



National Park Service  
U.S. Department of the Interior  
Grand Canyon National Park  
Grand Canyon, Arizona

# Supai Camp Improvements Environmental Assessment

August 2009



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# Supai Camp Improvements

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## Environmental Assessment

### Summary

Grand Canyon National Park proposes to complete improvements at Supai Camp located on the South Rim. Housing conditions at the camp are substandard. Issues include lack of indoor plumbing, unsafe and unhealthy housing conditions, a shortage of housing opportunities for the Havasupai Tribe at this location, and poor road conditions and configuration. This Environmental Assessment (EA) evaluates a No Action Alternative (Alternative A) and one additional alternative to address the purpose and need for action (Alternative B, Preferred). The Preferred Alternative includes rehabilitation of existing cabins, construction of new housing units, installation of a new sewer line connecting Supai Camp to the park's wastewater treatment plant, and several other site improvements.

Neither alternative would have more than minor impacts on special status species, general wildlife, archeological resources, visual/scenic quality, watershed values, air quality, soundscapes, floodplains and wetlands, visitor experience, environmental justice, prime and unique farmland, socioeconomic environment, wilderness character, or Indian trust resources. Alternative B, the preferred alternative would result in minor to moderate impacts to historic resources, ethnographic resources and cultural landscapes, vegetation, public health and safety, and park operations. No impairment of park resources would occur through implementation of either alternative.

### Public Comment

If you wish to comment on the environmental assessment, you may post comments online at <http://parkplanning.nps.gov/grca> or mail comments to: Steve Martin, Superintendent, Attn: Supai Camp EA, Grand Canyon National Park, P.O. Box 129 / 1 Village Loop, Grand Canyon, Arizona 86023.

This environmental assessment will be on public review for 20 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee we will be able to do so.

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## CHAPTER 1 PURPOSE AND NEED

### History of Supai Camp

For hundreds of years, the Havasupai people have used the area that now constitutes the South Rim of Grand Canyon National Park (GRCA). This area is part of the Havasupai traditional homelands that once extended from Grand Canyon, south and west to Flagstaff and Williams, Arizona, and beyond. In the 1930s the National Park Service (NPS) constructed residences at the area known as Supai Camp, and relocated Havasupai tribal members who had been living at Indian Garden and around Grand Canyon Village to those residences. The NPS, in developing the camp, established a residential area for use of the Havasupai people living and working on the South Rim. The total number of residences originally constructed at Supai Camp is unclear, but currently four historic cabins, one community building-turned-residence, and one community bathroom and laundry facility (washeteria) exist in this location.

The Havasupai Tribe and NPS entered into a general agreement to recognize the historic use and occupancy of Supai Camp by tribal members and establish the terms and conditions under which that use and occupancy may continue (NPS 2008). Under terms of this agreement, the Tribe is allowed to use and occupy the Camp for 50 years, from June 2, 2008, the date of signature, to June 2, 2058. Upon expiration of this term, the general agreement will automatically renew for an additional 50 years.

### Purpose and Need

Grand Canyon National Park proposes to improve substandard housing conditions at Supai Camp. These substandard housing conditions include: (1) lack of indoor plumbing; (2) unsafe and unhealthy housing conditions; (3) shortage of housing opportunities; and (4) poor road conditions and configuration.

- *Lack of indoor plumbing* The washeteria is the only building in Supai Camp with running water and connection to a leach field. Supai Camp is not connected to the park's wastewater treatment plant.
- *Substandard housing conditions* The five existing residences, four of which were built in the 1930s and are considered historic, are falling apart. Broken windows, celotex interior walls, missing roof shingles, damaged mortar, lack of running water, and lack of sewer connection are some of the issues facing these buildings.
- *Shortage of housing opportunities* Additional housing units are needed to provide a place for tribal members to live and work on the South Rim, provide housing for families with school age children so they can attend Grand Canyon School, and allow tribal members to apply for NPS and concessionaire positions.
- *Poor road conditions and configuration* Current road conditions and alignment do not allow winter snow plowing or access by propane delivery trucks.

### Objectives

1. Connect Supai Camp to the park's wastewater treatment plant
2. Improve the condition of existing housing units and make them compliant with current building and safety codes
3. Allow for construction of up to 20 additional housing units for tribal members, similar to what was described in the park's original concept plan
4. Provide year-round access to Supai Camp for residents, garbage trucks, propane trucks, and snow plows

Figure 1 Project location in the park

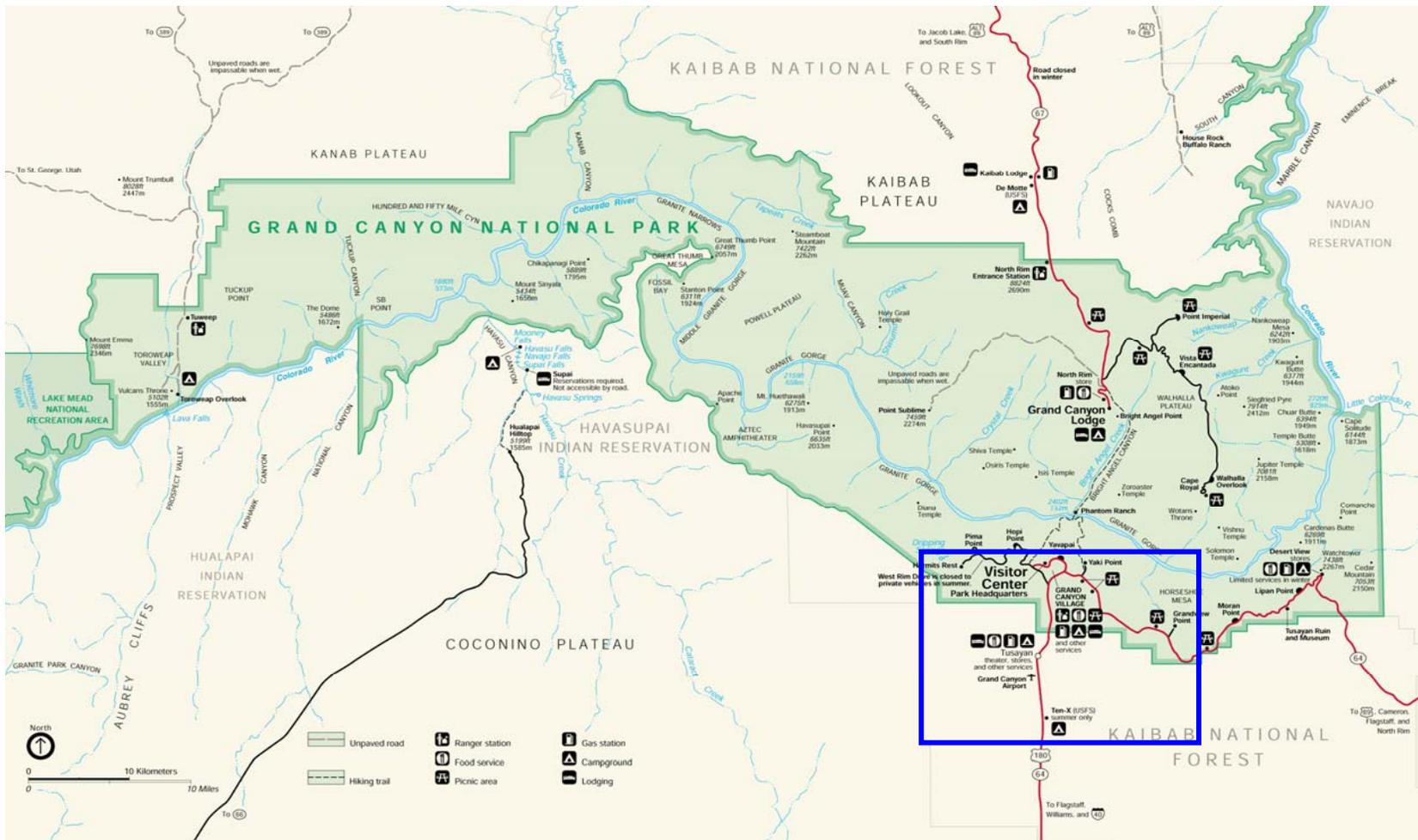
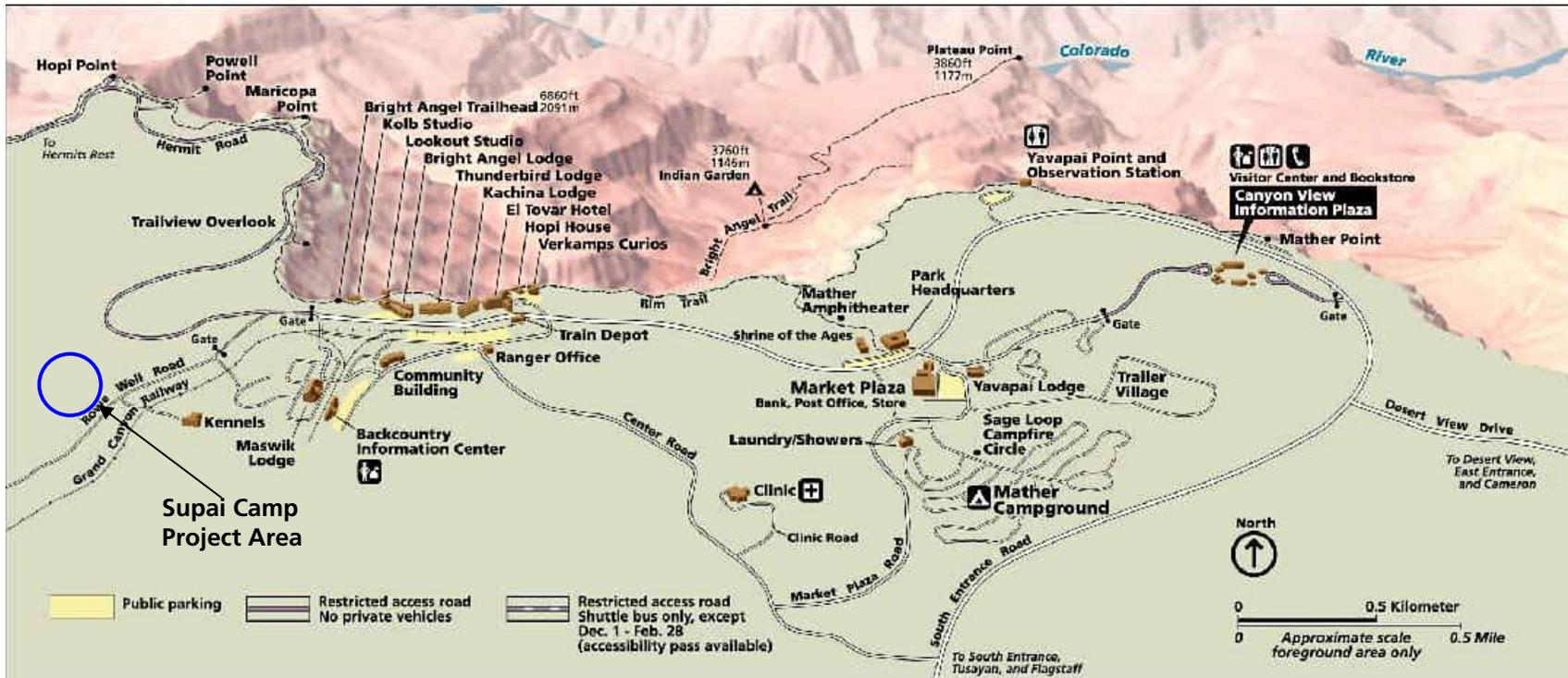


Figure 2 Specific project location



### **Park Purpose and Significance**

As described in GRCA’s 1995 General Management Plan (GMP), “the purpose of the park is based on the legislation establishing the park and its legislation governing the National Park Service. As a place of national and global importance, Grand Canyon National Park is to be managed to preserve and protect its natural and cultural resources and ecological processes, as well as its scenic, aesthetic, and scientific values; and provide opportunities for visitors to experience and understand the environmental interrelationships, resources, and values of the Grand Canyon without impairing the resources.”

