National Park Service
U.S. Department of the Interior

Pinnacles National Monument
Paicines, California

Pinnacles National Monument
Radio Coverage Improvement Project
Environmental Assessment
October 2009

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1.0 Purpose and Need for Action

Pinnacles National Monument (Pinnacles) proposes to improve its internal radio communications capabilities presently considered deficient in many areas of the Monument. Pinnacles proposes to install a new radio repeater to improve NPS radio reception in high priority areas of the Monument. The timeframe for installation would be 2009-2010.

The existing park operations radio communication system, comprised of two radio repeaters and three base stations, has a number of "dead" zones in the central and northern portions of the Monument. Some of these "dead" areas currently lacking radio coverage occur along popular visitor use areas in designated wilderness such as the North Wilderness Trail, Old Pinnacles Trail, and Balconies Cliff Trail. These heavily used areas have potential needs for active law enforcement and medical emergency responses. As a consequence, new infrastructure providing radio communications capabilities in "dead areas" within wilderness boundaries is crucial for supporting the park's wilderness operations.

The Monument has had medical and safety incidents where poor communications jeopardized the safety of park visitors and staff, or slowed down the park's incident response actions. During one situation involving a lightning caused wildfire in the East District, the park was not able to warn West District personnel of the situation and possible evacuation requirements until a staff member hiked to a remote area of the park having radio reception to both east and west districts. The time delay for the "human radio repeater" to get into position to transmit messages between the two sides could have potentially threatened lives of visitors and staff in the park.

In another incident, a visitor lost consciousness along a trail in a radio "dead zone" where the medical responder could not receive or transmit any radio signals. A second staff member had to rush up the trail for over a half mile to the highest elevation to make radio contact. In this case, communications failures delayed the evacuation and transport of the patient to advanced medical care.

Recently, law enforcement officers responded to visitors shooting guns along Old Pinnacles Trail. Because of poor radio coverage along this trail, a law enforcement ranger had to respond to the incident with no radio communication. Responding to a potentially dangerous situation without radio communication is a serious officer safety concern for the park. In addition, it is also critical for all employees on the trail to be able to report these incidents as soon as possible because they too are at risk as they are uniformed employees.

1.1 Objective

The objectives of the project is to provide new radio coverage in dead areas along heavily used hiking trails such as the Old Pinnacles Trail, Balconies Cliff Trail, and the North Wilderness Trail.

1.2 Project Setting

Pinnacles National Monument consists of 26,000 acres of diverse wildlands rising out of the chaparral-covered Gabilan Mountains, east of central California's Salinas Valley (see Figure 1 page 3). The Monument was created 100 years ago through a presidential proclamation by President Theodore Roosevelt based mainly on the presence of spectacular geologic features in the area including the remains of an ancient volcano, massive monoliths, spires, and sheer-walled canyons and talus passages. The rock formations divide the park into East and West Districts which are connected by trails, but not by a road. The Park's rock formations are a popular destination for climbers.

A rich diversity of wildlife can be observed in the Monument throughout the year, including the presence of federally endangered and other rare biological species. The rocky summits and peaks of Pinnacles provide nesting habitat and roosts for many raptors, including prairie falcons (*Falco mexicanus*) and golden eagles (*Aquila chrysaetos*) as well as many smaller bird species. The Monument is one of five release sites for the federally endangered California Condor (*Gymnogyps californianus*). In addition to animals, one of the more popular visitor activities is viewing the spring wildflower displays.

Over 60 percent (i.e., ca.16,000 acres) of the Monument is designated as Wilderness. Within these areas, more than 30 miles of trails access geological formations, spectacular vistas. Along with climbing in the wilderness rock formations, hiking along wilderness trails is one of the most popular visitor activities.

The Monument is geographically and administratively divided into the East and West Districts by the steep mountain peaks in the interior. There are no road connections between the two sides. The only connections between the two sides are via hiking trails which require an hour or more to cross to the other side. To drive around the park from one side to the other requires more than an hour.

1.3 Issues

The issues listed below were identified during internal (National Park Service) scoping meetings, site visits, and public scoping. Input from the staff interdisciplinary team was used to formulate the issues described below. They served as a guide in refining the alternatives, determining what resources could be impacted, and developing mitigation strategies to minimize impacts.

A scoping announcement was sent out to individuals, agencies, tribes (e.g., Amah Musun Tribe) and organization informing them of the proposal and requesting any suggestions and/or comments they might have regarding early planning for the project.

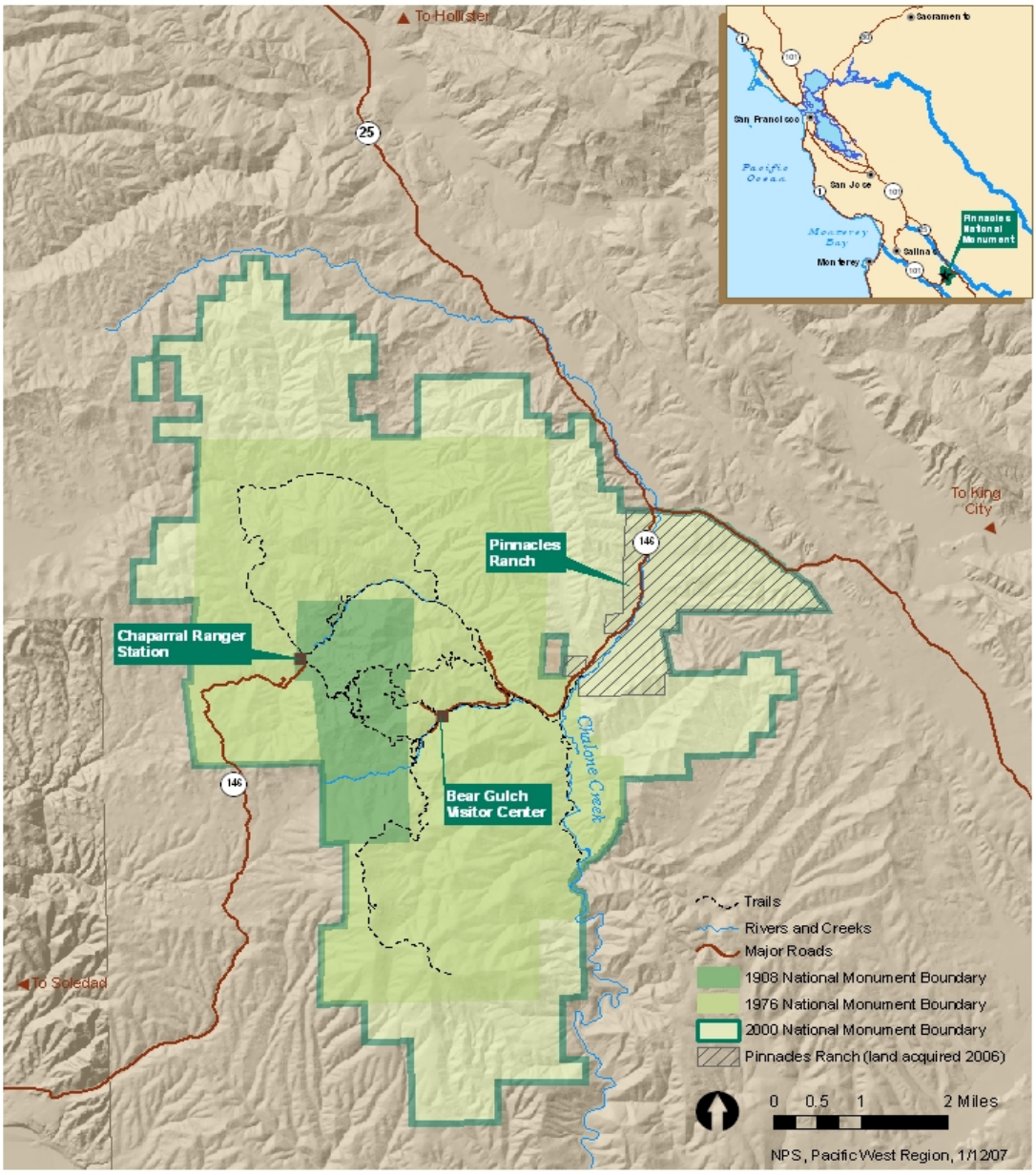

Figure 1. Pinnacles National Monument Vicinity Map.

The general public will have another opportunity to comment on this proposal during the 30 day public comment period. The public will be informed when the comment period begins through local newspapers, libraries, radio stations, the Monument's website, and the Monument's mailing list. A number of copies of the environmental assessment will be available to anyone until they run out. Several copies will be sent to local libraries for reviewing, and the document will be available for downloading at the Monument's website. The public will be encouraged to submit comments to the Monument's Planning, Environment, and Public Comment (PEPC) website and/or send them directly to the park.

The following are impact topics that will be further addressed in this document:

1.3.1 Wilderness Preservation

One existing (i.e., Scout Peak repeater) and one proposed radio repeater site (Willow Springs site) are located within the federally designated Wilderness. Wilderness values, including solitude, and view sheds would be impacted in certain portions of the wilderness during the short-term initial setup, the long-term maintenance schedule, and throughout the life of the system by the visual intrusion of radio repeater equipment. Installation and maintenance would require human work activities that would impact wilderness values for some visitors. Although it is preferable to site the radio infrastructure outside of wilderness boundaries and in places where it is less visible, the technical requirements of the system (i.e., optimum radio reception) may require the placement of equipment within designated wilderness and in areas that have a greater impact on the view shed.

1.3.2 Historic and Prehistoric Properties

The proposed new radio repeater with a 13 foot antenna pole and the existing radio repeater poles attached to the fire observation tower at Chalone Peak and the comfort station at Scout Peak may affect the historic view sheds associated with the National Register of Historic Places (NRHP) eligible Pinnacles Trail System. It appears the historic properties will not be adversely affected by this undertaking, based on a preliminary assessment according to National Register criteria. However, the precise degree of impact will be unknown until the final sitings and view shed analysis takes place. Excavation and clearing during construction could also potentially impact archeological resources in the Monument.

1.3.3 Vegetation

Installation of the radio repeater will require ground clearing and impacts to vegetation. Plant surveys will need to be conducted prior to construction activities at both the new radio repeater site and the microwave dish monopole sites.

1.3.4 Wildlife

It is estimated that between four and five million birds are killed each year in North America due to collisions with communications towers (Manville 1999). Most reported kills happen at towers that are several hundred feet in height and equipped with guy lines and/or lights. In addition, communications sites can impact bird nesting activities. At Pinnacles, numerous raptor nesting sites, including the federally protected California

Condor *(Gymnogyps californianus)* (see section 3.4.7 p.39), occur in potential radio repeater sites. In order to minimize bird collisions or disturb nesting sites, appropriate siting and construction of the radio repeater are extremely important. Clearing of vegetation and construction activities could impact small slow moving wildlife. Therefore, wildlife is an issue that will be analyzed in this document.

