave desert tortoises and banded Gila monsters would continue as described in the “Affected Environment” section. These reptiles would continue to be at risk of potential injury or mortality from interactions with vehicles, harassment from visitors, and habitat loss and degradation, but there would be no new impacts on Mojave desert tortoises or banded Gila monsters under the no-action alternative.

Pursuant to section 7 of the ESA, the no-action alternative would have *no effect* on the Mojave desert tortoise, as it would not result in new impacts on the tortoise or the designated critical habitat.

Cumulative Impacts: Under the no-action alternative, use of the project area by Mojave desert tortoise and banded Gila monster would remain unchanged; therefore, the no-action alternative would not contribute to cumulative impacts when considered with the ongoing and future projects occurring near the project area.

Impacts of the Proposed Action/Preferred Alternative on Special-status Species

Potential impacts on the Mojave desert tortoise and banded Gila monster under the proposed action during construction activities for rehabilitation of Cottonwood Cove Road include direct injury or mortality, temporary or permanent loss of suitable habitat, harassment, and increased predation. The resource protection measures for special-status species detailed in chapter 2 would be implemented to avoid or minimize the potential impacts on Mojave desert tortoise and banded Gila monster.

Under the proposed action, the road improvements would occur largely within the existing road corridor, rather than disturbing or fragmenting portions of continuous, undisturbed habitat. However, there would be two sections of the road that would be realigned, totaling approximately 0.37 mile. To minimize potential impacts, the areas to be disturbed would be staked or flagged before the onset of construction, and disturbance outside staked/flagged areas would be prohibited.

The proposed action would result in long-term adverse impacts on the Mojave desert tortoise and banded Gila monster from the permanent loss of approximately 7.8 acres of desert scrub-shrub habitat adjacent to the existing road and in the two portions of the roadway that would be realigned. As discussed in the “Vegetation” section, construction crews would need additional space on either side of the existing roadbed for proper installation of the new road and movement of construction vehicles, temporarily affecting an additional 23.9 acres of potential Mojave desert tortoise and banded Gila monster habitat. Temporarily disturbed areas would be restored following construction, as would approximately 1.0 acre of existing road that would be removed in the realignment area, resulting in permanent impacts on 6.8 acres of potential Mojave desert tortoise and banded Gila monster habitat.

A portion of this project area lies within designated critical habitat for Mojave desert tortoise, and critical habitat would be permanently and temporarily affected by construction activities. Project activities would disturb a total of approximately 21.9 acres within designated critical habitat. Of that total, approximately 5.1 acres would be permanently lost from widening the road, realigning the road in two sections, and improving water drainage. However, the realignment would result in approximately 1.0 acre of existing roadway that would be removed and the area restored, resulting in a net loss of 4.1 acres of critical habitat. Cottonwood Cove Road predates the designation of the desert tortoise critical habitat, as it was constructed as part of the Lake Mead NRA Mission 66 program (1953 to 1969), as described in detail in the “Cultural Landscapes” section. The desert tortoise critical habitat between the entrance station and the Cottonwood Cove marina has been developed and fragmented by the existing Cottonwood Cove Road since its designation in 1994; the habitat adjacent to the road is of lower quality due to the presence of the road and disturbance from vehicles leaving the road. Therefore, the areas affected are less likely to be used by desert tortoises than adjacent, undisturbed portions within the designated critical habitat.

Vegetation removal and soil disturbance can facilitate the spread of nonnative invasive plant species, ultimately degrading the native vegetation communities and the habitat for Mojave desert tortoise and banded Gila monster. Mitigation measures, such as cleaning and inspecting all construction vehicles prior to use in the project area, avoiding the use of imported soils, and monitoring and managing restored areas would be implemented to reduce the potential for the spread of nonnative species. After construction, all materials would be removed from the project area and the site would be prepared for revegetation. Desert habitats are generally slow to recover following disturbance, but to facilitate revegetation, soils and vegetation removed for construction would be salvaged and used for restoration efforts. The existing portions of Cottonwood Cove Road between stations 105 and 120 and stations 164 and 170 would be removed and revegetated. This would result in the creation of additional habitat, although the proximity of this habitat to the road would make it lower quality habitat for Mojave desert tortoise and banded Gila monster.

In addition to habitat loss and potential degradation, Mojave desert tortoise and banded Gila monster are at risk for injury or mortality from the use of construction equipment and vehicles in the project area, harassment by visitors and construction crews, and increased predation. All construction crews would be provided with awareness training before work begins so that they can identify Mojave desert tortoises and banded Gila monsters while on-site; understand the need to drive slowly, check for tortoises under vehicles before moving them, maintain the worksite to avoid entrapment dangers, maintain construction vehicles and equipment to avoid habitat contamination, and keep a clean worksite to avoid attracting predators (e.g., ravens, coyotes); and are aware of the procedures to follow if one of these species is observed. In addition, a qualified biologist would survey for desert tortoises and Gila monsters before construction begins and be onsite to monitor construction activities to ensure risks to special-status species are avoided/minimized to the extent possible.

Following construction, use of Cottonwood Cove Road would allow visitors and staff to drive at 45 miles per hour for the first 5.1 miles beyond the entrance station. This represents a change from the current conditions where drivers had to slow to navigate the curves that would be straightened under the proposed action. The constant speed may increase the potential for desert tortoises and Gila monsters to be injured or killed by vehicles on the road. Conversely, straightening the curves would increase the line of sight, allowing drivers to identify animals more easily in the road. Signs would be added to warn drivers of potential wildlife crossings on the road to minimize the potential for injury or mortality.

Pursuant to section 7 of the ESA, the proposed action *may affect but is not likely adversely affect* the Mojave desert tortoise. The proposed action has the potential to adversely affect Mojave desert tortoises through temporary and permanent habitat loss, injury or direct mortality, and harassment. Permanent habitat loss would amount to approximately 6.8 acres, and 4.1 acres of this would be within designated critical habitat for the Mojave desert tortoise; however, the habitat loss would be limited to areas immediately adjacent to the road, which is lower-quality habitat.

