

**National Park Service  
U.S. Department of the Interior**

# **Glen Canyon National Recreation Area Arizona- Utah**

**Lees Ferry Area Improvements  
Final Environmental Assessment/Assessment of Effect  
August 2006**



# United States Department of the Interior

NATIONAL PARK SERVICE  
Glen Canyon National Recreation Area  
P.O. Box 1507  
Page, Arizona 86040



IN REPLY REFER TO:

Dear Interested Party:

Enclosed with this letter is a copy of the *Lees Ferry Improvements Environmental Assessment* (EA) for a variety of projects proposed for the Lees Ferry area of Glen Canyon National Recreation Area (NRA). These projects, which would be completed over a 5 to 7 year time span, include: rehabilitate drainage structures located along Lees Ferry access road, including Cathedral Wash and No Name Wash; Lees Ferry compound upgrade; remove curb at graded raft launch ramp; replacement of floating courtesy dock; replacement of potable water intake at the Colorado River; install narrow band repeater for Grand Canyon National Park on the Paria Plateau overlooking Lonely Dell Ranch; establish the Arizona Road hiking trail; stabilize the Paria riverbank; and replacement of the USGS Gauging Station on the Paria River.

These projects are needed to replace, repair, or upgrade deteriorating utilities and facilities to ensure visitor and staff health and safety. Without these projects, visitor use and the visitor experience may be impacted.

The EA sections evaluate the alternatives in terms of potential impacts to the natural and cultural environment. Alternative A, the no-action alternative, describes current facilities. Alternative B proposes changes to the current facilities including repairs, replacements, and upgrades to utilities and facilities addressing future needs.

We welcome your review and comments during the public comment period from August 28 – September 28, 2006. The document is also available in electronic format on the internet at <http://parkplanning.nps.gov> or on compact disk by request. Printed copies are also available at the Page Public Library and at the visitor assistance desk at Glen Canyon NRA Headquarters Office located at 691 Scenic View Road in Page, Arizona.

If you wish to comment on the *Lees Ferry Improvements Environmental Assessment* you may mail comments to the name and address below or post comments online at <http://parkplanning.nps.gov>. The EA will be on public review for approximately 30 days. Our practice is to make comments, including names, home addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish us to consider withholding this information you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy and unsupported assertions will not meet this burden. In the absence of exceptional, documented circumstances, this information will be released. We will always make submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to Glen Canyon National Recreation Area, ATTN: Lees Ferry Improvements EA, P.O. Box 1507, Page, Arizona 86040. For more information about this project, please contact the Park at 928-608-6200.

Thank you for your time and interest in Glen Canyon NRA.

Sincerely,

Kitty L. Roberts  
Superintendent

Enclosure

# **Environmental Assessment/ Assessment of Effect**

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## **Lees Ferry Improvement Alternatives Glen Canyon National Recreation Area • Arizona- Utah**

### **SUMMARY**

This Environmental Assessment/Assessment of Effect (EA/AE) was prepared in response to the need to undertake a variety of tasks designed to improve visitor use and satisfaction at the Lees Ferry Developed Area of Glen Canyon National Recreation Area (Glen Canyon NRA).

Two alternatives were developed and analyzed: Alternative A, the No Action Alternative and Alternative B, the Action Alternative. Under the No Action Alternative specific management actions would not be undertaken and the projects included in this EA would not be approved and funded. The Action Alternative includes replacement of a variety of utilities and facilities as well as stabilization of the bridge over the Paria River and the access road to Lonely Dell Ranch and the installation of a radio repeater to improve health and safety of visitors and staff.

### **PUBLIC COMMENT**

If you wish to comment on the environmental assessment, you may mail comments to the name and address below, enter comments into the National Park Service Planning, Environmental and Public Comment website. This environmental assessment will be on public review for 30 days. It is the practice of the NPS to make all comments, including names and addresses of respondents who provide that information, available for public review following the conclusion of the environmental assessment process. We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Submit written comments to:  
Lees Ferry Improvement  
Alternatives EA  
Glen Canyon National  
Recreation Area  
P.O. Box 1507  
Page, AZ 86040- 1507

Comment by the internet through  
the National Park Service's  
Planning, Environmental and  
Public Comment website at:  
<http://parkplanning.nps.gov>

Hand- deliver comments  
to the NRA headquarters  
at:  
691 Scenic View Drive  
Page, AZ

United States Department of the Interior • National Park Service • Glen Canyon National Recreation Area

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## **SECTION I**

## **PURPOSE AND NEED**

### **Introduction**

This Environmental Assessment is being undertaken to identify and mitigate environmental impacts likely to be created by the construction and/or rehabilitation/repairs of the following projects: Repair of the rafting ramp access, Replacement of the courtesy dock, Demolition and replacement of the Grand Canyon National Park (NP) contact station; Replacement of the water treatment facility, Construction of the maintenance facilities, Stabilization to the Paria riverbank at the access road bridge, Creation of the Arizona Road Hiking Trail, Repairs and improvements to the Lees Ferry access road drainage system, Replacement of the USGS Gauging Station on the Paria River and installation of a Narrowband Radio Repeater on the Cliff overlooking the Paria River. These facilities are generally in poor repair as more than minimal maintenance has been deferred due to lack of funding. Improvements will provide replacement of poorly functioning visitor facilities as well as provide long term protection of important cultural resources. These projects will also increase visitor safety and enhance their enjoyment of the Lees Ferry area. These facility improvements are also needed to support the number of visitors expected to use the area.

The Colorado River corridor in Glen Canyon NRA is canyon- bound for its entire length below Glen Canyon Dam with the exception of its ending point at Lees Ferry. Here the river is accessible by road due to a natural break in the landscape after the river emerges from Glen Canyon and before it enters the Marble Canyon section of Grand Canyon. Glen Canyon Dam is located approximately 15 river miles upstream of Lees Ferry and is operated by the Bureau of Reclamation. This dam affects the volume, pattern, temperature, and sediment load of river flows through Glen Canyon NRA and Grand Canyon NP. The climate of the river corridor is generally arid; average annual precipitation is just over six inches. Precipitation comes in the form of summer thundershowers and gentle winter rains; snow occurs infrequently (less than 2.1 inches of annual average total snowfall). Temperatures are hot in the summer, with the average July maximum at Lees Ferry exceeding 103.4°F. Winter temperatures are relatively mild, with the January maximum at Lees Ferry averaging about 48.7°F and the minimum averaging about 26.8°F (Western Regional Climate Center 2003).

### **Current Management**

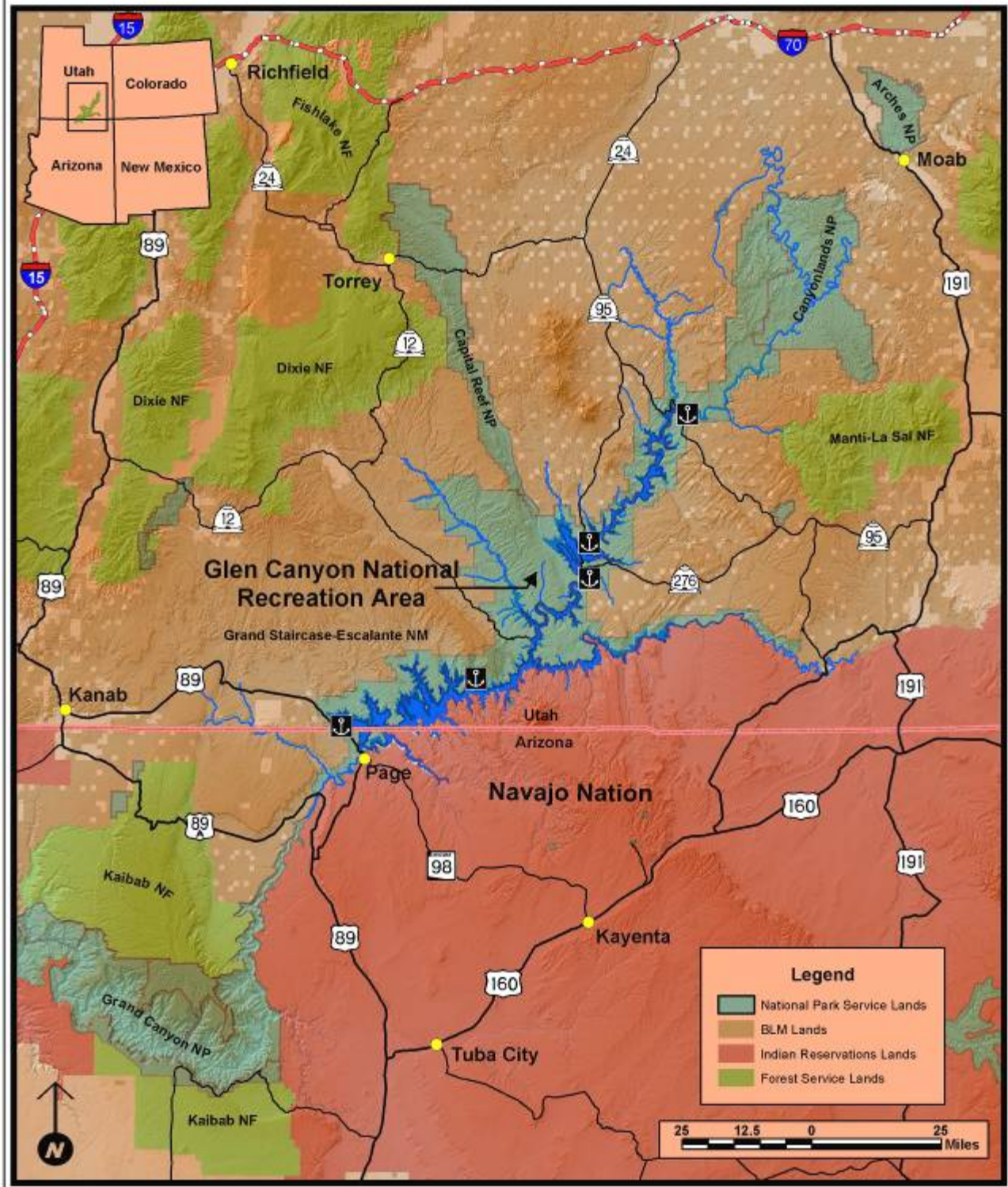
Management decisions for the Lees Ferry area are based on the 1979 General Management Plan for Glen Canyon National Recreation Area and the 1986 Final Development Concept Plan (DCP) for Lees Ferry, Arizona.

### **Enabling Legislations**

Glen Canyon NRA was established by enactment of Public Law (PL) 92- 593 on October 27, 1972. The legislation defines the purposes of the recreation area: “. . .to provide for public outdoor recreation use and enjoyment of Lake Powell and lands adjacent thereto. . . and to preserve scenic, scientific, and historic features contributing to public enjoyment of the area” (NPS 1979).



Map 1: Glen Canyon NRA Area Map



## Laws, Policies, and Authorities

The following regulations and guidance documents guide the planning and completion of the projects proposed in this EA.

**National Environmental Policy Act (NEPA)** – The purpose of NEPA is to encourage productive and enjoyable harmony between humans and the environment; to promote efforts which will prevent or eliminate damage to the environment and stimulate the health and welfare of humankind; and to enrich the understanding of the ecological systems and natural resources important to the Nation. NEPA requirements are satisfied by completion of a Categorical Exclusion (Catex), Environmental Assessment (EA), Environmental Impact Statement (EIS), or a memo to the files documenting existing NEPA work that covers the current proposed activity. In the case of an EA or EIS, NEPA requirements are met by successful completion of the document and an accompanying decision document.

**Director's Order- 12 (DO- 12)** – DO- 12 is the NPS guidance for Conservation Planning, Environmental Impact Analysis, and Decision Making. DO- 12 states the guidelines for implementing NEPA according to NPS regulations. DO- 12 meets all Council on Environmental Quality (CEQ) regulations for implementing NEPA. In some cases, the NPS has added requirements under DO- 12 that exceed the CEQ regulations.

**NPS Organic Act of 1916** – Congress directed the U.S. Department of the Interior and NPS to manage units “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (16 USC § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress (16 USC § 1 a- 1).

- **Clean Water Act/Regulations** – provides national recommended ambient water quality criteria and calls for no degradation of the nation’s surface waters.
- **Arizona and Utah Water Quality Regulations** – conserves waters of the states to protect, maintain and improve water quality.
- **Safe Drinking Water Act** - The SDWA authorizes the Environmental Protection Agency (EPA) to set maximum contaminant levels (MCLs) for dangerous chemicals, waterborne bacteria and viruses in the public’s drinking water.
- **Executive Order 11990** – provides for the protection of wetlands.
- **Executive Order 11988** – provides for the protection of floodplains.
- **Clean Water Act and Section 404 Regulations** – provides for the protection of wetlands and waters of the United States.
- **Endangered Species Act/Section 7** – provides for the listing and protection of endangered and threatened species and their critical habitat; requires consultation under Section 7 if any listed species may be adversely affected.
- **National Historic Preservation Act (NHPA)/Section 106** – provides for the identification and protection of historic sites and structures.



- **Archeological Resource Protection Act** – provides for the protection of archeological resources on public lands.
- **Executive Order 13007** – provides for protection of Indian sacred sites.
- **NPS Director's Order #28, *Cultural Resource Management Guidelines* (1998b)** – defines how the NPS will protect and manage cultural resources on NPS lands in accordance with the NPS Management Policies.

## **Relationship to Other Plans**

### **Glen Canyon National Recreation Area Colorado River Master Plan**

The Colorado River from Glen Canyon Dam to Lees Ferry presents an excellent opportunity to create high- quality habitat for wildlife and avifaunal species. This area is highly valued for its natural features and recreational activities; however, since the invasion of non- native vegetation—particularly tamarisk—the ecological function of the system has been compromised. Dynamic native riparian and wetland ecosystems are renowned for their high levels of biodiversity and productivity. As these ecosystems become increasingly imperiled by extensive modification and non- native species invasion, the need for restoration has also become increasingly urgent. This project is designed to meet two primary goals. The first is to develop a 20- year master plan for restoring riparian vegetation in Glen Canyon NRA by replacing non- native tamarisk with native vegetation. The second goal of this project is to implement the first phase of this master plan by restoring a 6- acre pilot site. NPS officials can use this master plan as a roadmap that provides direction for future restoration efforts in the 15- mile river corridor between Glen Canyon Dam and Lees Ferry. This plan should help guide management decisions by:

- Identifying revegetation sites and prioritizing them
- Recommending restoration methods and presenting options
- Estimating costs associated with various restoration methods
- Identifying potential funding sources
- Recommending long- term monitoring strategies

Replacing tamarisk with native vegetation at the pilot site will stabilize stream banks as well as restore and enhance its native biodiversity, ecological function, and indigenous riparian habitat characteristics. The pilot site would not only create essential habitat for avifauna and wildlife, but it will also enhance recreational opportunities, generate a crucial stock native seed for downstream dispersal, and provide a model for other restoration efforts throughout the southwest. Restoration efforts will strive to reflect the original character of the riparian setting as best as possible under current hydrologic conditions.

### **Grand Canyon National Park Colorado River Management Plan**

The Final Environmental Impact Statement/Colorado River Management Plan describes and analyzes alternatives for the management of recreational use of the Colorado River in Grand Canyon NP. For purposes of this plan, the Colorado River has been divided into two geographic sections, with a specific set of alternatives for each section. For the upper section from Lees Ferry (River Mile [RM] 0) to Diamond Creek (RM 226), the plan considers eight alternatives, including a no- action alternative (Alternative A) and a preferred alternative (Modified Alternative H). For the Lower Gorge section from Diamond Creek (RM 226) to Lake Mead (RM 277), the plan considers five alternatives, including a no- action alternative (Alternative 1), a National Park Service preferred alternative (Modified Alternative 4), and a Hualapai Tribe

proposed alternative (Alternative 5). The park shares a common boundary with the Hualapai Tribe along 108 miles of the Colorado River, and the Hualapai Tribe is a cooperating agency in the preparation of the Environmental Impact Statement. For the Lees Ferry alternatives, the alternatives represent different mixes and limits of group size, trip length, launches per day, user- days, seasonal variations, motorized and - use, commercial and noncommercial use, and other factors. Major issues addressed in the alternatives include the appropriate level of visitor use consistent with natural and cultural resource protection and visitor experience goals; allocation of use between commercial and noncommercial groups; the noncommercial permit system; the level of motorized and non- motorized boat use; the range of services provided to the public; the use of helicopters to transport river passengers to and from the river; and appropriate levels and types of upstream travel from Lake Mead. The National Park Service's preferred alternative (Modified Alternative H) provides for a mix of motorized and non-motorized use, at least six- months of non- motorized use season, more evenly distributed launch patterns, and changes permit systems and allocation.

### **Glen Canyon National Recreation Area General Management Plan (GMP)**

The Glen Canyon NRA GMP identified zones which define how different areas of the recreation area will be managed to achieve desired resource conditions and meet the recreation area's goals and objectives. The recreation area is divided into four zones: 1) Natural Zone, 2) Recreation and Resource Utilization (RRU) Zone, 3) Cultural Zone, and 4) Development Zone. Actual size of the Natural and RRU Zones varies with fluctuations in the level of Lake Powell. Due to the vast size of the recreation area and the lack of a formal boundary survey of the entire area, actual size of each zone (in acres) varies slightly from the numbers recorded in the GMP in 1979. Current acreage of each zone has been slightly modified as mapping technology has improved. The maximum allowable acreage for the recreation area as stated in Glen Canyon NRA legislation is 1,256,000 acres.

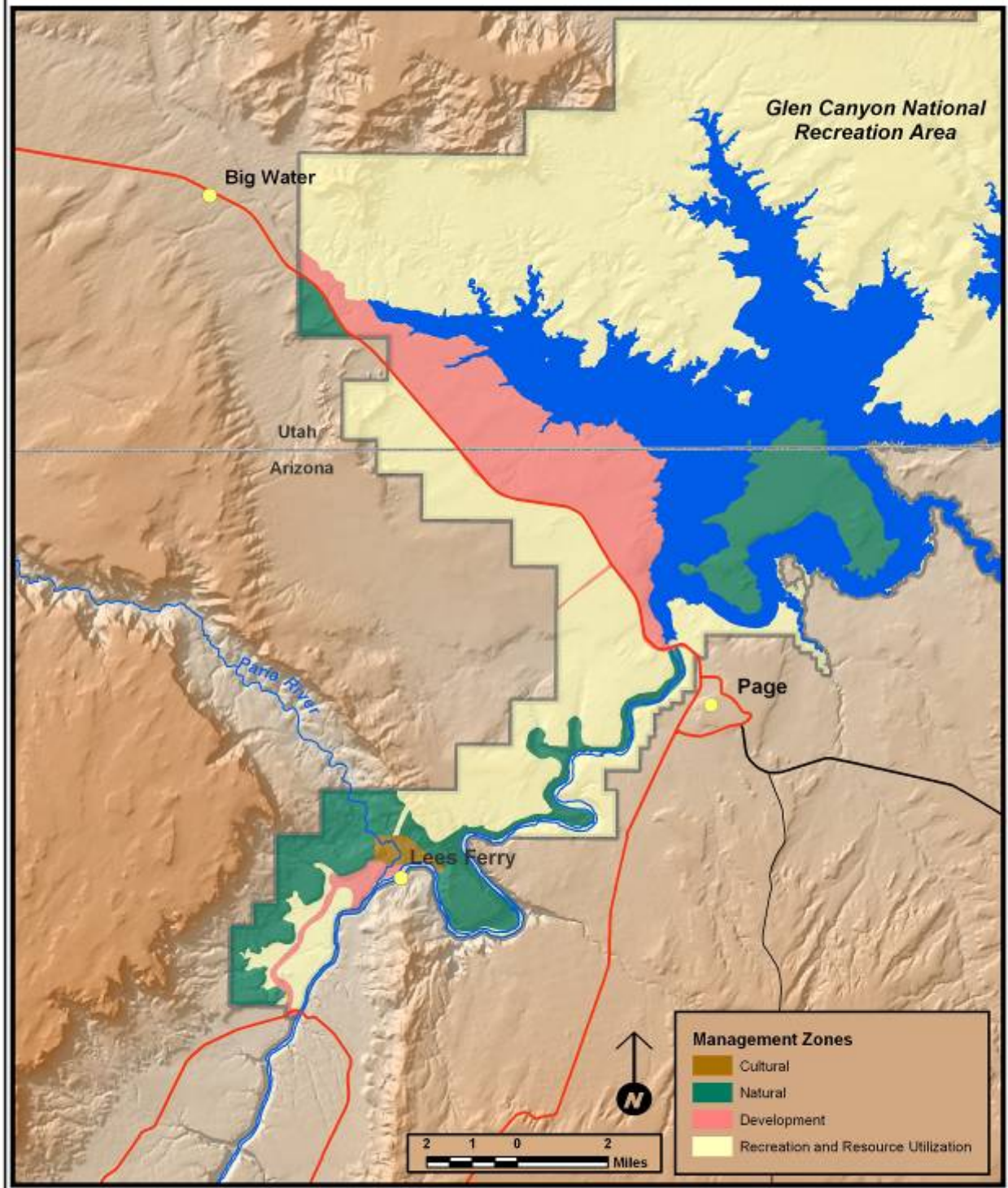
The Natural Zone (approximately 668,670 acres) includes the recreation area's outstanding scenic resources, relatively undisturbed areas isolated and remote from the activities of man, or areas bordering on places with established land- use practices complementary to those of the Natural Zone. In this zone, management focuses on maintaining isolation and natural processes while allowing grazing activities.

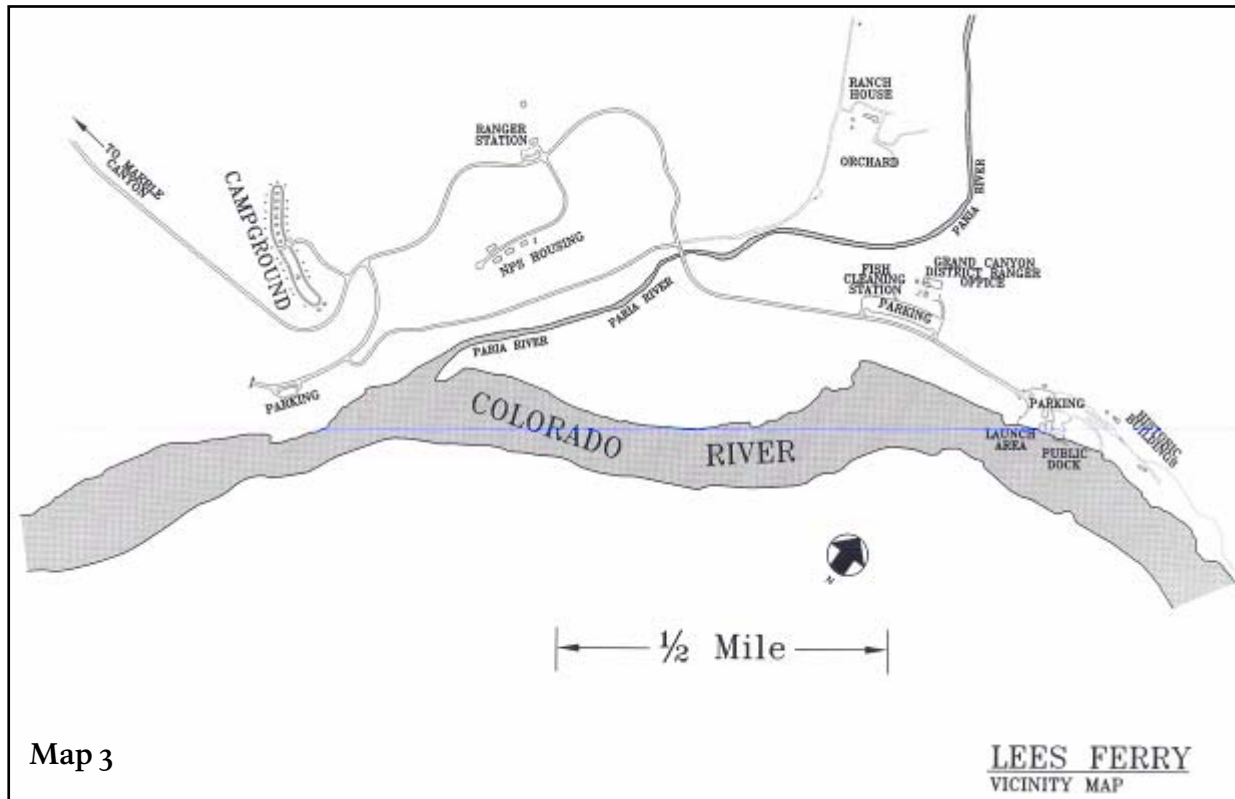
The RRU Zone (approximately 557,890 acres) consists of areas possessing somewhat less scenic value for utility rights- of- way or development. These areas are characterized by maintenance of natural processes while allowing to the extent possible both mining and grazing.

The Cultural Zone (approximately 450 acres) consists of areas where the most important management actions are the preservation, interpretation, and restoration of historic and archeological resources.

The Development Zone (approximately 19,270 acres) centers around the existing developed areas including Lees Ferry. In this zone the provision of visitor services and maintenance of facilities is practiced.

Map 2: Management Zones in Glen Canyon NRA





## Planning Team and Public Scoping

Glen Canyon NRA staff conducted both internal scoping and external scoping with the public and interested and affected groups and agencies. The NPS identified members of an internal interdisciplinary team (ID team), which met several times in the spring of 2006 to discuss project objectives, issues, impact topics, possible alternatives, and the results of public scoping. The team consisted of park division managers from Glen Canyon NRA and Grand Canyon NP as well as specialists in cultural resources, natural resources, maintenance, visitor protection rangers and Native American relations.