1.3.5 Health and Public Safety

There are several regions within the park complex where radio coverage is lacking. This presents a potential risk to public safety if an emergency occurs and the respondent cannot call for help on the radio from the location of the incident. However, the Monument is a rustic semi-remote park, and communication throughout are not feasible. Park public safety operations rely heavily on communications using two-way land mobile radios. Incident responses have highly critical radio needs because the radio is the usually the only form of communication available. The radio system is also critical for enabling NPS to communicate with other agencies the mutually respond to emergency incidents within Pinnacles (e.g., sheriff and Cal-Fire).

1.3.6 Park Operations

Maintenance and trails workers, resource crews, backcountry rangers, and fire personnel, among others, all rely on the radio to coordinate work crews, to check-in with dispatch, and for potential emergency needs that might occur. A lack of radio coverage in some key areas of the park makes timely communication for park staff impossible in some places. Staff members either forgo using the radio, or they have to travel to an area that has radio reception, thus increasing response time during emergencies.

1.4 Issues Considered but not Further Addressed

Several issues where considered not likely to be affected by the project due to the location of the proposed new radio repeater sites in upland areas, use of quiet solar energy power sources, and lack of lighting at either proposed structure. During scoping, Interdisciplinary team members considered the following topics would not likely be affected by the proposed project: geohazards, air quality, stream flow characteristics, wetlands, important fish habitat, socioeconomics, minority and low income populations, energy resources, soundscapes, night sky, urban quality, and gateway communities.

1.5 Relevant Laws, Regulations, and Policies

Various laws, regulations, and policies limit the nature and scope of management actions that are acceptable in the national park, recreation areas, and designated wilderness. Relevant portions are described in this section.

The Communications Act of 1934 (47 USC 305)
Government stations “shall use such frequencies as shall be assigned to each or to each class by the President…and shall conform to such rules and regulations designed to prevent interference with other radio stations and the rights of others as the [Federal Communications] Commission may prescribe.”

Director’s Order #15: NPS Wireless Spectrum Management
This Director’s Order sets forth the instructions and requirements for National Park Service managers to obtain and maintain effective wireless telecommunications systems which comply with all relevant standards and authorities. The order directs the NPS to

follow requirements for NPS facilities in the Radio Communications Handbook.

"The principal method of communicating by wireless in National Park Service units will be by utilizing units of the Service's private land mobile radio systems. The development, maintenance, and utilization of these private radio systems is essential to ensure that in critical, life safety situations, the NPS unit will have unfettered access to reliable, secure radio communications designed specifically to meet the essential geographic service area requirements of the NPS. In park operations, the use of commercial services will not be utilized except as may be required to supplement the Service's systems; the private land mobile radio systems of the Service shall be utilized to support essential law enforcement, public safety and management functions."

The Wilderness Act of 1964
Federal agencies administering designated wilderness are responsible for preserving the wilderness character of the area. Wilderness areas are devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. Prohibited uses include the following: there shall be no commercial enterprise and no permanent road within any wilderness area and, except as necessary to meet minimum requirements for the administration of the area (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Public Law No: 94-567 (1976) and Public Law No: 107-370 (2002)
Laws enacted by the U.S. Congress designating the Pinnacles Wilderness in 1976, and adding significant additions to the Wilderness in later designations. The Pinnacles Wilderness now has a total of 15,985 acres.

Director's Order #41: Wilderness Preservation and Management
"Planned administrative actions that may result in an exception to a prohibited use (i.e., chainsaws, aircraft use, **radio repeater sites**, …) or have the potential to impact wilderness resources and values must be consistent with an approved wilderness management plan and be documented in accordance with the park's minimum requirements process."

2006 NPS Wilderness Management Policies

6.3.10.1 Administrative Facilities
Administrative facilities (for example, ranger stations and/or patrol cabins, fire lookouts, radio and/or cellular telephone antennas, **radio repeater sites**, associated storage or support structures, drift fences, and facilities supporting trail stock operations) may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park's wilderness management plan or other appropriate planning documents.

This section indicates that the NPS may place a radio repeater site within wilderness if the repeater is found to be the minimum required to carry out wilderness management objectives of which public health and safety is an integral part. The necessity of the

repeater and the determination of the appropriate "minimum tool" would be determined by the "Minimum Requirement Analysis" process concurrent with the appropriate level of NEPA review.

The National Historic Preservation Act of 1966
Federal agencies must consider the effects of their activities (construction, licensing, or permits) on historic properties. Section 106 of the National Historic Preservation Act of 1966 directs federal agencies to take into account the effects of projects on historic or archeological properties that are listed in or eligible for listing in the National Register of Historic Places. Agencies must consult with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, an independent federal agency that advises the president and the congress on matters pertaining to preservation of historic architectural, archeological, and cultural properties. The Advisory Council comments on how the project affects significant properties. In most cases, agreement on how a project will be carried out with the least harm to important properties are written into a Memorandum of Agreement which is signed by the agency, the SHPO, and the Advisory Council.

The Endangered Species Act of 1973
Federal agencies must, in consultation with and with the assistance of the Secretary, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species. Agencies must also ensure that actions do not result in the destruction or adverse modification of critical habitat of such species.

NPS Reference Manual #50B: Risk Management Program (1999)
The Risk Management Program in part requires Operation Unit managers to "assure prompt initial treatment and transportation to emergency medical care facilities for occupational injuries and illnesses."

NPS Management Policies (2006)
Human Resources
1.9.1.4 Employee Safety and Health. "The safety and health of employees, contractors, volunteers, and the public are core Service Values." "The Service must ensure that all employees are trained and informed on how to do their jobs safely, and that they have the necessary clothing, materials, and equipment to perform their duties with minimal personal risk."

Wilderness Preservation and Management
6.3.4.3 Environmental Compliance. "Managers contemplating the use of aircraft or other motorized equipment or mechanical transportation within wilderness must consider impacts to the character, esthetics, and traditions of wilderness before considering the costs and efficiency of the equipment. "In evaluating environmental impacts, the NPS will take into account 1)wilderness characteristics and values, including the primeval character and influence of the wilderness; 2) the preservation of natural conditions (including the lack of man-made noise); and 3) assurances that there will be outstanding opportunities for solitude, that the public will be provided with a primitive and unconfined type of recreational experience, and that wilderness will be preserved and used in an unimpaired condition. Managers will be expected to appropriately address cultural resources management considerations in the development and review of environmental

compliance documents impacting wilderness resources."

6.3.5 Minimum Requirement. "All management decisions affecting wilderness must be consistent with the minimum requirement concept." "When determining minimum requirements, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience."

6.3.8 Cultural Resources. "Cultural resources that have been included within wilderness will be protected and maintained according to the pertinent law and policies governing cultural resources, using management methods that are consistent with the preservation of wilderness character and values."

6.3.10.1 Administrative Facilities. "Administrative facilities may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park's wilderness management plan or other appropriate planning documents."

Visitor Safety and Emergency Response
8.2.5.1 Visitor Safety. "The saving of human life will take precedence over all other management actions as the Park Service strives to protect human life and provide for injury-free visits. The Service will do this within the constraints of the 1916 Organic Act. The primary—and very substantial—constraint imposed by the Organic Act is that discretionary management activities may be undertaken only to the extent that they will not impair park resources and values."

"…the recreational activities of some visitors may be of especially high-risk, high-adventure types, which pose a significant personal risk to participants and which the Service cannot totally control. Park visitors must assume a substantial degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments."

Park Facilities
9.4.5 Miscellaneous Management Facilities. "When installations such as …communication monopoles…are necessary, they will be located and designed to minimize their impact on resources and their intrusion on the visitor experience. Whenever possible and practicable, such installations will be located within developed park areas or outside park boundaries. When totally utilitarian facilities…absolutely must be developed inside a park, they will be screened from view, sited to avoid adverse impacts on resources, and not detract from the visitor experience."

2.0 Alternatives

This chapter identifies the No Action Alternative (i.e., No change) and the Action Alternatives, including the Preferred Alternative which was developed to meet the project purpose and need of improving radio coverage in high use areas of the Monument.

2.1 Alternative A - No Action Alternative

For the No Action Alternative, no new radio repeater will be installed. The existing internal radio communications system operates using two radio repeaters that provide coverage for the network. A radio repeater is attached to the Chalone Peak fire observation tower which is located in the southern portion of the Monument. The antenna is attached approximately 40 feet above ground (see Photo 1). The Scout peak radio repeater, located more centrally in the Monument, is attached to a comfort station with the antenna approximately 20 feet above the ground (see Photo 2). Figure 2 shows the locations of existing radio repeaters in the Monument.

Three base stations existing at the Chaparral ES Cache, the Chalone Maintenance facility, and at the Bear Gulch Conference Room provide communications support within the Monument. There are currently 10 vehicle-mounted and 63 handheld radios in use in the Monument. Signals from the Monument are then signaled to the dispatch office located in Sequoia-Kings Canyon National Park.