### **Relationship to Other Plans and Policies**

Current plans and policies that pertain to this proposal include the 1995 Grand Canyon National Park General Management Plan (NPS 1995) and the 2006 National Park Service *Management Policies* (NPS 2006). Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is consistent with the 1995 Grand Canyon National Park General Management Plan (GMP), which proposes the development of housing in the park. The GMP identifies the actions, impacts, and mitigating measures necessary to resolve the issues facing the park. Many of these issues are the direct result of operating and occupying interim facilities that do not meet current health and safety codes.
- The proposal is consistent with the goals and objectives of the *2006 Management Policies* that state that park facilities within park boundaries should be located so as to minimize impacts to park resources. The proposed site of new housing units at Supai Camp was identified to minimize harm to all park resources.

### **Appropriate Use**

Section 1.5 of *2006 Management Policies*, “Appropriate Use of the Parks,” directs that the National Park Service must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it will not result in unacceptable impacts.

Section 8.1.2 of *2006 Management Policies*, *Process for Determining Appropriate Uses*, provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for”:

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values;
- total costs to the Service; and
- whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it.

Housing is a common and vital structure in most park units. Proper location, sizing, as well as construction materials and methods would ensure that unacceptable impacts to park resources and values would not occur. The proposed new housing and rehabilitation of existing housing units is consistent with the park’s general management plan and other related park plans. With this in mind, the NPS finds that construction and use of housing at Supai Camp is an acceptable use at Grand Canyon National Park.

The next question is whether such use, and the associated necessary and appropriate impacts, can be sustained without causing unacceptable impacts to park resources and values. That analysis is found in the *Affected Environment and Environmental Consequences* chapter.

### Issues and Impact Topics

Internal and public scoping resulted in the following substantive issues

- Construction of new housing units will disturb native vegetation and has potential to introduce or spread exotic plant species
- Park operations, including trash pick-up and snow plowing, should be considered
- Outdoor areas for traditional use should be considered in site plans for Supai Camp
- Some of the existing residences at Supai Camp are historic and would be affected by this project

Identified issues were used to formulate alternatives and mitigation measures. Impact topics were then selected for detailed analysis based on substantive issues, environmental statutes, regulations, executive orders, and NPS Management Policies. A summary of impact topics and rationale for selection or dismissal are given below.

### Impact Topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of Federal laws, regulations, and executive orders; 2006 *Management Policies*; and park staff knowledge of resources at Grand Canyon National Park. Impact topics carried forward for further analysis in this environmental assessment are

- Historic Resources
- Ethnographic Resources and Cultural Landscapes
- Vegetation
- Public Health and Safety
- Park Operations

### Impact Topics Dismissed From Further Analysis

Impact topics, as listed below, were dismissed from further consideration. During internal scoping, the park's interdisciplinary team conducted a preliminary resources analysis to determine context, duration, and intensity of effects the proposal may have on those resources. If the magnitude of effects was determined to be at the negligible or minor, there is no potential for significant impact and further impact analysis is unnecessary; therefore, the resource was dismissed as an impact topic.

For purposes of this section, an impact of negligible intensity is "at the lowest levels of detection, barely perceptible, and not measurable." An impact of minor intensity is "measurable or perceptible, but slight, localized, and would result in a limited alteration or a limited area." The rationale for dismissing these specific topics is stated for each resource.

*Special Status Species* Federally listed threatened and endangered species, species proposed for listing on the Endangered Species List, and species of particular concern to Grand Canyon National Park are unlikely to be affected by proposed actions. No known special status species occur in the project area and mitigation measures are in place to address certain species should they occur at any time. The park's Wildlife Biologist and Section 7 Coordinator determined the Preferred Alternative would have no effect on special status species if standard mitigation measures are

included in this EA and followed (Ward 2009). This impact topic was dismissed from further analysis based on the fact that no known special status species occur in the project area.

*General Wildlife* Proposed activities would involve some disturbance to vegetative communities and consequently to wildlife habitat. Habitat modification, noise, and other activities associated with project implementation will occur, but are not expected to have more than minor impacts on wildlife populations. Noise disturbance from construction activities and increased Supai Camp residential use could change the way species use this area. No sensitive nesting, fawning or calving areas are documented in the project vicinity, but it is possible that some adverse impacts could result. These impacts are considered minor due to the concentration of activities in an existing South Rim disturbed and developed area and availability of similar habitats nearby. Therefore, general wildlife populations were dismissed from further analysis.

*Archeological Resources* Section 106 (16 U.S.C. 470f) of the National Historic Preservation Act requires Federal agencies to take into account the effect of an undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.

Impacts to archaeological resources are not expected from project implementation since no archaeological sites have been located in project-area boundaries (NPS 2001). Ground disturbance would occur in pre-disturbed areas as much as possible and in areas previously surveyed for archaeological resources. Mitigation measure implementation would help ensure impacts to archaeological resources do not occur. Therefore, archaeological resources were dismissed from further analysis.

*Visual/Scenic Quality* To conserve the scenery of national parks and provide for visitor enjoyment are elemental NPS purposes as identified in the 1916 Organic Act. Although Supai Camp is not publically visible or part of the park's scenery, proposed improvements would enhance the visual quality of Supai Camp itself. However, these impacts are expected to be minor, beneficial, and localized. Therefore, visual/scenic resources were dismissed from further analysis.

*Watershed Values* The project area is located within the Bright Angel Wash watershed. There is no standing water or any major or minor drainage in Supai Camp. The proposed sewer connection between Supai Camp and the park's wastewater treatment plant would be laid in existing steel pipe situated under the intermittent Bright Angel Wash at least ten feet below the scouring depth of the drainage as required by Arizona state regulations (ADEQ 2005). This placement and depth limits potential for adverse impacts to Bright Angel Wash and watershed. There is no riparian habitat present within or adjacent to the project area. The Grand Canyon Village area is characterized by the absence of surface water, which generally drains through the groundwater system or returns to the atmosphere via evapotranspiration. Surface runoff usually only occurs following severe storm events. This is largely due to the permeable nature of the upper sedimentary layers underlying Grand Canyon Village area (NPS 1995, Roundy and Vernon 1996), and the evapotranspiration potential of the surrounding pinyon-juniper vegetation type (Huntoon 2000).

Proposed construction would involve some soil disturbance. Project components focus on construction of a sewer line from Supai Camp to the park's wastewater treatment plant, construction of new housing units, and rehabilitation of existing units. Impacts to soil and water resources could result through removal of live vegetation and erosion and/or subsurface flow to a downstream channel. Increased runoff due to paving can result in increased peak flows and higher sediment loads in some situations. Higher sediment loads can cause accelerated channel erosion, sedimentation, and flooding in downstream channel systems. However, due to the limited size and

extent of ground disturbance proposed for this project (maximum of six acres including previously disturbed areas), the fact that the area is within the Grand Canyon Village development zone, and adherence to mitigation measures designed to minimize potential for soil movement off-site during project implementation, overall impacts to soil and water resources would be negligible and would last only as long as the construction period. For these reasons, watershed values including soil and water resources were dismissed from further analysis.

*Air Quality* Grand Canyon National Park is a Federally mandated Class I Area under the Clean Air Act. As such, park air receives the most stringent protection against increases in air pollution and in further degradation of air quality-related values. The Act then sets a further goal of natural visibility conditions, free of human-caused haze. Park air quality is generally good and park pollution levels fall below those established by the Environmental Protection Agency to protect human health and welfare. However, visibility is usually well below natural levels due to air pollution; most of this pollution originates far outside park boundaries, and arrives as a well-mixed regional haze rather than as distinct plumes.

Section 118 of the Clean Air Act requires all Federal facilities to comply with existing Federal, state, and local air pollution control laws and regulations. The park Air Quality Specialist has determined that this project, due to its limited scope, would not require NPS consultation with the State of Arizona regarding air quality. However, because there is ground disturbance involved, there is a possibility of raising fugitive dust during project implementation or from disturbed areas afterwards. Application of mulch and gravel on the site, after work is completed, would provide long-term dust control. Mulch and gravel would stabilize the soil surface and reduce wind speed/shear against the ground surface.

Trenching and other minor onsite work would increase dust and combustion-related emissions. Dust raised during ground disturbance would be limited by project size and equipment used. By clearly marking project boundaries, unnecessary soil disturbance and consequent dust generation would be avoided. Water sprinkling can control fugitive dust emissions from light traffic in the project area. Construction equipment can adversely affect air quality by exhaust emissions. Minimizing the extent to which construction equipment idles would help reduce this effect. Minimizing idling would also help reduce noise impacts during construction. Indirect air quality impacts from routine daily vehicle emissions from visitors, employees, and official business would be unchanged.

Therefore, local air quality may be temporarily degraded by dust generated by construction activities under the action alternative, and emissions from construction equipment under implementation of alternatives. This degradation would result in an overall negligible impact to air quality, and would last only as long as construction activities occurred. Impacts to overall park air quality or regional air quality are not expected. Therefore, air quality was dismissed from further analysis.

*Soundscapes* The NPS is mandated to articulate operational policies that require, to the fullest extent practicable, protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. Natural sounds are intrinsic elements of the environment often associated with parks and park purposes. They are inherent components of “the scenery and the natural and historic objects and the wild life” protected by the NPS Organic Act. They are vital to the natural functioning of many parks, and may provide valuable indicators of the health of various ecosystems. Intrusive sounds are of concern to the NPS because they sometimes impede the service’s ability to accomplish its mission.

Supai Camp, as identified in the GMP, is within the development zone. Construction activities would generate some noise in the development zone above ambient conditions. Noise sources include vehicles, equipment, and additional people in the area conducting the work. Noise impacts from this project would only last the duration of construction. All construction would occur during daylight hours when noise from roads and associated traffic already affect the project area. Any additional traffic would only be temporary and would negligibly affect the areas in the short-term. Therefore, this project would have no considerable effects on soundscape. Similarly, effects of past, present, and foreseeable future actions on soundscape would be short-term and would not considerably affect soundscape. Therefore, soundscape was dismissed from further analysis.

*Floodplains and Wetlands* Executive Order 11988 (Floodplains) and Executive Order 11990 (Wetlands) requiring Federal agencies to examine potential action impacts on floodplains and wetlands, were reviewed for applicability. Because the project is not in a floodplain or wetland and would not affect this resource, floodplains and wetlands were dismissed from further analysis.

*Visitor Experience* The 1916 NPS Organic Act and NPS Management Policies 2006 direct national parks to provide for public enjoyment. Proposed construction activities and upgrades at Supai Camp would occur outside main South Rim visitation areas and are not expected to considerably affect park visitors; only negligible adverse short-term impacts could occur from South Rim construction traffic. Therefore, visitor experience was dismissed from further analysis.

*Environmental Justice* Executive Order 12898 requires consideration of impacts to minority and low-income populations to ensure these populations do not receive a disproportionately high number of adverse or human-health impacts. This issue was dismissed from further analysis because the proposed project is proposed to specifically address health and safety in relationship to housing for Havasupai Tribal members living at Supai Camp.