The objectives, issues, and impact statements and alternatives described in this document were identified by the team and described in a public scoping newsletter that was issued in April 2006 (Appendix A). Concurrently, consultations with the U.S. Fish and Wildlife service (USFWS), the Arizona State Historic Preservation Officer (SHPO), and Native American tribes were initiated. Staff also held impromptu discussions with 64 members of the public during May 2006. Based on the responses received and subsequent ID team communications, the impact topics and action alternatives were refined and finalized prior to analysis.

Much of the internal and public scoping comments centered on the use of the rafting ramp and adjacent camping area and how they were being impacted by the increase in visitor use and launch changes due to the Grand Canyon NP's Colorado River Management Plan. It became obvious very quickly that the issues related to management of this area are complex and need to be reviewed in depth and, therefore, fell outside of the range of this EA and would be better addressed in a separate management plan and associated NEPA document. It was also

determined that the request to concrete the rafting ramp was intertwined in these issues and was therefore removed from this EA.

Due to unforeseen project delays, the planning effort for the Rehabilitation of the Weaver Ranch House could not be completed in time for inclusion in this EA, therefore all references to this project have been removed from this EA and will be included in future NEPA documentation. It was also determined that NEPA documentation for the rehabilitation to the 11 buildings in the historic district has already been completed and therefore they were also deleted from this EA.

Projects were also added to this EA, including: Replace USGS Gauging Station, Install Narrowband Radio Repeater on Paria Plateau Overlooking Lonely Dell Ranch, create the Arizona Road Hiking Trail and Improve access to Graded Raft Ramp. A specific public request to improve access to the south side of the rafting ramp by removing the original curb and gutter in order to provide straight in and out access to private boat parties was reviewed favorably and has been included in this EA.

Due to the proposed changes throughout the Lees Ferry/Lonely Dell (LFLD) National Register Historic District, a new interpretive plan is also being proposed. This plan identifies ways the park staff would interact with the visitors and what information they will provide and how it will be provided. Possible changes include new information kiosks, regular ranger lead events, and new information brochures, etc.

Additional details concerning public scoping and consultation documented for this project are provided in the Consultation/Coordination chapter of this EA, following the impact assessment.

#### **National Historic Preservation Act, Section 106 Consultation Summary**

In accordance with Section 106 of the National Historic Preservation Act (NHPA), is required to consult with the appropriate State Historic Preservation Office (SHPO) on possible impacts to historical properties. A field consultation meeting was conducted March 23, 2006 with Mr. Bill Collins of the Arizona SHPO and the staff from the Cultural Resources group from Glen Canyon NRA. This meeting focused on the array of projects included in this EA and their possible impacts to the LFLD Historic District and during this discussion, Mr. Collins stated that he didn't think any of the proposed projects would have an adverse affect (per section 106 of the NHPA) on the LFLD Historic District.

#### **Endangered Species Act, Section 7 Consultation Summary**

In accordance with Section 7 of the Endangered Species Act (ESA), Glen Canyon NRA is required to consult with representatives of the United States Fish and Wildlife Service (USFWS) on the possible impacts to threatened and/or endangered species. An informal consultation meeting was held at Lees Ferry on May 25, 2006 with Mr. Bill Austin of the USFWS. This meeting resulted in a letter from the USFWS outlining their concerns and mitigation suggestions. These suggestions were incorporated into this EA and a copy of their letter can be seen in Appendix B.



## Impact Topics

Impact topics were used to focus on the evaluation of the potential consequences of the proposed alternatives. Impact topics were identified based on legislative requirements, topics specified in Director's Order #12 and Handbook (NPS 2001a), and park- specific resource information. Table 1 lists impact topics that were considered for analysis, whether or not each topic was retained for further analysis or dismissed, and the regulations and policies relevant to each topic. Following the table, reasoning is given for the dismissal of those topics that will not be analyzed further.

<b>Table 1: Impact Topics Considered for the Lees Ferry Improvement Alternatives</b>		
<b>Environmental Assessment</b>		
<b>Impact Topic</b>	<b>Retain or Dismiss*</b>	<b>Relevant Regulations or Policies</b>
Air quality	Dismiss	Federal Clean Air Act (CAA), CAA Amendments of 1990 (CAAA), NPS Management Policies 2001, and Utah Administrative Code, Title 307, Arizona Administrative Code, Title 18
Soils	Dismiss	NPS Management Policies
Vegetation	Retain	NPS Management Policies
Water Resources	Retain	Clean Water Act, Executive Order 12088, NPS Management Policies
Wetlands and Waters of the U.S.	Retain	Clean Water Act, Executive Order 12088, NPS Management Policies
Drinking Water	Retain	Clean Drinking Water Act, NPS Management Policies
Floodplains	Retain	Executive Order 11988, Executive Order 11990, Rivers and Harbors Act, Clean Water Act, NPS Management Policies
Wildlife	Retain	NPS Management Policies
Threatened and endangered species	Retain	Endangered Species Act, NPS Management Policies
Paleontological resources	Dismiss	NPS Management Policies
Cultural resources	Retain	Section 106, National Historic Preservation Act (NHPA), Historic Sites Act, Archeological Resource Protection Act, Native American Graves and Protection Act, Director's Order 28, Director's Order 12, Executive Order 13007, NPS Management Policies
Wilderness	Dismiss	Director's Order 41, NPS Management Policies
Ecologically critical areas or other unique natural resources	Dismiss	Wild and Scenic Rivers Act, 36 CFR 62 criteria for national natural landmarks, NPS Management Policies
Visitor use and experience	Retain	Organic Act, NPS Management Policies
Public health and safety	Retain	NPS Management Policies
Indian Trust Resources	Dismiss	Department of the Interior Secretarial Order No. 3206, Secretarial Order No. 3175
Prime and unique agricultural lands	Dismiss	Council on Environmental Quality (CEQ) 1980

Table 1: Impact Topics Considered for the Lees Ferry Improvement Alternatives Environmental Assessment		
Impact Topic	Retain or Dismiss*	Relevant Regulations or Policies
		memorandum on prime and unique farmlands
Conflicts with land use plans, policies, or controls	Dismiss	NPS Management Policies
Socioeconomics	Dismiss	40 CFR 1500 Regulations for Implementing NEPA
Energy requirements and conservation potential	Dismiss	NPS Management Policies
Environmental justice	Dismiss	Executive Order 12898

#### **Rationale for Dismissal:**

**Air Quality:** is considered a Class II airshed by the EPA. None of the proposed projects would have the ability to raise the constituent elements above the current National Ambient Air Quality Standards. Additionally, the proposed projects consist of construction projects that would not have even minor short term impacts.

**Soils:** None of the proposed project would impact the stability or type of native soils that occurs within the analysis area.

**Paleontological Resources:** There are no known paleontological resources within the analysis area.

**Wilderness:** There are no designated wilderness areas within the analysis area.

**Indian Trust Resources:** Indian trust assets are owned by Native Americans but held in trust by the United States. Requirements are included in the Secretary of the Interior's Secretarial Order No. 3206, "American Indian Tribal Rites, Federal—Tribal Trust Responsibilities, and the Endangered Species Act," and Secretarial Order No. 3175, "Departmental Responsibilities for Indian Trust Resources." The Bureau of Indian Affairs (BIA) and the National Park Service have formed a joint agency, the National Interagency Fire Center (website, <http://www.nifc.gov>) to handle wildfire management on Indian trust lands based on fire management plans approved by the Indian landowner. Indian trust assets do not occur within Glen National NRA.

**Prime and unique agricultural lands:** Prime farmland is defined as soil that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that land is available for farming uses. According to the Natural Resources Conservation Service (NRCS), none of the land within Glen Canyon NRA meets these requirements; therefore prime and unique agricultural lands was dismissed as an impact topic.

**Conflicts with land use plans, policies, or controls:** Refer to the section "Relationship to Other Plans" for a discussion on the absence of conflicts with other plans.

**Socioeconomics:** The proposed action and alternatives do not have the potential to affect the economic condition of Coconino County, AZ; therefore socioeconomics was dismissed as an impact topic.

**Energy requirements and conservation potential:** Refer to the impact topic “Sustainability and long- term management” for a rationale for dismissal of this topic.

**Environmental justice:** Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low- Income Populations,” requires that all federal agencies address the effects of policies on minorities and low- income populations and communities. None of the alternatives would have disproportionate health or environmental effects on minorities or low- income populations as defined in the Environmental Protection Agency’s Draft Environmental Justice Guidance (July 1996).

## **SECTION II**

## **ALTERNATIVES**

Alternatives considered for analysis must be consistent with Glen Canyon NRA enabling legislation as well as the existing GMP and must meet the purpose and need for action as defined in this EA. These considerations, as well as input from interdisciplinary team members and members of the public, formed the basis of the two alternatives that were developed; Alternative A, the no action alternative, and Alternative B, the management action alternative.

### **Alternatives Considered**

#### **Alternative A: Continue With Current Management/No Action Alternative**

Under this alternative, no changes from current placement, size, use or management of facilities at Lees Ferry would be implemented. The Current Development Concept Plan for Lees Ferry, which was written in 1980, identifies the boundaries of the developed area and proposed renovations, most of which have not taken place.

#### **Alternative B: Proposed Upgrades and Improvements**

The proposed projects in this alternative can be grouped by their association with specific features of the Lees Ferry area. These features include the Lees Ferry Compound area, the Paria River, the ramp area, communications area and Lees Ferry access road. The proposed construction schedule for these projects is seven to ten years, depending on availability of funding.

#### **Impacts to Cultural Resources and §106 of the National Historic Preservation Act**

In this EA, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality that implemented the National Environmental Policy Act. These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impact to cultural resources were also identified and evaluated by; 1) determining the area of potential effects; 2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; 3) applying the criteria of effect to National Register eligible or listed cultural resources that may be impacted; and 4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either adverse effect or no adverse effect must also be made for affected National Register listed or eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, a characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5, Assessment of Adverse Effects). A determination of

no adverse effect means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS Conservation Planning, Environmental Impact Analysis and Decision Making (Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. However, any resultant reduction in intensity of impact due to mitigation is an estimate of the effectiveness of mitigation under NEPA only. The level of effect as defined by §106 may not be similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 may be mitigated, the effect remains adverse.

## **Projects included in Alternative B**

### **Rehabilitate Drainage Structures Located along Lees Ferry Access Road, including Cathedral Wash and No Name Wash.**

This project would rehabilitate roadway drainage on Glen Canyon NRA Lees Ferry access road (See Map 4) from Marble Canyon (SR 89A) to the boat launching ramp at the Colorado River; a distance of 5.78 miles. Much of the existing drainage is undersized, susceptible to clogging or erosion, difficult to clean and maintain, and inadequately designed and constructed. The roadway is located in an extremely erosive geologic formation. As a consequence, surface water carries and deposits large quantities of sediment into ditches and drop inlets filling them and flooding the road. This creates a hazard for vehicular traffic as storm water runoff erodes graded ditches and road side fill slopes. Some roadway culverts are undersized and/or improperly aligned. The hydraulic structure crossing No Name Wash is often overtopped, leaving heavy deposits of soil on the road surface and eroding the roadway prism to the extent that it jeopardizes travel. Undersized collection features and conveyances such as inlet basins and down drains, paved ditches, urban section ditches, and curbs are subject to overflow. Surface drainage is not properly collected and transported to protected discharge points. Many drainage structures are also experiencing severe outlet erosion (see Figures 1, 2 & 3). All these effects are sufficient to jeopardize the roadway prism and travel way (See Map 4)

Ditches must be cleaned by hand because their design does not allow mechanized roadway maintenance equipment to be used. Additionally, an earthen berm and several spur dikes protecting the road that parallels Cathedral Wash constantly require reconstruction. The effect of all these issues is that the cost of maintenance in personnel and equipment is very high and correcting the drainage issues on this roadway would save the park staffing and cost and would also provide a safer road surface for the traveling public when visiting the Lees Ferry Area.



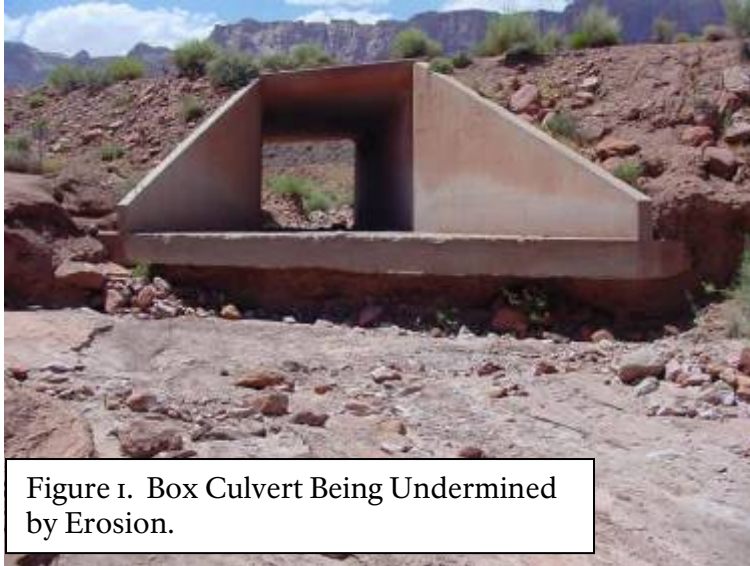


Figure 1. Box Culvert Being Undermined by Erosion.



Figure 2. Metal Culvert Being Undermined by Erosion.

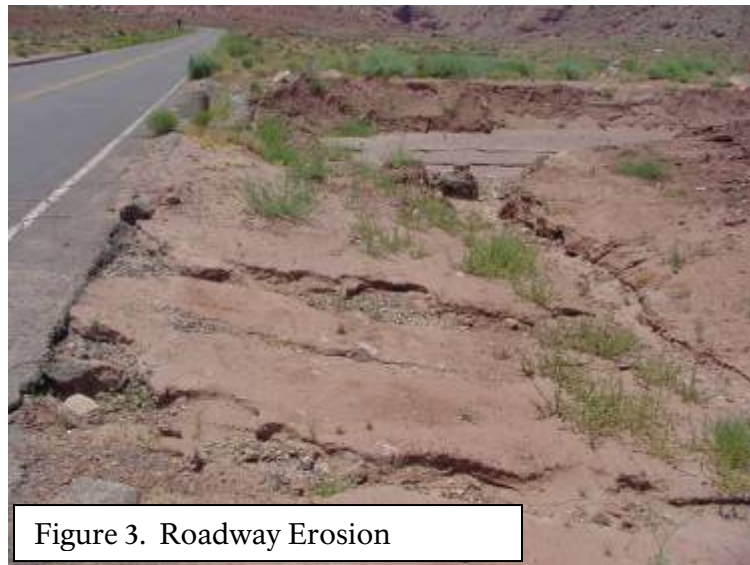
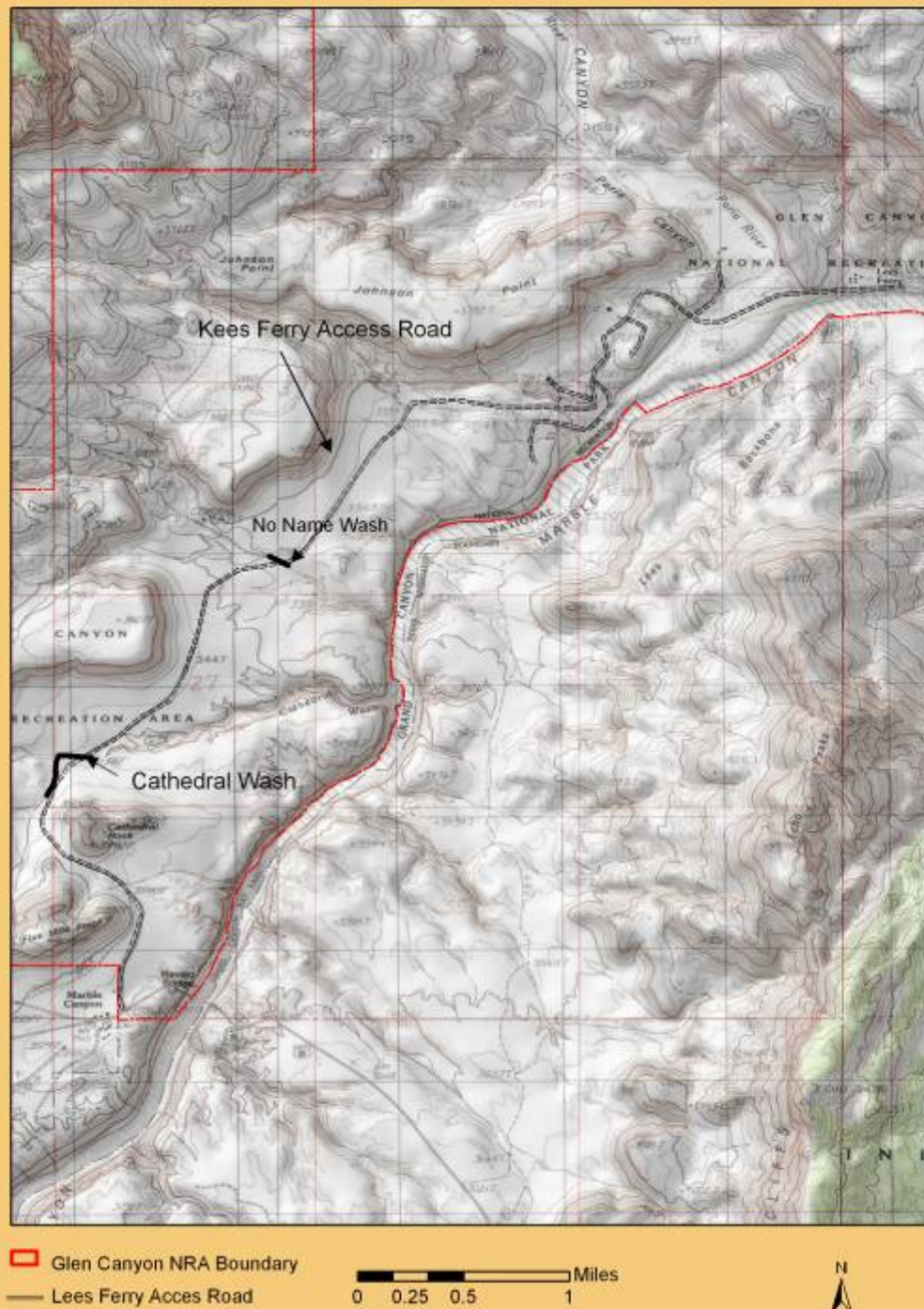


Figure 3. Roadway Erosion

The project would fix the drainage deficiencies on this roadway by installing properly designed drainage features (including box and metal culverts) and repairing existing erosion damage and providing protection against future erosion. This project would also include the installation of self- cleaning culverts where possible. It would also include the installation of concrete curbs, paved rundown ditches, down drain culverts, rock filled wire basket outlet protection and check dams to manage runoff and reduce erosion. Additionally, all roadside drainage ditches would be converted from U- ditches to V- ditches (refers to shape of ditch sides) so that mechanized cleaning methods can be used. Design would minimize visual impact by burying oversized culverts and/or using black or stained pipe, staining light colored rock filled wire baskets and other construction materials.

**Map 4. Drainage Structures Located  
Along Lees Ferry Access Road**



## Lees Ferry Compound Upgrade

This project addresses a coordinated, staged development of three projects. The individual projects include the replacement and upgrade of the existing facilities: the Grand Canyon NP Contact Station, the Maintenance Facility and the Water Treatment Facility (see Figure 3). All improvements will be located within the existing footprint of the current compound area. The compound area, which is approximately .72 acres, is located directly west of the 14- day parking area (see Figures 4 & 5).

The current Grand Canyon NP contact station, which is a double wide trailer (1310 square feet in size) placed in the compound in 1978, will be replaced with a new modular structure, approximately 1800 square feet in size. This building will be relocated toward the entrance of the compound in order to more easily receive orientation groups for down river trips. This building is intended to function as a Grand Canyon NP administrative center, not as a visitor center. Additionally, a storage structure and a boat shade structure dedicated to Grand Canyon NP activities will be incorporated in the compound's layout.

The upgraded Lees Ferry Maintenance Facility will include a 2000 square foot multi- function building and a 384 square foot enclosed storage building. In addition, shade structures for the maintenance and law enforcement ranger boats, backhoe, and a hazardous materials storage structure will complete the upgrades. The grounds will be paved in the high use areas with asphalt pavement and Portland cement concrete and will include a vehicle wash area with an oil/water separator (see Figure 6).

Installed in 1977, the existing water treatment plant and its associated features will be replaced with a modern facility that has the necessary equipment to meet current and future environmental codes and regulations. This facility will include pumps and storage tanks.

Wherever possible, like structures and functions, such as shade structures, will be combined to save space, materials and cost. Visual impact of the maintenance facilities will be reduced, where possible, by locating these behind the contact station and by screening. Vehicular and pedestrian traffic patterns will be reviewed to optimize space and reduce conflict.

The project includes the demolition and/or removal of existing structures, including removal of existing concrete pavement. Construction includes the excavation for foundations. Foundations must be of suitable depth and plan size to accommodate structure loads and soil conditions. Electricity, telephone, potable water, and waste water utilities exist, but will require some realignment and/or extension to the new structures. Disturbance will only be within the previously affected areas. A new egress road will allow pull through access. This road will start and end in the 14- day parking lot. The contact station will be American with Disability Act (ADA) accessible. Once construction is completed, the compound will be fenced to provide security for the water treatment plan, equipment, and buildings.





Figure 4. Front Entrance to Lees Ferry Compound

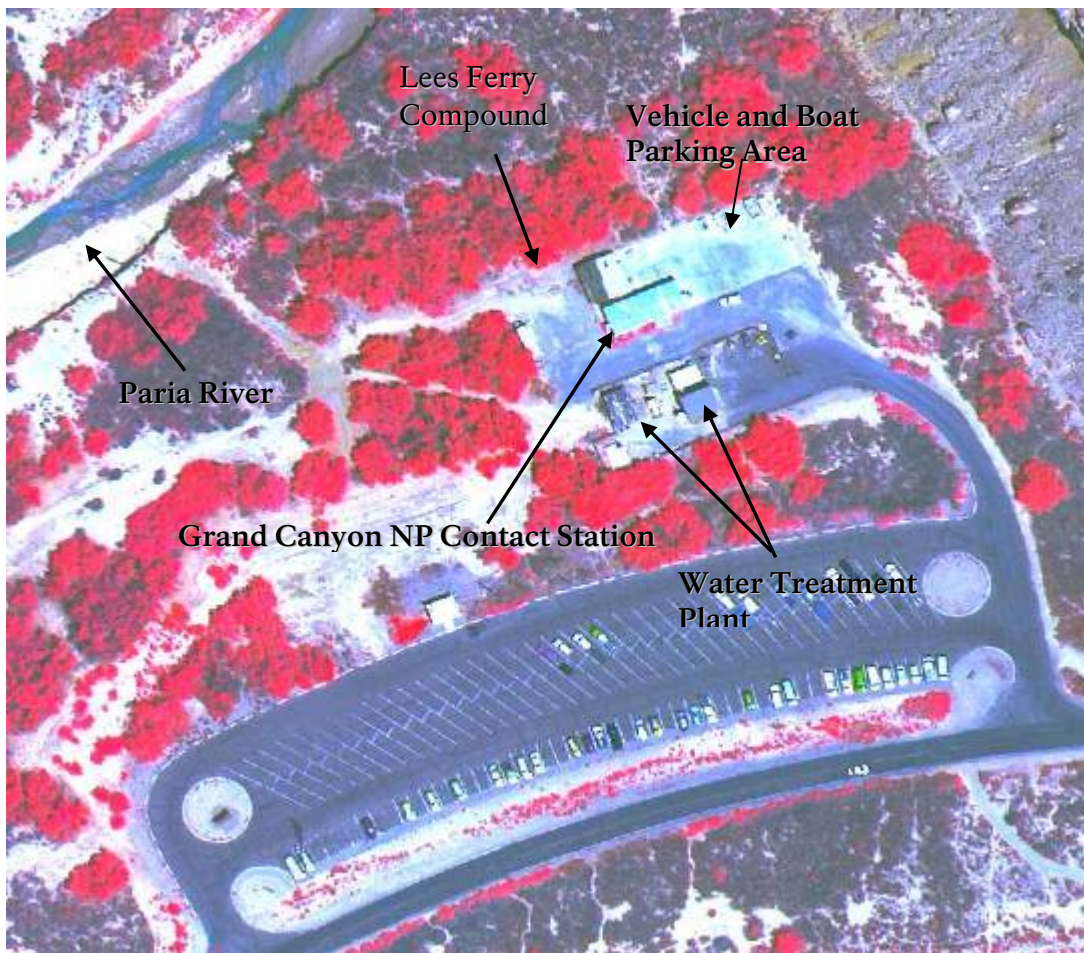
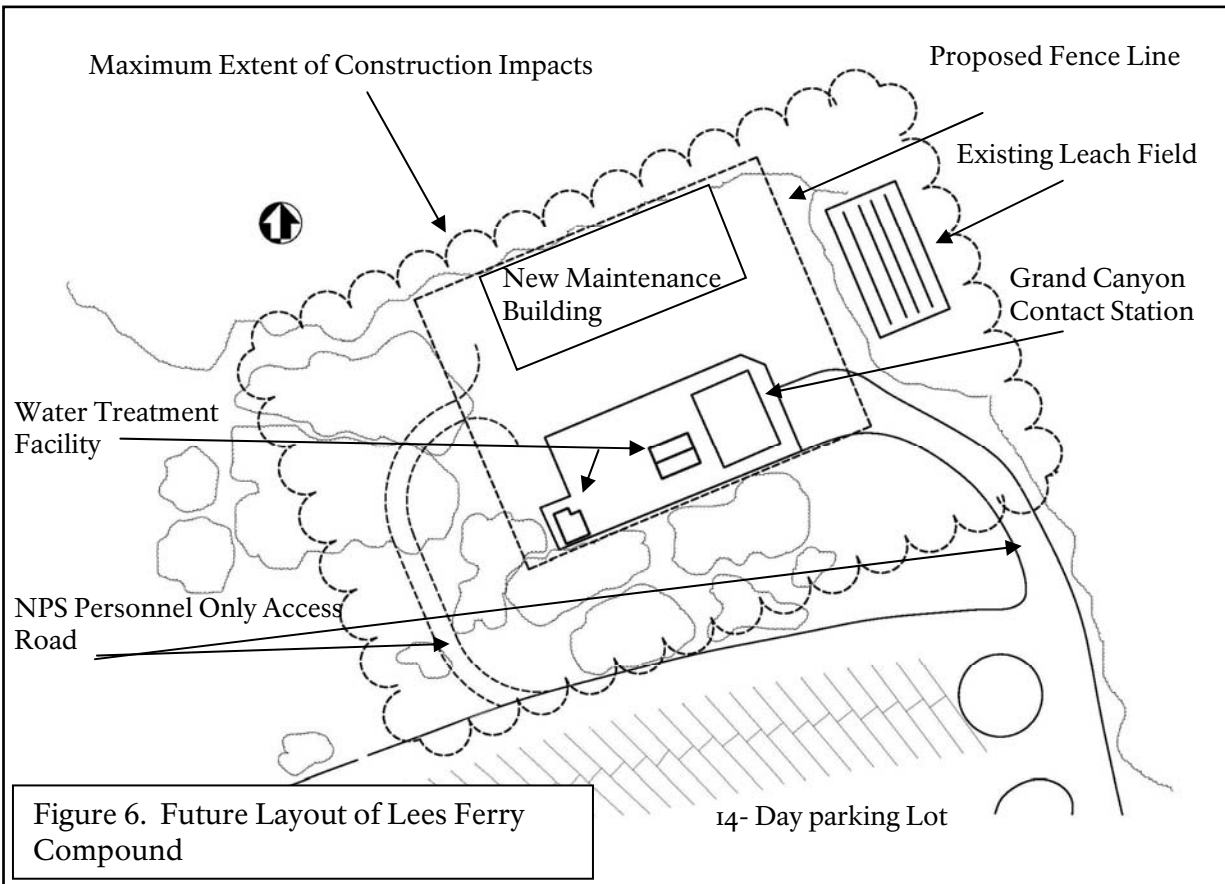


Figure 5. Current Layout of Lees Ferry Compound



### Remove Curb at Graded Raft Launch Ramp

The original configuration of the graded raft launch ramp, built in 1960's era, included the placement of a large concrete curb that extends from the top of the south side of the ramp to the access road and parking area. Over the last 10 years the ramp size has been increased to the south, causing the curb to become a safety impediment to ramp users. Removal will require the demolition of the curb, movement of a large informational sign and associated electrical power and a large trash dumpster (see Figure 7). Once these items are removed or relocated, the site will be filled with appropriately sized river gravel and compacted for use and curb will be replaced. This should alleviate some of the congestion at the ramp by providing private parties with the ability to back straight down to the river. The non- native tamarisk trees will be replaced by a small shade structure and picnic tables.