Cumulative Impacts: As discussed in the “Environmental Trends and Planned Actions” section above, special-status species and their habitats could be affected by a changing climate. Past actions that have affected Mojave desert tortoise and banded Gila monster include facility construction and maintenance — the flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects. These actions have resulted in adverse impacts on Mojave desert tortoise and banded Gila monster, including changes to potentially suitable habitat; however, these projects all occur outside of designated critical habitat for the tortoise. The Piute Eldorado Valley ACEC Management Plan

focuses on the conservation of the desert tortoise and its habitat, providing beneficial effects on both desert tortoise and Gila monster on BLM lands.

The proposed action would contribute temporary and permanent impacts on Mojave desert tortoises and banded Gila monsters, including designated Mojave desert tortoise critical habitat, from construction and operation of the improved Cottonwood Cove Road. However, the incremental impacts of this alternative would not make a substantial contribution to the impacts on Mojave desert tortoises and banded Gila monsters from other ongoing and future projects.

Conclusion for Special-status Species

The no-action alternative would not result in any new impacts on special-status species. No construction work would be undertaken, and Mojave desert tortoises and banded Gila monsters could continue to use the existing lower-quality habitats within the project area. The no-action alternative would have *no effect* on the federally threatened Mojave desert tortoise. The no-action alternative would also not contribute to cumulative impacts on Mojave desert tortoises or banded Gila monsters.

The proposed action would involve construction activities that could result in impacts on Mojave desert tortoises and banded Gila monsters, including loss of habitat, vegetation removal, the potential for harm from the use of heavy equipment in the project area, increased predation, and harassment. Construction activities would be localized and temporary and would occur along a previously disturbed and developed road corridor; however, the project would result in the loss of 6.8 acres of Mojave desert tortoise and banded Gila monster habitat, including a loss of 4.1 acres of desert tortoise critical habitat. Resource protection measures would be taken to ensure that impacts on these species are avoided/minimized as much as possible. The proposed action *may affect but is not likely to adversely affect* the federally threatened Mojave desert tortoise.

The proposed action would have an impact on Mojave desert tortoise and banded Gila monster habitat — including a portion of desert tortoise critical habitat — but the impacts would be limited to the lower-quality habitat adjacent to the existing road. When considering the special-status species habitat that would be permanently lost, the proposed action would affect a small amount of habitat compared to the amount of higher quality available within the park and the Piute Eldorado Valley ACEC. The proposed action would not contribute significantly to the future trends on Mojave desert tortoise and banded Gila monster on NPS or BLM lands.

Migratory Birds

Affected Environment

The MBTA protects migratory birds that are native to the United States or US territories and their nests with eggs or young. The MBTA prohibits the take (i.e., disturbing nests, killing, capturing, selling, trading, and transporting) of protected migratory bird species without prior authorization by the USFWS. Similarly, the Bald and Golden Eagle Protection Act (16 USC §§ 668-668c) prohibits the take, transport, sale, barter, trade, import and export, and possession of eagles, making it illegal for anyone to collect eagles and eagle parts, nests, or eggs without a permit.

The USFWS Information for Planning and Consultation tool identified Clark's grebe, western grebe, Costa's hummingbird, bald eagle, and golden eagle as migratory birds of concern for the Cottonwood

Cove Road Improvements project area (USFWS 2023a); however, it should be noted that this list does not include all migratory birds that could be found in or near the project area. More than 130 bird species have been identified at Cottonwood Cove (Cornell 2023a) and most are protected under the MBTA. The project area is located along the existing Cottonwood Cove Road and the habitat adjacent to the road is diminished due to the development and the presence and noise of vehicular traffic.

Environmental Trends and Planned Actions

Unlike desert reptiles and mammals, most birds are unable to burrow and are generally more exposed. A recent study in the Mojave Desert (Riddell et al. 2021), 90 well-surveyed sites were revisited to record species and compare the data. Researchers determine that there has been a 42% decline in bird diversity across the Mojave Desert, which occurs largely on protected land. A large factor in the decline of birds may be the lack of water. Birds thermoregulate by panting, but panting removes water from the body. To consume more water, birds must find and catch more food, which in turn requires more energy. Birds may die in these conditions or may leave the area for more suitable habitat (Riddell et al. 2021).

In addition to changes from climate change and ongoing threats, past and ongoing actions could have effects on these special-status species. Past actions that have affected migratory birds and/or their habitat include facility construction and maintenance — the flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects. These actions have resulted in adverse impacts on migratory birds, including changes to potentially suitable habitat, with the flood diversion structure project having the largest potential impact on potential habitat. The other projects are located much closer to the developed area, which has lower-quality habitat.

One current action that could benefit migratory birds is the Piute Eldorado Valley ACEC Management Plan, which takes measures to preserve the Mojave desert tortoise and maintain and restore habitat. This plan has beneficial impacts on desert tortoise habitat on BLM lands, which in turn benefits other species that use the same habitat.

Impacts Assessment

The analysis of migratory birds considered the potential direct and indirect impacts on the birds and their nests, as well as on suitable habitat within the project area. Impacts on migratory birds could include habitat removal, disturbance, and physical harm.

Impacts of the No-Action Alternative on Migratory Birds

The no-action alternative would not appreciably change the current conditions in the project area, as routine maintenance activities would continue but there would be no construction activities. Migratory birds could continue to be affected by disturbance from vehicles and visitor activities, and vehicles that trample vegetation along Cottonwood Cove Road would continue to degrade potential habitat; however, the no-action alternative would not result in new impacts on migratory birds within the project area.

Cumulative Impacts: Under the no-action alternative, use of the project area by migratory birds would remain unchanged; therefore, the no-action alternative would not contribute to cumulative impacts when considered with the ongoing and future projects occurring near the project area.

Impacts of the Proposed Action/Preferred Alternative on Migratory Birds

Under the proposed action, migratory birds could be affected by the presence of the construction crew, removal of habitat for the expansion of Cottonwood Cove Road, and associated construction noise.

Migratory birds would be disturbed by these elements and displaced during construction activities. Non-mobile individuals could be injured or killed. To avoid impacts on nesting migratory species, a qualified biologist would conduct a nest survey within the project area no more than five days before the scheduled construction activity and would establish an appropriately sized buffer around any active nests identified to avoid impacts, and the area would be avoided until the young birds fledge. Further, construction crews would be trained so that they are familiar with the MBTA and Bald and Golden Eagle Protection Act and would stop work if they encountered a nest until a qualified biologist could confirm whether the nest is active. If active, the biologist would establish an appropriate buffer around the nest.