*Prime and Unique Farmland* The Farmland Protection Policy Act of 1981, as amended, requires Federal agencies to consider adverse effects to prime and unique farmlands that would result in conversion of these lands to non-agricultural uses. Prime or unique farmland is defined as soil that particularly produces general crops as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. This proposed project's location and surrounding lands have been evaluated by appropriate park technical area specialists and specialists from the Natural Resources Conservation Service (NRCS). Based on their observations, the project area is not considered prime or unique farmland (Camp 2002). Therefore, this topic was dismissed from further analysis.

*Socioeconomic Environment* Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and park concessions. The local economy and most business in neighboring communities are based on construction, recreation, transportation, tourist sales, services, and educational research; the regional economy is strongly influenced by tourist activity. The GMP Environmental Impact Statement (EIS) discussed socioeconomic environment and impacts extensively. Some short-term benefits to local and regional businesses could occur from construction-related expenditures and employment. Local and regional businesses would be negligibly affected long term.

Supai Camp's original purpose was to provide housing for Havasupai people employed in the park, in an area sensitive to tribal needs. Today, the Camp also provides access to healthcare and education opportunities not currently available to the Tribe in Supai Village in Havasu Canyon.

There would be long-term benefits to the Havasupai Tribe by expanding employment, education, and healthcare opportunities. Impacts to the socioeconomic environment on the Tribe would be minor beneficial long term. Because impacts would be minor or less, socioeconomic environment was dismissed from further analysis.

*Wilderness Character* Most of the park has been recommended for wilderness designation. Until Congress formally acts on this recommendation, NPS policies require these areas be managed under Wilderness Act provisions. However, the proposed project area is part of the development zone as defined in the GMP, and outside recommended wilderness. Proposed actions in this area would not occur in recommended wilderness and would not directly affect wilderness character or wilderness values. For these reasons, wilderness character was dismissed from further detailed analysis.

*Indian Trust Resources* Secretarial Order 3175 requires any anticipated impacts to Indian Trust resources from a proposed project or action by The Department of the Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is the legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native tribes. Grand Canyon National Park does not have any Indian Trust resources; therefore, this topic was dismissed from further analysis.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508; National Park Service Director's Order #12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making.

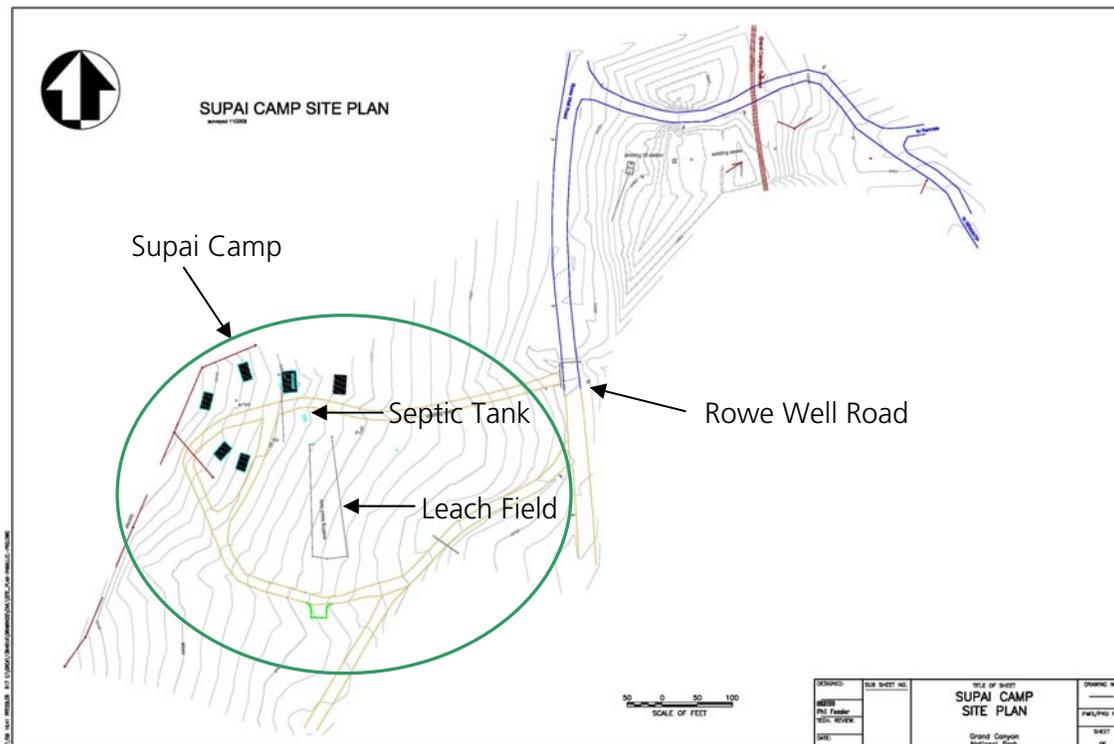
## CHAPTER 2 ALTERNATIVES

In February and April 2009, an interdisciplinary team of GRCA employees met for the purpose of developing project alternatives. These meetings resulted in the definition of project objectives described in Purpose and Need, and a list of alternatives that could potentially meet these objectives. A total of two action alternatives and the No Action alternative were originally identified for this project. Of these, one action alternative was dismissed from further consideration for various reasons, as described later in this chapter. One action alternative and the No Action alternative are carried forward for further evaluation in this EA. A summary table comparing alternative components is presented at the end of this chapter.

### Alternative A No Action

Under Alternative A, no upgrades or changes would occur at Supai Camp. The current septic system and leach field would continue to be used. No new construction would occur and the existing six buildings (four historic cabins, one non-historic cabin, and one community bathroom and laundry facility [washeteria]), would remain in their current condition. The one main road that exists at Supai Camp would not be improved under Alternative A. The outdoor use areas including corrals and a fire pit would remain in existing locations. Figure 3 shows the existing layout of buildings and roads at Supai Camp.

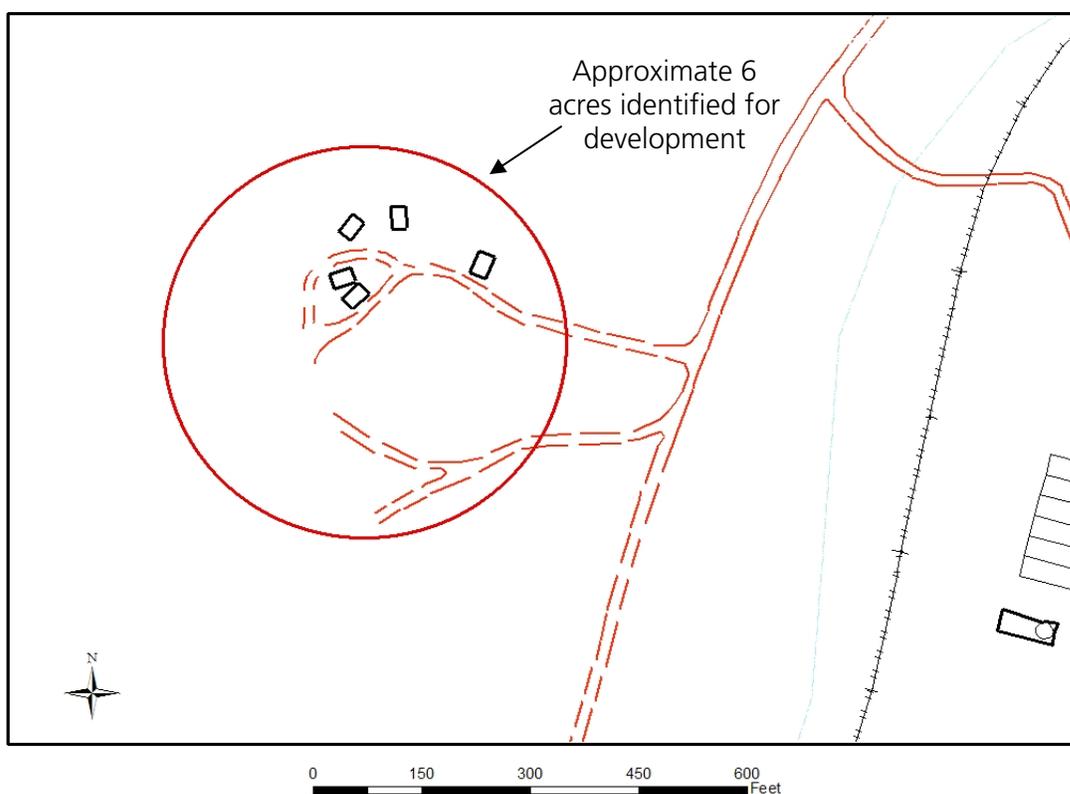
**Figure 3 Alternative A, No Action**



## Alternative B Preferred Alternative

Alternative B would complete improvements at Supai Camp. The Camp would be connected to the park's wastewater treatment system, and would no longer use a septic system and leach field. New units would be constructed, initially six units (three duplexes), with up to 14 additional units constructed as funding becomes available. The existing housing units would be rehabilitated to meet health and safety codes, including connections to water and sewer. Road expansion and improvements would occur to allow safe, year-round access to Supai Camp. Outdoor use areas would be considered and located appropriately. Construction would occur in previously disturbed areas as much as possible. Total disturbance for all project components, including future housing units, would not exceed six acres in the immediate vicinity of the existing Supai Camp units (see Figure 4).

**Figure 4** Acreage estimated for Alternative B implementation, including future housing units



## Utilities

Supai Camp would be connected with the park's wastewater treatment plant. The Camp currently has water and electric service which would continue to existing units, and would also be added to new units. Installation of utilities would include trenching, constructing a lift station, closing the existing leach field, and bringing in overhead utilities.

For the sewer pipe, a trench up to three feet wide and six and a half feet deep would be dug from Supai Camp to an area just west of the railroad tracks. At that point, an existing steel pipe

approximately ten feet below ground would house the sewer pipe for the remaining distance to the park's wastewater treatment plant.

A lift station would be constructed just west of the railroad tracks. The lift station would be made of concrete and would be approximately six feet tall, six feet wide, and six feet long.

The existing leach field at Supai Camp would generally be left in place because much of it has already silted in and mature vegetation has grown in this area. Some leach lines would be dug up and removed in areas where feasible and where little vegetation occurs.

The Supai Camp septic tank would be removed. Fill material would be added where the tank is removed. The tank likely has a 500-gallon capacity which would be approximately six feet long and three feet wide.

Water lines already exist at Supai Camp and would be accessed to provide one additional fire hydrant and water to both new and existing housing units. Trenches for water lines would generally be three feet wide and four feet deep.

Overhead utilities including electricity and telephone would be brought into the camp. Approximately three new power poles would be needed in and around Supai Camp to supply power to new housing units. Additionally, two new power poles would also be necessary to provide power to the lift station located near the railroad tracks. In the future, these utilities may be placed underground as funding becomes available.

All utilities would be situated to easily connect future housing units.

### **Construction of New Units**

Up to 20 housing units would be constructed at Supai Camp for Tribal members over the next ten years, similar to what was described in the park's original concept plan (see Figure 5).

Six units consisting of three duplexes would be constructed immediately. Each unit would consist of two bedrooms and one bathroom. All three buildings would have a large porch and several units would be constructed as fully accessible. Interior and exterior materials would be selected for durability and energy efficiency. Units would be partially manufactured off-site and constructed on a permanent foundation at Supai Camp. Exterior finishes would be selected to be compatible with the character of the Camp.