Figure 7. Aerial Photograph of Ramp Area at Lees Ferry

### Replacement of Floating Courtesy Dock.

The current floating courtesy dock was installed in 1982 and is comprised of interlocked floating chambers with a non-skid surface, shore-based supports and anchors and a large information sign. This dock is generally used by day visitors wishing to see the Colorado River up close and passengers embarking and disembarking from motor boats, rafts, kayaks and canoes headed upriver toward Glen Canyon Dam (see Figure 8). While the downriver trip passengers may use the dock to get a good look at the river, they generally do not embark or disembark by way of this dock. The integrity of the current dock has been compromised by collisions with boats and river flood debris. While a patch-work of repairs has kept the dock usable, replacement is the only choice to ensure visitor safety (see Figures 9 & 10). The new dock system would be manufactured at the factory and trucked to Lees Ferry. Once there, the old dock system would be removed via the ramp and the new

one floated into place. Replacement of this system assumes that the anchors, entrance ramp, and shore-based supports would also need to be replaced at the same time.

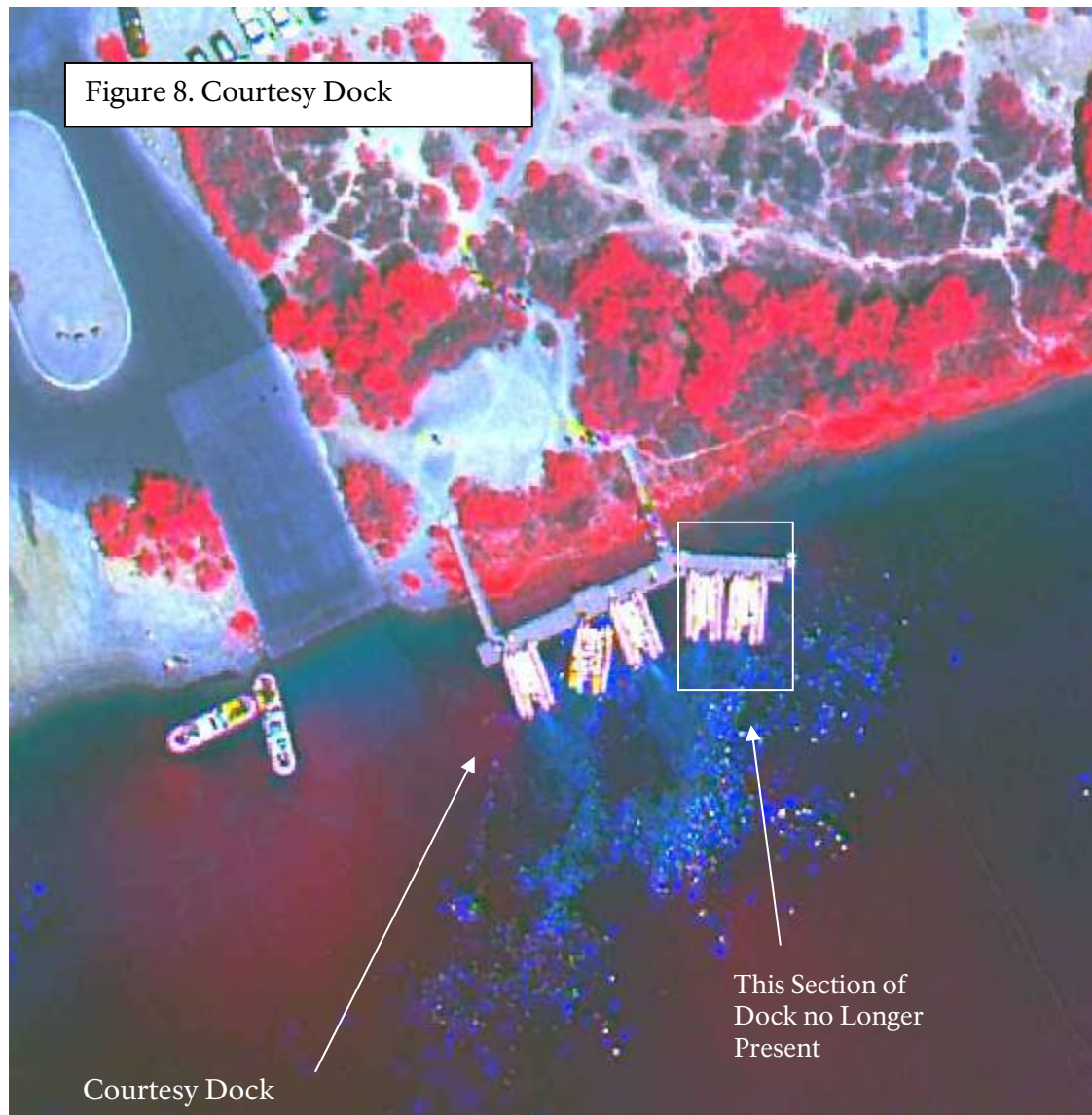






Figure 9. Courtesy Dock South End Support and Access Ramp

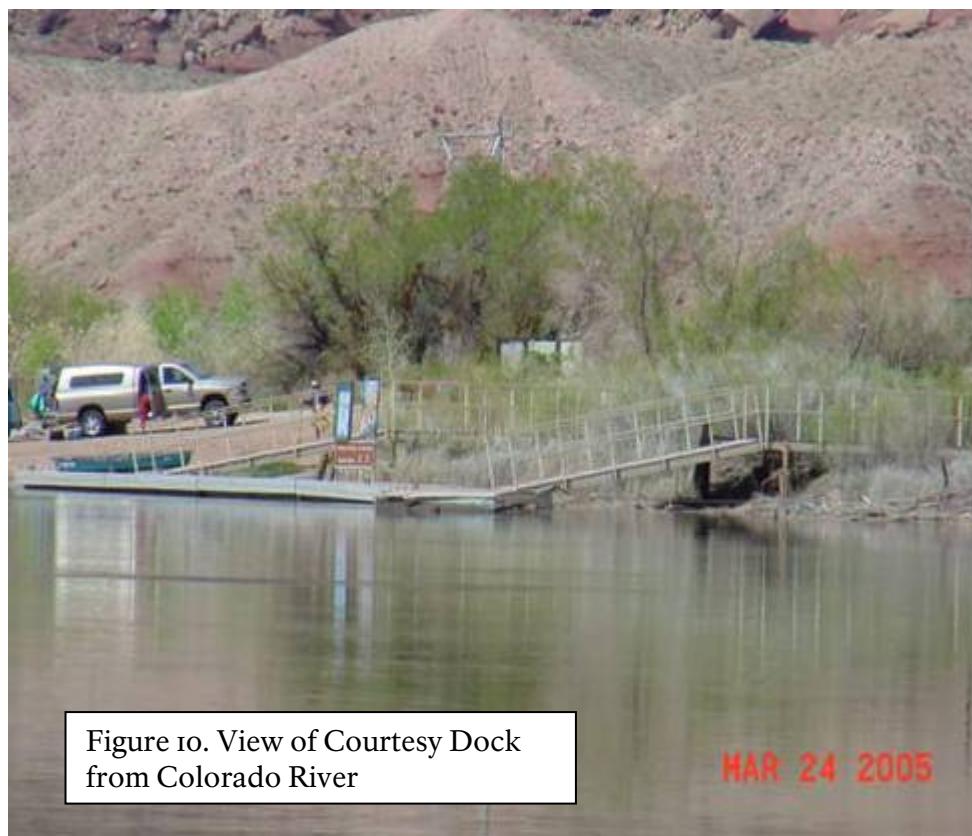


Figure 10. View of Courtesy Dock from Colorado River

## Replacement of Potable Water Intake at the Colorado River

The current Potable Water Intake (see Figures 11 and 12), which consists of a collection field (a wet sink lined with rocks), a screened intake pipe located in the river and a wet well with pump and transfer pipeline (located on dry land); all which were constructed in 1977.

The raw water taken from the Colorado River is high in sodium compounds, which over time has corroded the metal intake pipe and screen, internal workings of the pump and the metal transfer pipeline. This project would require the temporary removal of the rocks lining the wet sink, the

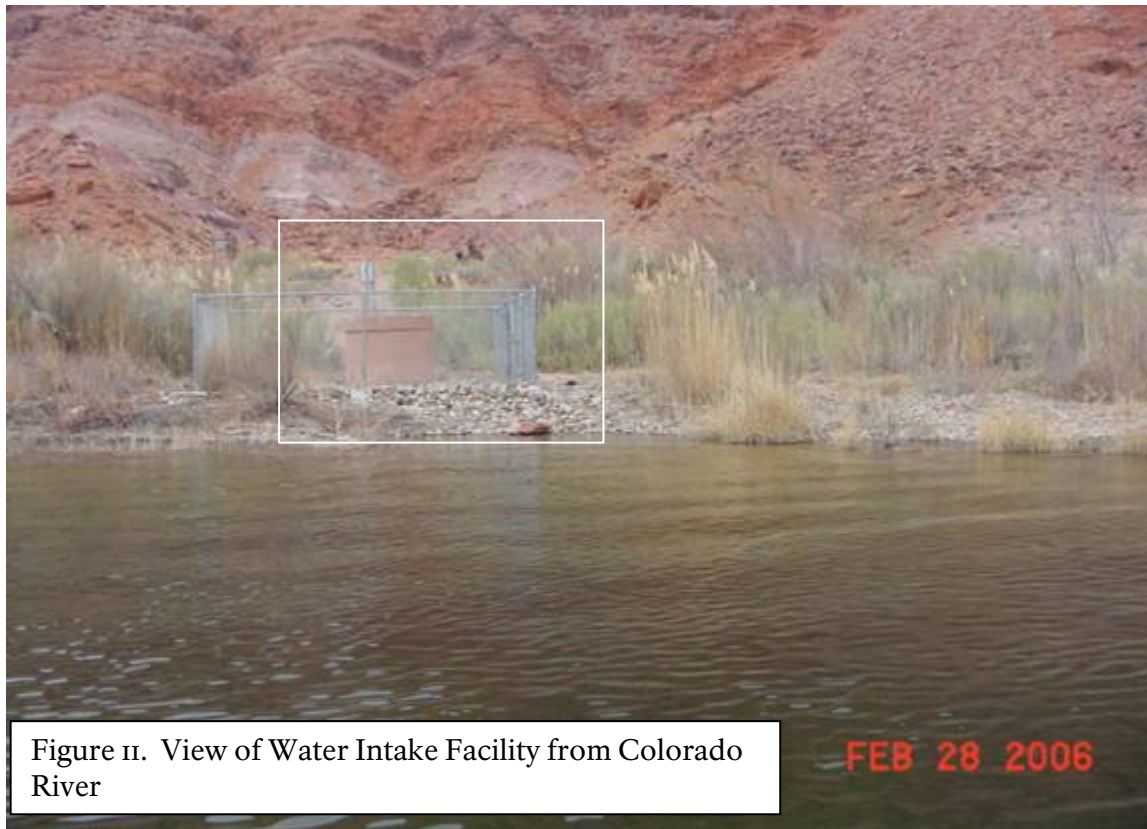


Figure 11. View of Water Intake Facility from Colorado River

replacement of the intake pipe and rocks in wet sink being returned. Additionally, the existing well pump will be overhauled if possible or replaced if too badly corroded and the transfer pipeline will be replaced from the pump to the junction with the distribution pipeline. All the work will take place within the existing disturbed area.



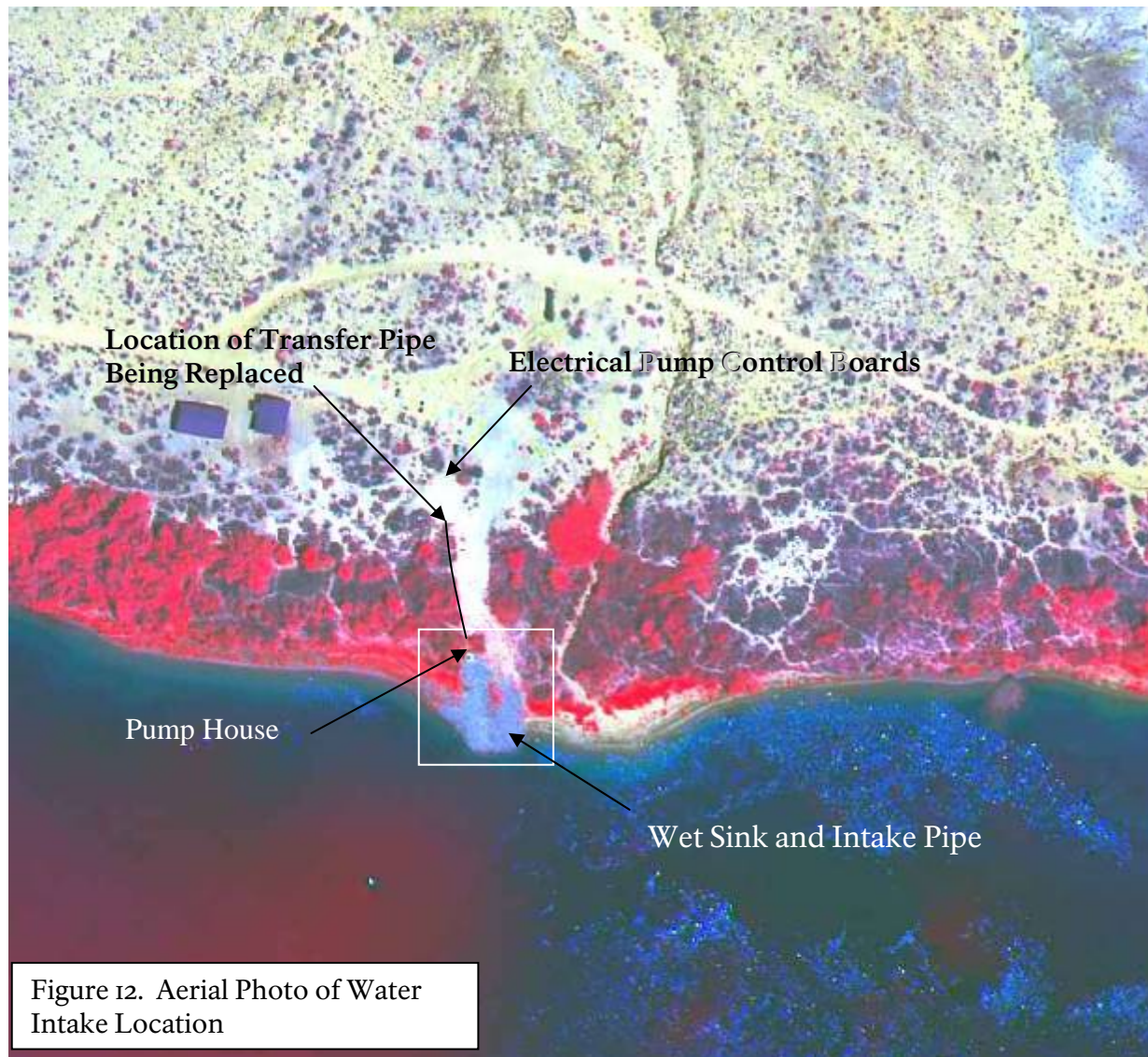


Figure 12. Aerial Photo of Water Intake Location

### Install Narrowband Repeater for Grand Canyon National Park On the Paria Plateau Overlooking Lonely Dell Ranch.

The proposed project would require the placement of a narrowband radio repeater at the break over of the Paria Plateau (see Figure 13). Currently Glen Canyon NRA has a narrowband solar powered repeater at this location (see Figure 14). This situation requires the Grand Canyon NP rangers stationed at Lees Ferry to relay information to and from their park through this repeater, which then affects the ability of other users to have timely access. This project would install a new repeater facility, which would include a tower, antenna and small equipment building. Once completed this facility would house both Grand Canyon and Glen Canyon narrowband repeaters and associated equipment. This repeater facility would be powered by electrical power via the Page Electric Utility (PEU) power lines that also occupy this area (see Map 5). The Glen Canyon solar powered repeater would be dismantled and removed from the site. Switching from solar to electrical would provide a reliable source of power, including generator derived power in the case of



emergency power loss. In order for these items to be installed, a new graded dirt road would need to be constructed from the end of the current road to the new location. It is thought that the power poles at the break over were originally installed using a helicopter as no evidence of a road currently exists. This road would also allow PEU to access the remaining portion of their lines for regular maintenance and in cases of emergency for service disruptions. Due to budget restraints, it is likely that the access road would be completed in advance of the installation of the repeater. The repeater facility will consist of a digital narrowband (12.5 KHz) VHF system that will provide digital conventional narrowband networks for law enforcement and medical uses.



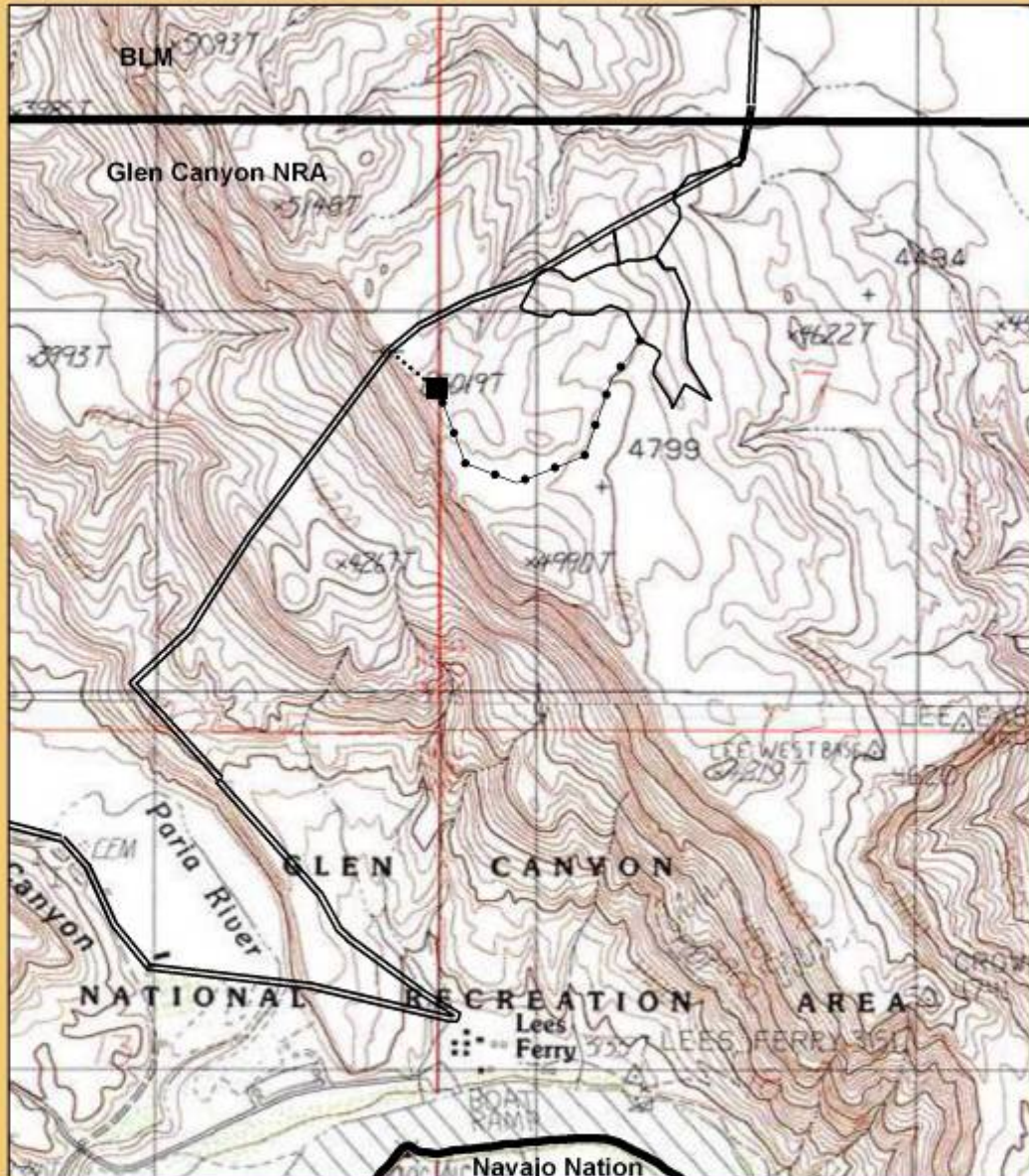
Figure 13. Current Solar Powered Repeater



Figure 14. Proposed Grand Canyon NP Electrical Powered Repeater

The site configuration will include an 8' x 8' x 6' environmental shelter that will either sit on a concrete pad or sit on 4 concrete blocks. It will have either a 47 foot articulating tower or a 60 foot adjoining tower with VHF and UHF antennas (see Figures 15 & 16 – these are mockups only. The actual facilities will take up no more space than identified below, but may ultimately look slightly different). The shelter and antenna will be fenced to provide security. The Permanent size of the facility will occupy an approximate 12' by 12' footprint. The temporary construction footprint will be approximately 25' by 25'. This facility is located within a utility corridor in a Recreation and Resource Utilization Zone. Neither the existing solar powered facility nor the proposed narrowband repeater facility could be easily seen from the Lees Ferry Area. The existing telephone poles and line can generally only be seen from the Lonely Dell area if pointed out and they are silhouetted by shadows. The tower would be located adjacent to the PEU pole before the line breaks over the plateau toward Lees Ferry. In order to make the tower unobtrusive, it would be painted a color that would blend into the surrounding rocky slopes.