The proposed action alternative would have adverse impacts on migratory birds associated with construction activities from the disturbance of 23.9 acres of vegetation adjacent to the road corridor. Although 6.8 acres would be permanently lost from road improvements, the remainder of the area would be revegetated using native species following construction. The habitat within the project area is lower quality due to its location adjacent to Cottonwood Cove Road. Large areas of undisturbed desert scrub-shrub habitat exist within the park, which would provide sufficient habitat for migratory bird species using the habitat near the project area. The impacts from the proposed action represent a small portion of similar habitat available throughout the park.

For the migratory bird species of specific concern identified by the USFWS IPaC system, the proposed action is unlikely to adversely affect Clark's grebes, western grebes, and Costa's hummingbird. Clark's grebes nest on large freshwater lakes and marshes with emergent vegetation along the edges and overwinter in saltwater or brackish habitats (Cornell 2023b). Western grebes require similar habitat to Clark's grebes — large freshwater lakes and marshes edged with reeds and rushes (Cornell 2023c). Both grebe species are abundant and known to breed in the park (NPS 2023a); however, given the development at Cottonwood Cove, Clark's and western grebes are unlikely to nest within or near the project area. Costa's hummingbirds inhabit scrub and woodland habitats and breed between January and June (Cornell 2023d; USFWS 2021c). This species is common and known to nest in the park (NPS 2023a), though it is not known to nest in the project area. Although Costa's hummingbird's breeding season would coincide with construction, protective measures would be conducted, as discussed above and in chapter 2, to avoid impacts on Costa's hummingbird.

Bald eagles are common in the park (NPS 2023a), but surveys indicate that bald eagles historically appear to prefer the Overton Arm region of Lake Mead, likely due to the large numbers of waterfowl and the lower recreation activity. Bald eagles visit Lake Mead and Lake Mohave between late September and early May with the greatest numbers occurring between December and February. Biologists have confirmed a nesting pair in the Black Canyon area on Lake Mohave (NPS 2022). Golden eagles are uncommon at the park (NPS 2023a) but may be seen soaring or hunting small mammals. Bald and golden eagles could use the project area for foraging. Although temporary adverse impacts would occur to these raptor species due to noise disturbance during construction, the impacts would be limited to the period of construction (approximately 9 months), localized to the project area, and minimized by the implementation of BMPs, such as the use of properly maintained construction equipment and turning off any idling equipment when not in use. Eagles temporarily disturbed by the construction may return after the completion of the construction. No potential nesting habitat for eagles would be disturbed.

Although the project area is located in habitat of diminished quality due to fragmentation from existing development, migratory birds could be adversely affected. The proposed action has the potential to adversely affect migratory birds through temporary and permanent habitat loss, disturbance from construction noise, and injury or direct loss of eggs and nestlings. Permanent habitat loss would amount to approximately 6.8 acres. With the implementation of mitigation measures and BMPs, no substantial long-term effects on migratory birds or bald or golden eagle populations are anticipated from the proposed action.

Cumulative Impacts: As discussed in the “Environmental Trends and Planned Actions” section above, migratory birds could be affected by a changing climate. Past actions in the project area (e.g., flood diversion structure, sewer force main replacement, water well installation, and water well supply line replacement projects) have resulted in adverse impacts on migratory birds, including changes to potentially suitable habitat. These projects affect desert scrub habitat, which is available throughout the park, and mostly occur in previously developed or disturbed areas. In addition, the park employs mitigation measures and BMPs on all projects to reduce or avoid environmental impacts to the extent possible. The Piute Eldorado Valley ACEC Management Plan focuses on the conservation of the desert tortoise and its habitat, which also benefits migratory birds on BLM lands that use the habitat.

The proposed action would contribute temporary and permanent impacts on habitat that migratory birds would have used due to construction and operation of the improved Cottonwood Cove Road. However, the incremental impacts of this alternative would not make a substantial contribution to the impacts on migratory birds from other ongoing and future projects.

Conclusion for Migratory Birds

The no-action alternative would not result in any new impacts on migratory birds, as no construction work would be undertaken, and migratory birds could continue to use the existing lower-quality habitats within the project area. The no-action alternative would not contribute to cumulative impacts on migratory birds.

The proposed action could have short- and long-term impacts on migratory birds, including noise disturbance and removal of potential habitat. Injury of migratory birds and their nests would be avoided through vegetation removal restrictions (when possible) and avoidance of any active nests identified before and during construction activities. With the implementation of mitigation measures and BMPs, the potential for impacts would be low. Additionally, the habitat adjacent to Cottonwood Cove Road is lower quality — it has been disturbed by the road itself as well as by additional disturbance from continual vehicular traffic. The proposed action could have an impact on individuals but would not have population-level effects, particularly with the implementation of mitigation measures and BMPs. When considering the amount of potential migratory bird habitat that would be impacted and the area that would be restored, the proposed action would affect a small amount of habitat compared to the amount of higher-quality habitat available within the park and the Piute Eldorado Valley ACEC. The proposed action would not contribute significantly to the future trends on migratory birds on NPS or BLM lands.

Cultural Landscapes and Historic Structures

Affected Environment

Following World War II, visitation to national parks saw a tremendous upsurge due to the rise of the popularity of automobiles, an enhanced interstate highway system, and a population explosion in America. The national parks were not equipped to manage the 50 million visitors that came to the parks in 1955. This was up from 12 million in 1936 and 22 million in 1946. Both the government and concessionaires' facilities were inadequate to meet the needs of the number of visitors and automobiles arriving in the parks, and there was a backlog of visitor and park facilities construction dating from 1942 to meet this demand (McClelland 1998). The NPS developed the Mission 66 program to expand visitor services and modernize park facilities. The NPS Mission 66 Era was characterized by broad-based construction, staffing, and a park expansion program that shaped how Americans experienced the national parks after World War II (Carr et al. 2015).