Photo 1. Radio repeater attached to Chalone Peak Fire Observation Tower

Photo 2. Radio repeater attached to Scout Peak Comfort Station

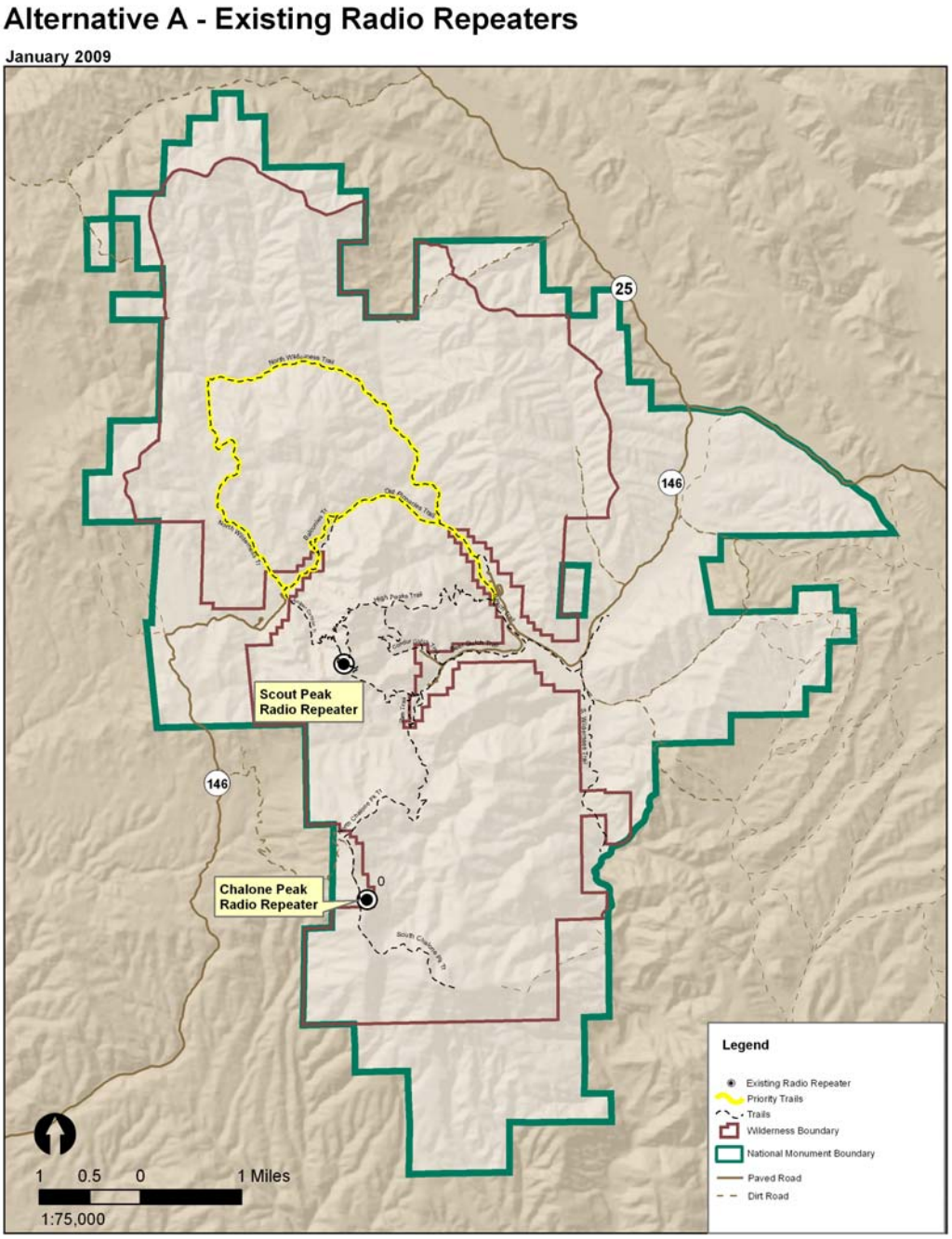

Figure 2. Existing Radio Repeaters

2.2 Action Alternative Equipment and Site Selections

The three Action Alternatives (Alternative B, C, and D) include the two existing radio repeaters described for Alternative A and a new radio repeater to be installed at a different location within the Monument. The Action Alternatives differ in the location of the proposed new repeater site. The following section describes site selection and proposed equipment for the new radio repeater.

2.2.1 Proposed New Radio Repeater Equipment

NPS Regional Radio staff recommended installing a new radio repeater in the Monument that would provide radio coverage along high use trails that currently experience "dead zones" in radio coverage. The equipment configuration for the new radio repeater will consist of a 25"x25"x52" metal repeater equipment box secured with 4 ground rods having an 8-10" ground clearance, and a 13 foot galvanized pipe onto which a solar panel and antenna are attached. An example of the equipment configuration for the radio repeater is shown in Photo 3. Equipment and installation workers will be transported via helicopters during installation. Installation of the radio repeater is expected to require one day. Maintenance visits will be made once a year by hiking to the repeater.

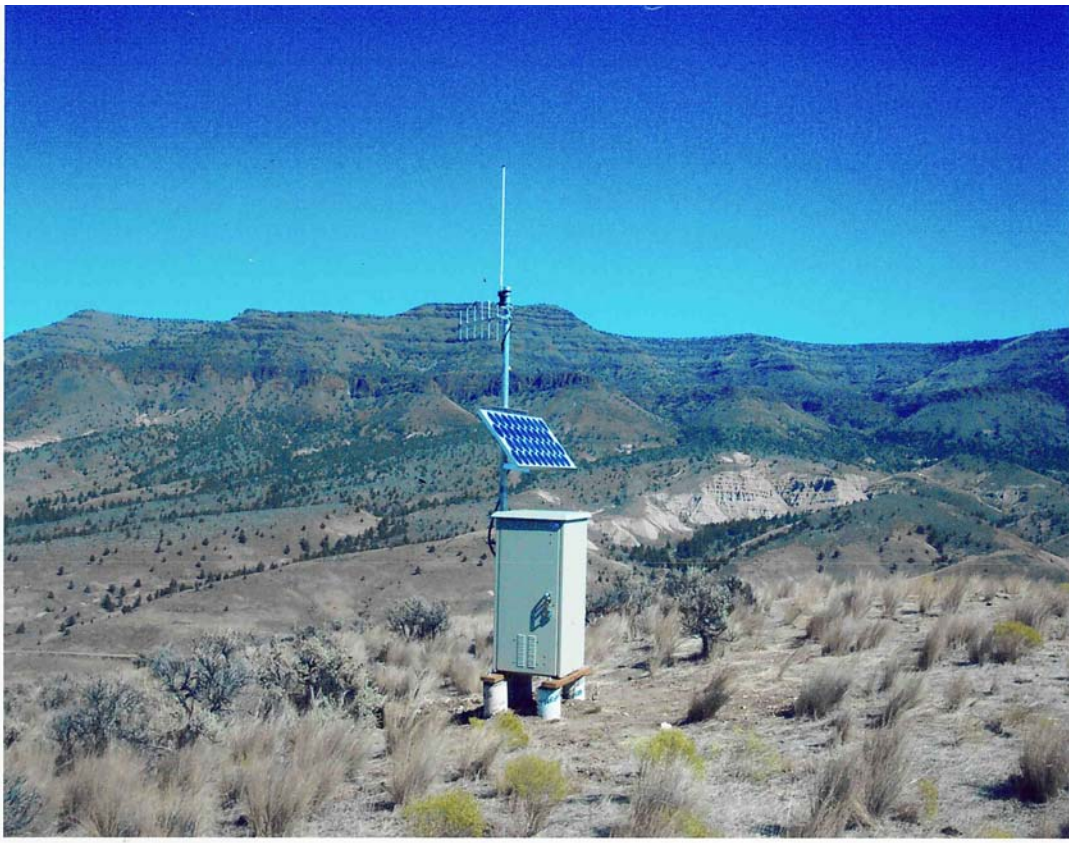

Photo 3. Example of radio repeater equipment configuration

2.2.2 Selection of New Radio Repeater Alternative Sites Using Ground Radio Surveys and GIS View shed Analysis

2.2.2.1 Priority Trails in Need of Improved Radio Coverage

To improve radio coverage in dead zones along high priority trails, siting and installation of a new radio repeater is proposed. Criteria used to site the new radio repeater included the following:

- Minimize impacts to view sheds and natural and cultural resources
- Maximize transmission and reception capabilities in dead areas along priority trails.

For the radio repeater siting, PINN staff prioritized areas in the monument they considered in need of improved radio coverage. Prioritizing was based primarily on high visitor use and remote trails presently lacking radio coverage. As shown in Figure 3, park staff considered Old Pinnacles (including the Balconies Cliffs Trail) and the North Wilderness Trail as the two top priority trails needing improved radio coverage.

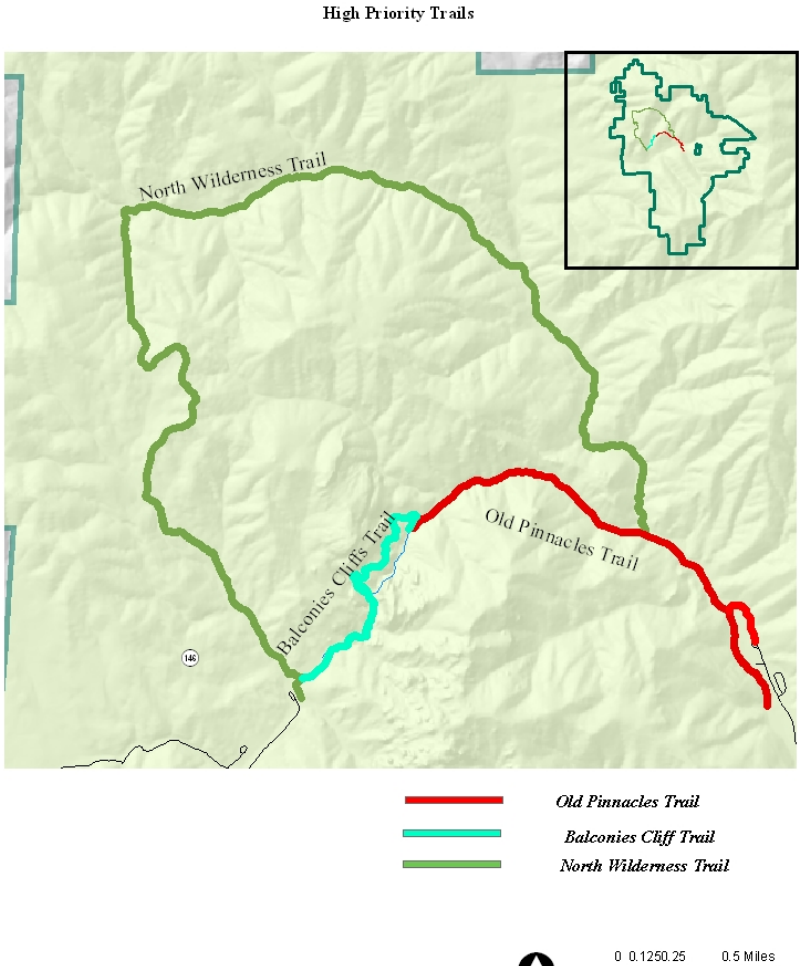

Figure 3. High Priority Trails

2.2.2.2 Ground Radio Surveys

Preliminary ground radio surveys by regional NPS radio staff were performed to locate potential sites to place a new radio repeater in order to provide radio coverage along priority trails (i.e., Old Pinnacles Trail (including Balconies Cliff Trail), and North Wilderness Trail). The survey involved park and regional NPS staff moving to various sites within the park and attempting radio contact with other staff personnel moving along priority trails. Results of this survey revealed a favorable site on a ridgeline adjacent to a pig exclusion fence near Willow Springs (see Figure 8, p.21). This site showed the best "on the ground radio reception" along Old Pinnacles Trail and the North Wilderness Trail compared to other sites tested. As shown in Figure 8, the Willow Springs site is located within Wilderness boundaries of the Monument.

2.2.2.3 Coverage Analysis using GIS 3D Spatial Analysis

The rugged topography of Pinnacles National Monument poses significant challenges for radio coverage. Trails and roads tend to be sited in steep monument canyons. In an attempt to locate potential suitable new radio repeater sites, including sites outside the wilderness boundary, regional NPS staff performed a view shed analysis using ArcView GIS 3D Spatial Analysis. A GIS analysis was performed looking from the high priority trails (i.e., Old Pinnacles, Balconies Cliff, and North Wilderness) trails outward, resulting in a set of hilltops and ridges with the highest potential to provide radio coverage of the priority trails. From there, the analysis was reversed, in order to estimate the extent of priority trail coverage from each of those sites. The intent of the analysis was to model likely radio coverages one could expect if a repeater were installed at a certain location within the monument. Areas within a view shed from a certain location will likely also to have radio contact.