Future housing units would be constructed within the six-acre area identified for current infrastructure and future development. Building design would be coordinated between GRCA staff and the Havasupai Tribe. Additional resource surveys would occur prior to future development, including vegetation and archeology. Housing unit designs may include single family units, multiple-unit structures such as duplexes, tri-plexes, or four-plexes, and will not exceed an additional 14 units. With this additional construction, a total of 25 housing units, including the five existing cabins, could be in place by 2019.

## Rehabilitation of Existing Units

A total of five housing units currently exist at Supai Camp. All units would be rehabilitated under Alternative B. In addition to connecting these units to water and sewer, potential repairs and rehabilitation efforts are

- Test interior and exterior for lead based paints and asbestos
- Remove or encapsulate lead and asbestos as needed
- Repair existing exterior siding or remove and replace where repairs are impracticable
- Remove and replace historic windows and frames
- Remove exterior doors and replace with insulated panel doors
- Reconstruct wood entrance stoop to meet applicable building codes
- Remove and replace all deteriorated wood framing
- Remove and replace roofing
- Remove celotex interior finishes and replace with wall board on walls and ceilings
- Install new interior trim and floor finishes
- Install heating system
- Install automatic sprinkler system and smoke detectors
- Install bath and kitchen fixtures
- Repair or replace cabinets and countertops
- Upgrade electrical service, wiring, and light fixtures
- Repair mortar on exterior rock base of buildings

Expansion of cabins, including adding rooms and overall square footage, could be considered and implemented. These efforts would be coordinated with park staff, the Havasupai Tribe, and the Arizona State Historic Preservation Officer.

## Roads

A new road would be constructed at Supai Camp to provide safe, year-round access to new and existing housing units. The existing road would also be improved as much as possible. The roads would be paved or graveled to facilitate snow plowing and overall access to the Camp.

## Outdoor Use Areas

The Supai Camp area has been used by the Havasupai Tribe since the 1920s for housing and community activities. Outdoor use areas would be located within the six acres identified for disturbance, and would include relocating the existing fire pit, fixing up an existing horse corral, and identifying other areas for community activities as needed. Construction of these outdoor use areas would be coordinated between the Havasupai Tribe and the NPS.

Figure 5 1933 Concept Plan for the Supai Camp Area

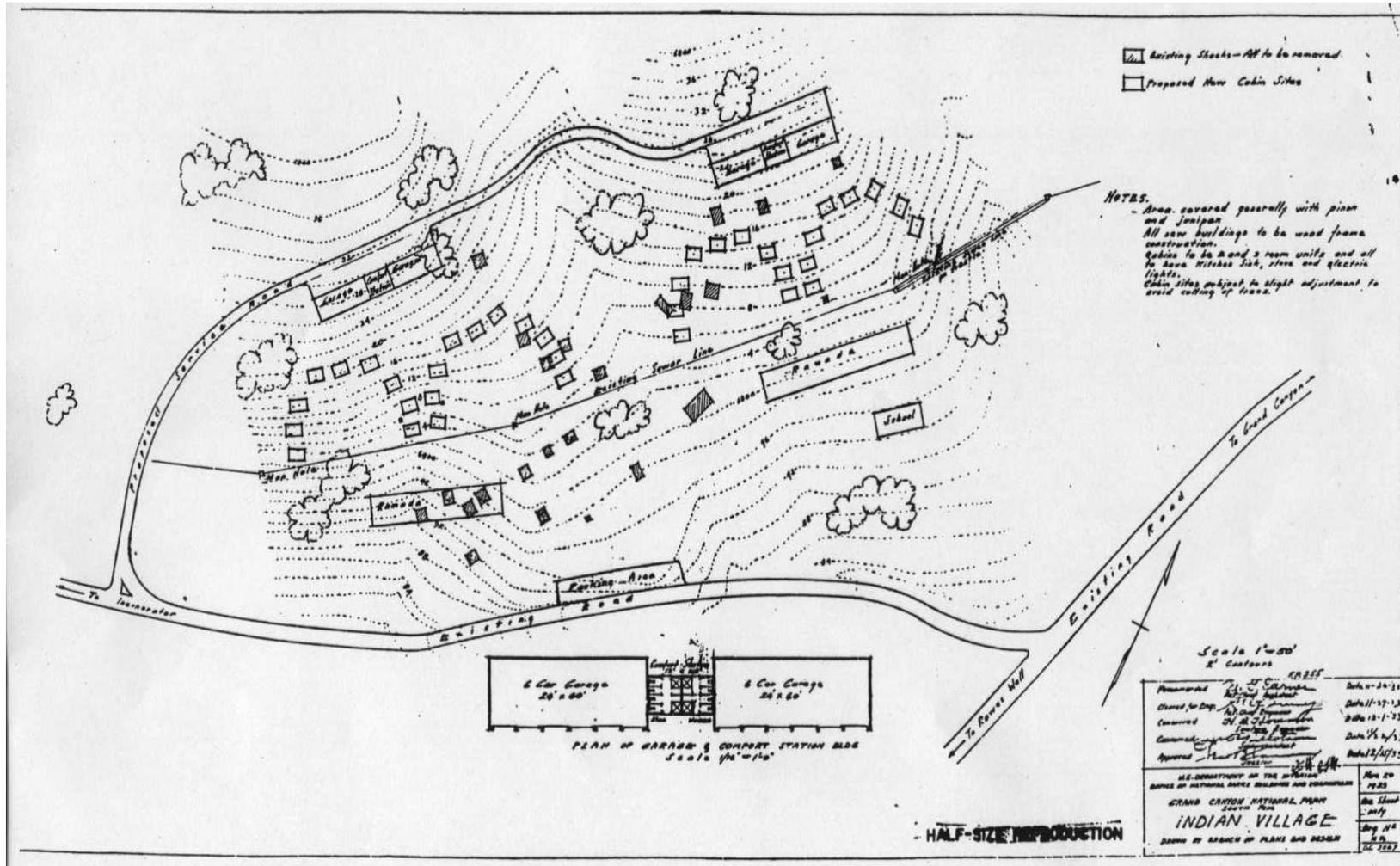
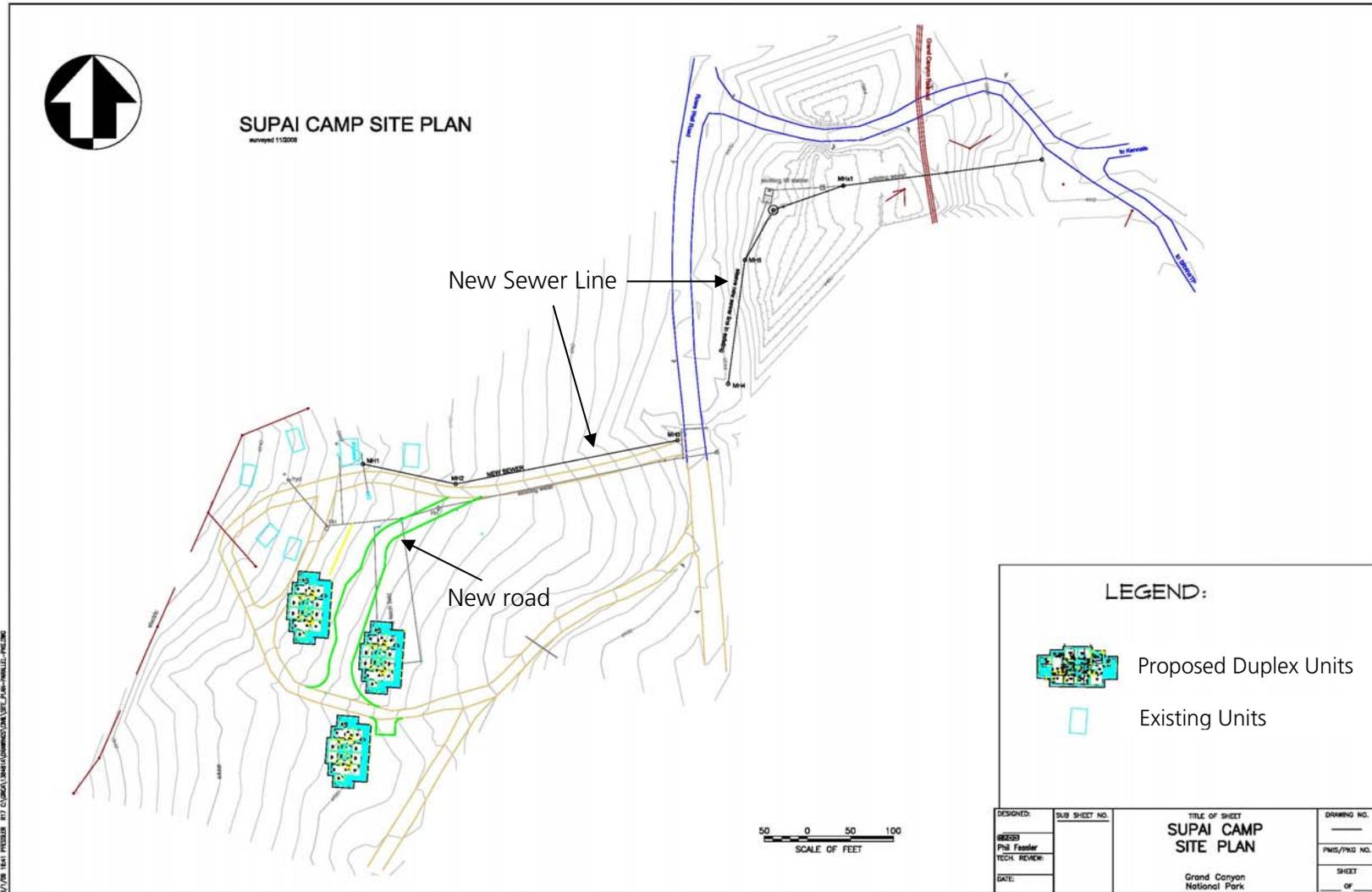


Figure 6 Alternative B, Preferred Alternative



## Mitigation Measures

The following mitigation measures were developed to minimize the degree of adverse effects and would be implemented during construction of the action alternative, as needed. The park's Project Manager would be responsible for implementation of these mitigation measures.