The Cottonwood Cove area was developed as part of the Mission 66 program, and the Cottonwood Cove Developed Area Historic District is eligible for the National Register of Historic Places (NRHP) (NPS 2005). The APE primarily encompasses the Cottonwood Cove Developed Area Historic District (see figure 5). The development at Cottonwood Cove is distributed into two types of zones or areas – the public use areas, including the concessionaire-operated area, and the NPS-operated zone (support services area). The public use areas operated by the concessionaire are spatially discrete from the areas operated by the NPS. Integrity is defined as a property's "ability to convey its significance." To be eligible for the NRHP, properties should retain most of the seven aspects of integrity — location, design, setting, materials, workmanship, feeling, and association. The main access road, residential and campground loop roads, boat launch area, primary access road to the trailer village, and circulation within the trailer village were all constructed as part of the Lake Mead Mission 66 program and maintain a high level of integrity in their location, setting, design, materials, workmanship, feeling and association (NPS 2005). A few changes have occurred outside the identified period of significance and were not planned as part of Mission 66 development (NPS 2005). Table 3 lists the contributing resources and character-defining features of the historic district, which includes Cottonwood Cove Road (NPS 2005). Non-contributing buildings include the fire station (Building No. 242), duplexes number 204 and 205, concessionaire store, and concessionaire café (NPS 2005).

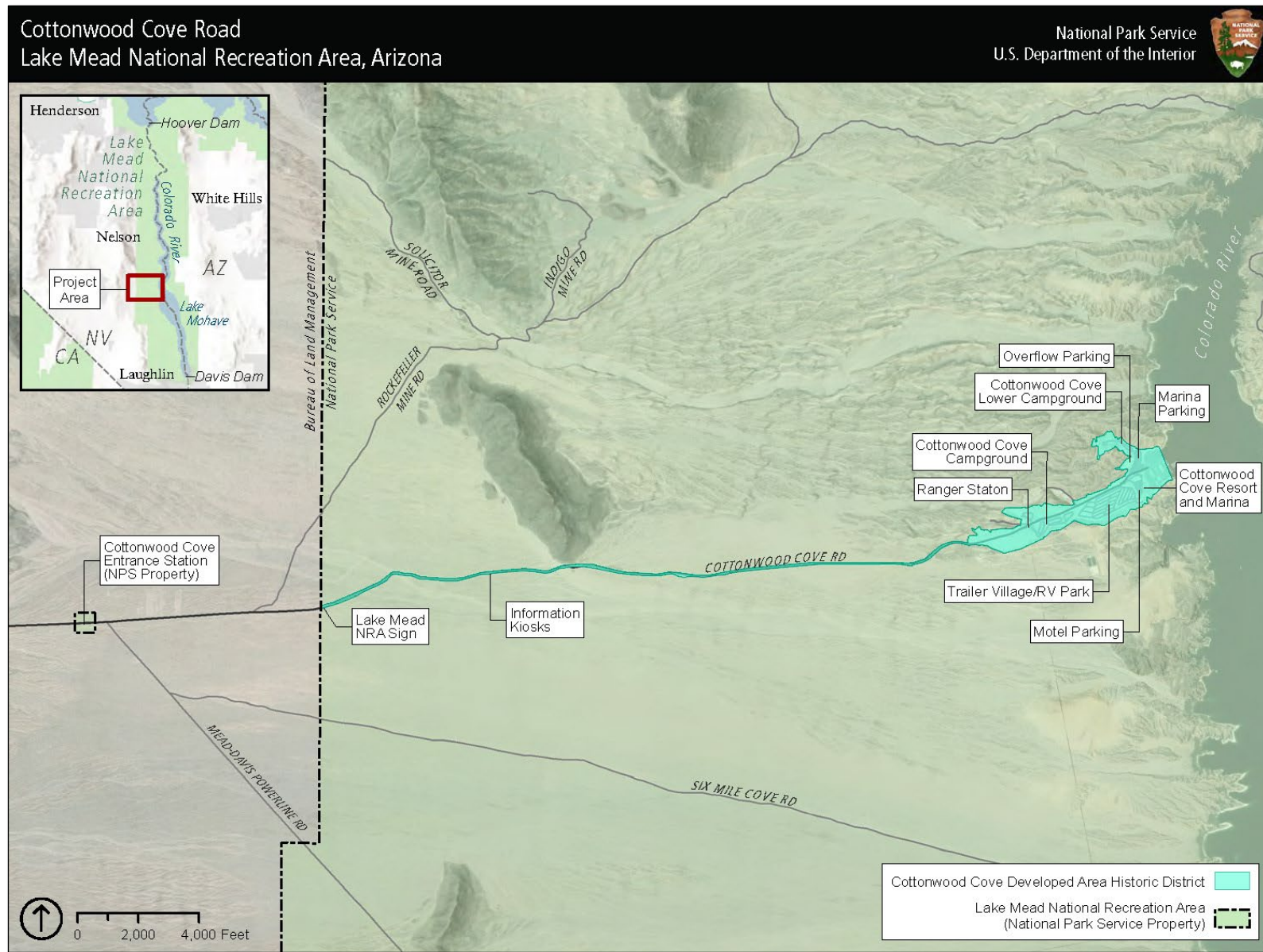
Table 3. Contributing Resources and Character-Defining Features of the Cottonwood Cove Developed Area Historic District

(Source: NPS 2005)

Resource Name	Resource Type	Character-defining Features	Zone/Use
Cottonwood Cove Road	Structure	Gentle arcs and slopes, intersections with campground loop roads, ranger station parking, boat launch, and trailer parking	NPS and Concessionaire operated/public use
Cottonwood Cove Ranger Station, Building Number 240	Building	Low-profile, spatial layout, exposed structural expression, light red color concrete masonry unit block wall construction, exposed roof structure, deep metal deck fascia, screen walls and exterior plaza, pedestrian pathways, parking area, narrow island of vegetation, planting areas, and planters	NPS operated/support services