The GIS analysis is based on 10-meter digital elevation topography only. In areas of very steep topography, such as the Balconies Cave Area, it may overestimate coverage because the 10-meter resolution is not fine enough to accurately represent the landscape. On the other hand, in areas with gradual topography, such as much of the North Wilderness Trail and the southeastern portion of the Old Pinnacles Trail, it may underestimate coverage because radio waves can "curve" slightly over hills while the GIS analysis works on a strict line-of-sight basis. Additionally, other factors such as vegetation have not been factored in. GIS is a good coarse-level tool for selecting potential repeater locations, but the final decision for exact siting should be based on the results of field testing.

Results were generated by extracting the trails that overlap with the coverage areas for each proposed repeater location. Table 2.2.2.3 (page 19) provides a summary of the miles of coverage for these trails. It is important to note that the objective is not as simple as maximizing absolute coverage of these trails. It is also desirable to situate the coverage on portions of the trail farthest from current coverage. This minimizes the distance an employee in an area without coverage would have to hike to obtain

coverage. For the same reason, it is also beneficial to add coverage to off-trail areas that can be quickly and easily hiked to from a trail. These additional components can best be evaluated by examining the coverage maps (Figures 4-7 pages 15-18).

To model the present radio coverage in the monument, a GIS analysis was first conducted on the existing radio system (i.e., No Action Alternative). As revealed in the analysis shown in Figure 4, the existing communication system of two radio repeaters and three base stations has extensive "dead" areas with no radio coverage along Old Pinnacles Trail and North Wilderness Trail (see Figure 4 on page 15). The existing communication system provides some coverage along the western portion of the North Wilderness Trail. With the No Action Alternative (Alternative A), the ability of park personnel to respond to visitor safety incidents and/or park operations in these heavily used remote areas will continue to be limited by poor communication capabilities.

The GIS analysis revealed potential new radio coverage along Old Pinnacles Trail and North Wilderness Trail when a radio repeater was simulated on the ridge east of Willow Springs. This ridge has several "knobs" that rise above the rest of the terrain, so five of the most promising of these were chosen for GIS analysis: the original "Willow Springs" site which was previously field tested, plus four more sites within one mile to the north (Willow Springs 1-4). Willow Springs 1-4 were considered but dismissed due to either insufficient coverage or potential impacts (see section 2.7.4.1 page 28), and the Willow Springs site will be included as the Preferred Alternative (i.e., Alternative B). The results of the GIS coverage analysis for the Willow Springs site are shown in Figure 5 (page 16).

Figure 6 (page 17) shows the results of the GIS analysis from the Harris Site, a location in the northern portion of the monument showing new coverage along the North Wilderness Trail. Based on some new coverage likely along one of the priority trails, this site will be included in one of the Action Alternatives (i.e., Alternative C).

Figure 7 (page 18) shows the results of the GIS analysis from the Smith Road Site located in the northern portion of the Monument, just outside the Wilderness boundary. GIS analysis of this site also shows some new coverage likely along the North Wilderness trail, and therefore, this site will be included in one of the Action Alternatives (i.e., Alternative D).

Although other potential new radio repeater locations analyzed showed coverage along the priority trails, these were not considered further based on deficiencies or potential impacts (see Section 2.7.4 on page 28).

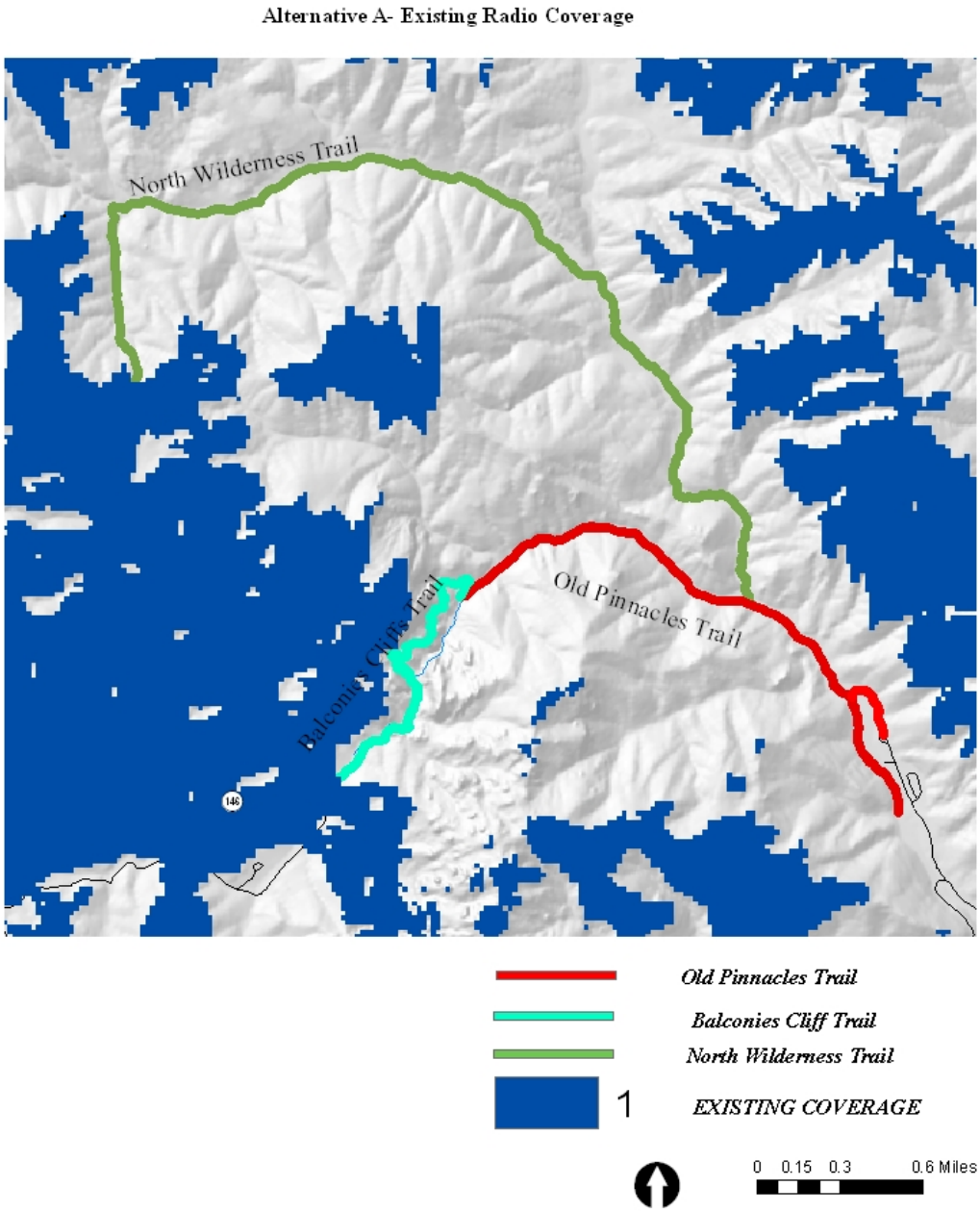

Figure 4. GIS View shed Analysis of Existing Radio Repeater Sites at Chalone Peak and Scout Peak (Alternative A – No Action Alternative)

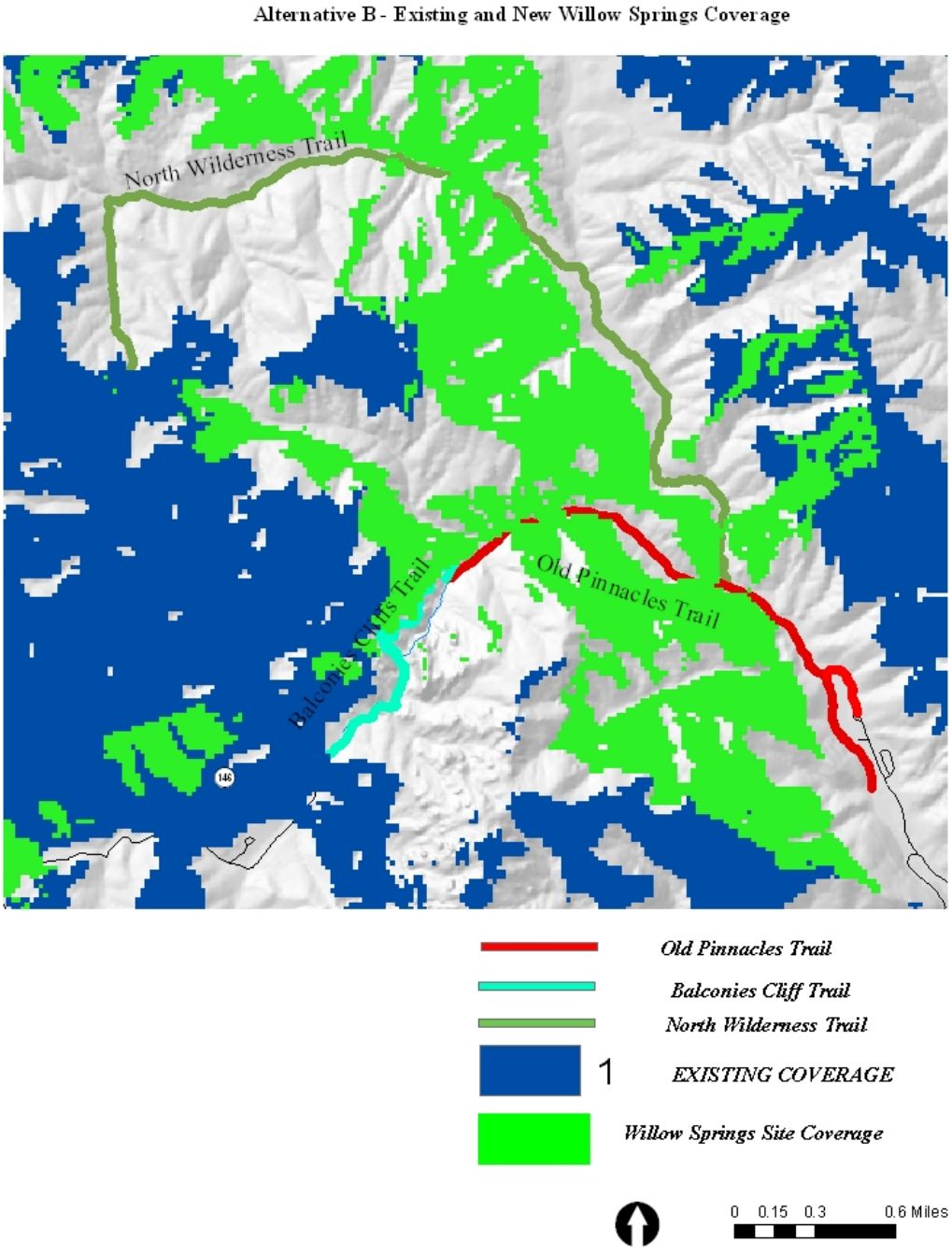

Figure 5. GIS View shed Analysis for Existing Coverage and New Willow Springs Site