Map 5. Proposed Location of  
Grand Canyon NP Narrowband Repeater



- Proposed Overhead Electrical Line
- ... Proposed Primitive Access Route
- Existing Electrical Lines
- Existing Primitive Access Route
- Proposed 12 x 12 Repeater Facility

0.5 0.25 0 Miles



# Paria Tower and Antennas

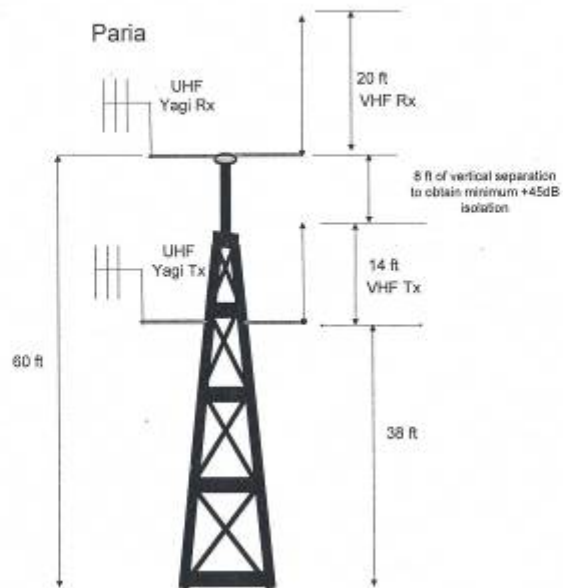


Figure 15

# Paria Floor Drawing

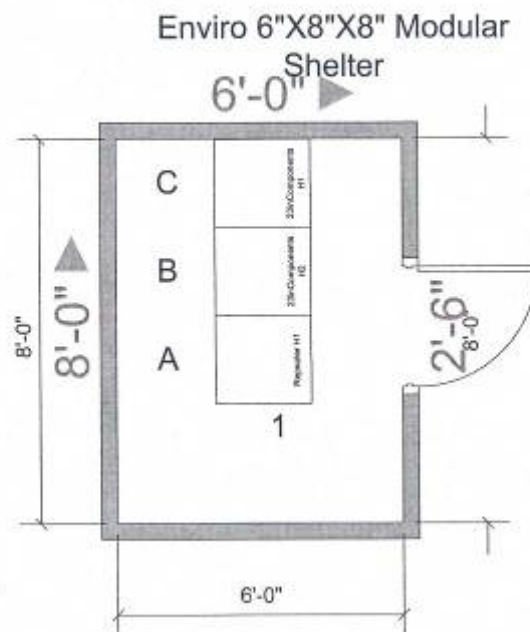


Figure 16

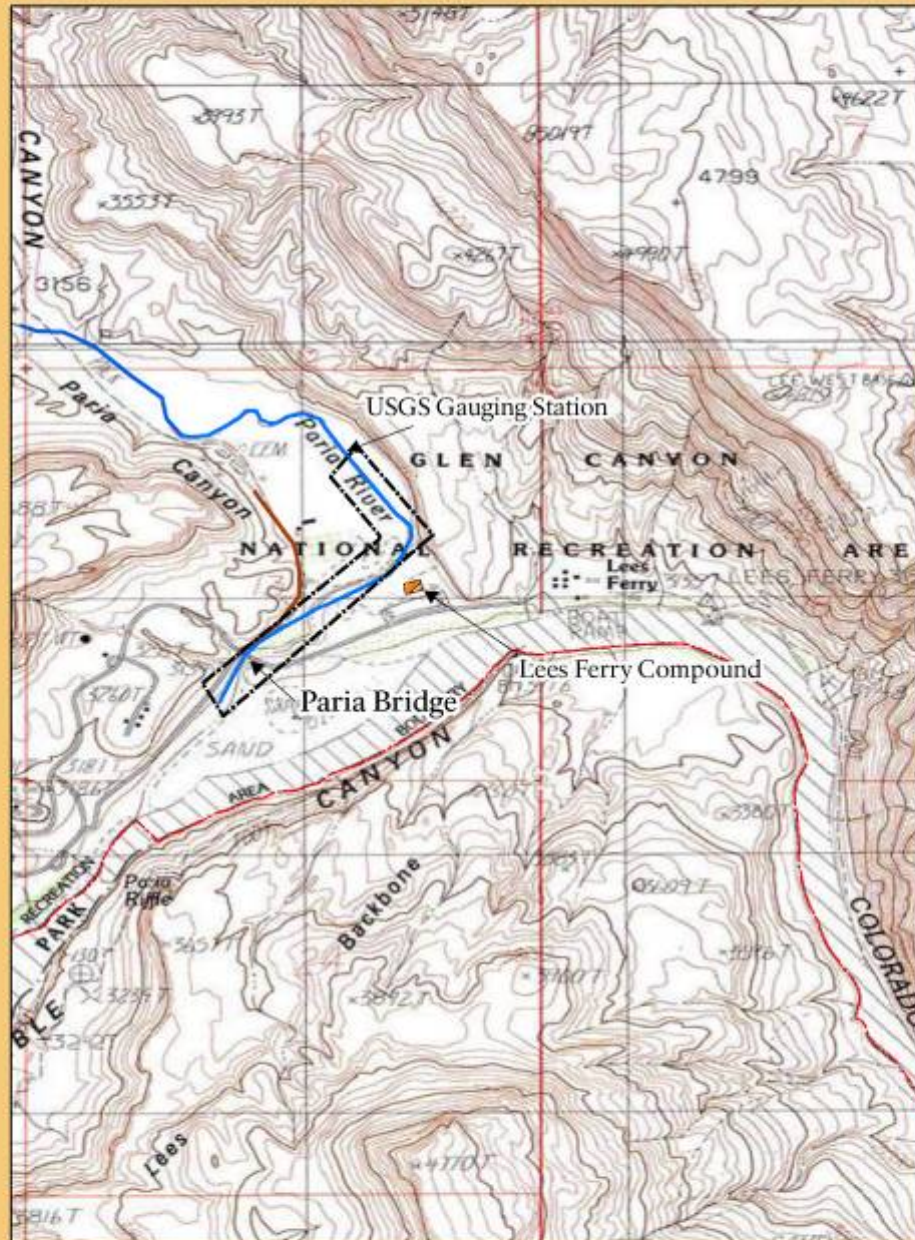


### Stabilization of erosion of the Paria River bank

While the Paria River has changed course during the years it has flowed through, ongoing down-cutting has created a situation where its current stream course is probably semi-permanent barring especially high levels of flooding (500 year event). This course has caused severe erosion problems along the access road to Lonely Dell Ranch (Figure 17) and at the bridge (Figure 18), where the Lees Ferry Area Access Road crosses the Paria River. Large amounts of fill (boulders, cement and native soils) are regularly placed into the river at these two points in an attempt to slow the erosion.



**Map 6. Paria River Bank Stabilization Locations**



- Area of Hydrologic Study
- Glen Canyon NRA Boundary
- Hydrological Study Area
- Current Flow Pattern of the Paria River

0 0.25 0.5  
Miles





The proposed project would include a hydrologic study of the river from the point where it passes the USGS gauging station to its convergence with the Colorado River, with special emphasis on the preceding and proceeding 1500 feet of river bed on either side of the bridge (Map 6).

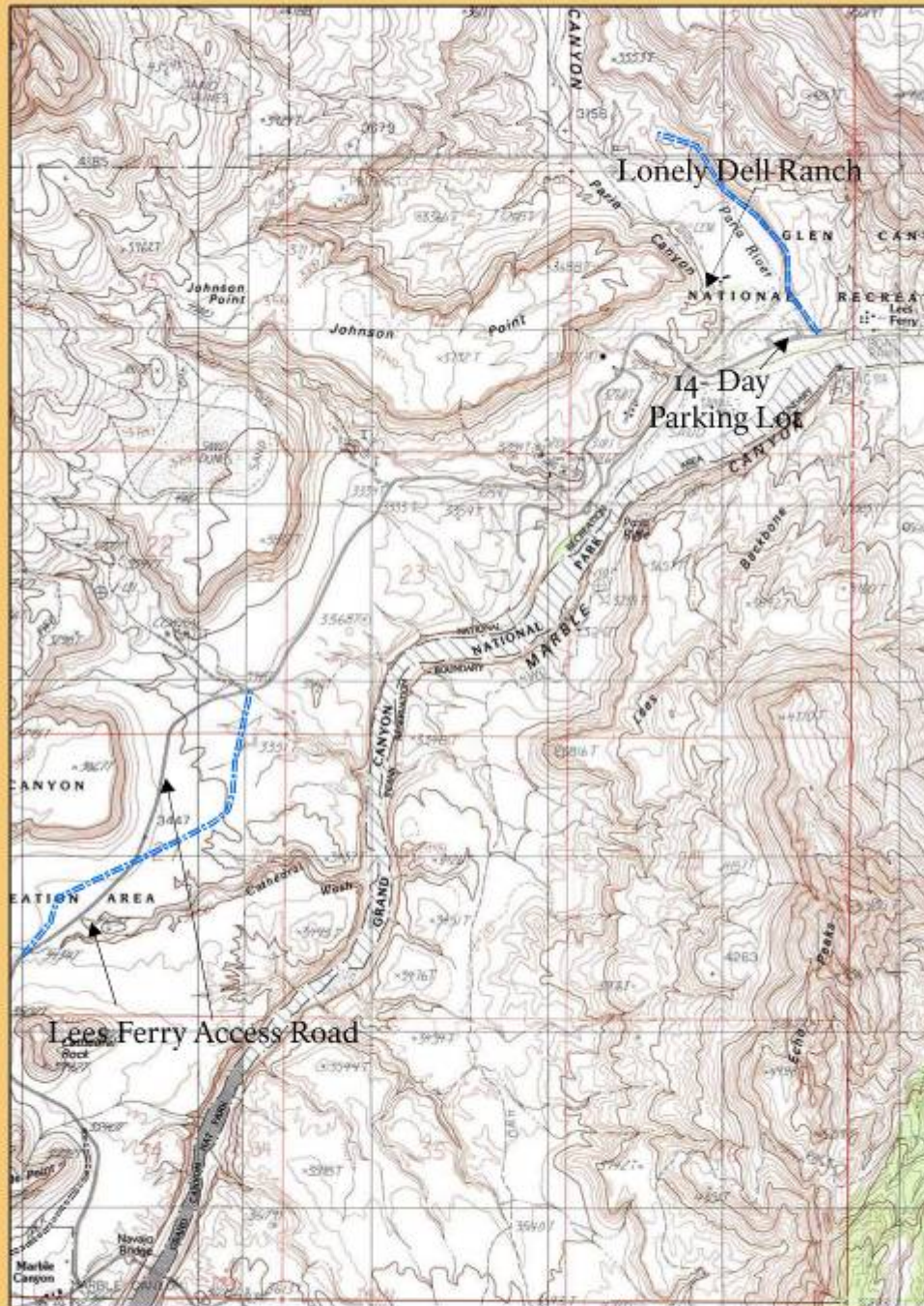
Stabilization may require the installation of a gabion system (rock-filled wire baskets), bank armoring and/ or finger dikes to slow and re-route stormwater coming down the Paria River. Placement of these types of systems requires extensive site preparation including grading and possible impoundment or re-routing of flowing stormwater.

Before construction can begin, the NPS will be required to obtain an individual Section 404 Clean Water Act permit from the U.S. Army Corps of Engineers as they have regulatory oversight on this type of project. As part of their permitting process, they will complete an Environmental Assessment based on the approved design. NPS policy would allow the Glen Canyon NRA Superintendent to use this EA as the appropriate NPS project level NEPA document as the U.S. Army Corps of Engineer's NEPA process includes the same public scoping and comment processes as the NPS.

### **Establish the Arizona Road Hiking Trail.**

Lees Ferry was established at the mouth of the Paria River as part of a wagon road from Utah to Arizona called the "Arizona Road". Several parts of the original wagon road from the 1870's still exist in the Lees Ferry area Map). Other parts were paved over to form the modern Lees Ferry access road. In the 1880's young couples from Arizona would travel north along the road to be married in the Church of Latter Day Saints (LDS) temple in St. George, Utah. It was during this time- period that it gained the nickname of the "Honeymoon Trail". A large portion of the route can still be seen via signposts on BLM lands to the north of Marble Canyon. The proposed project would establish a hiking trail along several portions of this trail that are still intact within the boundaries of Glen Canyon NRA (see Map 7). Establishment of a hiking trail would entail maintenance work to make the trail safe for visitors. It would also include the placement of numbered posts that correspond with a hiking guide, which would be made available to visitors at the information kiosk at the entrance station.

Map 7. Proposed Arizona Road Hiking Trail



Proposed Arizona Road Hiking Trail

0 0.25 0.5 1 Miles



## Replacement of the USGS Gauging Station on the Paria River

The USGS through the Flagstaff office monitors Paria River water levels and sediment loads as a part of their routine national stream monitoring program and to obtain required information for the Glen Canyon Dam Adaptive Management Program. Installed in 1932, this gauging site, which is located inside the boundary of the LFLD Historic District, is the oldest gauging station on any tributary to the Colorado River. Figure 19 shows the current gauging station. Figure 20 shows the original USGS monument, installed in 1932. Current gauging operations are insufficient due to meandering of the Paria River, which has over the past 74 years altered its flow pattern so that the current site is completely blocked by sediment build up. While the USGS has been trying to keep gauge in operation it has become inoperable, and a new gauging station needs to be built on the opposite bank where the active water channel is deepest during periods of flow. The planned gauging station will be 3' by 3' by 7' building that will be



Figure 19. Existing Gauging Station



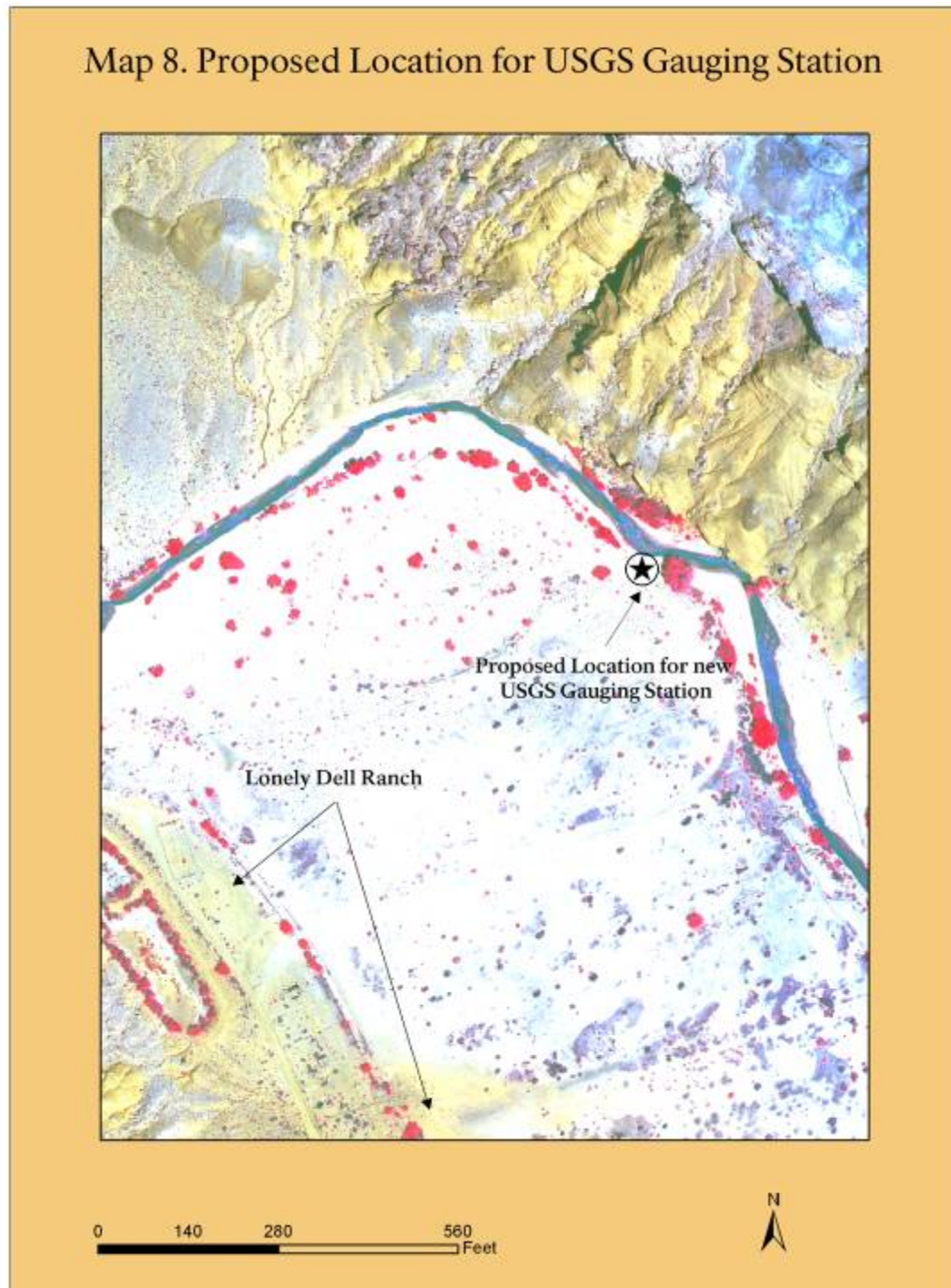
Figure 20. Original Gauging Station Monument



Figure 21. Approximate View of the Proposed Gauging Station Site from the Picture Window Cabin at Lonely Dell Ranch



designed to be visually complementary to the local environment and will not be visible from the Weaver Ranch House area. Figure 21 shows the view looking from the area north of the Weaver Ranch House to the proposed location of the new gauging station building. The new station will be using state of the art equipment. The proposed location for the new station is identified on Map 8.



## **ALTERNATIVES CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION**

There were no other alternatives considered during the development of this EA.

## **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

The environmentally preferred alternative is the alternative that will promote the policies expressed by the National Environmental Policy Act (NEPA). This includes alternatives that meet the following criteria to the greatest extent possible:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of resources that can be depleted.

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA §101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1978).

In the NPS, the No Action Alternative must also be considered in identifying the Environmentally Preferred Alternative. Alternative A, the No Action Alternative, represents the current management direction for Glen Canyon NRA. Alternative A does not provide for replacement of the courtesy dock, water intake, water treatment plant nor replacement of any of the other projects included in this EA and the goals of the National Environmental Policy Act are not fully realized. Alternative A would result in short and long-term impacts to these facilities at Lees Ferry by allowing continued deterioration, which could compromise the health and safety of the public and NRA staff, and may eventually lead to closure of some facilities as unsafe.



The environmentally preferable alternative is Alternative B, the Lees Ferry Improvement Alternative, because it surpasses the No Action Alternative in realizing the full range of goals stated in NEPA §101. Alternative B would improve health and safety and reduce long- term resource deterioration. As a result, this alternative would achieve the following:

- Reduce the risk to health and safety and other undesirable consequences of not replacing of existing facilities.
- Improve long- term protection of natural and cultural resources.
- Integrates resource protection with an appropriate range of visitor uses.

## **SECTION III**

## **AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This chapter describes the affected environment, or existing environment that could be affected by the alternatives considered, if they were implemented, for each impact topic retained for further analysis (see Table 1 of the Purpose and Need chapter of this document). Following this description is an analysis of the environmental consequences, or potential impacts, on the natural, cultural, and human environment at Glen Canyon NRA, from the implementation of the two alternatives considered in this EA.

The description of the Affected Environment, along with the description of Alternative A, the No Action Alternative, and the environmental consequences of the No Action Alternative combine to establish the baseline conditions against which the NPS and the public can compare the potential effects of Alternative B, the Agency Preferred Alternative.

### **METHODOLOGY**

For each impact topic, the analysis includes a brief description of the affected environment and an evaluation of effects. The impact analysis involved the following steps:

- Identify the area that would be impacted.
- Develop impact thresholds for intensity, context (local or regional), duration (short or long-term), and type (direct or indirect) of effects. The criteria used to define the intensity and duration of impacts associated with the analyses is presented in Table 2. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by an action and occur later in time or farther removed from the area, but are reasonably foreseeable.
- Identify and assess potential impacts using designated criteria, a review of relevant scientific literature, previously prepared environmental documents, and the best professional judgment of EA team resource specialists.
- Identify mitigation measures that may be employed to offset potential adverse impacts.

**Table 2: Impact Threshold Definitions**

<b>Impact Topic</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	<b>Duration</b>
<b>Public Health and Safety</b>	Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on the public health or safety.	The effect would be detectable and would likely be short- term, but would not have an appreciable effect on public health and safety. If mitigation were needed, it would be relatively simple and would likely be successful.	The effects would be readily apparent and long- term, and would result in substantial, noticeable effects to public health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful.	The effects would be readily apparent and long- term, and would result in substantial, noticeable effects to public health and safety on a regional scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.	Short- term – Effects last one year or less  Long- term – Effects last more than one year
<b>Natural Water</b>	Changes to water quality would be either non- detectable or, if detected, would have effects that would be considered slight, local, and short- term.	Changes in water quality would be measurable, although the changes would be small and the effects would be localized. No mitigation measure would be necessary.	Changes in water quality would be measurable and apparent, but would be relatively local. Mitigation measures would be necessary and the measures would likely be successful.	Changes in water quality would be readily measurable, would have substantial and possibly permanent consequences, and would be noticed on a regional scale. Mitigation measures would be necessary and their success would not be guaranteed.	Short- term – Recovers in less than one year  Long- term – Takes more than one year to recover
<b>Drinking Water</b>	Changes to water quality would be either non- detectable or, if detected, would have effects that would be considered slight, local, and short- term.	Changes in water quality would be measurable, although the changes would be small and the effects would be localized. No mitigation measure would be necessary.	Changes in water quality would be measurable and apparent, but would be relatively local. Mitigation measures would be necessary and the measures would likely be successful.	Changes in water quality would be readily measurable, would have substantial and possibly permanent consequences, and would be noticed on a regional scale. Mitigation measures would be necessary and their success would not be guaranteed.	Short- term – Recovers in less than one year  Long- term – Takes more than one year to recover
<b>Wetlands and Waters of the U.S.</b>	Effects to Waters of the US and/or wetlands would be below or at the lower levels of detection, (less than 1/10 of 1 acres), with no long- term consequences. Falls under the ACOE Nationwide Permit Program. Notification to the ACOE district Engineer is not required.	Effects to Waters of the US and/or wetlands would be detectable and relatively small in terms of area (less than 1 acre) and the nature of the change. Minor mitigation in the form of re- vegetation with native seeds and/or plants may be required. Falls under the ACOE Nationwide Permit Program with notification to the ACOE district	Effects to Waters of the US and/or wetlands would be readily apparent, 1- 5 acres in size, with possible long- term effects on the function and value that would be affected and may possibly be difficult to mitigate. Falls under ACE Individual Permit Program and ACOE district Engineer would be involved in process. Mitigation could	Effects to Waters of the U.S. and/or wetlands would be observable over a relatively large area and would change the character of the wetland or floodplain substantially (greater than 5 acres in size). Function and value could be permanently damaged, and mitigation would likely be unsuccessful. Falls under ACE	Short- term – Recovers in less than 3 years  Long- term – Takes more than 3 years to recover  * Assumes introduction of invasive weeds is controlled

**Table 2: Impact Threshold Definitions**

<b>Impact Topic</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	<b>Duration</b>
		Engineer required.	include re-vegetation or replacement in kind of affected resource.	Individual Permit Program and ACOE district Engineer would be involved in process. Mitigation would be limited to replacement in kind of affected resource	
<b>Floodplains</b>	Effects to Floodplains would be below or at the lower levels of detection, with no long- term consequences.	Effects to Floodplains would be detectable and relatively small in terms of area and the nature of the change. Long- term consequences are unlikely.	Effects to Floodplains would be would be readily apparent with possible long- term effects to function and value. Successful mitigation may prove difficult.	Effects Floodplains would be observable over a relatively large area and would change the character of the floodplain substantially. Function and value could be permanently damaged, and mitigation would likely be unsuccessful.	Short- term – Recovers in less than 3 years  Long- term – Takes more than 3 years to recover
<b>Vegetation</b>	No vegetation would be affected or some individual plants could be affected as a result of the alternative, but there would be no effect on native species populations and no spread of noxious weeds or exotics. Any effect would be small scale, and no species of special concern would be affected.	Changes in vegetative communities or species populations would be measurable, with small and localized effects to a relatively minor portion of any species population. The alternative would have some spread of noxious weeds and exotics. Mitigation to offset adverse effects, including special measures to avoid spread of noxious weeds and exotics, could be required and would be effective.	Changes in vegetative communities or species populations would be readily apparent, with effects to a sizeable segment of the species' population over a relatively large area. The alternative would have some spread of noxious weeds and exotics. Mitigation to offset adverse effects could be extensive, but would likely be successful.	Changes to vegetative communities or species populations would have a considerable long- term effect and affect a relatively large area in and out of the park. The alternative would have a considerable long- term effect on the spread of noxious weeds and exotics. Mitigation to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.	Short- term – Recovers in less than 5 years  Long- term – Takes more than 5 years to recover  Recovery is typically very slow in desert vegetation
<b>Wildlife</b>	Wildlife would not be affected or the effects would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population. Impacts would be well within the	Effects to wildlife would be detectable, although the effects would be short- term localized, and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.	Effects to wildlife would be readily detectable, long- term and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.	Effects to wildlife would be obvious, long- term, and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.	Short- term – Recovers in less than one year  Long- term – Takes more than one year to recover

**Table 2: Impact Threshold Definitions**

<b>Impact Topic</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	<b>Duration</b>
	range of natural fluctuations.				
<b>Threatened and Endangered Species</b>	No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in USFWS terms.	The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small. Minor effect would equate with a "may effect" determination in USFWS terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some long- term consequence to the individual, population, or habitat. Moderate effect would equate with a "may effect" determination in USFWS terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat, would be noticeably affected with a long- term, vital consequence to the individual, population, or habitat. Major effect would equate with a "may effect" determination in USFWS terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species or critical habitat.	Short- term – Recovers in less than one year  Long- term – Takes more than one year to recover
<b>Cultural Resources</b>	The impact to archeological resources, National Register Historic Places, and cultural landscapes is at the lowest levels of detection—barely perceptible and not measurable. Impacts would neither alter ethnographic resource conditions, nor alter the relationship between the resource and the affiliated group's body of practices and beliefs.	For archeological resources, the impact affects an archeological site(s) with modest data potential and no significant ties to a living community's cultural identity. The impact does not affect the character defining features of a National Register of Historic Places eligible or listed structure, district, or cultural landscape. Impacts to ethnographic resources would be slight and noticeable, but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the affiliated group's body of practices and beliefs	For archeological resources, the impact affects an archeological site(s) with high data potential and no significant ties to a living community's cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized. Impacts to ethnographic resources would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the	For archeological resources, the impact affects an archeological site(s) with exceptional data potential or that has significant ties to a living community's cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register. Impact to ethnographic resources would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the	Short term – Effects on the natural elements of a cultural landscape may be short- term (e.g., three to five years until new vegetation grows or historic plantings are restored, etc.)  Long term – Most cultural resources are non-renewable, so effects would be long term.