Resource Name	Resource Type	Character-defining Features	Zone/Use
Cottonwood Cove Upper Campground	Site	Three-loop vehicular circulation, individual campsites, existing period furnishings, non-native vegetation for shade and screening, irrigation, and comfort stations	NPS operated/public use
Cottonwood Cove Lower Campground	Site	One-loop vehicular circulation, individual campsites, existing period furnishings, non-native vegetation for shade and screening, irrigation, and comfort stations	NPS operated/public use
Cottonwood Cove Boat Launch Area	Site	Boat trailer parking and 200-foot-wide boat ramp	Concessionaire operated/public use
Cottonwood Cove Concessionaire Public Use Area	Site	Large trailer village, small waterfront hotel, café, convenience store, service station, marina, swimming beach, infrastructure, layout, and circulation	NPS operated/public use and support services
Cottonwood Cove Maintenance Utility Area	Site	Utility building and fenced maintenance area	NPS operated/support services
Cottonwood Cove Utility Building, Building Number 241	Building	"Dumbbell" shaped floor plan with connecting walk-through room, ribbon band windows, concrete masonry unit with steel frame, shallow mansard roof, and pinkish color	NPS operated/support services
Cottonwood Cove NPS Residential Area	Site	Three original housing units along the outer loop road, duplex, and curved roads	NPS operated/support services
Cottonwood Cove Residence Number 201	Building	Flat-roofed H-shaped plan with attached carport, concrete masonry unit walls on ends with vertical wood siding, window and door fenestration, and orientation for maximum shade	NPS operated/support services
Cottonwood Cove Residence Number 202	Building	Flat-roofed, rectangular ranch, wood-framed and stucco, window and door fenestration, floorplan for public and private spaces, and carport	NPS operated/support services
Cottonwood Cove Residence Number 203	Building	Flat-roofed, rectangular ranch, and window and door fenestration	NPS operated/support services

Figure 5. Cottonwood Cove Developed Area Historic District



Environmental Trends and Planned Actions

Cultural resources and ethnographic resources can be affected by climate change. Climate-related impacts on historic districts and cultural landscapes include both the built environment and ecosystem (when it is part of the landscape). Changes in temperature and precipitation patterns may stress building materials or favor different vegetation species patterns for historic or culturally significant vegetation. Climate change threats to archeological resources can take many forms, including erosion, inundation, heat, and chemical alteration. Climate change impacts ethnographic resources damaging tangible resources and/or disrupting or disconnecting people from their activities and associations with the place. Changes in temperatures may limit access to traditional hunting areas and are expected to shift migratory patterns of prey. Warming temperatures and changes in precipitation also may affect the distribution of key plant and animal species (Beavers et al. 2016).

In addition to changes from climate change, past actions have the potential to affect the cultural landscape. Actions that affect the cultural landscape are those that add new structures into or can be seen from within the historic district boundaries. The water and sewer line replacements were placed beneath previously paved and unpaved roads or disturbed corridors and did not result in effects on the cultural landscape. Development projects, including the flood diversion structure and new water well installation, resulted in additions and changes to the cultural landscape. These changes are subtle and small in scale. There are already modern additions to the cultural landscape, such as several residential buildings and the Cottonwood Cove fire station; therefore, these actions did not result in adverse effects.

Impacts Assessment

The regulations implementing Section 106 of the NHPA, define a historic property as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior.” The project area contains the Cottonwood Cove Developed Area Historic District, as described above. Impacts are considered to be adverse if the action may alter any of the characteristics of the historic district that qualify the property for inclusion in the NRHP in a manner that would diminish the property’s integrity (36 CFR 800.5).

Impacts of the No-Action Alternative on Cultural Landscapes

Under the no-action alternative, the park would continue to manage the road — a contributing element of the historic district — as it does currently to allow for continued use. Minimal repairs and maintenance efforts would sustain the road near its existing state of integrity. The roadway would continue to flood and roadway surfaces would continue to wear; the park would continue to repair and clear the road of debris as needed. There would be no new changes resulting from the no-action alternative and no changes to the historic district that would diminish its integrity.

Cumulative Impacts: Under the no-action alternative, there would be no direct or indirect impacts on the cultural landscape; therefore, this alternative would not contribute to cumulative impacts when considered with the past, ongoing, and future projects occurring near the project area.

Impacts of the Proposed Action/Preferred Alternative on Cultural Landscapes

Road Improvements. The road improvements that would occur within the historic district boundary include the following:

- improving the Lake Mead NRA monument pullout
- realigning two sections of the road between stations 105 and 120 and stations 164 and 170
- improving the low water crossings at stations 112 and 165
- lining and extending the existing new culvert near station 293
- widening the roadway with roadside ditches for runoff (between stations 3 and 325)
- widening the roadway with curb and gutter on both sides and a 5-foot sidewalk on the right side (between stations 325 and 368)
- improving the existing low water crossing at station 345 and adding a new low water crossing at station 306
- adding curb and gutter and other parking lot improvements around the Ranger Station
- making the parking lots, curb cuts, sidewalks, and all other facilities associated with this project physically accessible

These improvements would not alter the circulation patterns established during the Mission 66 period and would not be highly visible to the traveling public; however, these actions would introduce additional modern changes to the Cottonwood Cove Developed Area Historic District. For example, approximately 6.8 miles of Cottonwood Cove Road would be widened, and two sections of the road representing about 0.4 mile total would be realigned. Although the proposed project would have an effect on the historic district, it would not noticeably alter character-defining elements to the point of diminishing the overall integrity of the historic district. Therefore, the road improvements under the proposed action would result in no adverse effect on the historic district or its integrity.

Use of the staging area near the ranger station would not result in permanent changes to the historic district, as any potential visual impacts from construction staging would be temporary. The proposed action would include improvements to the entrance station. The entrance station is outside of the historic district and is not visible from the historic district. Therefore, these actions would not adversely affect the historic district or its integrity.

Marina and Concession Area Improvements. Improvements to the existing parking area north of Cottonwood Cove Road (figure 4) include repaving, installing curbing, wheel stops, and signs, and painting pavement markings. The Cottonwood Cove Resort and Marina parking lot (figure 4) would also be repaved with added rainwater diversion improvements, installation of signs, and pavement painting. A concrete masonry unit block fence would be constructed along the western edge of the parking lot to separate it from the RV park. The block fence would be a new structure within the historic district and noticeable to some visitors; however, concrete block is a commonly used material throughout the historic district. The wall could also be removed from the historic district at a later time, so this change is not irreversible. The other proposed changes to the Cottonwood Cove Resort and Marina parking lot would be designed to minimize visual effects on the historic district. Therefore, these improvements would result in no adverse effects on the historic district or its integrity.