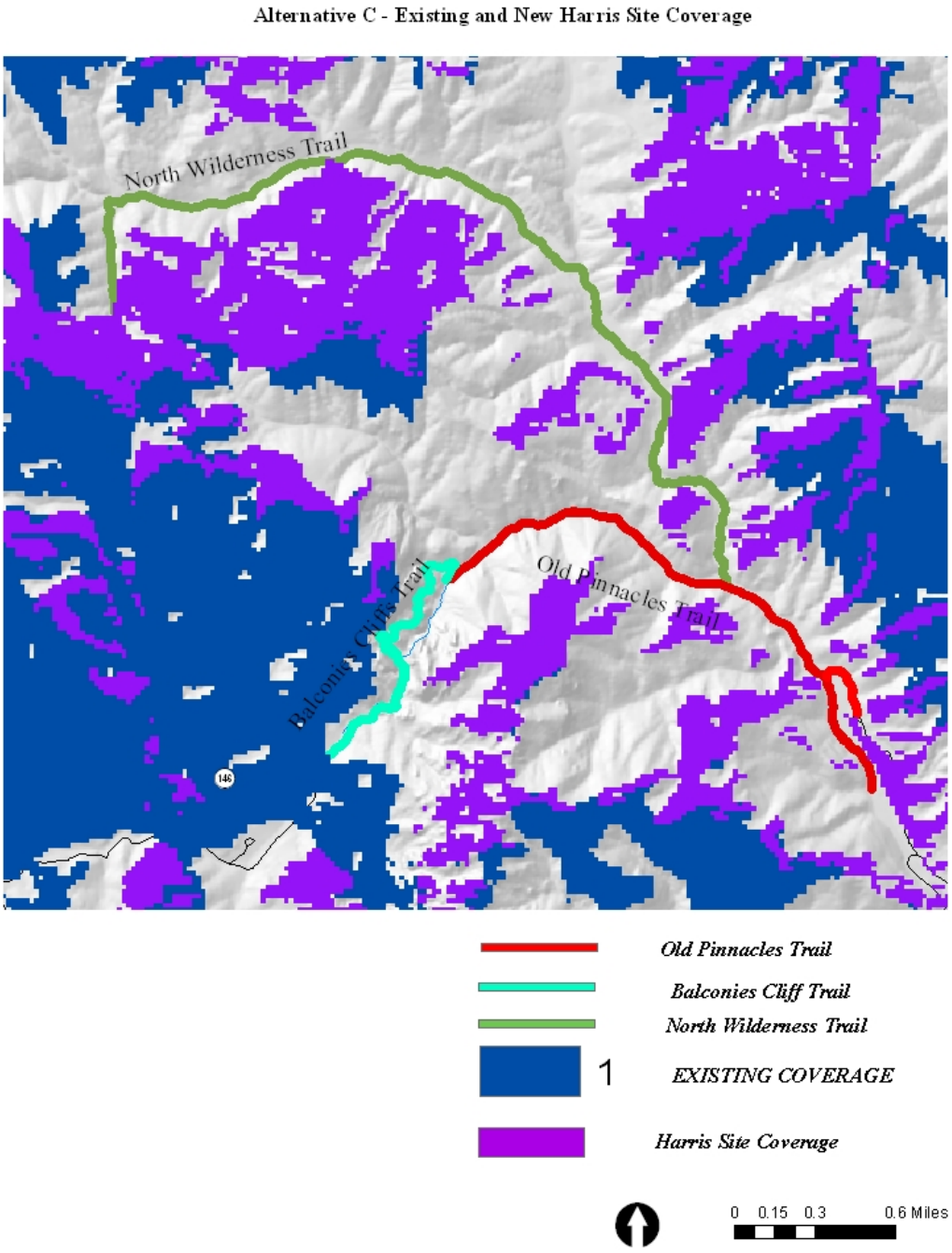

Figure 6. View shed/Radio Coverage Analysis from Harris Site.

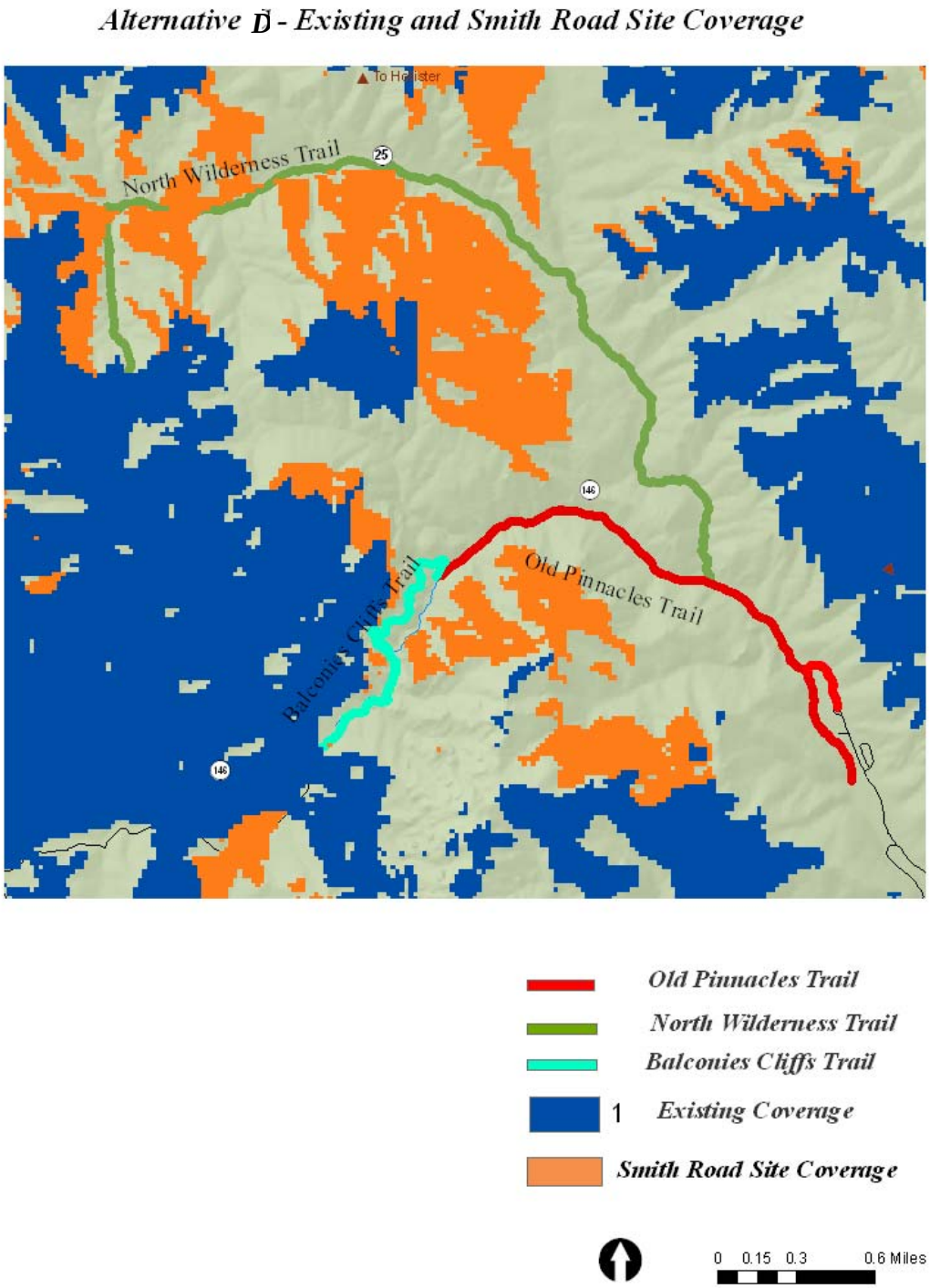

Figure 7. View shed/Radio Coverage Analysis from Smith Road Site.

Table 2.2.2.3: GIS Radio Coverage Analysis for the Old Pinnacles and North Wilderness Trails.

Coverage Areas	Old Pinnacles Trail (includes Balconies segment) (miles covered)	North Wilderness Trail (miles covered)	Total Miles of Priority Trails Covered
Total Trail Length	2.2 miles	6.6 miles	**8.8 miles**
Existing Coverage	None	2.3 miles	**2.3 miles**
Willow Springs	0.4 miles	2.7 miles	**3.1 miles**
Harris Site	None	2.7 miles	**2.7 miles**
Smith Road	None	2.6	**2.6 miles**
Bear Valley Coverage	.006 miles	2.3 miles	**2.3 miles**

(Note: Values include existing coverage, so a site offering no coverage on the Old Pinnacles Trail and 2.3 miles on the North Wilderness Trail represents no new coverage. Actual radio coverage will vary.)

Results of this analysis revealed that placement of a radio repeater at the Willow Springs would likely result in approximately 0.4 mile of new coverage along the 2.2 mile trail Old Pinnacles Trail (see Table above). The Bear Valley Site showed coverage along Old Pinnacles Trail, but it is located in a California Condor sensitive area, and therefore could not be considered further. None of the other sites showed any coverage along Old Pinnacles Trail. Results of the GIS Analysis support the ground radio studies that showed the Willow Springs site as the most favorable location to install a radio repeater to improve coverage along Old Pinnacles Trail.

The GIS view shed analysis also reveals that the three action alternatives would likely increase radio coverage along the North Wilderness Trail by only 5 to 6 percent. This increase in coverage does not appear to be substantial, and the differences in expected coverage along the North Wilderness Trail between the Willow Springs, Harris, and Bear Valley sites are very minimal.

Based on the enhanced coverage along Old Pinnacles Trail, and at least some improvement along the North Wilderness Trail, the Willow Springs site will be included as the radio repeater site for the Preferred Alternative (i.e., Alternative B). The Harris radio repeater site will be included in Alternative C, and the Smith Road repeater site will be included in Alternative D.

Additional selected sites outside of designated Wilderness were subjected to view shed analysis to determine whether a suitable radio repeater site outside the Wilderness boundary could be found. However, none of the other sites showed very good coverage along priority trails compared to the selected Action Alternative sites.

2.3 Alternative B - Existing Radio Repeaters and a New Radio Repeater at Willow Springs (Preferred Alternative)

Under this alternative, one new radio repeater installed near Willow Springs. Installation of the radio repeater at the Willow Springs site is expected to require one day, using a helicopter for delivering equipment and workers to the site and for maintenance work (see Figure 8 on page 21). The radio repeater site is in a clear area adjacent to the pig fence (see Photo 4 page 22). The construction area for installation will be approximately 15 feet x 15 feet.