**Contractor Orientation** Contractors working in the park are given orientation concerning proper conduct. This orientation is provided both in writing and verbally at a preconstruction meeting. This policy would continue for this project. Orientation would include, but would not be limited to

- Wildlife should not be approached or fed
- Collecting any park resources, including plants, animals, and historic or prehistoric materials, is prohibited
- Contractor must have a safety policy and a vehicle fuel-spill and leakage policy

**Limitation of Area Affected** The following mitigation measures would be implemented to minimize the area affected by construction activities and potential for adverse impacts

- Staging areas for a construction office (trailer), construction equipment, and material storage would either be located in previously disturbed areas near project sites or in other disturbed areas that best meet project needs and minimize new ground disturbance. All staging areas would be returned to pre-construction conditions or better once construction is complete. Standards for this, and methods for determining when standards are met, would be developed in consultation with the park's Vegetation Program Manager
- Construction zones would be fenced with construction tape, snow fencing, or similar material before construction begins. Fencing would define the construction zone and confine activity to the minimum construction area required. All protection measures would be clearly stated in construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone as defined by fencing

**Soil Erosion** To minimize soil erosion, the following mitigation measures would be incorporated into the action alternative

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods would be used to minimize any potential soil erosion
- Grading and trenching operations would be by backhoe, track hoe, Pionjar, ditch digger and/or trencher, with excavated material side-cast for storage. Any trenching restoration operations would follow guidelines approved by park staff. Compacted soils would be scarified, and original contours reestablished
- Any revegetation efforts would use site-adapted native species and/or site-adapted native seed, and park policies regarding revegetation and site restoration would be incorporated

**Vegetation** To minimize vegetation impacts, prevent exotic vegetation introduction, and minimize spread of noxious weeds, the following mitigation measures would be incorporated into the action alternative

- The park's Vegetation Program Manager would provide input on salvage potential and tree avoidance at project sites where necessary and would also spot-check work progress
- All construction equipment that would leave the road would be pressure-washed prior to entering the park and would be clean of any soil, plant matter, or other materials
- Staging area locations for construction equipment would be park-approved. If determined by the Vegetation Program Manager to be necessary, exotic vegetation would be treated prior to beginning of construction

- Pruning necessary for this project, and for any future periodic maintenance in the area, would adhere to the park's tree pruning guidelines with the goal of retaining health and integrity of trees and shrubs treated. Damage to trees or roots in or adjacent to project areas during construction would be avoided as much as possible
- Any fill materials needed would be obtained from a park-approved source. Topsoil from the project area would be retained whenever feasible
- Any revegetation efforts would use site-adapted native seed and/or plants
- Vegetation material removed during the project would be cut and chipped onsite
- Disturbed areas would be mulched, or gravel would be applied, as appropriate to limit invasion and spread of invasive, nonnative plants
- Aspen fiber erosion control products, not straw products would be used
- If erosion control fencing is used, soil would be piled in front of the fence to avoid creating bare soil and potential for invasive plant species encroachment
- Top soil and vegetation would be scraped down four inches and taken to an approved landfill, as feasible, in the invasive plant infested area identified by Vegetation Program staff
- Top soil in areas where little or no invasive plants exist would be scraped and piled onsite to be replaced after construction is complete

**Special Status Species** To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract would include provisions for discovery of such. These provisions would require cessation of construction activities until park staff evaluated the impact, and would allow contract modification for any measures determined necessary to protect the discovery. Mitigation measures for known special status species are

*California Condor*

- If a condor lands within 300 feet of the construction site, construction would cease until it leaves on its own, or permitted personnel employ techniques that result in the individual condor leaving the area
- Construction workers and supervisors would be instructed to avoid interaction with condors, and to contact appropriate park or Peregrine Fund personnel immediately if and when condor(s) occur at a construction site
- The construction site would be cleaned at the end of each day work is conducted (i.e., trash disposed of, scrap materials picked up) to minimize likelihood of condors visiting the site. Park condor staff would complete a site visit to the area to ensure adequate clean-up measures are taken
- To prevent water contamination and potential condor poisoning, the park-approved vehicle fluid-leakage and spill plan would be adhered to for this project. This plan would be reviewed by the park's Wildlife Biologist to ensure adequacy in condor protection for this project
- If condor nesting activity is known within 0.5 miles of the project area, light and heavy construction in the project area would be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the park's Wildlife Biologist and the U.S. Fish and Wildlife Service (USFWS)

*Mexican Spotted Owl (MSO)*

- Prior to construction activities, the park's Wildlife Biologist would be contacted for any new information related to MSO or their status near the project area

**Soundscapes** To minimize construction impacts on soundscapes, the following mitigation measures would be incorporated into the action alternative

- To reduce noise, construction equipment would not be left idling any longer than is necessary for safety and mechanical reasons, and no construction would occur at night

**Cultural Resources** To minimize construction impacts on cultural resources, the following mitigation measures would be incorporated into the action alternative

- If previously unknown archeological resources are discovered during the project, a park Archeologist would be contacted immediately. All work in the immediate vicinity of the discovery would be halted until the resources could be identified, documented, and an appropriate mitigation strategy developed, if necessary, in accordance with stipulations of the applicable programmatic agreements among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation
- All workers would be informed of the penalties of illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would also be informed of correct procedures if previously unknown resources are uncovered during construction activities
- Areas selected for equipment and materials staging are expected to be in existing disturbed areas where there is no potential for archeological resource disturbance. If sites selected for these activities change during later design phases for implementation, additional archeological surveys would be conducted

**Visitor Experience** The following mitigation measures would be incorporated into the action alternative to minimize construction impacts on visitor experience

- Unless otherwise approved by the park, operation of heavy construction equipment would be restricted to dawn to dusk, year-round

**Park Operations and Safety** The following mitigation measures would be incorporated into the action alternative to minimize construction impacts on park operations, and minimize safety risks to employees, visitors, and residents

- NPS, concessionaires, other park employees, and residents would receive public notification on project implementation and road delays or road closures, as appropriate

**Air Quality** Air quality impacts of the action alternative are expected to be temporary and localized. To minimize these impacts, the following actions would be taken

- To reduce entrainment of fine particles from hauling material, sufficient freeboard would be maintained, and loose material loads (aggregate, soils, etc.) would be tarped
- To reduce tailpipe emissions, construction equipment would not be left idling any longer than necessary for safety and mechanical reasons
- To reduce construction dust in the short term, water would be applied to problem areas. Equipment would be limited to the fenced project area to minimize soil disturbance and consequent dust generation
- Landscaping and revegetation would control long-term soil dust production. Mulch and plants would stabilize soil and reduce ground surface wind speed/shear

## Alternatives Considered and Dismissed

The following alternative was considered for project implementation, but was ultimately dismissed from further analysis

- Construction of housing for the Havasupai Tribe at a different park location. The Pinyon Park area was a traditional housing area for the Tribe and was considered in this planning process; however, because Supai Camp is already established and because it is located in the area identified by the NPS the 1930s to construct housing, the Pinyon Park alternative was dismissed from further analysis.

## Alternative Summaries

Table 1 summarizes major components of Alternatives A and B, and compares the ability of these alternatives to meet project objectives (project objectives are identified in Purpose and Need). As shown in Table 1, Alternative B meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

**Table 1 Summary of Alternatives and Project Objectives**

Project Objectives	Alternative A No Action	Alternative B Supai Camp Improvements
	Meets Project Objectives?	Meets Project Objectives?
Connect Supai Camp to the park's wastewater treatment plant	No The Camp is not currently connected to the park's wastewater treatment system. Under Alternative A, Supai Camp would continue to use the existing leach field	Yes A connection to the park's wastewater treatment plant would be completed under Alternative B
Improve the condition of the existing housing units and make them compliant with current building and safety codes	No Housing units at Supai Camp do not meet current building and safety codes. Under Alternative A, these units would remain as is	Yes Existing housing units would be rehabilitated to meet current health and safety codes
Allow for construction of up to 20 additional housing units for Tribal members, similar to what was described in the park's original concept plan	No The five cabins and washeteria would be the only buildings in Supai Camp. No new construction would occur	Yes. Up to 20 housing units would be constructed at Supai Camp as funding was available
Provide year-round access to Supai Camp for residents, garbage trucks, propane trucks, and snow plows	No Current road condition and configuration does not allow year-round access	Yes A new road configuration would be constructed to allow for year-round access to Supai Camp

Table 2 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics carried forward for further analysis are included. Chapter 3, Affected Environment and Environmental Consequences, provides a more detailed explanation and analysis of these impacts.

**Table 2 Environmental Impact Summary by Alternative**

<b>Impact Topic</b>	<b>Alternative A No Action</b>	<b>Alternative B Preferred Alternative</b>
<b>Historic Resources</b>	Minor adverse long-term impacts from deferred maintenance and continued deterioration of the four historic cabins at Supai Camp	Moderate, beneficial, long-term impacts to historic resources from rehabilitation of historic cabins at Supai Camp. Cumulative impacts minor adverse long term
<b>Ethnographic Resources and Cultural Landscapes</b>	Minor adverse long-term impacts from potential changes in use of Supai Camp	Moderate beneficial long-term impacts to ethnographic resources and cultural landscapes from all improvements that would encourage and sustain Havasupai Tribe use of Supai Camp. Cumulative impacts minor adverse long term
<b>Vegetation</b>	Minor adverse impacts from continued exotic plant infestations and minor, beneficial impacts because native vegetation would remain in place and would not be disturbed	Minor adverse impacts to vegetation from direct disturbance and removal of native plant species including a number of healthy ponderosa and pinyon trees and negligible beneficial long-term impacts from potential removal of invasive plant infested topsoil and native plant salvage at Supai Camp. Cumulative impacts minor adverse long-term
<b>Public Health and Safety</b>	Minor adverse long-term impacts because housing conditions would remain below current health and safety codes and Supai Camp would not be accessible to residents, propane trucks, or emergency service vehicles year-round	Moderate beneficial long-term impacts to public health and safety because improvements would include upgrades to existing housing units that would meet health and safety codes, upgrades to the roads to allow for year-round access, and construction of larger housing units. Short-term adverse minor impacts during construction would occur. Cumulative impacts moderate beneficial long term
<b>Park Operations</b>	Negligible adverse long-term impacts due to continuation of park operations without any change	Minor long-term beneficial impacts would result from increased housing opportunities and increased efficiency of Supai Camp buildings. Minor adverse long-term impacts to park operations would result from increased maintenance and administrative needs from new housing units and improved roads. Cumulative impacts minor beneficial long term

## Identification of the Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying criteria suggested in the National Environmental Policy Act of 1969, which guides the Council on Environmental Quality (CEQ). CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s §101

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

Through the process of internal and public scoping, the environmentally preferred alternative selected is Alternative B, the Preferred Alternative. Alternative B best meets the purpose and need for action and best addresses overall NPS objectives and evaluation factors while minimizing impacts to park resources. Alternative B promotes public health and safety, identified in Criteria 2 and 3, by upgrading existing substandard housing, whereas Alternative A would add to existing health and safety concerns. Alternative B protects important historic and cultural resources identified in Criteria 4. This Alternative also best achieves a balance between population and resources use, as identified in Criteria 5.

## CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes affected environment, or present condition, in the project area and analyzes potential environmental consequences, or impacts, expected from implementing the action alternative or taking no action at this time. Impact topics selected in Chapter 1 include cultural resources, park operations, and public health and safety. Direct, indirect, and cumulative effects, and impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes impact as either beneficial or adverse, direct or indirect
  - *Beneficial* A positive change in condition or appearance of resource or change that moves resource toward a desired condition
  - *Adverse* A change that moves resource away from a desired condition or detracts from its appearance or condition
  - *Direct* An effect caused by an action and occurs in the same time and place
  - *Indirect* An effect caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable
- **Context** describes the area or location in which impact will occur. Are effects site-specific, local, regional, or even broader?
- **Duration** describes length of time an effect will occur, either short or long term
  - *Short term* Impacts generally last only during construction; resources resume pre-construction conditions following construction
  - *Long term* Impacts last beyond the construction period; resources may not resume pre-construction conditions for a longer period of time following construction
- **Intensity** describes degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because intensity definitions vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this EA

### Methodology

Impact analysis and conclusions contained in this chapter were based on park staff knowledge of resources and site, review of existing literature and park studies, information provided by specialists in the NPS and other agencies, and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP and EIS was specifically referenced for information on affected resources in the project area.

### Cumulative Effects

Council on Environmental Quality regulations, which implement 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 impacts are considered for both the No Action and action alternative.

Cumulative impacts were determined by combining Preferred Alternative impacts with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Grand Canyon National Park and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and temporal scope of the cumulative analysis is similarly small. The geographic scope for this analysis includes actions in park boundaries, while the temporal scope includes projects in a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting cumulative effects analysis, listed from past to future:

*Historic Railroad Depot Rehabilitation* A 2008 historic structures report provides specific treatment recommendations for rehabilitation of this structure. Major interior and exterior building improvements are anticipated 2013-2014, including repairs to non-functioning restrooms and accessibility upgrades. Due to drainage problems on the building's north side, the paved lane adjacent to the building may be removed to re-grade and facilitate drainage away from the building. Approximately 0.5 acres would be disturbed.