A paved one-acre overflow parking area would be constructed adjacent to the marina parking lot south of the Cottonwood Cove Lower Campground, and the 1.4-acre parking area south of the road near the Cottonwood Cove Resort and Marina parking lot (figure 4) would be formalized. These changes to the design would result in a slight modification to the spatial organization and increase the size of the built environment. However, these changes would occur in areas already accommodating this type of use and infrastructure within the planned operational zones.

Overall, the NPS would select materials that would be compatible with historic materials in terms of design, color, and texture; blend into the existing built historic district and landscape; and be in accordance with the Secretary of Interior Standards for preservation. When construction is complete, cut and fill slopes would be rounded at the tops and superficially contoured in such a way as to minimize unnatural-looking straight lines and angles and to match the surrounding natural landscape of the area. The proposed action would have a long-term effect on the features of the historic district. However, the impacts would not alter any of the characteristics of the historic district that qualify the property for inclusion in the NRHP, nor would the overall integrity of the property's location, design, setting, materials, workmanship, feeling, or association be diminished. Therefore, the potential impacts would result in no adverse effect.

Cumulative Impacts: As discussed in the “Environmental Trends and Planned Actions” section above, the desert environment, and therefore the historic setting and cultural landscape, could be affected by a changing climate. Actions that affect the cultural landscape are those that added new structures into or can be seen from within the historic district boundaries (water and sewer line replacements, flood diversion structure, and new water well installation); however, these changes are subtle and small in scale. Because there are already modern additions to the cultural landscape, these actions do not result in adverse effects.

The proposed action would improve Cottonwood Cove Road and contribute non-historic elements to the Cottonwood Cove Developed Area Historic District; however, the impacts of this alternative would not make a substantial contribution to the impacts of other projects and trends, and the overall character of the landscape would remain.

Conclusion for Cultural Landscapes

The no-action alternative would not result in new impacts nor contribute to cumulative impacts on the Cottonwood Cove Developed Area Historic District.

Under the proposed action, there would be changes to the circulation infrastructure and the introduction of new infrastructure into the Cottonwood Cove Developed Area Historic District. To reduce the effect of the changes, the NPS would select materials that would be compatible with historic materials and be in accordance with the Secretary of Interior Standards for preservation. The changes and additions would not alter the characteristics of the historic district that qualify the property for inclusion in the NRHP; therefore, the changes would result in no adverse effects and would not contribute to cumulative impacts on the Cottonwood Cove Developed Area Historic District. Concurrence from the Nevada State Historic Preservation Office and Tribal Nations on the assessment of effect is pending.

CHAPTER 4: CONSULTATION AND COORDINATION

This chapter summarizes the consultation and coordination process for the Cottonwood Cove Improvements project.

Public Participation

Civic Engagement. The NPS introduced the project and invited public comment via a press release dated October 1, 2021. Comments were accepted through November 1, 2021. The NPS received four correspondences through the NPS's Planning, Environment, and Public Comment (PEPC) website. Comments and concerns were related to the potential for additional flooding and the need for the project as it relates to safety. Commenters also suggested additional elements for inclusion in the proposed action. These comments were considered but dismissed when developing the alternatives carried forward in this EA for full analysis, as described in chapter 1.

Public Review. The EA will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, tribes, and organizations. It also is available on the NPS's PEPC website at: <https://parkplanning.nps.gov/LAKE>.

Agency Consultation

Nevada State Historic Preservation Office. As required by Section 106 of the NHPA, the park initiated consultation with the Nevada SHPO beginning on September 8, 2020. The park provided an assessment of effects, with a determination of no adverse effect on historic properties and the Cottonwood Cove Developed Area Historic District. Concurrence from the Nevada SHPO was not granted, and additional information was requested from Nevada SHPO at that time. The NPS has maintained a no adverse effect determination, as proposed work would not significantly alter or remove character-defining elements of the Cottonwood Cove Developed Area Historic District. Further consultation with the Nevada SHPO regarding the additional cultural resources survey conducted in December 2022 and potential impacts on the historic district is ongoing. If SHPO comments require mitigation for adverse effects, the EA will be revised and republished for another 30-day comment period.

Tribes. The NPS sent a letter initiating consultation to 18 Tribal Nations on March 3, 2022. The letters described the project, the results of the cultural resources survey, and NPS's determination of no adverse effect. The letters inquired about interest in additional consultation and participation in the project. The Hopi Tribe concurred with the determination of effect on March 15, 2022, and the Ak-Chin Indian Community responded on April 28, 2022, stating that it had no comments. The Cultural Manager for the Moapa Band of Paiutes responded on March 15, 2022, stating they had no questions or comments, but the Moapa Tribal Historic Preservation Officer replied via email on March 31, 2022, requesting additional information related to the project and requested a site visit. No other responses have been received from tribal groups. The park provided the information requested and completed a site visit in September 2022. The Moapa THPO requested an archeological survey that encompassed a wider buffer on either side of Cottonwood Cove Road. The park conducted the survey in December 2022 in accordance with the Moapa THPO's preferences. Consultation with the appropriate Tribal Nations for the 2022 cultural resources survey is currently underway.

US Fish and Wildlife Service. As required by Section 7 of the ESA, the NPS consulted with the USFWS regarding the potential effects of the proposed action/preferred alternative on federally listed species. The

NPS initiated consultation for this project with the USFWS on September 29, 2020 through a request to append the Cottonwood Cove Road improvements project to its PBO, and the USFWS issued a BO on November 18, 2020. The NPS updated its request to append to its PBO to update project impacts and include critical habitat impacts that occur on NPS and BLM lands. Consultation with the USFWS is ongoing; the updated consultation package was submitted on February 7, 2023. If the USFWS comments indicate that the impacts from the Cottonwood Cove project are unable to be appended to the NPS and BLM BPOs or if consultation results in a change to the effects determination for desert tortoise, the EA will be revised and republished for another 30-day comment period.

Stakeholder Outreach

The following agencies, Tribal Nations, and organizations were contacted and invited to participate in the planning process.