2.4 Alternative C –Existing Radio Repeaters and a New Radio Repeater at Harris Site

For this Alternative, a new radio repeater with a thirteen feet high antenna pole (see example configuration in Photo 3 page 11) would be installed at the Harris Site (see Figure 9 page 23). Equipment and workers would have access to the site using ground transportation along a dirt road (i.e., no helicopters will be needed for installation and maintenance). The radio repeater will be installed in a partially cleared area adjacent to the road (see Photo 5 page 24). As seen in Figure 9, the Harris radio repeater site is located outside the designated wilderness boundary.

2.5 Alternative D –Existing Radio Repeaters and a New Radio Repeater at Smith Road Site

For this Alternative, a new radio repeater with a 13 feet high antenna pole would be installed at the Smith Road Site (see Figure 10 page 25). As seen in Figure 10, the Smith Road radio repeater site is located outside the designated wilderness boundary. The site is in a cleared area adjacent to a dirt road (see Photo 6 page 26).

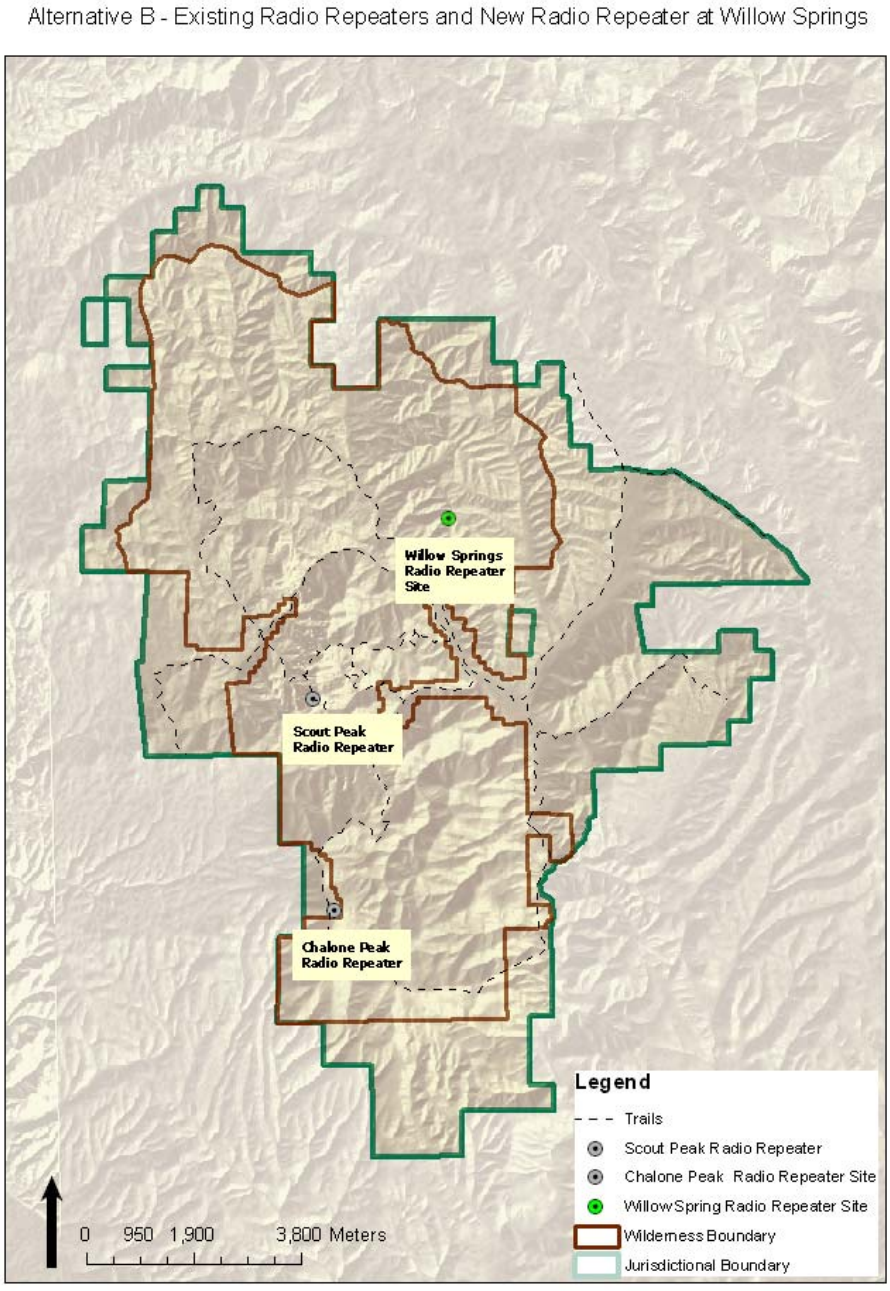

Figure 8. Alternative B – Existing Radio Repeaters and new Radio Repeater at Willow Springs Site

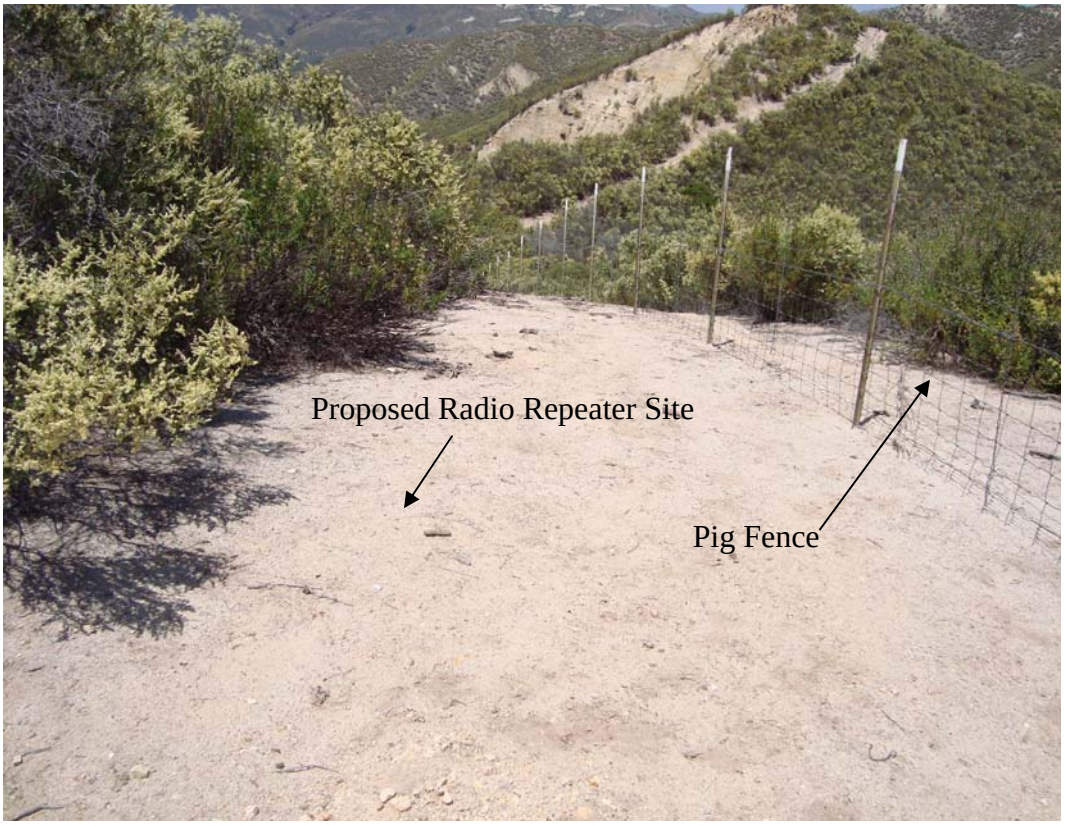

Photo 4. Proposed radio repeater at Willow Springs site along pig fence.

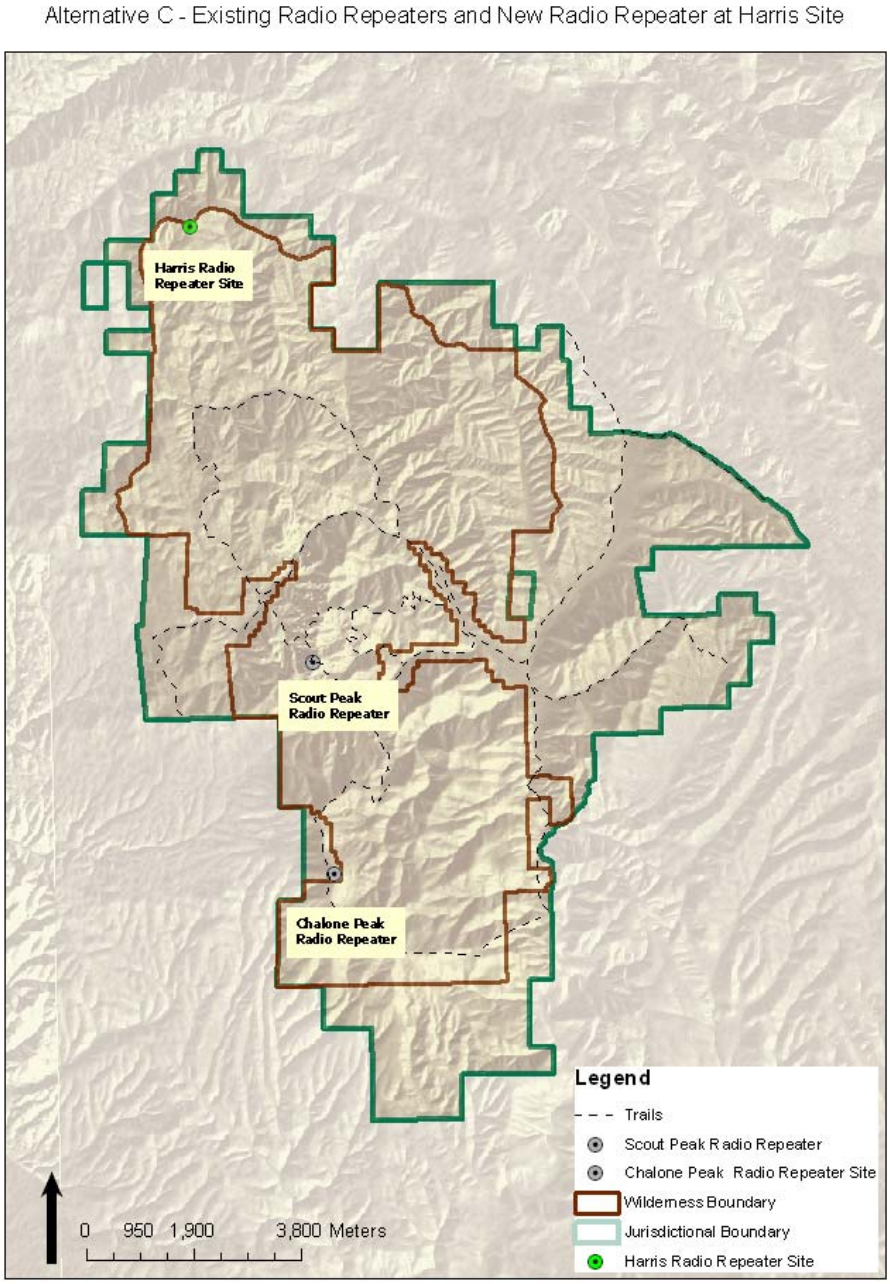

Figure 9. Alternative C – Existing Radio Repeaters and a New Radio Repeater at Harris Site.