*South Rim Visitor Transportation Plan (SRVTP)* The SRVTP's purpose is to provide a transportation system that addresses the park's most pressing transportation issues through the year 2020. The plan accommodates current and anticipated South Rim visitation levels, facilitates enhanced visitor experiences, and protects park resources. The plan includes constructing new parking areas near the Visitor Center, expanded shuttle bus service from Tusayan, expanded shuttle bus transit in the village and to Hermits Rest, and South Entrance Station improvements such as additional vehicle lanes and tour bus management.

*Bright Angel Trailhead Area Design Plan* GRCA plans to implement a design plan for the Bright Angel Trailhead area. Proposed actions include developing a plaza near the primary trailhead, enhancing trail connections and wayfinding, constructing a new restroom near the proposed plaza and existing mule corral, and improving parking area vehicle circulation. Future phases could include hardening the parking surface and delineating parking spaces, additional revegetating and landscaping, and enhancing wayfinding and interpretive signs.

*Employee Housing* GRCA currently has a shortage of employee housing. Through this project, approximately 64 housing units will be constructed in eight, eight-plex apartment buildings. The buildings, along with parking, access, and utilities will be in Grand Canyon Village in a previously disturbed area where trailer housing units are currently located. The project is expected to begin in 2010; estimated disturbance five to ten acres.

### **Other Ongoing Activities**

*Fire Management Plan Activities* These include fire management activities such as prescribed burns, wildland fire-use fires for resource benefit, manual and mechanical thinning, and suppression fires.

*Exotic Plant Management Activities* Exotic plant management is an ongoing activity throughout the park and includes integrated pest management to treat high priority invasive, nonnative plant species. Treatments include cultural, manual, mechanical, and chemical controls.

*Routine Maintenance of Buildings and Roads* The NPS routinely maintains park buildings and roads as funding is available.

## Impairment

Management Policies require analysis of potential effects to determine whether or not actions would impair park resources (NPS 2006). The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values.

Although Congress has given the National Park Service 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 responsible NPS manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent it has a major or severe adverse effect on a resource or value whose conservation is

1. necessary to fulfill specific purposes identified in the park's establishing legislation or proclamation
2. key to the park's natural or cultural integrity or
3. identified as a goal in the park's general management plan or other relevant National Park Service planning documents

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination on impairment is made in the Conclusion section for each resource topic carried forward in this chapter.

## Unacceptable Impacts

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS applies a standard that offers greater assurance that impairment will not occur by avoiding unacceptable impacts. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable.

Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- be inconsistent with a park's purposes or values, or
- impede attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- create an unsafe or unhealthful environment for visitors or employees, or
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- unreasonably interfere with
  - park programs or activities, or
  - an appropriate use, or

- the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park.
- NPS concessioner or contractor operations or services (NPS 2006)

In accordance with Management Policies, park managers must not allow uses that would cause unacceptable impacts to park resources. To determine if unacceptable impact could occur to the resources and values of Grand Canyon National Park, impacts of proposed actions in this environmental assessment were evaluated based on the above criteria. A determination on unacceptable impacts is made in the Conclusion section for each physical resource topic carried forward in this chapter.

## **Historic Resources**

### **Affected Environment**

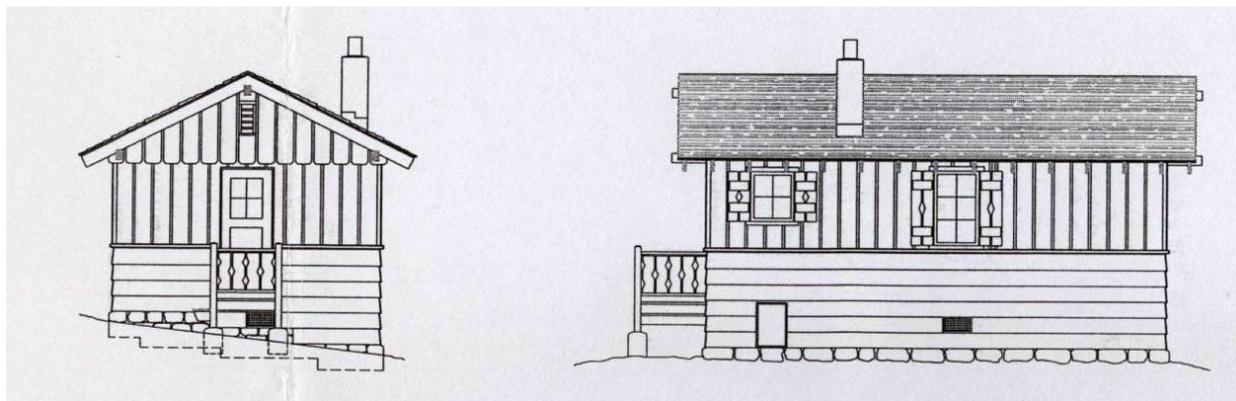
Supai Camp was established to provide a housing area for Havasupai Tribal members originally living in areas in or near Grand Canyon Village. The Grand Canyon Village area and adjacent areas below the canyon rim were used traditionally by the Havasupai people as part of their seasonal rounds. After GRCA establishment, the people were displaced by the NPS and found refuge in marginal areas surrounding the administrative areas of the new national park.

In the early 1930s, the NPS established a permanent residential area at what is now known as Supai Camp. Prior to construction of the small cabins at Supai Camp, Havasupai people occupied shacks and traditional brush structures scattered throughout the South Rim area. With establishment of permanent dwellings, these temporary structures were abandoned. In 1933 the NPS proposed a master plan for the Camp showing a village of 36 new small residential cabins, armadas, garages, and a school. The proposed plan included the removal of 22 existing buildings or “shacks” to use the descriptive label from the site plan shown in the alternative descriptions.

Demolition and removal of the 22 existing Havasupai homes at the Camp was the only part of the master plan fully accomplished; demolition sometimes occurring while residents were temporarily away and their possessions still in the home. Only six of the 36 proposed new cabins were built, but were never plumbed or hooked up to nearby utility systems. The cabins are similar to the standardized NPS design for small “bachelor ranger” cabins built in other park locations.

Extant historic resources at Supai Camp include four historic cabins built in 1934 (see Figure 7); two more were built, but destroyed by fire. In the 1960s a plumbed bath house was built and later expanded to include laundry facilities. This is the only building with plumbing onsite. The laundry/bathhouse was recently renovated with Bureau of Indian Affairs funds and is in good condition. In the 1950s a Christian missionary organization built a small church onsite, cheaply constructed out of plywood and without a foundation. This building was later used as a community building and now as a residence; it is in very poor condition.

**Figure 7 Extant Supai Historic Cabin; all four historic cabins are similar**



The National Register of Historic Places-listed Water Reclamation Plant is adjacent to Supai Camp. Built in 1925, the sewage treatment plant was considered state-of-the-art for its time, as it was one of the first to recycle water for re-use in flushing toilets and watering hotel lawns. The abandoned sewage supply line traverses Supai Camp; however, it is not considered a significant or contributing feature of the treatment plant and will be removed. No other properties eligible for listing on the National Register of Historic Places would be impacted in this project.

### Intensity Level Definitions

The four existing cabins constructed in the 1930s are the only historic resources in the project area eligible for the National Register of Historic Places. Methodology used for assessing impacts to these historic structures is based on how the project will affect features for which these structures are significant. The thresholds for this impact assessment are

- Negligible** Impact is at lowest levels of detection, barely perceptible and not measurable
- Minor**
- Adverse* Impact is measurable or perceptible, but is slight and affects a limited area of a structure or group of structures. Impact does not affect character-defining features of a National Register of Historic Places eligible or listed structure and would not have a permanent effect on structure integrity
  - Beneficial* Stabilization/preservation of features is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties
- Moderate:**
- Adverse* Impact is measurable and perceptible. Impact changes one or more character-defining feature(s) of a historic structure, but does not diminish integrity of resource to extent its National Register eligibility jeopardized
  - Beneficial* Rehabilitation of a structure is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties
- Major**
- Adverse* Impact is substantial, noticeable, and permanent. For National Register eligible or listed historic structures, impact changes one or more character-defining features(s) of the historic resource, diminishing resource integrity to the extent it is no longer eligible for National Register listing

*Beneficial* Impact is of exceptional benefit and restoration of a structure is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties

**Context** All impacts to historic resources would be localized

**Impacts** **Alternative A, No Action**

Under Alternative A, minor adverse impacts to the four Supai Camp historic cabins would result from continued deferred maintenance and deterioration. These cabins have not been well maintained and are in need of both exterior and interior repairs and rehabilitation. Alternative A, No Action, would allow these buildings to remain in their current deteriorated condition and no repairs or rehabilitation would occur.

Allowing these buildings to remain as they are, falling into further disrepair, would eventually affect character-defining features and could potentially change eligibility for listing on the National Register.

*Cumulative Effects* Historic South Rim resources have been impacted as a result of modifications to historic buildings and structures, and intrusion of incompatible modern buildings into historic districts. In addition, deterioration of some buildings as a result of natural weathering and use has compromised defining architectural characteristics. These past impacts are moderate adverse long term.

Recently implemented, in-progress and foreseeable future projects with potential to affect historic resources include the Historic Railroad Depot Rehabilitation, South Rim Visitor Transportation Plan, Bright Angel Trailhead Area Design Plan, and ongoing maintenance of historic structures throughout the South Rim area. These projects have been or will be assessed for effects to historic resources, and discussed with the State Historic Preservation Officer (SHPO). Consultation with the park's cultural resource staff and SHPO would ensure any adverse impacts of future projects on historic resources would be minimized. Therefore, cumulative impacts to historic resources would be adverse moderate long term.

*Conclusion* Alternative A implementation would result in minor adverse long-term impacts from deferred maintenance and continued deterioration of the four Supai Camp historic cabins. Cumulative impacts would be moderate adverse long term. No impairment of or unacceptable impacts to historic resources would result.

**Impacts** **Alternative B, Preferred Alternative**

Preferred Alternative implementation would result in moderate beneficial long-term impacts to historic resources. Historic cabins would be repaired and brought to modern standards including addition of indoor plumbing. All work would be completed using the Secretary of the Interior's Standards for the Treatment of Historic Properties to limit any chance for adverse impacts to these historic structures.

These historic cabins are significant for their association with and use by the Havasupai Tribe. Needed building repairs would insure they are brought to a livable and sustainable condition, and insure continued use and preservation.

New unit design and construction would be sensitive to the historic nature of the Supai Camp cabins. Materials and finishes would be compatible with, yet distinctive from, these historic structures. Again, because the cabins are significant for association and use by the Tribe, construction of new units in the area would not affect significance.

*Cumulative Effects* Alternative B implementation, combined with past, present, and reasonably foreseeable future actions, would result in minor adverse impacts to historic resources. As discussed under Alternative A, adverse impacts have occurred in the past as a result of modifications to historic buildings and structures, intrusion of incompatible modern buildings in historic districts, and deteriorations of historic buildings. Present and reasonable foreseeable future actions are carefully assessed to minimize adverse impacts to historic resources. Alternative B would result in moderate beneficial impacts and would lessen the overall adverse cumulative effect. Again, cumulative impacts under Alternative B would be minor adverse long term.