Table 2: Impact Threshold Definitions					
Impact Topic	Negligible	Minor	Moderate	Major	Duration
			affiliated group's practices and beliefs.	resource and the affiliated group's body of practices and beliefs would be jeopardized.	
<b>Visitor Use and Experience</b>	Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short- term. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short- term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.	Changes in visitor use and/or experience would be readily apparent and likely long- term. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.	Changes in visitor use and/or experience would be readily apparent and have important long- term consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.	Short- term – Occurs only during incident response or during the treatment action  Long- term – Occurs after the incident or after the treatment action

## Cumulative Impacts

The CEQ regulations for implementing the National Environmental Policy Act of 1969 (42 USC 4321 *et seq.*) require assessment of cumulative impacts in the decision making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non- federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects are considered for both the no- action and proposed action alternatives. Other ongoing actions that may result in a cumulative impact are identified in the Purpose and Need Section of this EA.

## Impairment Analysis

NPS *Management Policies* (NPS 2001b) requires analysis of potential effects to determine whether or not actions would impair park resources or values.

The fundamental purpose of the NPS, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, actions that would adversely affect park resources and values.

These laws give the NPS the management discretion to allow impact to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the NPS personnel, would harm the integrity of park resources or values, including the opportunities that

otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. Impairment may result from NPS activities in managing the park, from visitor activities, or from activities undertaken by concessioners, contractors, and others operating in the park. An impact would be more likely to constitute an impairment if it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park
- identified as a goal in the park's general management plan or other relevant NPS planning documents

A determination on impairment is included in the impact analysis section for all impact topics relating to park resources and values.

## **Impact Topics**

### **Public Health and Safety**

**Existing Condition:** The health and safety of recreation area visitors and staff is of the utmost importance to the NPS. The NPS is always striving to upgrade facilities to ensure they are as safe as possible for visitors and staff alike. Currently provides potable drinking water at the ramp, campgrounds, Lees Ferry Compound, Glen Canyon Ranger Station, and staff housing that meets or exceeds Safe Drinking Water Act standards. They also provide flush toilets at the ramps, a courtesy dock to assist in the safe transition of people and equipment on and off of all kinds of boats, a contact station for visitors going down river, a bridge to safely cross the Paria River, an access road to Lonely Dell Road and maintained boat launching ramps that increases the safe launching of boats. Without replacement, many of these facilities will likely deteriorate to the point of being unsafe. Additionally, radio communications in the Lees Ferry area is unreliable and requires multiple bouncing of signals.

### **Impacts of Alternative A**

**Analysis:** Under Alternative A, none of the proposed projects would occur and the health and safety of visitors and staff are likely to be jeopardized as these utilities and facilities would continue to deteriorate and the use of these utilities and facilities would need to be curtailed or abandoned. Additionally, if the water treatment plant is not upgraded and the water intake structure replaced Glen Canyon NRA would not be able to provide potable water to the visiting public or to the campground, potable water taps, staff housing, and work buildings. A lack of raw water due to a non- functioning water intake would also negatively affect the use of the flush toilets, fish cleaning station, fire response, and irrigation water for the Lonely Dell Orchard. If Alternative A were chosen the impact to visitor and staff health and safety would be adverse and long- term and the Lees Ferry area would likely revert to a “use at your own risk

area.” Emergency radio communications would still continue to operate in a patchy and ineffective mode, putting the health and welfare of visitors and staff at risk.

**Conclusion:** Implementation of Alternative A would result in moderate short- term and long-term adverse impacts on public health and safety depending on the intensity of use at Lees Ferry. There would be no impairment of park values or resources.

**Mitigation Measures:** None

## **Impacts of Alternative B**

**Analysis:** Meeting the health and safety needs of the public and staff is the primary reason these projects are being proposed. Under Alternative B, public health and safety would be improved due to stabilization and/or replacement of visitor facilities will ensure visitors are able to view and receive interpretation and use recreation based facilities without fear of harm from failing utility systems and/or deteriorated buildings. Replacing the water intake and treatment facility will ensure staff and visitors alike have an abundant amount of clean fresh water that would meet all federal and state regulatory parameters. Stabilizing the Paria River around the bridge and Lonely Dell access road and installing new USGS gauging station equipment will help to protect these facilities and the visitors using them from storm water damage. Installation of the Grand Canyon NP Repeater facility will help ensure visitors receive timely help when needed. Removing the obstructing curb at the rafting ramp will help ensure the safety of pedestrians and their equipment. Replacing the courtesy dock will help ensure the safe transfer of people and equipment to and from boats.

Construction of these facilities could effect public health and safety by creating fugitive dust emissions, and create walkway and traffic obstructions. Additionally, these facilities would not be available while they are being replaced; causing a temporary nuisance to visitors and staff alike.

Flooding of the Paria River bank behind the Lees Ferry Compound could cause the release of hazardous materials into the environment.

**Conclusion:** Implementation of Alternative B may cause short- term minor detrimental impacts to health and safety during construction periods associated with the completion of these projects. Additionally, release of hazardous materials could cause long- term minor impacts to visitors to Lees Ferry and users of the Colorado River (assuming flood waters wash over into the Colorado from the Paria River). The Improvements to facilities and utilities at Lees Ferry would have beneficial, minor to moderate, long- term effects to the health and safety of visitors and staff. There would be no impairment of park values or resources.

**Mitigation Measures:** The Hazardous Material storage areas proposed for the Lees Ferry Compound will be designed to withstand most flooding events. If time permits, all hazardous materials will be moved to high ground prior to storm events likely to breach the river bank behind the compound. Additionally, the maintenance personnel at Lees Ferry will endeavor to use environmentally friendly products and limit the amount of hazardous materials purchased. Glen Canyon NRA dispatch monitors the National Weather Service flashflood warnings and

would initiate evacuation of facilities and surrounding area of visitors and NPS personnel as the likelihood of a flood event greater than the 100- year level occurs. Once evacuation measures are initiated, visitors and staff alike would be urged to seek higher ground, which is only a very short distance and only a very few minutes from this location, thus allowing quick evacuation. NPS staff would assist in evacuations of visitors and complete area checks to determine all visitors are safe.

Appropriate traffic and pedestrian barriers will be placed to protect visitors and staff from construction related injuries.

Best management practices, including control of dust emissions and a traffic and pedestrian management plan will be instituted to ensure that the visitors, staff, and the natural and cultural resources of Lees Ferry are protected to the maximum extent possible.

## **Water Resources**

### **Natural Waters**

**Existing Condition:** The Lees Ferry area has a number of important water resources including the Colorado River, downstream from the Glen Canyon Dam, the Paria River, several intermittent washes, and groundwater. Each of these water resources could potentially be affected by the proposed alternatives. Other water resources that are common in the region such as seeps and springs do not exist in areas potentially affected by the proposed alternatives.

**Colorado River Tailwater:** The nature of the Colorado River at Lees Ferry is dominated by the Glen Canyon Dam. Originally a large sediment- laden desert river, the dam has altered the river's temperature, sediment load, and hydrograph. The temperature is relatively constant year- round, averaging 46°F (8°C). The sediment load for which the Colorado River was named now drops out of suspension in the upper reaches of Lake Powell; at Lee's Ferry the river water is clear and nutrient levels are low. The hydrograph, which varied greatly through the year before the dam, is now fairly constant with the greatest variation occurring on a daily cycle and ranging from 5,000 cubic feet per second (cfs) to about 20,000 cfs. Occasional floods, limited by dam capability, are carried out for natural resource related values. Details of the hydrograph are determined by the Secretary of the Interior through the Bureau of Reclamation based on recommendation of the Glen Canyon Dam Adaptive Management Program.

The Colorado River, below Glen Canyon Dam to Lees Ferry supports a self- sustaining rainbow trout population. Changes caused by the Glen Canyon Dam have created an environment that supports trout well, but is not suited for native Colorado River fish. Some native fishes use the river, such as the spackled dace and flannel mouth sucker, but the cold water suppresses spawning.

**Paria River:** The Paria River is the only major tributary to the Colorado River below Glen Canyon Dam and within. The Paria is one of very few sediment sources for the Colorado River through Grand Canyon. The Paria River enters the Colorado at Lees Ferry after flowing through the historic district and near several of the proposed project areas. The Paria River is particularly important for many additional reasons including spawning habitat for native fish.



**Intermittent Washes:** Several intermittent washes trace through the Lees Ferry area. These washes are normally dry, during rain events with high run- off the washes flow. These washes typically include numerous pools and other catchments that can hold water after flow has ceased. These temporary pools support unique forms of life specifically adapted to temporary systems. Intermittent streams and their temporary pools are important water resources in desert environments.

**Groundwater:** Groundwater near the surface at Lees Ferry is intimately linked with the Colorado and Paria Rivers. Other potential water- bearing strata are poorly known and not potentially affected by the proposed alternatives.

### **Impacts of Alternative A**

**Analysis:** If the intake pipeline or the pipeline leading to the water treatment plan were to fail, river water would most likely flow back downhill and enter the Colorado River, bringing with it sediments from the bank area. Additionally, fresh water would not be available for drinking, washing hands or flushing the toilets, which could lead to human wastes entering the waterway. If this scenario happened, Glen Canyon NRA maintenance staff would place micro- flush portable comfort stations (with toilets) in the ramp area and endeavor to repair the water line as soon as possible.

**Conclusion:** Alternative A would result in short- term, negligible to minor adverse impacts to the quality of natural water available at Lees Ferry. There would be no long- term impacts to the quality of natural waters. There would be no impairment of park values or resources.

### **Impacts of Alternative B**

**Analysis:** The following projects could contribute construction related pollutants and sediments, which could temporarily degrade water quality (ie, during the construction period);

- USGS Gauging Station – on the Paria River
- Courtesy Dock Replacement – on the Colorado River
- Replace water intake facility – on the Colorado River
- Stabilize the bridge over the Paria River and Lonely Dell Access Road – on the Paria and Colorado Rivers
- Rehabilitate Drainage Structures located along Lees Ferry Access Road – on intermittent washes and the Colorado River.
- Lees Ferry Compound – on the Colorado River
- Remove Curb at Rafting Ramp – on the Colorado River

The Paria River contributes the majority of sediments to this portion of the Colorado River and this sediment is an important component to the natural water of the river, helping to support a wide array of native wildlife. Construction of the stabilization of the Paria riverbank could require the grading and re- contouring of up to 10 acres of riverbed and bank. During construction, any water present will have to be either impounded or re- routed, which could decrease or increase the amount of sediment that reached the Colorado River. Additionally, stabilizing the river bank will of itself limit the amount of erosion based sediment that is available for movement downstream.

**Conclusion:** Construction of the proposed projects would result in short- term, moderately adverse impacts on water resources. There would be no long- term impacts to the quality of natural waters. There would be no impairment of park values or resources.

**Mitigation Measures:** As required by the Clean Water Act, prior to the start of each project staff or their paid contractors will obtain an Arizona Pollutant Discharge Elimination Permit from the State of Arizona. This permit requires the completion of a storm water management plan and erosion control plan. Using the best management practices available, these plans include instructions on the placement of barriers to insure construction related pollutants and sediments do not enter surface waters in the Lees Ferry Area. Additionally, during the design of the stabilization of the Paria riverbank, special care will be given to ensure that only minimal amounts of sedimentation are captured and that the majority of sediments reach the Colorado River.

## **Drinking Water**

**Existing Conditions:** The Lees Ferry Water System is classified as a Transient Non-Community Public Water System which serves a population of approximately 480 through 12 connections. This small water system consists of an intake pump capable of providing 110 gallons per minute of raw surface water, a “Conventional” filtration water treatment plant (WTP) with a maximum production capacity of seventy (70) gallons per minute, a 175,000 gallon elevated water tank, and a three- legged distribution system. The three legs include the Campground Main, the Housing Main, and the Main Ramp/Lonely Dell Ranch Main.

The Lees Ferry raw water intake is located on the Colorado River below the Glen Canyon Dam. The intake structure consists of a gravel packed infiltration zone raw water intake/infiltration gallery and a fenced raw water intake locked pumping vault/wet well. The pump delivers water to the water treatment plant through underground piping.

The Lees Ferry Surface Water Treatment Plant (WTP) is a full treatment, standard (“Conventional”) filtration plant that is rated at a maximum production capacity of 70 gallon per day (GPM) but operates most efficiently at fifty 50 GPM or less. 50 GPM meets or exceeds peak summer demand of 25,000 GPD without difficulty. This “Conventional” filtration WTP consists of automated Programmable Logic Controller (PLC) controls, a 2,000 gallon fiberglass clear well/surge tank (contact tank), a 6,500 gallon backwash retention tank, and a hypo- chlorinator, all located within the Water Treatment Facility in the Lees Ferry Compound.

The WTP also controls, through the PLC and automated valves, raw water that is distributed to the Lonely Dell Ranch Orchard. The WTP calls for the intake pumps to provide raw water to the plant but the automated valves divert the water to the Lonely Dell Ranch Orchard just prior to entering the plant’s water treatment process.

## **Impacts of Alternative A**

**Analysis:** If the raw water intake system and the water treatment plant are not replaced, the NPS will lose the ability to produce potable water at Lees Ferry. Drinking water will then need to be

brought in by truck and stored prior to dispensing. Drinking water quality impacts tend to increase as more intermediary steps are included.

**Conclusion:** Alternative A would result in negligible to minor, long- term adverse impacts to the quality of drinking water available at Lees Ferry. There would be no impairment of park values or resources.

**Mitigation Measures:** None

## **Impacts of Alternative B**

**Analysis:** Replacing the raw water intake system and water treatment facility will help ensure safe drinking water is available for all visitors and staff using the Lees Ferry area. As currently configured, the current treatment plant cannot meet the soon to be invoked changes to Arizona State drinking water standards. Additionally, the buried pipeline associated with the raw water intake system is badly degraded and collapse could occur at any time.

**Conclusion:** Alternative B would result in a minor, long- term beneficial impact to the quality of drinking water available at Lees Ferry. There would be no short- term impacts to the quality of drinking waters. There would be no impairment of park values or resources.

**Mitigation Measures:** None

## **Floodplains**

**Existing Condition:** The Lees Ferry Compound is situated on the combined alluvial fan of the Paria River and gravel bar deposited by the Colorado River. The Federal Emergency Management Administration (FEMA) has identified this geologic formation as a flood plain as illustrated by FEMA Flood Map 0400190375B, subject to varying degrees of flooding by a 100-year precipitation event on the Paria River. Due to many variables including a local bridge over the Paria River, remnants of old channels left during the meandering period of the Paria River, varying river cross- sections, and constructed earthen features, the flood depths range from zero to approximately 14 feet. The area in which the existing compound is located has been in continuous use at least since the early 1970's when the water treatment plant was constructed. The compound is currently comprised of the water treatment plant, the Grand Canyon NP Ranger Contact Station and storage buildings, and the Glen Canyon NRA maintenance and storage buildings.

Other agencies, including the USGS and AZ Game and Fish Department, park boats and store scientific equipment within the compound. This is the most visited area at Lees Ferry and these are the most heavily used public facilities.

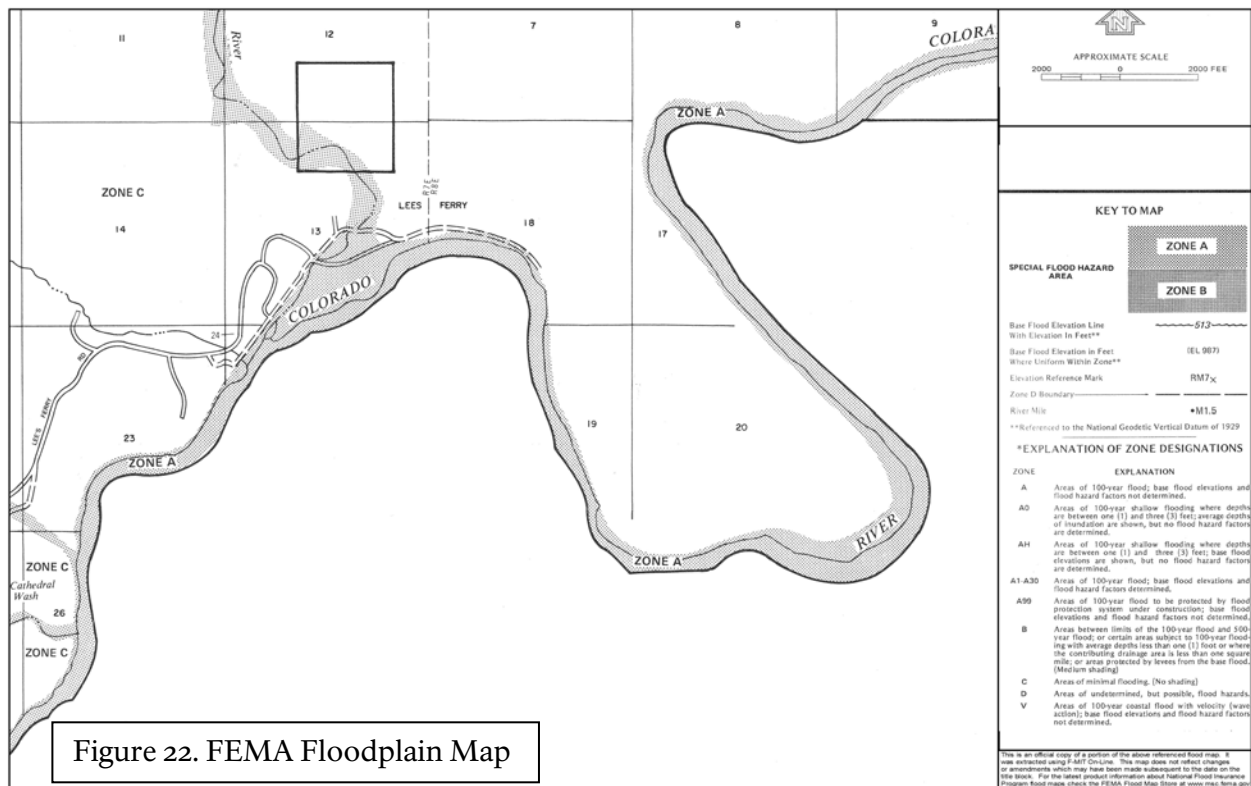


Figure 22. FEMA Floodplain Map

Sited adjacent to the 14 day parking lot where boaters park their vehicles and boat trailers, the taking river trips down the Grand Canyon. Grand Canyon NP rangers working out of the existing contact station provide visitors with information on various recreational activities, and maintain an NPS presence for the public. The Grand Canyon NP contact station is within easy walking distance to the boaters' input ramp and the comfort station. The compound and contact station are located in an appropriate location to initiate Search and Research (SAR) operations on the Colorado River or in the backcountry.

## Impacts of Alternative A & B

**Analysis:** On March 24, 2006, a survey was undertaken to determine what effect a 100- year flood event of the Paria River would have on the structures and occupants of the compound. Based on this site visit and hydrologic analysis, it was determined by NPS hydrologists that the area within the compound would not be subject to flooding due to the 100- year event. The analysis shows that the river is approximately 14 feet deep and contained within the river banks, with approximately 12 to 18 inches of riverbank remaining above the flood level. However, downstream, the river may top the bank and follow remnants of old channels. These channels appear to act as a safety valve by lowering the river's surface gradient and providing the freeboard. The point at which the trajectory of the river aligns with the compound, the compound is approximately 350 feet from the river bank and is therefore unlikely to be affected. However, the area may be vulnerable in a rare 500 year event, which could top the riverbank. Additionally, demolition of the existing facilities and construction of new facilities within the



compound would not change current flood flow patterns. Therefore, the adverse impacts to the floodplain from the proposed alternative would be direct, negligible to minor and short to long-term depending on level of flooding event. NPS policies require parks to complete a Statement of Findings (SOF) if a project is going to adversely impact a floodplain. The SOF, which is located in Appendix B, summarizes the investigation and identifies any mitigation measures.

**Conclusion:** The Lees Ferry Compound and has been in its current location at least since the early 1970's, initially as the site for the water treatment plant. Facility management and maintenance activities are anchored to the water treatment plant, and resource and visitor protection activities to the Colorado River access and adjacent historic district, and close to the compound. This locale is optimal for staging NPS operations and providing direct services for the parks' visitors. It provides sufficient space for upgrading existing facilities to current standards and adding needed structures for the protection of equipment and materials. Relocating these facilities out of the floodplain would be exorbitant in cost, reduce essential services to visitors, and reduce operational efficiencies. There would be short-term impacts to the floodplain due to construction activities. There would be moderate, long-term, adverse impacts to the floodplain due to the continued placement of the existing and/or new facilities associated with the Lees Ferry Compound. There would be no impairment of park values or resources.

**Mitigation Measures:** To mitigate impact on the floodplain, all new construction would be confined to the previously disturbed area, and as a consequence, above the 100-year flood stage. The current communication and warning system will be maintained in order to evacuate visitors and their personal property in the event of a severe storm over the Paria River drainage.

Glen Canyon NRA dispatch monitors the National Weather Service flashflood warnings and would initiate evacuation of facilities and the surrounding area of visitors and NPS personnel as the likelihood of a flood event greater than the 100-year level occurs. They will be provided with a figure that shows the amount of water in cubic feet per second needed to reach a level above the 100-year flood stage. Once evacuation measures are initiated, visitors and staff alike would be directed to seek higher ground, which is only a very short distance and only a very few minutes from this location, thus allowing quick evacuation. NPS staff would assist in evacuations of visitors and complete area checks to determine all visitors are safe.

## **Wetlands and Waters of the United States**

**Existing Conditions:** The U.S. Army Corps of Engineers (USACE) has jurisdiction over protecting Waters of the U.S., including wetlands under section 404 of the Clean Water Act. Waters of the U.S. are defined as waters that are navigable for interstate commerce and their tributaries. The Colorado River has been identified as a navigable waterway. The Paria River and several large washes are contributing tributaries within the Lees Ferry area and would also be considered the jurisdiction of the USACE. The USACE has developed an extensive permitting process to ensure projects affecting jurisdictional waters [(Water of the U.S. found below the regulatory defined "ordinary high water mark") OHWM] do not compromise water quality. Typically these permits come with a variety of mitigation measures to which the applicant must adhere. The NPS regularly applies for USACE permits as part of their

construction planning and incorporates any mitigation measures into their construction specifications and design plans.

Wetlands are a type of “Waters of the U.S.” and also generally fall under the jurisdiction of the USACE. Wetlands are defined as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]). Wetlands have three diagnostic characteristics that include (1) over 50% of the dominant species present must be classified as obligate, facultative wetland, or facultative, (2) the soils must be classified as hydric, and (3) the area is either permanently or seasonally inundated (US ACOE 1987). There are small patches of wetland vegetation along the bottom and sides of the Paria River, along the bank of the Colorado River between the supports for the courtesy dock and on either side of the water intake structure.

**Impacts of Alternative A** – There would be no impacts and no impairment of park values or resources.

## **Impacts of Alternative B**

### **Analysis:**

#### Water Intake Replacement

The intake structure consists of a gravel packed infiltration zone for raw water intake and a fenced- in raw water intake pumping vault. While a variety of wetland species occurs on either side of the fenced vault site, the area within the fence is regularly maintained, including mowing of vegetation, which mainly consists of non- native, non-wetland grasses. Construction of the project would require the removal of all vegetation growing on the graveled infiltration zone and the rock containment wall located between the two.

#### Courtesy Dock Replacement

While the majority of the dock floats on the Colorado River, the walkway to the dock is suspended on support structures that are fixed to the banks. A small amount of the wetland species that occurs all along the bank would be permanently displaced due to the installation of the support structures. There may also be some short- term trampling of vegetation while installation is completed.

#### Stabilization of Erosion of the Paria River Banks

The Paria River, which is classified by the U.S. Geological Survey as a perennial stream, is a major tributary to the Colorado River and as such falls under the jurisdiction of the USACE. Stands of wetland species can be found on sand bars and on either bank throughout the length of the Paria within. This project may require the placement of stabilization devices that would require the removal of all the vegetation growing along terraces and on the river bottom. Currently the maximum extent of the study area is 2500’ x 175’ “or about 10 acres in size.

### Rehabilitate Drainage Structures Located along Lees Ferry Access Road, including Cathedral Wash and No Name Wash

Because of the intermittent nature of the washes located along Lees Ferry access road, true wetland species are not present, but rather more ephemeral riparian species persist.

**Conclusion:** The previously listed projects could have direct short and long- term negligible to moderate impacts on wetlands and waters of the U.S. There would be no impairment of park values or resources.

**Mitigation Measure:** Because a portion of each of the proposed projects would occur in jurisdictional waters, the NPS would need to obtain the appropriate level of permit from the USACE. This permit would require the development of best management practices to ensure pollution does not reach waters of the U.S. and minimizes the loss of wetlands. It also requires replacement of any wetlands lost during construction. As is typical in these types of projects, if impacts are small and there is a surrounding seed bank, restoration generally consists of natural re- growth over the construction site. For a project the potential size and scope of the stabilization of the Paria riverbanks would require the development of a specific mitigation plan for wetlands. The most likely scenario would include use of erosion control structures that are able to support plant growth along with use of seeds and possibly live plants. Level of restoration is dependent on life cycle needs of plants targeted for replacement.