Photo 5. Alternative C Proposed Radio Repeater Site (i.e., Harris Site)

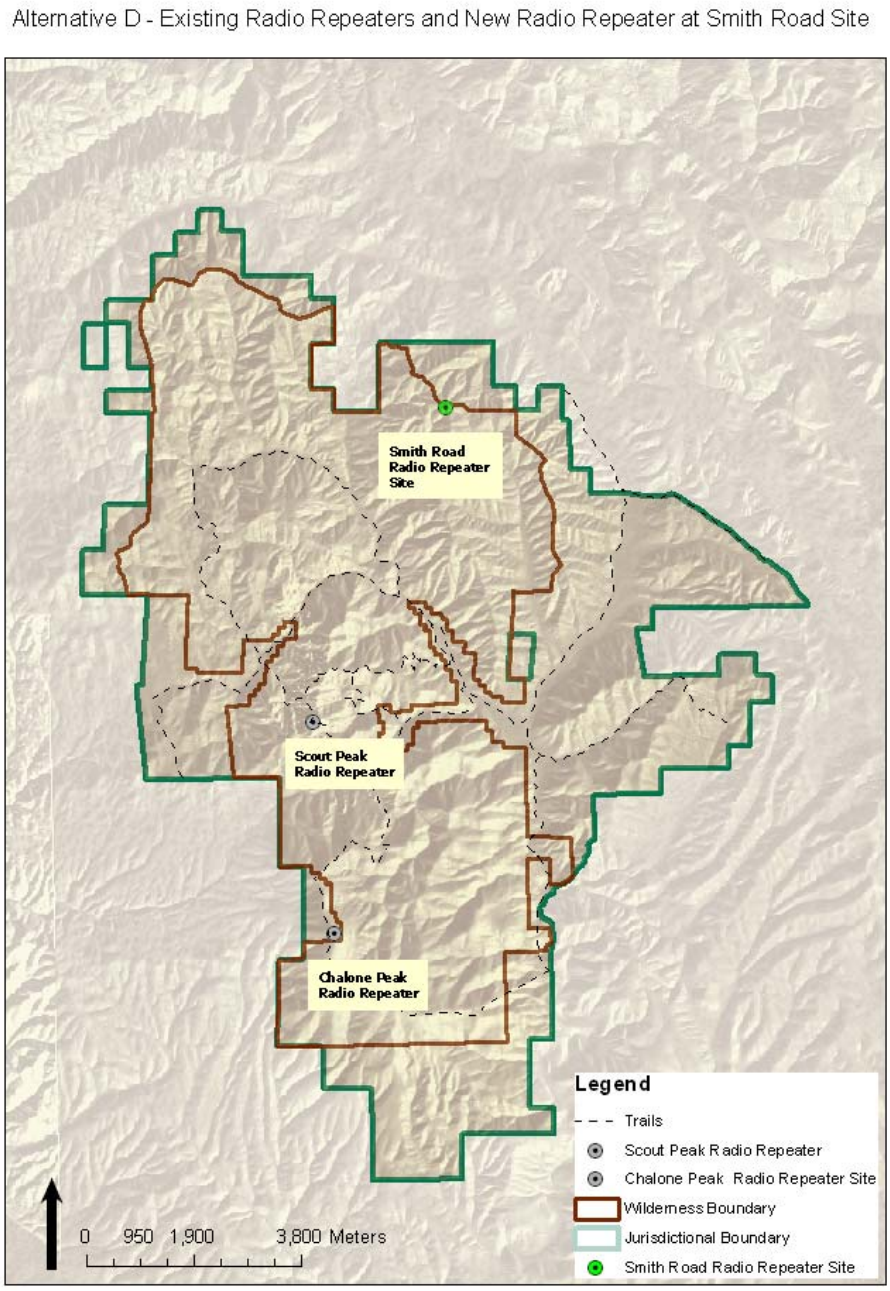

Figure 10. Alternative D – Existing Radio Repeaters and new Radio Repeater at Smith Road Site

Photo 6. Alternative D Proposed Radio Repeater Site (at Smith Road)

2.6 Environmentally Preferred Alternative

The environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment, and that best protects, preserves, and enhances historic, cultural, and natural resources. The NPS is required to identify the environmentally preferred alternative that will promote the national environmental policy expressed in NEPA (Sec. 101 (b)).

The No-Action Alternative (Alternative A) would be the environmentally preferred alternative. The biological and physical environment is best protected by continuing to use the existing radio system as-is. Impacts to visitor experience, wilderness values, wildlife disturbance, and ground disturbance, among others, would be minimized under the No-Action Alternative. The amount of helicopter activity that would be required under the Action Alternatives (Alternatives B, C, and D) would have impacts on visitor experience, wilderness values, and wildlife disturbance. The increase in new human-made structures will diminish the natural view sheds from the wilderness and this would have greater impacts to visitor experience, wilderness values, and ground disturbance. Therefore, the No-Action Alternative would be the environmentally preferred alternative.

2.7 Alternatives Considered but not Further Addressed

The following alternatives were considered but not further addressed in this EA. Reasons for dismissing each alternative are described below.

2.7.1 Use of a tall Microwave Tower

A proposal was made to link the existing radio repeaters to a 100-200 feet high microwave monopole with sufficient bandwidth to provide telephone and data services as well as radio system control. However, this alternative was dismissed because of potential view shed impacts, migratory bird impacts, wilderness impacts, visitor experience impacts, and increased costs.

2.7.2 No permanent structures

A portable "gap filler" repeater that could be placed on any hilltop, close to, and only during an incident, that could relay a radio signal back to the Chalone repeater was proposed. The repeater would work within the existing radio system to provide "spot" coverage when and where needed. This alternative was dismissed because it would not improve radio control from SEKI Dispatch; the equipment would not be maintained in a ready condition at all times; and personnel would be needed to deploy the equipment.

2.7.3 Use of Cell Phones or Satellite Phones Instead of Radios

The use of cell phones or satellite phones instead of radios was suggested during public scoping. This is an alternative that was considered but rejected because it would not comply with the requirements of Director's Order 15, which states that the primary method of wireless communication will be by utilizing the Service's private land mobile radio system. It further states that, in park operations, the use of commercial services will not be utilized except as may be required to supplement NPS systems; the private land mobile radio systems of the NPS shall be utilized to support essential law enforcement, public safety and management functions. The Director's Order recognizes the unique needs of public safety agencies. These needs include:

1. dedicated networks to ensure high levels of reliability in adverse conditions
2. one-to-many broadcast capability (point to multipoint)
3. equipment designed for quick response in emergency situations
4. the best possible coverage within a geographic area, with a minimum of "dead zones"
5. priority calling and call preemption

Land-mobile radio is the technology best designed to meet these needs. Commercial services (i.e., satellite and cellular phone services) do not meet the needs of public safety agencies because:

1. call set-up times are long (dialing, waiting for call connection, busy signals, etc.)
2. transmissions are point-to-point only
3. coverage is over a limited geographic area, primarily populated areas
4. availability is shared
5. users are dependent on the service owners for redundancy and backup power
6. there is no priority preemption
7. cell phones are usually not available during/after large area disasters (floods, earthquakes) because they are dependent on local power companies that would be affected by disasters.

Satellite services have the following additional disadvantages:

1. long delay times in transmissions that hinder two-way voice communications
2. a direct line of sight to the satellite is required (i.e., transmitting within heavily forested areas or inside buildings would not work)
3. satellite availability is intermittent, so calls are often dropped and it may take several minutes before service is available once again
4. user equipment is bulky
5. per-minute charges for service are expensive

2.7.4 Alternate Radio Repeater Sites

Several radio repeater sites were considered but dismissed due to insufficient coverage or potential impacts.

2.7.4.1 Willow Springs Sites 1-4

Willow Springs sites 1-4 are located on the ridge within one mile north of the Willow Spring site (Alternative B). All of them provide new coverage to the North Wilderness Trail. However, Willow Springs sites 2 and 3 do not provide any coverage of the Old Pinnacles Trail, so they were dismissed due to insufficient coverage. Willow Springs 4 does provide coverage of the Old Pinnacles Trail, but only on the Balconies Cliffs portion, so it was also dismissed due to insufficient coverage. Willow Springs 1 provides coverage comparable to that of the Willow Spring site, but it is located directly above a cliff regularly used by nesting prairie falcons, a California State Species of Special Concern. Siting the repeater here would likely severely negatively impact nesting falcons. Federally Endangered California condors often roost above cliffs, so using this site would have a high potential for impacting this species. Willow Springs 1 was therefore dismissed due to potential biological impacts.

2.6.4.2 Bear Valley Repeater Site

The Bear Valley site is located high on a ridge 2.5 miles east of the Scout Peak repeater, outside of Wilderness. Although this site provides considerable new radio coverage overall, it provides almost none on the priority trails (0.006 miles on the Old Pinnacles Trail and none on the North Wilderness Trail). Additionally, it is located adjacent to the California condor release facility. Condors frequent this area, so a repeater at this site might negatively impact this endangered species. Moreover, condors would be likely to land on the repeater and tear off any external parts, damaging the installation. Although this site is outside of designated Wilderness, it was dismissed due to insufficient coverage and potential impacts to (and from) California condors

3.0 Affected Environment

This chapter describes the resources expected to experience environmental impacts upon implementation of any of the alternatives. The present status of the resources, as described in this chapter, will be used to determine impacts in Chapter 4.

3.1 Wilderness

Pinnacles contain 16,048 acres of Congressionally-designated wilderness (over 60 % of the Monument). The park's wilderness contains many features characteristic of a Coast Range chaparral vegetation community and the remains of a relic volcano. The Pinnacles wilderness is characterized by outstanding opportunities for solitude, dark night skies, natural quiet, Class I air quality, healthy ecosystems, and unconfined recreation. Pinnacles Wilderness is unique to the region in that it includes major geologic faults directly associated with the San Andreas Fault. The topography within the Wilderness ranges from 760 feet to about 3,250 feet near North Chalone Peak, the highest point in the Monument.

Pinnacles Wilderness has only been protected as designated Wilderness since 1976. Prior to that time, a few buildings (e.g. comfort stations) and other infrastructure improvements (trail improvements) were constructed within the present-day Wilderness boundaries, and most of these human-made improvements are not considered compatible with Wilderness principals.