*Conclusion* Alternative B implementation would result in moderate beneficial long-term impacts to historic resources from rehabilitation of Supai Camp historic cabins. Cumulative impacts would be minor adverse long term. No impairment of or unacceptable impacts to historic resources would result.

## **Ethnographic Resources and Cultural Landscapes**

### **Affected Environment**

#### *Ethnographic Resources*

Ethnographic resources are defined by the NPS as any “site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (Director’s Order 28, Cultural Resource Management). GRCA lands are traditionally affiliated with 11 Native American tribes, including the Havasupai Tribe. Supai Camp, in particular, is considered an ethnographic resource by the Havasupai Tribe (Wray 1990).

#### *Cultural Landscapes*

As defined in the Cultural Resource Management Guideline (DO-28), cultural landscapes are settings humans create in the natural world. They are intertwined patterns of things both natural and constructed, expressions of human land manipulation and adaptation. Characteristics of cultural landscapes include land uses and activities, patterns of spatial organization, response to the natural environment, cultural traditions, circulation networks, vegetation, buildings, structures, and features. Cultural Landscape Inventories have been completed in several park areas. Although Supai Camp has not been formally inventoried, the Camp itself is considered a cultural landscape.

### **Intensity Level Definitions**

**Negligible** Impacts at lowest levels of detection; historic properties would receive no change to diagnostic artifacts, defining features, or characteristics that contribute to National Register of Historic Places eligibility. Negligible impacts are barely perceptible and alter neither resource condition, such as traditional access and site preservation, nor relationship between resource and affiliated group’s body of practices and beliefs

<b>Minor</b>	<p><i>Adverse</i> Impacts would be slight and noticeable and would neither appreciably alter resource conditions, such as traditional access or site preservation, nor relationship between resource and affiliated group’s body of beliefs and practices</p> <p><i>Beneficial</i> Impacts allow access to and/or accommodate a group’s traditional practices or beliefs</p>
<b>Moderate</b>	<p><i>Adverse</i> Impacts be apparent and alter resource conditions or interfere with traditional access, site preservation, or relationship between resource and affiliated group’s practices and beliefs, even though the group’s practices and beliefs would survive</p> <p><i>Beneficial</i> Impacts facilitate traditional access and/or accommodate a group’s practices or beliefs</p>
<b>Major</b>	<p><i>Adverse</i> Impacts alter resource conditions. Proposed actions would block or greatly affect traditional access, site preservation, or relationship between resource and affiliated group’s body of beliefs and practices, to the extent that survival of a group’s beliefs and/or practices jeopardized. Impacts result in significant changes or destabilization to defining elements and resource condition and an increase in exposure or vulnerability to natural elements</p> <p><i>Beneficial</i> Impacts encourage traditional practices and/or accommodate a group’s beliefs or practices. Beneficial effects include maintaining natural ecosystem processes</p>
<b>Context</b>	All impacts to ethnographic resources and cultural landscapes localized

**Impacts      **Alternative A, No Action****

Under the No Action alternative, no improvements would be completed at Supai Camp. Existing homes would continue to deteriorate and the Camp could eventually become unlivable. Traditional use of the area might cease which would have a direct impact on Supai Camp as an ethnographic resource and cultural landscape. Although Supai Camp is not an Indian trust resource, a general agreement for use and occupancy of Supai Camp is in place. In addition, the park remains committed to government-to-government consultations and maintains a close consultative relationship with the Tribe. Implementation of the No Action alternative would not fulfill the commitments made to the Tribe in the 1930s. Impacts to ethnographic resources and cultural landscapes would be minor adverse long term.

*Cumulative Effects* South Rim ethnographic resources and cultural landscapes have been impacted by development that has changed the way the area is used today. Past development has likely impacted area archaeological resources, ethnographic resources and cultural landscapes. Loss or disturbance of these resources on South Rim (in conjunction with previous losses and prevailing threats to finite numbers of these resources throughout the region) incrementally diminishes overall understanding of Grand Canyon’s cultural history. These past impacts are moderate adverse local long term.

Recently implemented, in-progress and foreseeable future projects have potential to affect ethnographic resources and cultural landscapes and will be assessed for effects to these resources

and discussed with SHPO. Consultation with the park's cultural resource staff and SHPO would ensure any adverse impacts of future projects on ethnographic resources and cultural landscapes would be minimized. Therefore, when combined with Alternative A, cumulative impacts to ethnographic resources and cultural landscapes would be moderate long term.

*Conclusion* Alternative A implementation would result in minor adverse long-term impacts from potential changes in Supai Camp use. Cumulative impacts would be moderate adverse long term. No impairment of or unacceptable impacts to ethnographic resources or cultural landscapes would result.

## **Impacts            Alternative B, Preferred Alternative**

Implementation of Alternative B would result in moderate beneficial long-term impacts to ethnographic resources and cultural landscapes. Construction of new housing units, rehabilitation of existing housing units, improvements to the roads, and consideration for outdoor use areas would provide for continued and expanded use of Supai Camp.

Existing and additional housing opportunities would present access to employment, education, and healthcare opportunities to Havasupai Tribe members not currently available at Supai Village. In addition, the NPS would fulfill its commitments made to the Tribe in the 1930s.

Other actions associated with Alternative B including road improvements to allow year-round access to Supai Camp including school buses, addition of plumbing to existing cabins, and coordination with residents and the Tribe to define and develop outdoor use areas for important tribal activities including traditional ceremonies, memorial services, and celebrations would add to the beneficial impacts and sustainable use of Supai Camp as an ethnographic resource and cultural landscape.

*Cumulative Effects* Alternative B implementation combined with past, present, and reasonably foreseeable future actions would result in minor adverse impacts to ethnographic resources and cultural landscapes. As discussed under Alternative A, adverse impacts have occurred in the past as a result of development, and loss and disturbance of cultural resources. Present and reasonable foreseeable future actions are carefully assessed to minimize adverse impacts to ethnographic resources and cultural landscapes. Alternative B would result in moderate beneficial impacts and would lessen overall adverse cumulative effect. Again, cumulative impacts under Alternative B would be minor adverse long term.

*Conclusion* Alternative B implementation would result in moderate beneficial long-term impacts to ethnographic resources and cultural landscapes from all improvements that would encourage and sustain Supai Camp use by the Havasupai Tribe. Cumulative impacts would be minor adverse long term. No impairment of or unacceptable impacts to ethnographic resources or cultural landscapes would result.

## **Vegetation**

### **Affected Environment**

Major South Rim vegetation types include ponderosa pine forest, pinyon/juniper woodland, and big sagebrush associations. In general, ponderosa pine occupies cooler and moister sites with deeper soils above 7,000 feet. Pinyon/juniper typically inhabits drier sites with shallower soils below 7,000

feet. Sagebrush occupies broader valley bottoms with deeper soils (NPS 1995). Supai Camp is located in ponderosa pine forest. In general, the forest is healthy throughout the project area and would be impacted by any construction activities.

#### *Invasive species*

Several invasive nonnative plant species were found during vegetation surveys conducted June 9 and 11, 2009 (NPS 2009a). Table 3 lists species with priority for treatment.

**Table 3 Nonnative plant species with treatment priority**

Common Name	Scientific Name	Priority for Treatment
Foxtail barley	<i>Hordeum jubatum</i>	High
Jointed goatgrass	<i>Aegilops cylindrical</i>	High
Bull thistle	<i>Cirsium vulgare</i>	Medium
Woolly mullein	<i>Verbascum thapsus</i>	Medium
Horehound	<i>Marrubium vulgare</i>	Medium
Lambsquarter	<i>Chenopodium species</i>	Low
Cheatgrass	<i>Bromus tectorum</i>	Low
Rip-gut brome	<i>Bromus diandrus</i>	Low
Sweetclover	<i>Melilotus officinalis</i>	Low

Invasive plant species have potential to be impacted through this project, specifically during construction activities.

#### **Intensity Level Definitions**

Methodology used for assessing impacts to vegetation is based on how the project will affect native and exotic vegetation in the project area. Thresholds for this impact assessment are

- Negligible** No native vegetation affected, or some individual native plants could be affected, but a change to a biotic community would not be measurable or perceptible
- Minor** Action results in a measurable or perceptible, small, localized change to a biotic community. The change would be of little consequence
- Moderate** Action results in an impact to biotic community measurable and of consequence, but localized
- Major** Action results in a measurable change to a biotic community. Change would be large and/or widespread and could have serious consequences for the species or natural community

#### **Impacts Alternative A, No-Action**

Under Alternative A impacts to vegetation would be long term minor adverse and long term minor beneficial. No construction or ground disturbance would occur under this alternative; therefore, no impacts to native vegetation would occur. Existing invasive nonnative plant species would remain at Supai Camp and would be treated by the vegetation staff as funding and time allows. If invasive plants were treated, impacts to vegetation would be beneficial long term minor. If no treatment were to occur, invasive plants could spread within Supai Camp and adjacent areas which would result in adverse long-term minor impacts on vegetation.

*Cumulative Effects* Vegetation in the project area and other South Rim developed areas has been impacted by native vegetation removal, soil compaction, and introduction and spread of invasive plants. Most recently implemented, in-progress, and foreseeable future projects with potential to affect vegetation include implementation of the South Rim Visitor Transportation Plan, construction of employee housing, management of exotic plant species, and fire management plan activities. Vegetation is considered and mitigation measures included in most projects to limit impacts to native and invasive, nonnative vegetation. Revegetation plans are often incorporated into project planning to take advantage of native plant salvage potential prior to ground disturbance, treat invasive plant species before and after ground disturbance, and plan for revegetation efforts after construction projects are complete. Therefore, when combined with Alternative A, cumulative impacts to vegetation would be adverse minor long term.

*Conclusion* Alternative A implementation would result in minor adverse impacts from continued exotic plant infestations. Minor beneficial impacts would result because native vegetation would remain in place and not disturbed. Cumulative impacts would be minor adverse long term. No impairment of or unacceptable impacts to vegetation would result.

### **Impacts      Alternative B, Preferred Alternative**

Alternative B implementation would result in minor beneficial long-term, and minor adverse long-term impacts to vegetation. Proposed construction of new housing units would involve direct disturbance of vegetative communities and tree removal on a maximum six acres over the next ten years. Other project components involving ground disturbance include trenching to connect Supai Camp to the park's wastewater treatment plant, and to install other utilities to both existing and new units, and proposed road improvements. Widening of existing Supai Camp roads and construction of a new road in the area has potential to directly and adversely impact vegetation. Vegetation impacts include complete removal, pruning, and root disturbance. Potential also exists to increase disturbance to adjacent biotic communities through spread of exotic vegetation and noxious weeds.

Salvage of trees, shrubs and grasses and exotic plant treatment may occur prior to ground disturbance to minimize adverse impacts to vegetation. A vegetation survey conducted for this project found a large infestation, an approximately 1,475 square foot area, of invasive plant species in the project area. A mitigation measure was incorporated into this project to remove as much of the topsoil as feasible within this infested area and dispose of it at a landfill outside the park to minimize spread.

After project completion, revegetation efforts would be employed as funding is available to restore native plant communities. Disturbed areas would be covered with mulch or gravel to reduce invasion and spread of exotic plant species. Future plant surveys and treatment in and around Supai Camp would continue as part of the park's ongoing exotic plant management program.