Agencies

- US Fish and Wildlife Service
- US Army Corps of Engineers
- Bureau of Land Management
- Federal Highway Administration

Tribes

- Ak-Chin Indian Community
- The Hopi Tribe
- Chemehuevi Tribal Council
- The Colorado River Tribal Council
- Fort Mojave Tribal Council
- Fort Yuma-Quechan Tribal Council
- Gila River Indian Community Council
- Havasupai Tribal Council
- Hualapai Tribal Council
- Kaibab Paiute Tribal Council
- Las Vegas Paiute Council
- Moapa Band of Paiutes Tribal Council
- Navajo Nation Tribal Council
- Paiute Indian Tribe of Utah Tribal Council
- Pueblo of Zuni Tribal Council
- Salt River Pima-Maricopa Indian Community Council
- Shivwits Band of Paiutes
- Yavapai-Prescott Tribal Board of Directors

State Government

- Nevada State Historic Preservation Office
- Nevada Department of Conservation and Natural Resources
- Nevada Division of Outdoor Recreation

Local Offices

- Boulder City, NV Mayor's Office
- Henderson, NV City Manager's Office
- City of Kingman, AZ Mayor
- Clark County, NV
- Boulder City, NV City Manager's Office
- Henderson, NV Chamber of Commerce
- Kingman, AZ Chamber of Commerce
- Boulder City, NV Chamber of Commerce
- Moapa Valley, NV Chamber of Commerce
- Meadview, AZ Chamber of Commerce

Concessionaires

- AccessParks
- Lake Mead Cruises
- Las Vegas Boat Harbor & Lake Mead Marina
- Willow Beach Marina/Store
- Cottonwood Cove
- Lake Mead RV Village
- Temple Bar Resort
- Callville Bay
- Echo Bay
- Katherine Landing Recreational Company
- Temple Bar Resort
- Black Canyon Raft Office

Community

- Lake Mead NRA and BLM land visitors
- Lake Mead NRA and BLM employees
- Cottonwood Cove RV Park

REFERENCES

- Archer, S.R. and K.I. Predick
- 2008 Climate change and ecosystems of the southwestern United States. *Rangelands*, 30(3), 23-28.
- Arizona-Sonoran Desert Museum
- 2008 “Animal Fact Sheet: Gila Monster.” Available online: <https://www.desertmuseum.org/kids/oz/long-fact-sheets/Gila%20Monster.php>. Accessed January 12, 2022.
- Barrows, C.W.
- 2011 Sensitivity to climate change for two reptiles at the Mojave-Sonoran Desert interface. *Journal of Arid Environments* 75: 629-635.
- Beavers R., A. Babson, and C. Schupp (ed).
- 2016 *Coastal Adaptation Strategies Handbook*. 134009. National Park Service. Washington, DC.
- Beck, D.D.
- 1990 Ecology and Behavior of the Gila Monster in Southwestern Utah. *Journal of Herpetology* 24: 54 – 68.
- Bureau of Land Management (BLM)
- 2022 *Piute Eldorado Valley Area of Critical Environmental Concern Management Plan, Final Environmental Assessment*. June.
- Carr, E., E. Jackson-Retondo, L. Warner, and The Collaborative, Inc.
- 2015 *National Park Service Mission 66 Era Resources, National Register of Historic Places Multiple Property Documentation Form*.
- Center for Biological Diversity
- 2018 Petition to List the Mojave Poppy Bee (*Perdita meconis*) under the Endangered Species Act and Concurrently Designate Critical Habitat. October.
- Cornell Lab of Ornithology (Cornell)
- 2023a “eBird, Hotspot Map: Lake Mead NRA--Cottonwood Cove Resort & Marina.” Available online: <https://ebird.org/hotspot/L367723>. Accessed March 8, 2023.
- 2023b “Clark’s Grebe Life History.” Available online: https://www.allaboutbirds.org/guide/Clarks_Grebe/lifehistory. Accessed Nov March 8, 2023.
- 2023c “Western Grebe Life History.” Available online: https://www.allaboutbirds.org/guide/Western_Grebe/lifehistory. Accessed March 8, 2023.

- 2023d “Costa’s Hummingbird Life History.” Available online:
https://www.allaboutbirds.org/guide/Costas_Hummingbird/id. Accessed November 24, 2021.

Federal Highway Administration (FHWA)

- 2020 *Aquatic Resources Inventory, Cottonwood Cove Access Road, Clark County, Nevada*. NV FTNP LAKE 237(2) Prepared for Federal Highway Administration, Central Federal Lands Highway Division. Prepared by HDR. April.

Lower Colorado River Multi-Species Conservation Program

- 2021 “Threecorner Milkvetch and Sticky Buckwheat Conservation in the Lake Mead National Recreation Area” Available online:
https://lcrmscp.gov/reports/2020/c02_annrep_2020.pdf#page=8&zoom=100,141,550. Accessed January 11, 2021.

Jepsen, S., D.F. Schweitzer, B. Young, N. Sears, M. Ormes, and S.H. Black

- 2015 *Conservation status and Ecology of Monarchs in the United States*. 36 pp. NatureServe, Arlington, Virginia, and the Xerces Society for Invertebrate Conservation, Portland, Oregon.

McClelland, L.F

- 1998 *Building the National Parks, Historic Landscape Design and Construction*. The John Hopkins University Press, Baltimore.

National Park Service (NPS)

- 1998 NPS-28: *Cultural Resource Management Guideline*. June.
- 2002 Directors Order 77-1: *Wetland Protection*. October.
- 2003 Directors Order 77-2: *Floodplain Management*. September.
- 2005 *Determination of Eligibility, Cottonwood Cove Developed Area, Lake Mead National Recreation Area. National Register of Historic Places Registration Form*. Completed by Elaine Jackson-Retondo, Ph.D., Historian.
- 2006 *NPS Management Policies 2006*.
- 2014 *Cottonwood Cove and Katherine Landing Final Development Concept Plans Environmental Impact Statement*. Lake Mead National Recreation Area.
- 2015a *Foundation Document, Lake Mead National Recreation Area, Arizona and Nevada*. September 2015.
- 2015b *National Park Service NEPA Handbook*. September 2015.
- 2015c “Research Needs, Mojave National Preserve.” Available online:
<https://www.nps.gov/moja/learn/nature/researchneeds.htm>. Accessed August 7, 2022.
- 2016 “Southwestern Willow Flycatcher.” Available online:
<https://www.nps.gov/articles/southwestern-willow-flycatcher.htm>. Accessed November 24, 2021.
- 2018 *Climate Friendly Parks: Lake Mead National Recreation Area Action Plan*.