### **Wildlife, Vegetation and Endangered Species**

#### **Existing Condition:**

Vegetation: There are generally two Desert shrubland shadscale (*Atriplex confertifolia*) communities found at Lees Ferry. One of these is found on the Moenkopi formation, while the second occurs on Kaibab limestone. Although both are dominated by shadscale, the herbaceous species are different. The Kaibab limestone community supports the listed endangered Brady's pincushion cactus (*Pediocactus bradyi*.) Floristically the shadscale shrublands that occur on limestone is more diverse than on the Moenkopi soils, with numerous forbs and annuals. The exotic grass species, *Schismus arabicus* has invaded this limestone community, and may pose a threat to the *Pediocactus* since it is fire adapted and creates a fire cycle.

The dry wash community (i.e. Cathedral Wash) includes mixed shrubs, forbs and annual species with no clear dominants. Arizona State Species of Concern, the Marble Canyon spurge (*Euphorbia aaron- rossii*) occurs where these small dry washes reach the cliffs along the Colorado River.

Wildlife: Lees Ferry is situated on a major bird migration route up that follows the Colorado River. Almost 200 species have been documented from the area. Bi- weekly surveys between 1994 and 1998 documented 114 songbirds using the Lonely Dell Ranch area and the riparian vegetation near the launch ramp. Large numbers of waterfowl seek refuge at Lees Ferry between October- January during the hunting season, with concentrations of more than 2000 birds of 20 or more species some years. A Peregrine falcon (*Falco peregrinus*) eyrie occurs across the Colorado River in the vicinity of Paria Riffle Beach, and golden eagles (*Aquila chrysaetos*) and red- tailed hawks (*Buteo jamaicensis*) frequently use the area for foraging. Great Blue herons

(*Ardea herodias*) have been nesting across the river from the launch ramp since 1998. Cooper's hawks (*Accipiter cooperii*) are known to nest in the Chinese Elm trees at Lonely Dell Ranch.

A variety of mammals are found at Lees Ferry including coyotes (*Canis latrans*), bobcats (*Felis rufus*), black tailed jackrabbit (*Lepus californicus*), beaver (*Castor canadensis*), ground squirrels, bats and variety of mice, and rats. Reptiles include a variety of snakes and lizards. Amphibians also inhabit the area. Arizona State Listed Species of Concern, the Grand Canyon Pink Rattlesnake has been seen in the Lees Ferry Area.

The Colorado and Paria Rivers are home to a variety of native and non- native game fish. Rainbow trout (*Oncorhynchus mykiss*) a non- native game fish species dominates the Colorado River from the dam down to the insertion point of the Paria near the Paria riffle fishing beach. In the main body of the Paria River and below the insertion point, where the water from the incoming Paria warms and adds silt to the Colorado, Red shiner (*Cyprinella lutrensis*), Flannel mouth sucker (*Catostomus latipinnis*), Bluehead suckers (*Catostomus discobolus*), Roundtail chub (*Gila robusta*), Fathead minnows (*Pimephales promelas*), Mosquito fish (*Gambusia affinis*) and Speckled dace (*Rhinichthys osculus*) are more likely to occur. Carp (*Cyprinus carpio*) and Flannel mouth suckers (*Catostomus insignis*) an Arizona state listed species of concern, can be found in the Paria during the spring when water levels are high.

## **Impacts of Alternative A**

**Analysis:** Under this alternative there would be no impacts to vegetation or wildlife species and there would be no impairment of park values or resources.

**Mitigation Measures:** None

## **Impacts of Alternative B**

**Analysis:** With the exception of the stabilization of erosion of the Paria River bank project, the impacts to vegetation and wildlife from all the remaining proposed projects would be negligible to minor, short- term, indirect, and highly localized.

Lees Ferry Compound – The majority of the compound within the existing fence line is already denuded of vegetation. Wildlife found within the fence line consists mainly of mice and ground squirrels. The existing compound is surrounded by large tamarisk trees, which are considered an invasive species in Coconino County. Some of these trees will need to be removed in order to accommodate the construction within the compound as well as the pull through drive. Most birds using these trees for foraging and roosting are year around residents that includes owls and ravens.

Paria Repeater Site – Some vegetation may be removed as the access road is completed. Due to the very sparse nature of the vegetation in the area, which is mostly comprised of slick rock, the amount to be removed is very minor and will recover on its own. There may also be some small amount of inadvertent death of small burrowing rodents, reptiles and insects within the road corridor. Wildlife and vegetation species found in the project area are ones commonly found



throughout this part of Arizona. They also tend to reproduce at prodigious speed to fill territory openings. The repeater site is entirely sited on slick rock and will not affect vegetation.

Replace Water Intake - There is some minor amount of riparian vegetation that will need to be removed along the intake and transfer pipelines. Removing the stones covering the intake pipeline in the river as well as removing and replacing the pipeline itself may cause a minor amount of short- term sediment disturbance, which depending on the time of year could affect hatching trout. During the water- fowl migratory season, the area around the water intake provides cover for roosting and foraging.

Replace USGS Monitoring Station - Project may require the removal of one or more cottonwood tree seedlings.

Improve Arizona Hiking Trail - Use of the trail portion that follows the Lees Ferry access road, may impact some vegetation species through trampling from foot traffic. Construction of the portion of the trail by the Lees Ferry Compound would require specific trail contouring that may remove native and non- native plants along the path as well as fill small animal holes in the path.

Lees Ferry Access Road Drainage Repair Projects - Repair and/or replacement of metal and concrete box culverts and other drainage structures will likely require the removal of a minimum of native and non- native vegetation species.

Ramp Area Curb Removal - Removal of the curb and placement of a graded and graveled drive would require the removal of the local plant cover, including several large tamarisk trees. Construction so near the river could also allow construction- based pollution to enter the river.

Stabilization of Erosion of the Paria River bank - Impacts to vegetation and wildlife would be minor to major, short- term, direct and indirect, and highly localized.

This project may require the placement of stabilization devices that would require the removal of all the vegetation growing along the riverbottom on terraces. Currently the maximum extent of the study area is 2500" x 175 "or about 10 acres in size. Construction activities could contribute construction- based pollution to the river, which in turn could affect those fish species using the Paria for breeding. Additionally, diverting or impounding the stormwater flow could also affect the ability of fish species to breed in the river.

**Conclusion:** Alternative B would generally result in minor to major, short- term, highly localized adverse impacts to vegetation and wildlife due to construction activities.

Alternative B would not produce major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishing legislation of the recreation area, key to the natural or cultural integrity of the recreation area or opportunities for enjoyment of the recreation area, or identified as a goal in the recreation area's general management plan or other NPS planning documents.

**Mitigation Measures:** Projects along the banks of the Colorado River will be accomplished during the low- water season and appropriate water retention systems will be installed if

necessary, to protect water quality. Best Management Practices would be instituted to control the movement of storm- water runoff from construction projects into the Paria and Colorado Rivers in order to protect fish species from construction impacts.

All construction plans would include protective measures to ensure there are no introductions of weeds.

Most vegetation removed during construction projects will be replaced within a growing season through natural processes if weeds are controlled. Gabion structures and finger dikes can be constructed to encourage the growth of native species on the top and sides of these structures.

All of the vegetation or wildlife species being removed by the construction of the proposed projects are common throughout the northern portion of Arizona and their individual removal will not impact the overall numbers or health of the remaining members.

## Threatened and Endangered Species

**Existing Conditions:** Species listed as endangered, threatened and candidates for listing are included on Table 3. Species or potentially suitable habitat for listed species likely to be present within this analysis area is discussed in sections following Table 3. Species listed by the USFWS for which suitable habitat is not present within the analysis area are eliminated from further discussion.

Table 3			
Species Listed in Coconino County, Arizona			
<u>Common Name</u>	<u>Scientific Name</u>	<u>Listing Status</u>	Habitat available for species within the analysis area in
Apache Trout	<i>Oncorhynchus apache</i>	T	No, Habitat Not Present
Bald Eagle	<i>Haliaeetus leucocephalus</i>	AD, T	Yes
Black- Footed Ferret	<i>Mustela nigripes</i>	E, EXPN	No, Habitat Not Present
Brady Pincushion Cactus	<i>Pediocactus bradyi</i>	E	Yes
California Brown Pelican	<i>Pelecanus occidentalis</i>	DM, E	No, Coastal Vagrant
California Condor	<i>Gymnogyps californianus</i>	E, EXPN	Yes
Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	T	No, Habitat Not Present
Fickeisen Plains Cactus	<i>Pediocactus peeblesianus fickeiseniae</i>	C	No, Outside Known Range of Species
Humpback Chub	<i>Gila cypha</i>	E	Yes
Kanab Ambersnail	<i>Oxyloma kanabense</i>	E	No, Outside Known Range of Species

Table 3			
Species Listed in Coconino County, Arizona			
<u>Common Name</u>	<u>Scientific Name</u>	<u>Listing Status</u>	Habitat available for species within the analysis area in
Little Colorado Spinedace	<i>Lepidomeda vittata</i>	T	No, Outside Known Range of Species
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	No, Habitat Not Present
Navajo Sedge	<i>Carex specuicola</i>	T	No, outside of known range of species
Razorback Sucker	<i>Xyrauchen texanus</i>	E	No, Outside of Known Range of Species
San Francisco Peaks Groundsel	<i>Senecio franciscanus</i>	T	No, Outside Known Range of Species
Sentry Milk- Vetch	<i>Astragalus cremnophylax</i> <i>var. cremnophylax</i>	E	No, Outside Known Range of Species
Siler Pincushion Cactus	<i>Pediocactus</i> (= <i>Echinocactus</i> ,= <i>Utahia</i> ) <i>sileri</i>	T	No, Outside Known Range of Species
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	No, Habitat Requirements Not All Present – Surveys Were Conducted For Past 10 Years – All Negative
Welsh's Milkweed	<i>Asclepias welshii</i>	T	No, Habitat Not Present In GCNRA
Yellow- Billed Cuckoo	<i>Coccyzus americanus</i>	C	Yes, This species identified on the Colorado River upstream from the Lees Ferry Area during migration surveys.

Coconino County list of endangered species was obtained from:

<http://ifwzes.fws.gov/EndangeredSpecies/lists/ListSpecies.cfm>

Flora species distribution information was obtained from Arizona Rare Plant Field Guide, fauna species distribution was obtained from: <http://www.gf.state.az.us>.

### Information on Species That Occur In the Lees Ferry Analysis Area

**Brady pincushion cactus** (*Pediocactus bradyi*) grows between 3400 and 4600 feet elevation in open, exposed, sunny locations on the Kaibab Limestone. This cactus occurs among sparse

vegetation characterized by scattered shrubs like shadscale and torrey jointfir, a variety of grasses, and annuals. Glen Canyon NRA currently monitors this plant species on a bi- yearly basis.

**The humpbacked chub** (*Gila cypha*) is an endangered fish of the Colorado River system. Designated critical habitat for this species occurs from the inflow of the Paria River down the Colorado River.

**Bald eagles** (*Haliaeetus leucocephalus*) can be found in Glen Canyon NRA, primarily on slick rock around the Lake Powell shoreline during the wintertime. They may be occasionally seen along the Colorado River below the Glen Canyon Dam.

**Yellow- Billed Cuckoo** (*Coccyzus americanus*) has been seen very occasionally during annual migratory bird surveys on the Colorado River below Glen Canyon Dam. There is no record of this species nesting in Glen Canyon NRA. This species, which is declining in numbers, nest in thick stands of riparian vegetation that is dominated by mature willow and cottonwood trees. It is likely that the sightings were migratory birds that were seen roosting or foraging.

The Lees Ferry area is included in the Northern Arizona California Condor Nonessential Experimental Population Area where **California condors** (*Gymnogyps californianus*) have been reintroduced. California condors generally roost in rocky cliffs or in trees in the mountains and foothills of this arid region. Condors are common below Glen Canyon Dam along the Colorado River, particularly in the area of Marble Canyon and Navajo Bridge.

## **Impacts of Alternative A**

**Analysis:** There would be no impacts and no impairment of park values or resources.

## **Impacts of Alternative B**

### **Analysis:**

**Brady's Pincushion Cactus:** The proposed Arizona Road trail will be located about ½ mile from several populations of Brady's pincushion cactus. Due to the extreme summer heat, use of this trail is likely to be highest during the late fall, winter and early spring. This species lays dormant and retracts into the soil much of the year and is only above ground during the late spring growing season if sufficient liquid (rain or snow) has fallen. It is expected that the numbers of people actually hiking this portion of the Arizona Trail will be quite small and there is little chance that users would stray off trail and accidentally trample individuals of this species. In order to prevent illegal removal or poaching of this species, the exact locations of this species will not be included in this document. In accordance with Section 7 of the ESA, Glen Canyon NRA biologists have determined that the proposed project would have a "may affect, not likely to adversely effect" on this species.

**California condor:** Condors can regularly be seen soaring in the Lees Ferry Area, are attracted to human activities, especially construction projects, where they can be physically injured or accidentally poisoned. In accordance with Section 7 of the ESA, Glen Canyon NRA biologists



have determined that the proposed project would have a “may affect, not likely to adversely effect” on this species.

Bald Eagles: Bald eagles are only rarely seen below Glen Canyon Dam, usually right at Lees Ferry where foraging is easier due to the lack of high vertical cliffs as well as width of the Colorado River at this point. They are only seen foraging in the winter and have not been seen in the Lees Ferry area any other time of the year. It is theorized that the birds seen at Glen Canyon NRA in the winter are members of the Arizona Population that nests in the southern part of the state. Additionally, the bald eagles in the NRA are able to move freely from one roost site to another and always vacate an area being occupied (even temporarily) by humans. In accordance with Section 7 of the ESA, Glen Canyon NRA biologists have determined that the proposed project would have a “may affect, not likely to adversely effect” on this species.

Humpbacked chub: Critical habitat for this species has been created within along a stretch of the Colorado River, from the mouth of the inflowing Paria River to boundary with Grand Canyon NP. This species requires the presence of warm silt laden waters, which the Paria provides. Due to the presence of Glen Canyon Dam, the Paria River is the 1<sup>st</sup> major point where large amounts of silt enter the Colorado River. Completion of the stabilization of the Paria River banks has the possibility to have an minor, long- term indirect impact to this species and its critical habitat by lessening the amount of silt running into the Colorado River by trapping or impeding the movement of silt. There could also be a minor, short- term increase in movement of silt during the construction phase. In accordance with Section 7 of the ESA, Glen Canyon NRA biologists have determined that the proposed project would have a “may affect, not likely to adversely effect” on this species.

Yellow billed cuckoo: Suitable migratory roosting and foraging habitat for this species only occurs upriver and around several bends of the Colorado River. None of the projects proposed in this EA would affect this species during its migration. In accordance with Section 7 of the ESA, Glen Canyon NRA biologists have determined that the proposed project would have a “no affect” on this species.

**Conclusion:** The proposed projects would have short- term negligible adverse impacts the above identified threatened and/or endangered species. There would be no impairment of park values or resources.

#### **Mitigation Measures:**

Brady’s pincushion cactus: The trail guide will remind hikers to stay on the trail. Additionally, natural resource staff will continue to monitor this species to determine if hiking is having detrimental impacts on this species. If there are detrimental impacts, use of this trail may be curtailed or suspended.

California condor: In cooperation with the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service, has established as set of mitigation measures to protect this species from construction projects impacts. These mitigation measures would be incorporated into all construction documents:

- If a condor is spotted directly on or over the construction site, activities will cease until

the bird leaves or is driven off by a biologist.

- Construction workers and supervisors are instructed to avoid interaction with condors and to immediately contact the appropriate Park personnel if and when the condor(s) settle at the construction site.
- The construction site will be cleaned up at the end of each day (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site.
- All dead animals found within 500- feet of the construction zone will be immediately disposed of by placing the carcass the nearest available dumpsters.
- To prevent water contamination and potential poisoning of condors, a Spill Prevention and Cleanup Plan (SPCP) will be developed and implemented for this project. It will include provisions for immediate clean- up of any hazardous substance, and will define how each hazardous substance will be treated in case of leakage or spill. This plan needs to consider possible leakage from support vehicles as well as the drill rig(s). Please forward a digital copy on CD of the plan to the Environmental Specialist at Glen Canyon National Recreation Area, P.O. Box 1507, Page, AZ 86040.
- All drilling personnel will be given a copy of the enclosed literature regarding condor concerns.
- Project personnel are strictly prohibited from hazing condors (chasing, flapping arms, throwing objects, honking horn, etc.)

Humpbacked Chub: A Glen Canyon NRA approved storm water pollution prevention plan that includes erosion control will be required for each project, which will greatly reduce the possibility of construction related pollution affecting this species.

Yellow- billed Cuckoo: None

Bald Eagles: None

## **Cultural Resources**

**Existing Conditions:** A majority of the projects lie within the boundaries of the Lees Ferry/Lonely Dell Ranch Historic District (LFLD Historic District). The most recent form nominating this property to the National Register of Historic Places was completed in July, 1997, and the property was accepted for listing on the National Register in November of the same year. The District contains a total of 26 contributing elements, including numerous historic structures, a cemetery, irrigation ditch, and the remains of an historic steamboat. Also contained within the district are numerous modern non- contributing structures including maintenance buildings, launch ramp and comfort station. Additionally, Lonely Dell Ranch has been identified by the Secretary of the Interior as a Historic Landscape.

The significance of the District is based on its association with early Mormon settlement, early ranching and agriculture, early mining, early U.S. Geological Survey exploration, the exploration and development of the Colorado Plateau, and transportation across the Colorado River.

In 2000 the NPS completed an Historic Structures Report for the District which summarizes its history in 5 separate phases: The **Introductory Era** (including Native American occupation and early European exploration), the **Mormon Crossing Era** (including early operation of the ferry by Jacob Hamblin, John D. Lee, the Johnson family, and James Emmet), the **Final Ferry Era** (including Charlie Spencer's mining operations, the operation of the Grand Canyon Cattle Company, the beginning of USGS operations, and the creation of a polygamist retreat by the Johnson family), the **Recent Era** (including the construction of the "Paradise Canyon" dude ranch by Leo Weaver, its subsequent ownership and occupation first by Essy Bowers and subsequently by Gus Griffin, and ongoing USGS operations), and the **Modern Era** (including the purchase of Lonely Dell by the Consortium, and the acquisition and management of both properties by the NPS).

Structures included within the District are made of stone and log, with the exception of the Weaver Ranch House which is partly wooden frame construction. The NPS actively stabilizes and monitors 12 historic structures and 5 associated features, although some are in a ruined condition. Recently new roofs were installed in the USGS residence, Spencer Bunkhouse, Placer Corporation Office, Lee's Fort, Samantha Johnson Cabin, polygamist cabin, and Picture Window cabin; maintenance work and repairs on these structures are ongoing. In addition, an intensive program of yearly monitoring and repairs is being developed to maintain these structures in a stable condition.

### **Impacts of Alternative A**

**Analysis:** Alternative A would not result in impacts to the LFLD historic district or the Lonely Dell Historic Landscape. There would be no impairment of park values or resources.

**Mitigation Measures:** None

### **Impacts of Alternative B**

**Analysis:** While most of the proposed facilities would occur within LFLD Historic District, none of them would directly affect any of the contributing features that make the LFLD Historic District eligible for listing on the National Register of Historic Places. None of the projects would occur within the Lonely Dell Historic Landscape; though the construction of a new USGS gauging station would occur on its boundary. Impacts would be related to noise, dust and traffic issues. Improvements to all facilities in the Lees Ferry Area would also likely be the cause of increased visitor use patterns due to improved amenities.

The USGS gauging station, was originally installed in 1922 is well over 50 years old and therefore may qualify for listing on the National Register of Historic Places. The proposed replacement of this station would occur across the river from the existing station. The existing station will not be removed and interpretive signs would be installed to provide historical information on its use to the visiting public.

**Conclusion:** Construction related affects to the remaining projects would have only negligible, short- term, adverse impacts to the Cultural Resources at Lees Ferry. There would be no impairment of park values or resources.

**Mitigation:** Phasing of construction projects, set hours of construction noise, and control of fugitive dust emissions would all help lessen the impacts of construction on the cultural resources.

### **Arizona Road**

**Existing Conditions:** The Old Arizona Road, known later as the “Honeymoon Trail,” was a significant travel route between Arizona and Utah from 1872 until 1928. The trail went from Kanab to Lees Ferry on the Colorado River, then south to Tuba City. From there it continued upstream along the Little Colorado to several primarily Mormon settlements that were founded in the 1870’s and 80’s. Several other historic roads and trails from southern Arizona joined the Old Arizona Road at various points. Lees Ferry was a vital part of this road. The steep walls of the Grand and Glen Canyons were a barrier for 700 miles and the only feasible crossing point for the Colorado River was at Lees Ferry. In later years, the road was dubbed the “Honeymoon Trail” for the large numbers of Mormon couples who traveled its route north to St. George in order to have their marriage sealed in the Temple there. However, in addition to this activity, the road also served as a major travel route for pioneers and settlers from all walks of life.

The Old Arizona Road runs through the Lees Ferry/Lonely Dell Ranch Historic District and is largely extant within the District. Most sections of the road are easily identifiable and the route can be plotted with accuracy. Because the road links Lees Ferry with Lonely Dell Ranch, it was seen as a perfect interpretive theme with which to unify the two historic areas, providing opportunities to talk about courage, independence, perseverance, and the adventure inherent in exploration and travel. These universal themes would resonate with nearly any type of audience and allow them to make their own personal connection with this historically rich resource.

An Interpretive Plan calls for relatively minimal work on this historic road to make it a viable walking trail for visitors to the District. There are places near the Paria where the road needs to be protected from erosion; some minor work would need to be done to define the parameters of the trail and/or correct any potential safety hazards. Numbered markers would be placed on the trail to correspond with a walking guide that the park would produce, which would give the background and history of the trail. There would be no damage or alteration of the historic fabric of the road.

### **Impacts of Alternative A**

**Analysis:** Alternative A would not result in any impacts to cultural resources at Lees Ferry. There would be no impairment of park values or resources.

**Mitigation Measures:** None

### **Impacts of Alternative B**

**Analysis:** There are places near the Paria where 150 feet of the road has been washed away and some minor work would need to be done to improve the trail in this area. Numbered markers would be placed on the trail to correspond with a walking guide that the park would produce, which would give the background and history of the trail. There would be no damage or

alteration of the historic fabric of the road. The Interpretive Plan calls for relatively minimal work on this historic road to make it a viable walking trail for visitors to the District.

**Conclusion:** Under this alternative the creation of the Arizona Road hiking trail would have direct, long- term, negligible impacts. There would also be short- term negligible impacts due to trail construction and installation of route markers and signage. There would be no impairment of park values or resources.

## **Ethnographic Resources.**

**Existing Conditions:** Traditional cultural properties or places are locations of special heritage value to contemporary communities, including Native American groups and descendants of early pioneers, because of their association with the cultural practices or beliefs rooted in the histories of those communities. Thus, they are important in maintaining the communities' cultural identities. These resources may include archaeological sites, geographic areas, or natural resources such as springs/seeps, vegetation, wildlife, or mineral deposits.

Based on traditions passed down through the generations, natural resources found in the Lees Ferry region are important to the Navajo Nation, Hopi, San Juan Southern Paiute, Kaibab Paiute, White Mesa Ute Band of the Ute Mountain Tribe, Kanosh Paiute Band, Koosharem and Shivwits Paiute Bands, and Zuni Native American Tribes. All resources associated with the natural environment are important to the tribes' traditional beliefs about mother earth and utilizing that which she created. These resources include plants, animals, humans, rocks, water, and mountains. Tribes are often reticent to reveal information about the type or location traditional of properties. Accordingly, specific sites or locations are not listed in this public document.

## **Impacts of Alternative A**

**Alternative A** would not result in any impacts to Ethnographic resources at Lees Ferry. There would be no impacts and no impairment of park values or resources.

## **Impacts of Alternative B**

**Analysis:** Increased visitation due to the improved amenities may cause an increase in visitor use of the Lees Ferry Area. Increased visitation would increase the likelihood that all resources, including ethnographic resources may receive greater impacts from handling, walking, boating, etc.

**Conclusion:** There would be a direct long- term, negligible, adverse impact on ethnographic resources at Lees Ferry due to possible increase in visitor use of the area due to improved amenities.

**Mitigation Measure:** Ethnographic resources would be monitored by park staff and changes in visitor use patterns instituted if impacts of increased visitation become apparent.



## Visitor Use and Experience

**Existing Conditions:** While visitors are drawn to the Lees Ferry area for many reasons the main reasons are boating the Colorado River and touring the Lees Ferry Historic District. The discussions in this section will be limited to the use of the river. Information on use and impacts related to the historic district and ethnographic resources are discussed in the previous sections.

### Upriver Trips

Raft trips upriver are scheduled based on customer demand and the river rafting concessioner is permitted to have as many as 20 pontoon style rafts on the river at any one time. While numbers may approach this number in the busy summer season, there are often many days when no trips are made in the winter. These trips originate at Glen Canyon Dam, where customers board the rafts through the main concrete access tunnel to the dam. The trips available are half- day and full day trips and all the customers are picked up at Lees Ferry and bused back to Page at the end of the trip. If the threat level is elevated by Homeland Security, the customers are bused down to Lees Ferry where they board the rafts for the trip upriver. In this case, they would also get off the rafts at the Lees Ferry ramp at the end of the trip. These rafts will also ferry individual kayakers and canoeists upriver for a fee. Private trips upriver do not currently require permits and numbers of boats and/or passengers are not currently counted by Glen Canyon NRA staff. The flat water commercial trips that explore the first 15 miles of the Colorado River (from Glen Canyon Dam to the Lees Ferry area) are managed by contract and numbers of trips and passengers are counted.