*Cumulative Effects* Implementation of Alternative B combined with past, present, and reasonably foreseeable future actions would result in moderate adverse long-term impacts to vegetation. As discussed under Alternative A, adverse impacts have occurred in the past as a result of native vegetation removal, soil compaction, and introduction and spread of invasive plants. Present and reasonably foreseeable future actions are designed to minimize adverse impacts to vegetation. Again, cumulative impacts under Alternative B would be minor adverse long term.

*Conclusion* Implementation of Alternative B would result in minor adverse impacts to vegetation from direct disturbance and removal of native plant species including a number of healthy ponderosa and pinyon trees. Negligible beneficial long-term impacts would also result from potential treatment of invasive plant infested topsoil and salvage at Supai Camp. Cumulative impacts would be minor adverse long term. No impairment of or unacceptable impacts to vegetation would result.

## Public Health and Safety

### Affected Environment

Park managers seek to provide a safe and healthful environment for visitors and residents in Grand Canyon National Park. Public health and safety is identified in the Purpose and Need in this EA. The park recognizes existing Supai Camp units do not meet current health and safety codes and, at approximately 300-square feet per unit, these cabins are too small to house more than one or two individuals. In addition, the road configuration does not allow for safe access in winter by residents, snow plows, propane trucks, or emergency vehicles.

### Intensity Level Definitions

<b>Negligible</b>	A change in public health and safety not measurable or perceptible
<b>Minor</b>	A change in public health and safety readily apparent with few measurable consequences
<b>Moderate</b>	A change to public health and safety readily apparent with measurable consequences
<b>Major</b>	A severely adverse or exceptionally beneficial change to public health and safety

### Impacts **Alternative A, No Action**

Under Alternative A minor, adverse long-term impacts on public health and safety would result. The No Action Alternative would not bring existing cabins up to current building codes. Roads would remain unimproved and not accessible year-round. The five approximately 300-square-foot cabins would be the only housing units in Supai Camp. These units would continue to be lived in without any plumbing. Finally, Supai Camp would not be hooked up to the park's wastewater treatment plant and would continue to use the leach field located at the Camp.

*Cumulative Effects* Many past projects have improved South Rim public health and safety including building upgrades to meet current health and safety codes. These past impacts are minor beneficial long term. Most recently implemented, in-progress, and foreseeable future projects with potential to affect public health and safety include implementation of the South Rim Visitor Transportation Plan, fire management activities, and routine maintenance of park infrastructure. Short-term adverse impacts have also resulted during construction activities throughout the park. In addition, projects have been or will be designed to minimize adverse impacts on public health and safety. Therefore, when combined with Alternative A, cumulative impacts to public health and safety would be beneficial minor long term.

*Conclusion* Implementation of Alternative A would result in minor adverse long-term impacts because housing conditions would remain below current health and safety codes and Supai Camp would not be accessible to residents, propane trucks, or emergency service vehicles year-round.

Cumulative impacts would be beneficial minor long term. No impairment of or unacceptable impacts to public health and safety would result.

### **Impacts    Alternative B, Preferred Alternative**

Implementation of Alternative B would result in moderate beneficial long-term impacts to public health and safety from many project components. Construction of new units would meet current health and safety codes. New units would be much larger than existing cabins and accommodate multiple people or a family more easily than existing smaller cabin units.

Upgrades to road conditions and configuration would allow for year-round access to Supai Camp. These upgrades would allow residents, snow plows, propane trucks, school buses, emergency vehicles, garbage trucks, and other vehicles to access Supai Camp throughout winter.

Rehabilitation of existing cabins would meet current health and safety codes. Removal and abatement of hazardous materials such as asbestos and lead paint would occur. Addition of indoor plumbing would improve living quality in the existing cabins. Smoke detectors and sprinklers would be added to these cabins to reduce risk of fire.

Short-term adverse impacts would occur during construction and would be minor.

*Cumulative Effects*    Implementation of Alternative B combined with past, present, and reasonably foreseeable future actions would result in moderate beneficial impacts to public health and safety. As discussed under Alternative A, beneficial impacts have occurred in the past as a result of various actions including building upgrades to meet current health and safety codes. Some short-term adverse minor impacts have occurred from construction activities. Present and reasonable foreseeable future actions are carefully designed to minimize adverse impacts to public health and safety. Again, cumulative impacts under Alternative B would be beneficial moderate long term.

*Conclusion*    Implementation of Alternative B would result in moderate beneficial long-term impacts to public health and safety because improvements would include upgrades to existing housing units to meet health and safety codes, road upgrades to allow year-round access, and construction of larger housing units. Short-term adverse minor impacts during construction would occur. Cumulative impacts would be moderate beneficial long term. No impairment of or unacceptable impacts to public health and safety would result.

## **Park Operations**

### **Affected Environment**

Park operations refer to adequacy of staffing levels and quality and effectiveness of park infrastructure in protecting and preserving vital resources and providing for effective visitor experience. Infrastructure facilities include roads providing access to and within the park, housing for staff required to work and live in the park, visitor orientation facilities, administrative buildings, management-support facilities, and utilities such as phones, sewer, water, and electric. For this project, infrastructure with potential to be affected includes the existing and proposed housing units at Supai Camp, roads to and in the camp, and utilities.

The park Superintendent is ultimately responsible for GRCA park operations management. In 2008, the park employed 445 full-time staff (NPS 2009b) to manage operations including visitor services and facilities, resource management and preservation, planning and environmental compliance, emergency medical services, law enforcement, search and rescue operations, fire center operations, air operations, facilities management and maintenance, and administrative duties. The divisions that would work in Supai Camp and on proposed improvements are the Facilities Management Division (building, utilities and road maintenance, trash and recycling pick-up, and snow plows), Visitor and Resource Protection (emergency services), Science Center (resource protection and coordination with the Havasupai Tribe), and Administration (billing of utilities and rent as appropriate).

### Intensity Level Definitions

- Negligible** A change in operations localized and barely perceptible or measurable. No measurable difference in operating costs from existing levels, and no change in financial balance between revenue sources and operating costs. Park operations not affected or effect at or below lower levels of detection; no appreciable effect on park operations
- Minor** A change in operations slight and localized, with few measurable consequences in existing park facilities. Additions or reductions in operations costs less than 15% of existing levels. Slight change in current staffing arrangements or operations required to reach a balance with funding
- Moderate** A change readily apparent, with measurable consequences and occurs inside and outside park boundaries. Additions or reductions in operating costs between 16% and 30% of existing levels. Changes required in park operations or result in a financial imbalance between available funding and annual operating costs
- Major** A change readily apparent, with measurable consequences over a regional area. Additions or reductions in operating costs more than 30% of existing levels. Changes require new administrative structures and/or result in a significant financial imbalance between available funding and annual operating costs

### Impacts **Alternative A, No Action**

No improvements or construction would occur under Alternative A and no change to current park operations would be necessary. Under the No Action Alternative, park staff would continue to minimally maintain buildings and roads at Supai Camp. Snow plowing would occur as much as possible on the existing road in Supai Camp; however, because the road is in poor condition and steep, plowing has not always been possible. Trash dumpsters would not be provided for weekly pick-up by the park's maintenance staff. Billing residents for water and rent would continue by the park's administrative staff. Emergency services and law enforcement would continue to respond to Supai Camp as needed. Therefore, impacts to park operations under Alternative A would be adverse negligible long term.

*Cumulative Effects* South Rim park operations have been affected through implementation of past projects. These past impacts are minor beneficial long term and include increased efficiency and balance between funding and operational costs. Adverse long-term minor impacts have also resulted from increased operating costs. Most recently implemented, in-progress, and foreseeable

future projects described at the beginning of this chapter have potential to affect park operations. These projects are reviewed for potential effects to park operations and created to minimize adverse impacts. Therefore, when combined with Alternative A cumulative impacts to park operations would be beneficial minor long term.

*Conclusion* Implementation of Alternative A would result in negligible adverse long-term impacts from continuation of park operations. Cumulative impacts would be beneficial minor long term. No unacceptable impacts to park operations would result.

### **Impacts Alternative B, Preferred Alternative**

Implementation of Alternative B would result in both beneficial and adverse impacts to park operations. Adverse impacts would be minor long term. Construction of new units and addition of road surfaces and parking would add to park maintenance needs. NPS maintenance crews would plow snow and pick up trash and recycling. Rent and utilities would be billed by NPS administrative staff. Finally, NPS emergency service and law enforcement would respond to Supai Camp as needed.

Beneficial impacts would be minor long term. All project components would be planned to be efficient for park operations. Building materials would be durable and require minimal maintenance. Construction of new housing would encourage Havasupai Tribal members to apply for NPS and concessions jobs and could alleviate some park housing constraints.

*Cumulative Effects* Implementation of Alternative B combined with past, present, and reasonably foreseeable future actions would result in long-term minor beneficial impacts to park operations. As discussed under Alternative A, beneficial impacts have occurred in the past as a result of increased efficiency and balance between funding and operational costs. Adverse impacts have also occurred due to increased operating costs. Present and reasonable foreseeable future actions are carefully assessed to minimize adverse impacts to park operations. Alternative B would add both adverse and beneficial impacts to the overall cumulative impact which would be minor beneficial long term.

*Conclusion* Implementation of Alternative B would result in minor adverse long-term impacts to park operations from increased maintenance and administrative needs from new housing units and improved roads. Beneficial impacts would be long-term minor from increased South Rim housing opportunities and increased efficiency of all Supai Camp buildings. Cumulative impacts would be minor beneficial long term. No unacceptable impacts to park operations would result.

## CONSULTATION AND COORDINATION

### Internal Scoping

Internal scoping was conducted by an interdisciplinary team of Grand Canyon National Park professionals. Interdisciplinary team members met February 12 and April 17, 2009 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed construction site. Results of the February and April 2009 meetings were used in preparation of this environmental assessment.

### External Scoping

External (public) scoping was conducted to provide information about the proposal to upgrade and rehabilitate Supai Camp in Grand Canyon National Park and to generate input on EA preparation.

### State Agencies

State Historic Preservation Officer

### Affiliated Native American Groups

Havasupai Tribe

### List of Preparers

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## REFERENCES

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Director's Order 12	Conservation Planning, Environmental Impact Analysis, and Decision-Making
Director's Order 28	Cultural Resources Management
Director's Order 28-A	Archaeology
Director's Order 47	Soundscape Preservation and Noise Management
Director's Order 77	Natural Resources Management
Director's Order 77-1	Wetlands Protection
Director's Order 77-2	Floodplain Management

**Executive Orders** referenced in this document are available online at [www.archives.gov/federal-register/executive-orders](http://www.archives.gov/federal-register/executive-orders)

Executive Order 11990	Protection of Wetlands
Executive Order 11988	Floodplain Management
Executive Order 12898	General Actions to Address Environmental Justice In Minority Populations and Low-Income Populations
Executive Order 13007	Indian Sacred Sites

**Secretarial Orders** referenced in this document are available online at Secretarial Order 3175 Indian Trust Assets and Tribal Lands [www.usbr.gov/mp/cao/newmelones/RMP/RIR/5.0-Indian\\_Trust\\_Assets.pdf](http://www.usbr.gov/mp/cao/newmelones/RMP/RIR/5.0-Indian_Trust_Assets.pdf)

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- Secretary of the Interior's Standards for the Treatment of Historic Properties, 36 CFR 68 [www.nps.gov/history/hps/tps/standguide/](http://www.nps.gov/history/hps/tps/standguide/)

## Acronyms

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DO	Director's Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
GMP	General Management Plan
GRCA	Grand Canyon National Park
MSO	Mexican Spotted Owl
NEPA	National Environmental Protection Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
SHPO	State Historic Preservation Officer
USFWS	U.S. Fish and Wildlife Service