- 2022 “Bald Eagle.” Available online: <https://www.nps.gov/lake/learn/nature/bald-eagle.htm>. Accessed March 8, 2023.
- 2023a “Species List for Lake Mead National Recreation Area.” Available online: <https://irma.nps.gov/NPSpecies/Search/SpeciesList/LAKE>. Accessed March 7, 2023.
- 2023b “Pollinators – Monarch Butterfly” Available online: <https://www.nps.gov/articles/monarch-butterfly.htm>. Accessed March 8, 2023.
- 2023c “Lake Mead National Recreation Area, Annual Park Recreation Visitation (1904 - Last Calendar Year).” Available online: [https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20\(1904%20-%20Last%20Calendar%20Year\)?Park=LAKE](https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=LAKE). Accessed March 7, 2023.
- 2023d “Lake Mead National Recreation Area, Traffic Counts.” Available online: <https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Traffic%20Counts?Park=LAKE>. Accessed March 7, 2023.
- NatureServe
- 2022a “*Perdita meconis*, Mojave Poppy Bee.” Available online: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.114779/Perdita_meconis. Accessed January 17, 2022.
- 2022b “*Heloderma suspectum*, Gila Monster.” Available online: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.103164/Heloderma_suspectum. Accessed March 21, 2022.
- Nevada Department of Wildlife (NDW)
- 2022 “Gila Monster.” Available online: <https://www.ndow.org/blog/gila-monster/>. Accessed January 6, 2022.
- Nevada Division of Environmental Protection
- 2022 *Nevada 2020-2022 Water Quality Integrated Report, Assessment Period - October 1, 2013 through September 30, 2020*. Nevada Division of Environmental Protection, Bureau of Water Quality Planning. February.
- Nevada Division of Natural Heritage
- 2022 *At-Risk Plant and Animal Tracking List*. Nevada Division of Natural Heritage, Department of Conservation and Natural Resources. July.
- Pelton E.M., C.B. Schultz, S.J. Jepsen, S.H. Black, and E.E. Crone
- 2019 Western Monarch Population Plummet: Status, Probable Causes, and Recommended Conservation Actions. *Frontiers in Ecology and Evolution* 7:258.
- Riddell, E.A., K.J. Iknayan, L. Hargrove, S. Tremor, J.L. Patton, R. Ramirez, B.O. Wolf, and S.R. Beissinger
- 2021 Exposure to climate change drives stability or collapse of desert mammal and bird communities. *Science* 371, no. 6529: 633-636.

Salas, D.E., J. Stevens, J. Evens, D. Cogan, J. S. Ratchford, and D. Hastings

- 2016 *Vegetation mapping of Lake Mead National Recreation Area*. Natural Resource Report NPS/MOJN/NRR—2016/1344. National Park Service, Fort Collins, Colorado.

Southern Nevada Water Authority

- 2022 “Our current water supply.” Available online: <https://www.snwa.com/water-resources/current-water-supply/index.html>. Accessed August 8, 2022.

Southwest Monarch Study

- 2018 *Monarch Migration and Breeding In The Southwest*. Available online: <https://www.swmonarchs.org/SouthwestMonarchMigrationandBreeding.pdf>. March 8, 2023.

The Nature Conservancy

- 2007 *Conservation Management Strategy for Nine Low Elevation Rare Plants in Clark County, Nevada*. The Nature Conservancy, Nevada Field Office. March.

University of Minnesota

- 2018 “Soil compaction: causes, effects and control.” Available online: <https://extension.umn.edu/soil-management-and-health/soil-compaction>. Accessed January 21, 2022.

US Department of Agriculture

- 1996 “Soil Quality Resource Concerns: Soil Erosion.” Available online: <https://nrcspad.sc.egov.usda.gov/DistributionCenter/pdf.aspx?productID=391>. Accessed January 21, 2022.

US Environmental Protection Agency

- 2021a “Nevada Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants.” Available online: https://www3.epa.gov/airquality/greenbook/anayo_nv.html. Accessed November 24, 2021.
- 2021b “Nonattainment Areas for Criteria Pollutants (Green Book).” Available online: <https://www.epa.gov/green-book>. Accessed November 24, 2021.

US Fish and Wildlife Service (USFWS)

- 2009 *Desert Tortoise Authorized Biologist Request Form*. US Fish and Wildlife Service, Ventura Fish and Wildlife Office.
- 2011 *Revised recovery plan for the Mojave population of the desert tortoise (Gopherus agassizii)*. US Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.
- 2015 “Relict Leopard Frog (*Lithobates onca*).” Available online: https://www.fws.gov/nevada/protected_species/amphibians/species/relict_leopard_frog.html. Accessed November 24, 2021.

- 2017 “Western Yellow-billed Cuckoo, *Coccyzus americanus*.” Available online:
https://www.fws.gov/sacramento/es_species/Accounts/Birds/yellow_billed_cuckoo/.
Accessed November 24, 2021.
- 2021a “Mojave Desert Tortoise (*Gopherus agassizii*).” Available online:
https://www.fws.gov/nevada/desert_tortoise/dt/dt_life.html. Accessed December 22,
2021.
- 2021c “Birds of Conservation Concern.” Available online:
[https://www.fws.gov/birds/management/managed-species/birds-of-conservation-
concern.php](https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php). Accessed November 23, 2021.
- 2022 “Yuma Ridgway’s rail (*Rallus obsoletus yumanensis*)” Available online:
<https://ecos.fws.gov/ecp/species/3505>. Accessed July 1, 2022.
- 2023a “Information for Planning and Consultation (IPaC) Resource List.” Available online:
<http://ecos.fws.gov/ipac/>. Accessed March 6, 2023.
- 2023b “Listed species believed to or known to occur in Clark, Nevada.” Available online:
<https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=32003>.
Accessed March 6, 2023.