### Downriver Trips

Downriver rafting trips are either provided by concessioners contracted to Grand Canyon National Park (Grand Canyon NP) or private individuals or groups (non- commercial). All trips are based on a permit system administered by Grand Canyon NP. Grand Canyon NP completed a Colorado River Management Plan in February of 2006. This plan changes the visitor use patterns at Lees Ferry; the only launching point for rafting trips down the Grand Canyon. This plan requires that the maximum number of trips on the river at one time would be reduced from 70 to 60. To accomplish this reduction, all trip launches will be more regularly staggered from the ramp. Additionally, there will be an increase in the estimated number of trip launching to 981 (from 866) per year and an associated increase in the number of recreation passengers to 22,802 (from 22,143). While all the downriver trips start at Lees Ferry area, commercial passengers can join float trips at Phantom Ranch and Whitmore (about 70% start their trips from Lees Ferry area). River user trend analysis for trips going downriver through the Grand Canyon has shown a significant rise in the numbers of commercial and noncommercial rafters since 1965 when Glen Canyon Dam was built. Commercial and non-commercial passenger numbers have risen from less than 1,000 per year in 1965 to about 20,000 commercial and 4,000 non- commercial passengers per year in 2006.

The ramp that supports all this activity was originally built to meet the much lower use demands of the 1960s. The commercial outfitters using the large motorized rafts bring their equipment in on specially designed tractor trailer rigs. These rigs back straight down the ramp to unload the rafts and the trip provisions. The private rafters usually bring their equipment in on trailers pulled by a variety of non- commercial sized vehicles. During the past five years, the ramp space has been increased by the Grand Canyon NP Rangers in an attempt to provide more room for the private rafters. The private rafters cannot back straight down the ramp due to the presence

of a large curb left over from its original construction. The latecomers especially are forced to negotiate a gauntlet of vehicles, rafts, and supplies to reach an open area of the ramp.

Neither the existing solar powered facility nor the proposed narrowband repeater facility could be easily seen from the Lees Ferry area. The existing telephone poles and line can generally only be seen from the Lonely Dell area if pointed out and they are silhouetted by shadows. The tower would be located adjacent to the PEU pole before the line breaks over the plateau toward the Lees Ferry area. In order to make the tower unobtrusive, it would be painted a color that would blend into the surrounding rocky slopes.

### **Impacts of Alternative A**

**Analysis:** Under Alternative A, impacts to visitor use and experience would be direct, minor and long- term. The experience visitors have while at the Lees Ferry area may be negatively impacted by the lack of improved amenities. Since so many of the visitors are using the graded raft ramp; without the removal of the curb, problems related to launch ramp congestion will continue to exist and may eventually become unbearable to some visitors. Additionally, lack of updated amenities, including the water treatment plant, water intake structure, courtesy dock and continued inability of Grand Canyon NP Rangers access the Glen Canyon NRA radio repeater in a timely fashion could also affect the visitors use and experience.

**Conclusion:** There would be direct, long- term, and negligible to minor, adverse impacts to the visitors use and experience of the Lees Ferry area.

**Mitigation Measures:** None

### **Impacts of Alternative B**

**Analysis:** Visitors would be able to enjoy the offerings of the area without having to worry about problems related to poorly conditioned equipment and facilities. They would be slightly inconvenienced during construction of the various projects.

**Conclusion:** Under this alternative, there would be direct, long- term minor to moderate, beneficial impacts to the visitors use and experience of the Lees Ferry Area. There would also be negligible short- term adverse impacts due to actual construction of the proposed projects.

**Mitigation Measures:** Installation of proper pedestrian warnings and barricades, prevention of dust emissions and regular clean- up of construction sites will help alleviate impacts on the visitors use and experience of the Lees Ferry area. In order to make the narrowband repeater tower unobtrusive, it would be painted a color that would blend into the surrounding rocky slopes.

### **Table of Summary of Impacts**

Table 4 briefly summarizes the effects of each of the alternatives on the impact topics that were selected for analysis at Glen Canyon National Recreation Area. More detailed information on the effects of the alternatives is provided in the “Affected Environment and Environmental Consequences” section of this document.

Table 4: Summary Comparison of Impacts of Alternatives		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
Public Health and Safety	Implementation of Alternative A would result in minor to moderate short- term and long- term adverse impacts on public health and safety depending on the intensity of use of the existing facilities. Drinking water standards changes proposed by the State of Arizona cannot be met with the current water treatment facility. If the water intake is not replaced, it may fail due to ongoing corrosion and raw water will not be available for treatment for use by the visiting public. If the courtesy dock is not replaced and the existing dock fails, the ability to safely load and unload passengers and equipment would be compromised.	Implementation of Alternative B may cause short- term minor detrimental impacts to health and safety during construction periods associated with the completion of these projects. Additionally, improvements to facilities at Lees Ferry would have beneficial, minor to moderate, long-term effects to the health and safety of visitors and staff. There would be no impairment of park values or resources. There would be no impairment of park values or resources.
Water Resources (Natural and Drinking Water)	Natural Water: There would be no impacts and there would be no impairment of park values or resources. Drinking Water: Alternative A would result in negligible to minor, long-term adverse impacts to the quality of drinking water available at Lees Ferry. There would be no impairment of park values or resources.	Natural Water: Construction of the proposed projects would result in short and long- term moderately adverse impacts on water resources. There would be no impairment of park values or resources. Drinking Water: Alternative B would result in a minor, long- term beneficial impact to the quality of drinking water available at Lees Ferry. There would be no impairment of park values or resources.
Floodplains (Impacts are the same for A & B)	The Lees Ferry compound has been in its current location at least since the early 1970's, initially as the site for the water treatment plant. Facility management and maintenance activities are anchored to the water treatment plant, and resource and visitor protection activities to the Colorado River access and adjacent historic district, close to the compound. This locale is optimal for staging NPS operations and providing direct services for the parks' visitors. It provides sufficient space for upgrading existing facilities to current standards and adding needed structures for the protection of equipment and materials. Relocating these facilities out of the flood plain would be exorbitant in cost, reduce essential service to visitors, and reduce operational efficiencies. There would be no impairment of park values or resources.	
Wetlands and	There would be no impacts and no	The proposed projects would have

Table 4: Summary Comparison of Impacts of Alternatives		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
waters of the U.S.	impairment of park values or resources.	direct short and long- term negligible to moderate impacts on wetlands and waters of the U.S. There would be no impairment of park values or resources.
Wildlife, vegetation and Threatened and Endangered Species	There would be no impacts and no impairment of park values or resources.	Alternative B would result in minor to moderate, short- term, highly localized adverse impacts to vegetation, wildlife and threatened and/or endangered species due to construction activities. Alternative B would not produce major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishing legislation of the recreation area, key to the natural or cultural integrity of the recreation area or opportunities for enjoyment of the recreation area, or identified as a goal in the recreation area's general management plan or other NPS planning documents.
Cultural Resources	Alternative A would not result in impacts to the LFLD historic district or the Lonely Dell Historic Landscape. There would be no impairment of park values or resources.	There would be negligible, short- term adverse impacts within the LFLD Historic District due to construction related effects. There would be no impairment of park values or resources. Under this alternative the creation of the Arizona Road hiking trail would have direct, long- term, negligible impacts. There would be no impairment of park values or resources.
Visitor Use and Experience	There would be direct, long- term, and negligible to minor adverse impacts to the visitors use and experience of the Lees Ferry Area.	Under this alternative, there would be direct, long- term minor to moderate, beneficial impacts to the visitors use and experience of the Lees Ferry Area. There would also be negligible short-term adverse impacts due to actual construction of the proposed projects.

## Cumulative and Secondary Impacts

Alternative A would not result in any Cumulative impacts to resources at Lees Ferry. There would be no impacts and no impairment of park values or resources.

## Impacts of Alternative B

**Analysis:** The various projects proposed in Alternative B would contribute to an additive or cumulative effect on the resources at Lees Ferry area. Of particular interest is the possibility of impacts to the waters of the Colorado and Paria Rivers, as most projects will take place in or adjacent to one of these water bodies. While construction phasing would help alleviate any short term cumulative impacts, several other projects not included in this EA are also likely to impact the Colorado River within the same timeframe. Glen Canyon NRA is in the process of developing a restoration plan for a 15- mile stretch of the Colorado River between Glen Canyon Dam and the Lees Ferry area. Restoration activities (also dependent on funding availability) include removing large stands of non- native tamarisk and replacing these with native plant species. Restoration often requires the use of heavy equipment, which could result in construction related surface water pollution. The Grand Canyon NP has just completed their Colorado River Master Recreation Plan, which includes management planning with regards to the number of trips headed downriver from the Lees Ferry area for the next 10 years. This plan will allow a higher number of rafters heading downstream through the Canyon. Higher numbers of users often translates into increased impacts to water quality.

**Conclusion:** The preferred alternative, in conjunction with other past, current or foreseeable project will have a short- term (construction related) and long- term (increased number of visitors), negligible to minor adverse impact to the resources in the Lees Ferry area.

**Mitigation Measures:** Glen Canyon NRA has developed a water quality program that samples areas of high use to ensure water quality is not degraded. This program will be extended to the Lees Ferry area, first on an experimental basis and then if warranted on a scheduled basis.

### Summary of Mitigation Measures

Table 5 provides a summary of mitigation measures for the proposed projects. These measures will help ensure that all the project impacts are less than significant.

Table 5: Summary of Mitigation Measures		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
Public Health and Safety	None	<p>The Hazardous Material storage areas proposed for the Lees Ferry Compound will be designed to withstand flooding events. If a flooding event is likely to be extremely large, these materials will be relocated to high ground prior if enough prior warning if available.</p> <p>Flooding warnings will be issued to visitors and staff alike and evacuations will take place when warranted.</p>



Table 5: Summary of Mitigation Measures		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
		<p>Appropriate traffic and pedestrian barriers will be placed to protect visitors and staff from construction related injuries.</p> <p>Best management practices will be instituted during project completion to ensure that the visitors, staff and the natural and cultural resources of Lees Ferry are protected to the maximum extent possible.</p>
<b>Water Resources (Natural and Drinking Water)</b>	<p>Natural Waters: None</p> <p>Drinking Water: None</p>	<p>Natural Water: As required by the Clean Water Act, prior to the start of each project, staff or their paid contractors will obtain an Arizona Pollutant Discharge Elimination Permit from the State of Arizona. This permit requires the completion of a storm water management plan and erosion control plan. Using the best management practices available, these plans include instructions on the placement of barriers to insure construction related pollutants and sediments do not enter surface waters in the Lees Ferry Area. Additionally, during the design of the stabilization of the Paria riverbank, special care will be given to ensure that only minimal amounts of sedimentation are captured and that the majority of sediments reach the Colorado River.</p> <p>Drinking Water: None</p>
<b>Floodplains (Impacts are the same for A &amp; B)</b>	<p>To mitigate impact on the flood plain, all future construction of the identified structures will be confined to the previously disturbed area, and as a consequence, above the 100 year flood stage. The current communication and warning system will be maintained in order to evacuate visitors and their personal property in the event of a severe storm over the Paria River drainage. Glen Canyon NRA dispatch monitors the National Weather Service flashflood warnings and would initiate evacuation of facilities and surrounding area of visitors and NPS personnel as the likelihood of a flood event greater than the 100- year level occurs. Once evacuation measures are initiated, visitors and staff alike would be urged to seek higher ground, which is only a very short distance and only a very few minutes from this location, thus allowing quick</p>	

Table 5: Summary of Mitigation Measures		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
	evacuation. NPS staff would assist in evacuations of visitors and complete area checks to determine all visitors are safe.	
<b>Wetlands and waters of the U.S.</b>	None	<p>Because a portion of the each of the proposed projects would occur in jurisdictional waters, the NPS would need to obtain the appropriate level permit from the USACE. This permit would require the development of best management practices to ensure pollution does not reach waters of the U.S. and minimizes the loss wetlands. It also requires replacement of any wetlands lost during construction. As is typical in these types of projects, if impacts are small and there is a surrounding seed bank, restoration generally consists of natural re- growth over the construction site. For a project the potential size and scope of the stabilization of the Paria riverbanks would require the development of a specific mitigation plan for wetlands. The most likely scenario would include use of erosion control structures that are able to support plant growth along with use of seeds and possibly live plants. Level of restoration is dependent on life cycle needs of plants targeted for replacement.</p>
<b>Wildlife, vegetation and Threatened and Endangered Species</b>	None	<p>Projects along the banks of the Colorado River will be accomplished during the low water season and appropriate water retention systems will be installed if necessary, to protect water quality. Best Management Practices would be instituted to control the movement of stormwater runoff from construction projects into the Paria and Colorado Rivers in order to protect fish species from construction impacts. All construction plans would include protective measures to ensure there are no introductions of weeds. Most</p>

Table 5: Summary of Mitigation Measures		
Impact Topic	Alternative A, No Action	Alternative B, Lees Ferry Improvement Alternatives
		<p>vegetation removed during construction projects will be replaced within a growing season through natural process. Gabion structures and finger dikes can be constructed to encourage the growth of native species on the top and sides of these structures. All of the vegetation or wildlife species being removed by the construction of the proposed projects are common throughout the northern portion of Arizona and their individual removal will not impact the overall numbers or health of the remaining members. California condor mitigation measures for construction projects will be a required part of each construction projects plans and specifications.</p>
Cultural Resources	None	<p>Phasing of construction projects, set hours of construction noise, and control of fugitive dust emissions would all help lessen the impacts of construction on the cultural resources.</p>
Visitor Use and Experience	None	<p>Installation of proper pedestrian warnings and barricades, prevention of dust emissions and regular clean- up of construction sites will help alleviate impacts on the visitors use and experience of the Lees Ferry area.</p>
Cumulative Impacts	None	<p>Glen Canyon NRA has developed a water quality program that samples areas of high use to ensure water quality is not degraded. This program will be extended to the Lees Ferry area, first on a experimental basis and then if warranted on a scheduled basis.</p>

## Consultation/Coordination

### Public Scoping including Agencies/Tribes/Organizations/Individuals Contacted

Public scoping for the preparation of the proposed EA was conducted in March 2006. Letters and postcards were sent out to a variety of individuals, tribes and agencies. Notice was also posted on the Park's Planning Web Page at <http://parkplanning.nps.gov/>. Public notices were also released to local news organizations.

Comments were received from several federal agencies and 11 individuals. These comments resulted an additional internal scoping meeting between and Grand Canyon NP to discuss ideas presented from the public. Most concerns centered on the proposed paving of the ramp, which was subsequently removed from the EA and the need for better ramp and ramp side camping management. The joint park staff determined that ramp management issues could adequately be covered in this EA and needed to be addressed in a separate management plan and EA. Based on the remaining responses received, the impact topics and alternatives were refined and finalized prior to analysis.

**State Historic Preservation Office.** An informal meeting was conducted with the staff members from the Arizona State Historic Preservation Office at Lees Ferry. This meeting focused on the array of projects included in this EA and their possible impacts to the Lees Ferry Historic District. In the next step of the consultation process, the SHPO will receive copy of this EA, which will describe the impacts of all the projects and recommended determination of Effect finding. The consultation process will be complete when we receive notice of their agreement with our determination of effect.

**U.S. Fish and Wildlife Service.** The Southwestern Ecological Services Office of the USFWS was contacted regarding the potential effects to endangered or threatened species and designated critical habitat for this project. They responded with a letter dated May 16, 2006. A copy of their letter is available in Appendix B. The Arizona office offered information regarding the current status of threatened and endangered species in the state and mitigation measures relevant to the California condor, which are included in detail in the "Threatened and Endangered Species" section of the "Affected Environment and Environmental Consequences" chapter of this EA.

**Tribes/Nations:** Federal legislation and NPS policy require personnel within the NPS to consult with Native Americans if any federal action may affect areas of cultural importance to them. Identification of such resources is made at tribal consultation meetings to address the concerns of Native Americans in addition to scoping letters sent to them as an initial contact about the project.

Preliminary research revealed that ancestors of several tribal communities had either lived in or used the project area. Consultation was undertaken on the following dates with the following tribes/nation.

- Hopi Tribal Council meeting on 6- 21- 06
- Kanosh group of the Paiute Indian Tribe of Utah on 4- 11- 06

- Shivwits group of the Paiute Indian Tribe of Utah on 5- 04- 06
- Pueblo of Acoma in New Mexico on 5- 17- 06
- Pueblo of San Juan in New Mexico on 5- 17- 06
- Ute Mountain Ute Tribal Council in Towaoc, Colorado on 4- 26- 06
- Navajo Nation Chapters
  - Coppermine on 6- 08- 06
  - Gap/Bodaway on 6- 25- 06
  - LeChee on 5- 08- 06

Tribal governments for each of these Native American communities were provided information about the project and presentations given by the Native American Liaison of Glen Canyon NRA as to the nature of the project. Comments, questions, and concerns were sought to determine their interest, use, and impacts on those resources important to them.

### List of Preparers

Name	Title	Office
<b>National Park Service</b>		
Barbara Wilson	Environmental Specialist	Headquarters – Page, AZ
John Spence	Ecologist	Headquarters – Page, AZ
Chris Kincaid	Cultural Resource Specialist/Archeologist	Headquarters – Page, AZ
Lynn Wulf	Archeologist	Headquarters – Page, AZ
Paul Cloyd	Project Manager	Denver Service Center, Denver, CO
Alan Malmquist	Historic Structures Maintenance Personnel	Headquarters – Page, AZ
Mark Anderson	Aquatic Ecologist	Headquarters – Page, AZ
Tim Windle	Civil Engineer	Headquarters – Page, AZ
Max King	Interpretation Branch Chief	Headquarters – Page, AZ
Pete Howard	Trails and Roads Foreman	Headquarters – Page, AZ
Norm Boese	Maintenance Supervisor	Headquarters – Page, AZ
Pauline Wilson	Native American Liaison	Headquarters – Page, AZ

### List of Recipients

The following agencies, tribes, and organizations have been notified of the release of this EA with information on how to obtain copies. Landowners adjacent to the NRA and other interested parties have also been sent notification of the availability of the document with information on how to obtain copies.

#### Federal Agencies

Bureau of Land Management  
     Grand Staircase Escalante National Monument  
 National Park Service  
     Grand Canyon National Park  
 U.S. Bureau of Reclamation  
 U.S. Environmental Protection Agency, Region VIII  
 U.S. Fish and Wildlife Service  
     Arizona State Office



U.S. House of Representatives  
U.S. Senate  
U.S. Army Corps of Engineers, Los Angeles Division

**State Agencies**

Arizona Department of Environmental Quality  
Arizona Game and Fish  
Arizona Historic Preservation Office

**Tribes and Native American Interests**

Hopi Tribe  
Kaibab Paiute Tribe  
Kanosh Band of Paiute Indian Tribe of Utah  
Koosharem Band of the Paiute Indian Tribe of Utah  
Navajo Nation  
    Oljato Chapter  
    Inscription House Chapter  
    Navajo Mountain Chapter  
    Shonto Chapter  
    Coppermine Chapter  
    Gap/Bodaway Chapter  
    LeChee Chapter  
    Kaibeto Chapter  
  
San Juan Southern Paiute Tribe  
Shivwits Band of Southern Paiute  
White Mesa Ute Band of the Ute Mountain Tribe

## Selected Bibliography

Barbour, Michael Ed.

- 2000 North American Terrestrial Vegetation, University of Cambridge, Cambridge, United Kingdom.

Huges, Lee

- 2005 Brady Pincushion Cactus. Desert Plants. 13 pp.

Spence, John R.

- 1996 A survey and classification of the riparian vegetation of selected side canyons of Lake Powell, Glen Canyon National Recreation Area. Final Report, Resource Management Division, , National Park Service. 83 pp.

Spence, John R. and Julie A.C. Zimmerman

- 1996 Preliminary Flora of Glen Canyon National Recreation Area. National Park Service, Resource Management Division, Glen Canyon National Recreation Area

National Park Service (NPS), U.S. Department of the Interior

- 1979 Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives, and Final Environmental Assessment – Glen Canyon National Recreation Area, Arizona/Utah. July 1979.
- 1995 Programmatic Agreement Among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, Dated July 17, 1995.
- 1998 1994- 1997 Lake Powell winter aquatic bird surveys, Glen Canyon National Recreation Area, Utah and Arizona. Unpublished report, Resource Management Division, 40 pp.
- 1998a Director's Order – 28: *Cultural Resource Management Guideline*. Dated June 11, 1998.
- 2001a *National Park Service Management Policies 2001*.
- 2001b Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision- making*. Dated January 8, 2001.
- 2002a Checklist of Mammals, Glen Canyon National Recreation Area. January 2002. Available at: [http://www.nps.gov/Glen Canyon NRA/docs/mammals.pdf](http://www.nps.gov/GlenCanyonNRA/docs/mammals.pdf). Accessed: September 24, 2004.
- 2002b Checklist of Reptiles and Amphibians, Glen Canyon National Recreation Area. March 2002. Available: [http://www.nps.gov/Glen Canyon NRA/docs/reptiles&amphibs.pdf](http://www.nps.gov/GlenCanyonNRA/docs/reptiles&amphibs.pdf). Accessed: September 24, 2004.

- 2004c Field Checklist of the Birds of Glen Canyon National Recreation Area. April 2004. Available: [http://www.nps.gov/Glen Canyon NRA/docs/birdchecklist2.pdf](http://www.nps.gov/GlenCanyonNRA/docs/birdchecklist2.pdf). December 16, 2005.
- 2006 Final Hazardous Material Assessment /Survey Report, Weaver Ranch House, Glen Canyon Recreation Area, Marble Canyon, Arizona. Baker Corp reference GSA- GS- 00F- 0032M
- 2006 Restoration of the Weaver Ranch House, PMIS Number GLEN CANYON NRA 106185, Value Analysis Study 2006- 06.

U.S. Army Corps of Engineers

- 1987 Wetlands Research Program Technical Report Y- 87- 1 (on- line edition), Wetlands Delineation Manual. Final report dated January 1987.

U.S. Fish and Wildlife Service

- 1979 Classification of Wetlands and Deepwater Habitats of the United States. Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. U.S. Fish and Wildlife Service. Washington, DC.
- 1994 Endangered and Threatened Wildlife and Plants: Determination of Critical Habitat for Four Colorado River Endangered Fishes; Final Rule. Federal Register 50:13374- 13400.
- 2002 Letter from Steven Spangle, Field Supervisor, Flagstaff, Arizona to Kitty Roberts, National Park Service . Dated May 26, 2006.
- 2006 List of Threatened and Endangered Species in Coconino County, <http://www.fws.gov/arizonaes/Documents/CountyLists/Coconino.pdf>.

## **Appendix A – Public Scoping Brochure**



# Glen Canyon National Recreation Area

## National Park Service

March 20, 2006

### PUBLIC SCOPING FOR IMPROVEMENTS PROPOSED FOR THE LEES FERRY AREA IN GLEN CANYON NATIONAL RECREATION AREA

The National Park Service (NPS) seeks the benefit of your comments during a 30-day public scoping period to identify issues and alternatives for analysis in an environmental assessment (EA) regarding proposed improvements to the Lees Ferry area of the Glen Canyon National Recreation Area in Coconino County, Arizona. The Lees Ferry area is located along the Colorado River 15 miles below Glen Canyon Dam. The area includes a national historic district containing outstanding examples of buildings relating to early pioneer ranching and river crossing. It is also the only starting point for commercial and private rafting trips down the Colorado through the Grand Canyon, and provides the only access point for the world class trout fishery upstream to Glen Canyon Dam. With the completion of the Colorado River Management Plan by Grand Canyon National Park and the proposed recreational focus of the Vermillion Cliffs Resource Management Plan (BLM) the park service is expecting an increase in the number of visitors to Lees Ferry and is proposing the following efforts to enhance the visitor experience, provide adequate visitor safety while protecting the fragile resources.

The proposed improvements include several large projects:

- Restoration of the historic Weaver Ranch House, including possible alternative uses.
- Replacement of the Grand Canyon White Water Rafting Contact Station and Lees Ferry Maintenance Facility.

The proposed improvements also include a variety of smaller projects including:

- Replace existing concrete boat ramp and graded raft ramp with new concrete surfaces,
- Replace the courtesy dock beside the boat ramp,
- Replace the potable water intake on the Colorado River,
- Rehabilitate the Lees Ferry access road drainage system including replacement of culverts and cross-drains and bank stabilization of the Cathedral and No Name Wash,
- Provide bank stabilization along the Paria River to protect Lonely Dell access road and the Paria River bridge, and
- Complete minor rehabilitation to the 11 buildings in the historic district.

During the public scoping period we are also requesting your input on the proposed interpretation plan for the historic district. This plan can be viewed on our Planning, Environmental and Public Comment (PEPC) system found at <http://parkplanning.nps.gov>.

We also encourage you to provide input on the proposed change in use of the historic Weaver Ranch. Particularly, we are interested in knowing if individuals or groups would like to use all or portions of the ranch house and what types of uses would be envisioned (as an example – historic society meeting using a computer – projector setup, or a weekend camping retreat, using the kitchen to prepare meals, etc). If you are proposing a special use, we would also like to know the level of the proposed activity (daily, weekly, monthly, seasonally, etc) and if your group would need any special equipment or interface with National Park Service Staff (Interpretive Ranger). We are also proposing a change to the interpretive plan for the area and would like your input on the prospectus, which can also be found on the National Park Service's Planning, Environmental and Public Comment website at: <http://parkplanning.nps.gov/glca>.



#### Currently Identified Alternatives

1) No-Action Alternative. This alternative represents the baseline or benchmark from which to compare the impacts of the proposed project. In this case, "No-Action" means the proposed projects would not take place;

2) Proposed Action. Glen Canyon NRA would pursue the completion of both major and minor projects as funding becomes available.

During the completion of this EA, Impact Analysis will be conducted at a minimum on the following resources areas: Water Resources, Floodplains, Waters of the U.S./Wetlands, Cultural Resources, Fish and Wildlife and Species of Special Status, Visitor Use and Socioeconomics.



**What does the scoping period mean?** Scoping is done in the initial phase of a project to seek input from a variety of sources. The input is used to identify possible alternative, issues, areas requiring additional study, and topics that will be analyzed in the EA process. This is an opportunity for you to provide us with your suggestions, comments, and concerns regarding this project.

**Is scoping my only opportunity to comment on the project?** No, once the EA is developed, the document will be made available for public review and comment for a 30-day period.

**Please submit your scoping comments to the NPS by April 31, 2006:**

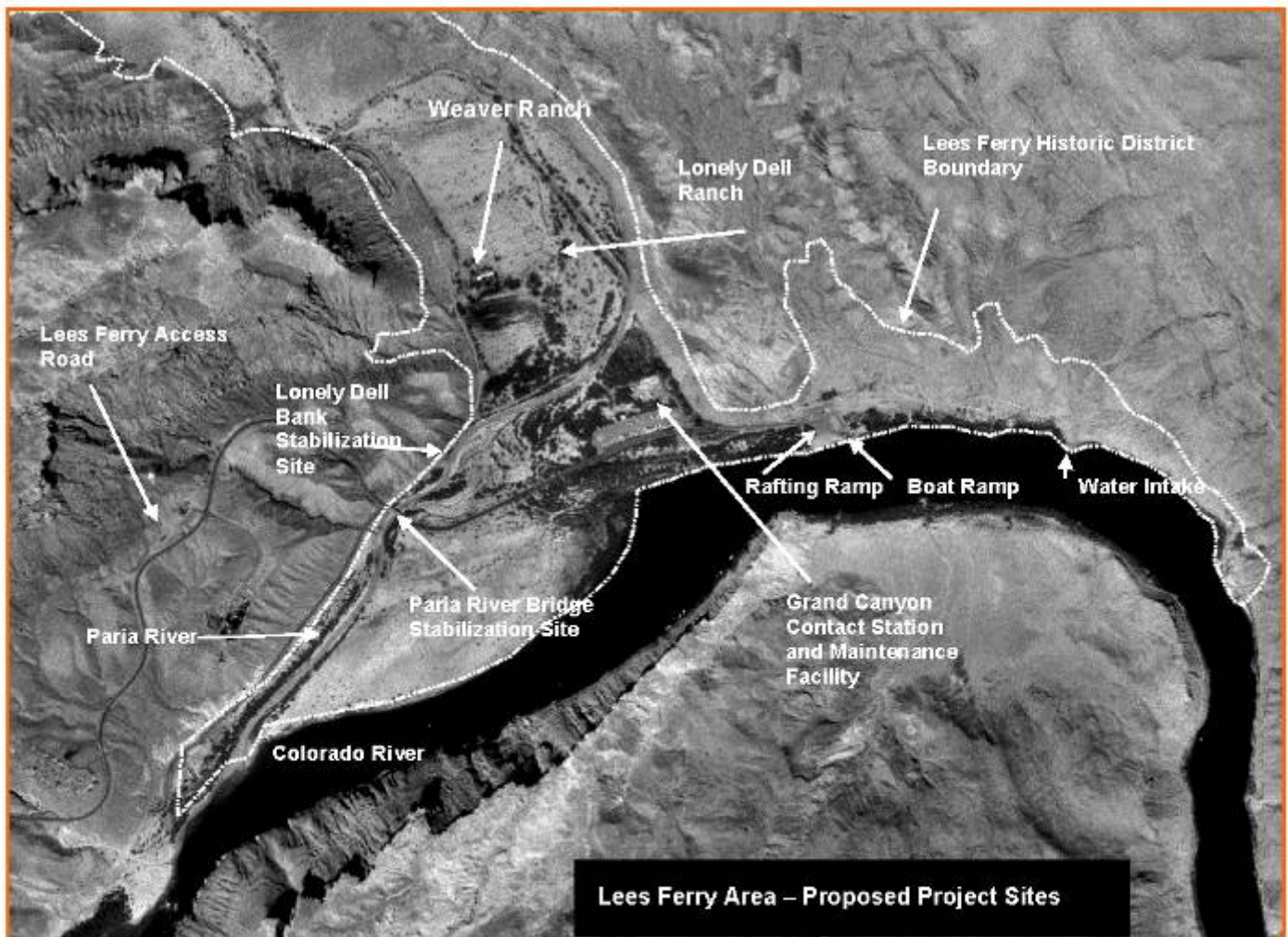
1. Do you have any information to share about issues/concerns related to this proposed project, or are there any issues/concerns about the project that you think we should consider?
2. Are there any other alternatives that you think should be considered?
3. If you wish to receive a copy of the environmental assessment when it is released for public review and comment in the Summer of 2006, please let us know if you prefer to receive a printed copy, a CD, or notification where you can download the EA.

**If you wish to comment on any issues associated with this project, please submit your comments in one of the following ways:**

Submit written comments to:  
Lees Ferry Improvements EA  
Glen Canyon National Recreation Area  
P.O. Box 1507  
Page, AZ 86040-1507

Comment by the internet through the  
National Park Service's Planning,  
Environmental and Public Comment  
website at: <http://parkplanning.nps.gov>

Hand-deliver comments to the  
NRA headquarters at:  
691 Scenic View Drive  
Page, AZ



## **Appendix B – USFWS Consultation Letter**



## United States Department of the Interior

U.S. Fish and Wildlife Service  
Arizona Ecological Services Field Office  
2321 West Royal Palm Road, Suite 103  
Phoenix, Arizona 85021-4951  
Telephone: (602) 242-0210 Fax: (602) 242-2513



In Reply Refer to:

AESO/SE  
22410-2006-I-0412

May 16, 2006

### Memorandum

To: Superintendent, Glen Canyon National Recreation Area, Page, Arizona (Attn: Lees Ferry Improvement EA)

From: Field Supervisor

Subject: Lees Ferry Improvements

Thank you for your March 20, 2004, scoping letter requesting comments to identify issues and alternatives for analysis in an environmental assessment (EA) regarding proposed improvements to the Lees Ferry area of the Glen Canyon National Recreation Area in Coconino County, Arizona. We offer the following comments:

The scoping letter indicated that during development of the EA, impact analysis will be conducted for several resources including Fish and Wildlife and Species of Special Status. Based on the description of the project area, the endangered Brady pincushion cactus (*Pediocactus bradyi*), the endangered California condor (*Gymnogyps californianus*), and the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) may occur in the area. We recommend that the impact analysis include evaluation of possible effects of the proposed action to those species. We are also interested in working with you to develop conservation measures that may be appropriate for those species. For example, we have previously provided you with several conservation measures to address impacts to the California condor, and you have implemented some or all of those measures for several other projects. We recommend implementing those measures that are appropriate for this proposed action.

The scoping letter asked us to identify the format of the EA we would like to receive for review. We would like to receive a printed copy and a compact disk (CD) of the EA.

The State of Arizona and various American Indian Tribes maintain lists of sensitive species that may not be protected by Federal law. We recommend that you contact the Arizona Game and Fish Department (AGFD) and the Navajo Nation to determine if sensitive species may occur in your action area. We also encourage you to invite the AGFD and the Navajo Nation to participate in the review of your proposed action.

Thank you for the opportunity to comment. If we can be of further assistance, please contact Bill Austin (928) 226-0614 (x102) or Brenda Smith (x101) of our Flagstaff Suboffice.

*Brenda H Smith*  
*for* Steven L. Spangle

cc: Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
President, Navajo Nation, Window Rock, AZ

\\fw2azp-fp1\workfiles\Bill Austin\LEESFERR.412.doc burl

## **Appendix C – Floodplain Statement of Findings**

STATEMENT OF FINDING  
LEES FERRY FLOOD PLAIN  
July 27, 2006

## Introduction

Glen Canyon NRA plans to replace the existing Grand Canyon NP (GRCA) contact station and storage buildings and Glen Canyon NRA (GLCA maintenance and storage buildings and water treatment facility, build shelters for four river boats and a backhoe, and build storage for hazardous materials at Lees Ferry, Arizona, adjacent to the Colorado River. These facilities will be located within the existing 32,000 s.f. "compound" area now housing the existing water treatment plant, contact station, maintenance building, and associated storage buildings. An egress drive to facilitate pull-through parking in the compound will be constructed; this will be the only affected area outside of the existing compound and it will cross previously disturbed ground.

The current and proposed future footprint of each structure are as follows:

Facility	Current Size in Square Feet	Proposed Size in Square Feet
GRCA Contact Station	1370	1600
GRCA Storage Building	832	400
GLCA Maintenance Facility	240	2065
GLCA Storage Building	384	400
Water Treatment Plant	384	384
Hazardous Storage Building	0	225
Covered Parking	0	2500
Total Size of All Facilities	3210	7574
Size of Compound	32,000	32,000

As currently planned all the new structures except the covered parking will be raised 6" above existing grade to provide positive drainage which would require approximately 200 cubic yards (c.y.) of new fill. The 150 linear foot (l.f.) egress drive will measure 18" deep and 13' wide and will contribute an additional 108 c.y. of fill. The top elevation of the drive will be equal to the current elevation of the compound. A crawl space will be constructed below the GCRA contact station. This will produce approximately 180 c.y. of excavation.

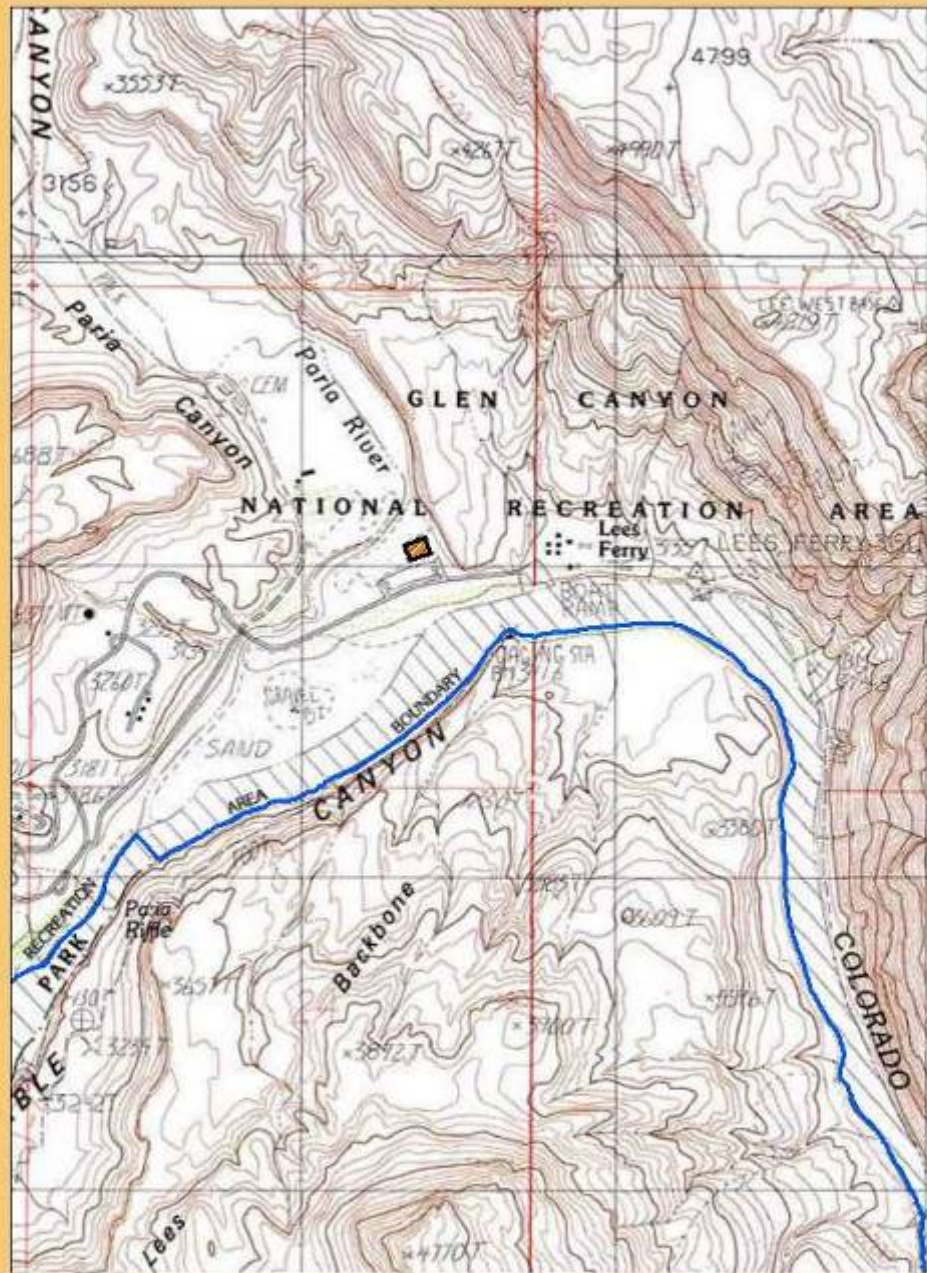
Underground utilities will need to be relocated to serve the new facilities. The existing septic tank and leach field (west of the building) for the contact station will be abandoned in place and the a new line and septic tank will be attached to an existing leach field to the east of the new



building site. The main raw water line coming into the treatment plant will be rerouted to the south of its current location. A new potable water line will be run from the existing water tank to the new GCRA contact station. Underground electrical and telephone lines will also need to be rerouted to serve the new facilities. The improved compound will be surrounded by a security fence with staff only gates incorporated at several locations.



## Lees Ferry Compound

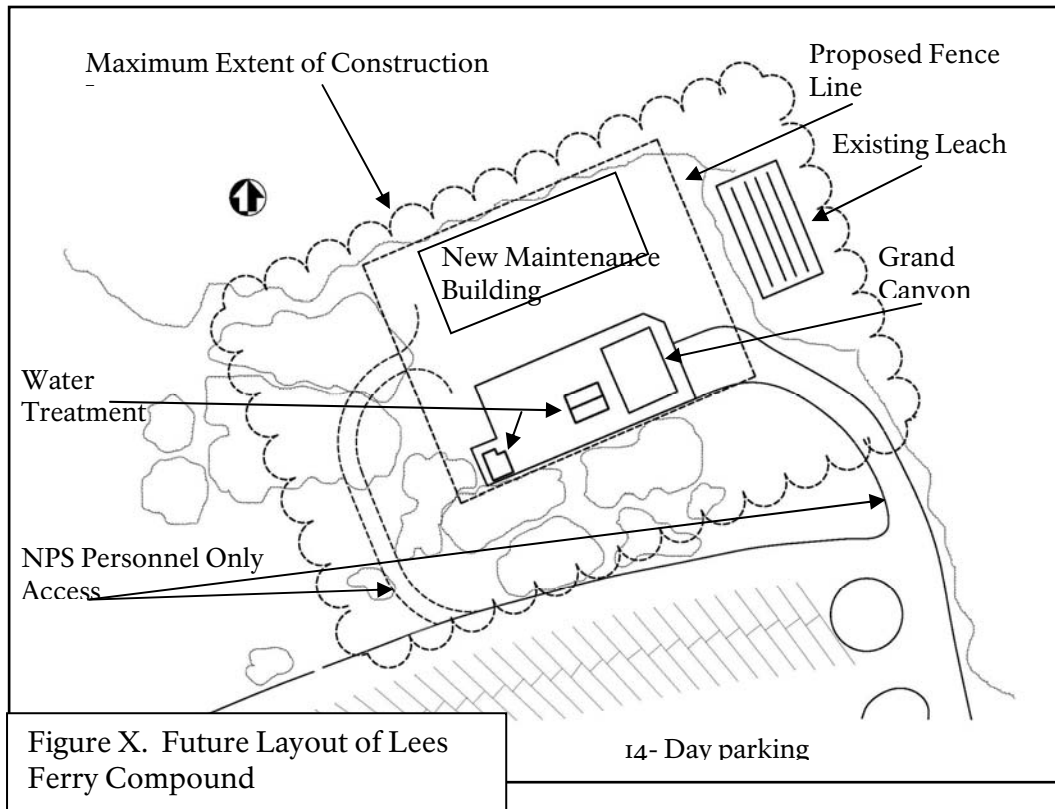


0 140 280 560 840 1,120 Meters

Lees Ferry Compound

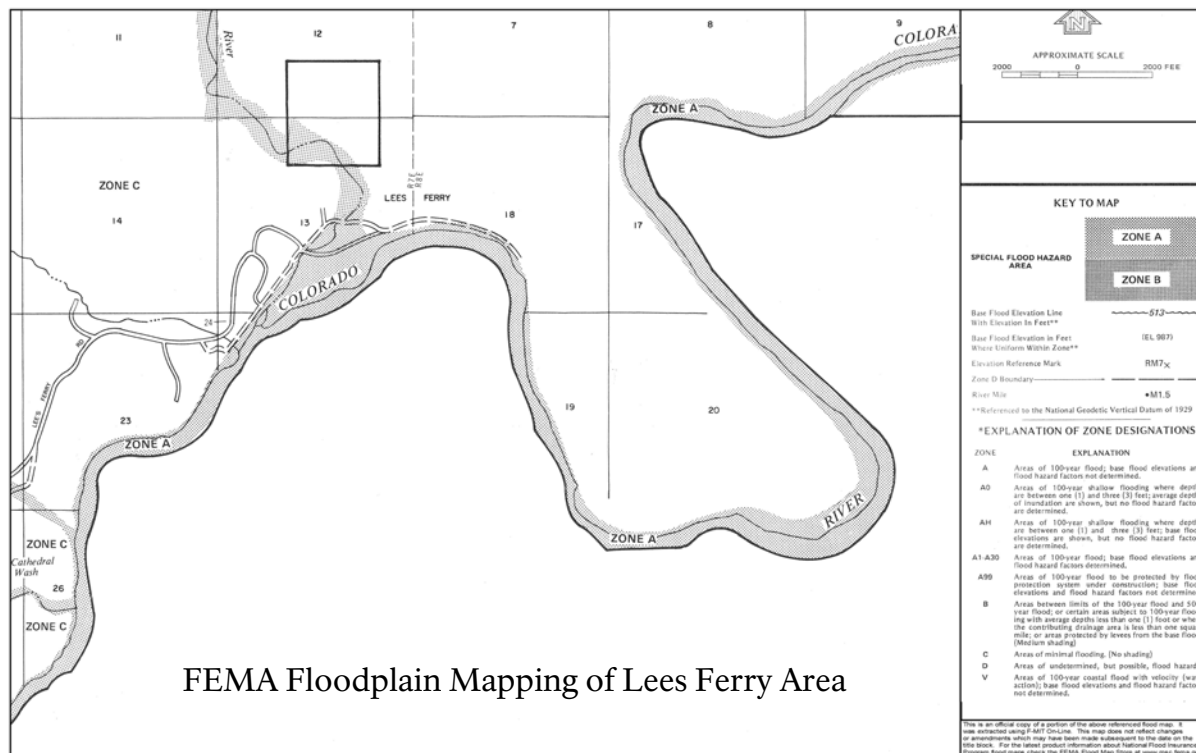
GLCA Boundary





## Site Description & Nature of Flooding:

The compound is situated on the combined alluvial fan of the Paria River and gravel bar deposited by the Colorado River. The Federal Emergency Management Administration has identified this geologic formation as a flood plain as illustrated by FEMA Flood Map 0400190375B, subject to varying degrees of flooding by a 100- year precipitation event on the Paria River. Due to many variables including a local bridge over the Paria River, remnants of old channels left during the meandering period of the Paria River, varying river cross- sections, and constructed earthen features, the flood depths range from zero to approximately 14 feet.



## Justification for Use of Floodplain:

The area in which the existing compound is located has been in continuous use at least since the early 1970's when the water treatment plant was constructed. The compound is currently comprised of the water treatment plant, the GRCA ranger contact station and storage buildings, and the GLCA maintenance and storage buildings. Other agencies, including the USGS and AZ Fish and Wildlife Service, park boats and store scientific equipment within the compound. It is located adjacent to the fourteen day parking lot and fish cleaning station; it is close to the boat ramp and courtesy dock, comfort station, and historic Lee's fort and ferry. This is the most visited area in Lees Ferry and these are the most heavily used public facilities.

Sited adjacent to the 14 day parking lot where boaters park their vehicles and boat trailers, the compound is an ideal location for the GRCA rangers to make contact with and orient visitors taking river trips down the Grand Canyon. GRCA rangers working out of the existing contact

station provide visitors with information on various recreational activities, and maintain an NPS presence for the public. The GCRA contact station is within easy walking distance to the boaters' input ramp and the comfort station. The compound and contact station are located in the perfect location to initiate SAR operations on the Colorado River or in the back country.

The compound is the only flat terrain in the area large enough to contain all the aforementioned structures, all essential to NPS operations, maintenance, and visitor support. Centralizing facility management and maintenance with resource and visitor protection operations at this location maximizes use of an already effected area and yields certain efficiencies in future site design and construction.

Co- locating the water treatment plant and maintenance building in the compound maximizes operation and maintenance of the treatment plant while allowing personnel to attend to other infrastructure operations and maintenance. This site is the closest feasible location to the launch ramp and comfort station, the fish cleaning station in the 14- day parking lot, as well as the water intake and associated pumps for the potable water system and the Lonely Dell ranch orchard irrigation system. This site is also within a mile of the NPS housing and the historic Lonely Dell Ranch. This close proximity allows for regular inspections, ease of maintenance, and cost effective janitorial service. Relocating the maintenance building and separating these two facilities would reduce many of these efficiencies and would require a large area of new disturbance within the district.

Consolidating these facilities in a single site reduces redundancies in utilities and disturbance to natural and cultural resources. It provides sufficient space for upgrading and expanding facilities to current standards, and allows for construction of storage structures and shade shelters to protect equipment and materials. Constructing a full service maintenance facility adjacent to the plant will not only facilitate on- going plant operations, but support other infrastructure operations and maintenance in the Lees Ferry area.

Cost of establishing a new site and relocating some or all of these facilities outside the floodplain is estimated to be a cost prohibitive \$2,000,000.

Hazardous materials such as gasoline, motor oil, fertilizer, and chlorine are stored in the various GLCA and GRCA buildings and used on a regular basis. A specific facility at the compound for hazmat storage would secure these materials at a central location in the event of a flood.

The compound is set back behind the 14 day parking and screened by riparian vegetation. Few building sites in the Lees Ferry area can provide this visual protection. Sites at higher elevations are more visually exposed and difficult to screen and are often visible to boaters on the Colorado River as well as those visiting the historic district and Lonely Dell ranch.

Since the Colorado River was blocked by the construction of Glen Canyon Dam sediment, including gravel is no longer deposited at the mouth of the Paria River. This deposition was a major mechanism in the meandering characteristics of the Paria River. *Since the Paria River has ceased meandering it has deeply incised its current course, increasing the depth of its channel significantly which has reduced the likelihood of future meandering.*

#### **Site Specific Flood Risk:**

On March 24, 2006, hydrologist Gary Smillie with the NPS Water Resources Division inspected the confluence of the Paria and Colorado Rivers. He specifically addressed the area north of the compound, at which point the Paria River flows directly at the compound. The purpose of his survey was to determine what effect a 100 year flood event of the Paria River would have on the structures and occupants of the compound. Based on his site visit and hydrologic analysis, he determined that the area within the compound is not subject to flooding due to the 100- year event. The analysis shows that the river is approximately fourteen feet deep and contained within the river banks, with approximately 12 to 18 inches of free board remaining. However downstream, the river may top the bank and follow remnants of old channels. These channels appear to act as a safety valve by lowering the river's surface gradient and providing the freeboard. The point at which the trajectory of the river aligns with the compound, the compound is approximately 350 feet from the river bank and is therefore unlikely to be affected. This area may be vulnerable in a rare 500 year event, but then so would most of the Lees Ferry development.

#### **Flood Plain Mitigation:**

Construction and operations will be confined to the approximate limits of the existing compound and adjacent, historically disturbed areas. GLCA dispatch monitors the National Weather Service flashflood warnings to initiate evacuation of facilities and surrounding area of visitors and NPS personnel. Once evacuation measures are initiated, visitors and staff alike would be urged to seek higher ground, which is only a very short distance and only a very few minutes from this location, thus allowing quick evacuation.

#### **Summary:**

The Lees Ferry compound has been in its current location at least since the early 1970's, initially as the site for the water treatment plant. Facility management and maintenance activities are anchored to the water treatment plant, and resource and visitor protection activities to the Colorado River access and adjacent historic district, close to the compound. This locale is optimal for staging NPS operations and providing direct services for the parks' visitors. It provides sufficient space for upgrading existing facilities to current standards and adding needed structures for the protection of equipment and materials. Relocating these facilities out of the flood plain would be exorbitant in cost, reduce essential service to visitors, and reduce operational efficiencies.

To mitigate impact on the flood plain, all future construction of the identified structures will be confined to the previously disturbed area, and as a consequence, above the 100 year flood stage. The current communication and warning system will be maintained in order to evacuate visitors and their personal property in the event of a severe storm over the Paria River drainage.