The Pinnacles Wilderness contributes to preserving America's heritage by providing access to large undeveloped areas where the visitor can not only catch a glimpse of natural processes at work, but also feel that they are a part of the larger community of life. Pinnacles Wilderness offers the ability for visitors to immerse themselves in natural elements of a remote, pristine central California landscape. Pinnacles Wilderness offers visitors the reward of seeing expansive, high quality, undeveloped vistas; exploring natural landscapes; breathing clean air; and the ability to experience outdoor solitude and natural quiet. The majority of the approximately 32 miles of maintained trails course through Wilderness. These qualities make Pinnacles Wilderness particularly valuable given the Monument's 60-mile proximity to a major metropolitan region.

Much of the Pinnacles Wilderness boundary reaches the Monument boundary and is bordered by private ranches and vineyards. Threats of concern in the Wilderness are trespass by livestock, off-road vehicles, and introduction of invasive plant species and non-native animals. Broader scale management concerns are air, water, noise, and light pollution from surrounding non-wilderness lands.

Pinnacles management of designated wilderness is guided by NPS Management Policies, and the park is in the process of developing a Wilderness Management Plan. NPS Management Policies direct that parks manage wilderness as follows:

> *"All management decisions affecting wilderness must be consistent with a minimum requirement concept. ……When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight*

than economic efficiency and convenience. If a compromise of wilderness resource or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable."

3.2 Cultural Resources

3.2.1 Cultural Resource Types

The National Park Service recognizes five types of cultural resources: archeological resources, structures, cultural landscapes, ethnographic resources, and museum objects.

Archeological resources are the physical evidences of past human activity, including evidences of the effects of that activity on the environment, and are frequently conceptualized and managed as spatially discrete archeological sites.

Structures—constructed works built to serve some human activity—are usually immobile and can be of either prehistoric or historic age. Examples include buildings and Monuments, trails, roads, dams, canals, fences and structural ruins. The National Park Service manages structures through the List of Classified Structures (LCS), an inventory of all prehistoric and historic structures with historical, architectural, or engineering significance.

Cultural landscapes are a reflection of human adaptation and use of natural resources and often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

Ethnographic resources are basic expressions of human culture and the basis for continuity of cultural systems. These encompass both the tangible and the intangible, and include traditional arts and native languages, religious beliefs and subsistence activities.

Finally, *museum objects* include specimens, objects and manuscript and archival collections. These are frequently kept in a museum or designated curation facility.

It is important to note that a given cultural resource may qualify as one or more of these types.

3.2.2 Prehistory, Ethnography and History

No prehistoric chronological sequence has been developed specifically for the Gabilan Range, and most researchers have utilized sequences developed in adjacent areas such as the western San Joaquin Valley and Monterey Bay area (Breschini et al., 1983). Although archeological materials dating from the late Pleistocene through late Holocene have been documented in the greater region, the majority of assemblages from the Pinnacles area appear to post-date the middle Holocene. Rather than indicating a lack of early human presence, however, this may be reflective of limited archeological investigations and geomorphologic processes that eroded or buried earlier deposits.

The Monument lies near the historic boundary of the Coastanoan and Salinan tribal groups, although it may have been encompassed within the territory of the Coastanoan *čalon* (or Chalone) Tribelet (Breschini et al., 1983). The Chalone numbered perhaps 900 individuals and held the upper San Benito and middle Salinas valleys. The Chalone followed a hunter-gatherer subsistence pattern, relying on wild plant and animal foods, although the abundance and distribution of these resources was influenced by management practices such as periodic burning. The historic settlement pattern included villages surrounded by procurement areas used for the extraction of specific resources. Villages were located in the best habitation areas (flat topography, perennial water), conditions that occur only in the east-central portion of the Monument. East-west trade between the Pacific Coast and San Joaquin Valley was very important, and a potential Native American (and later stock) trail may have traversed the Monument (Oberg, 1979).

The history of the Monument area is summarized in Oberg (1979), Breschini et al. (1983) and Babalis (in draft). Sustained Spanish presence in the region began with the creation of Mission Nuestra Señora Dolorossima de la Soledad in the Salinas Valley southwest of the Monument in 1791. The local Native American population, including the ChaloneTribelet, was soon enticed or forced to join the mission ranks. While none fell within the present boundary, several Spanish land grants were claimed on the lands surrounding the Monument, the occupants of which emphasized the raising of stock.

Following the acquisition of California by the United States, mining became an important economic driver in the region. Development of the New Idria quicksilver mine (approximately 50 miles east of the Monument) in the 1850s encouraged the rise of a regional transportation network and associated communities of Paicines, Tres Pinos and San Benito. Concurrently, lands within and surrounding the Monument were claimed by homesteaders intent on ranching and other agricultural endeavors to serve local communities and rapidly growing population centers in the San Francisco Bay area. Still, in the mid to late 1800s the region was remote and also attracted a less desirable element. The enigmatic bandit Joaquin Murrietta supposedly maintained a hideout near the Monument in the early 1850s, as did Tiburcio Vasquez, whose illegal activities in the Paicines area in the 1870s are well chronicled.

The spectacular geological features of the Monument gained local attention by the late 1800s. By the early 1890s, a movement arose to preserve the area for future generations, and enlisted the help of Stanford University President, Dr. David Starr Jordan, a prominent biologist. With such an endorsement, Gifford Pinchot, Chief Forester of the United States Forest Service, compelled President Theodore Roosevelt to set aside 16,000 acres as Pinnacles National Forest Reserve in 1906. The concurrent passage of the Antiquities Act, which enabled the President by proclamation to establish national Monuments, prompted Pinchot to seek a change in status as it would afford greater protection than a national forest reserve. This was accomplished in 1908, and administrative responsibilities for the 2,080 acre Monument were transferred to the Department of the Interior in 1910, and to the National Park Service upon its creation in 1916. Significantly smaller than the original national forest reserve, early land acquisitions were made to expand the Monument.

Development of Monument infrastructure was slow, with no road access until 1925. In 1933, Civilian Conservation Corps (CCC) Camp Pinnacles was established within the Monument. Over the next 11 years, the CCC undertook the development of the major administrative and visitor facilities. Subsequent developments and improvements have

been carried out by the NPS, and the Monument has expanded to 24,000 acres through additional land acquisitions and transfers.

3.2.3 Archeological Resources

Seven archaeological surveys have been conducted and documented in Pinnacles National Monument. Information on the archeological resources within Pinnacles National Monument is summarized in several sources (Olsen et al., 1967; Fritz and Smith, 1978; Haversat, Breschini and Hampson, 1981). A total of 33 archeological sites have been recorded and others, await formal documentation. Of these, 25 represent Native American occupations, while three are the remnants of homesteads settled in the late Nineteenth or early Twentieth centuries. Less than 10% of the acreage in the Monument has been surveyed at either an "intensive" or "reconnaissance" level. Factors influencing survey effectiveness include thick vegetation, rugged terrain and alluvial and colluvial erosion and deposition.

Documented prehistoric resources include both rock-shelters and open-air sites, often containing flaked stone artifacts (cryptocrystalline silicates and fine to coarse-grain volcanic and metamorphic rock), bedrock and portable milling tools, and midden constituents (ashy soil, bone, fire-cracked rock). Most of these sites occur near water sources in the Chalone Creek drainage, although this area has also received by far the most extensive survey coverage. Very few temporal data are available, although the majority of the sites probably date to late prehistoric times. The archeological record seems to reflect a rather restricted range of activities (hunting, plant extraction and processing) performed by small groups of individuals. Based on rather meager evidence, three of these sites were nominated to the National Register of Historic Places (NRHP) as the Chalone Creek Archaeological District in 1978. No other prehistoric archeological resources have been formally evaluated. It is anticipated that significant prehistoric archeological resources may be found associated with oak woodlands on newly acquired lands in the east-central portion of the Monument.

The historical sites include building foundations associated with other landscape modifications (rock walls, pits, fences), and trash scatters containing an array of artifacts (stoves, cans, glass, ceramics, ammunition, farm implements). None of these historical sites has been formally evaluated for National Register significance as archeological resources.

3.2.4 Structures and Cultural Landscapes

At total of 42 structures is listed on the List of Classified Structures (LCS) for Pinnacles National Monument, 31 of which have been determined eligible for listing on the NRHP Another nine have not been formally evaluated, while two others were determined to lack eligibility but are still managed as cultural resources. These range from buildings to smaller scale elements such as retaining walls and trails. With the exception of the masonry drainage channel apparently built by the Civilian Conservation Corps (CCC), the historic era sites are the remains of homesteads (foundations, masonry, trash deposits, wire fencing, etc.) related to dry land subsistence agriculture from the early American period of settlement. No Spanish or Mexican era sites are known within the Monument.

A large number of significant structures are located within the NRHP-eligible, 797-acre Pinnacles East Entrance District, located in the east-central portion of the Monument. The District encompasses park roads, and the Chalone, Condor Gulch, Bear Gulch, and Moses

Springs developed areas, and is associated with early park development between 1923 and 1941 (Provencher et al., 2002).

The Pinnacles Trail System cultural landscape encompasses the recreational trail network and associated features (e.g., comfort stations, Bear Gulch Dam) developed by the CCC and NPS between 1923 and 1941 (Biscombe, Owens, and Babalis (in draft). The Pinnacles Trail System cultural landscape has been recommended to be eligible for listing on the NRHP.

3.3 Vegetation

Vegetation in and near the Monument includes chaparral, oak woodlands, riparian woodlands and grasslands. The only vegetation potentially impacted from the microwave monopole and/or radio repeater alternative sites is chaparral.

3.3.1 Chaparral

The most common vegetation type in the Monument surrounding the project area is chaparral, covering approximately 80% of the land surface within the Monument. Pinnacles is considered the best representation of a chaparral ecosystem in the state and in the National Park System.

Pinnacles chaparral is a mosaic of shrub associations adapted to extremes in temperature and precipitation and to periodic consumption by fires. The common shrubby species in chaparral vegetation include chamise (*Adenostoma fasciculatum*), buckbrush (*Ceonothus cuneatus*), manzanita (*Arctostaphylos spp*.), mountain mahogany (*Cercocarpus betuloides*), and holly-leaved cherry (*Prunus ilicifolia* ssp. *ilicifolia*).

3.3.2 Rare Plants

Although there are no state or federally listed plants known to occur in Pinnacles National Monument, there are 14 plants listed as rare by the California Native Plant Society (Table 3.3.2) (CNPS 2007). Nineteen species of lichens that occur in the Monument are listed as rare by the California Lichen Society. A particularly rare species of lichen *Texosporium sancti-jacobi* is known from only a few sites and has been ranked as critically endangered and is on the Global Red List of Lichens by the International Committee for the Conservation of Lichens (Thor 1996).

Table 3.3.2: **CNPS Vascular Plants documented within Pinnacles National Monument**

Scientific Name	Common Name	CNPS Rank
Chorizanthe douglasii	Douglas' spineflower	4.3
Delphinium californicum ssp. *interius*	coast larkspur	1B.2
Eriastrum virgatum	virgate eriastrum	4.3
Eriogonum nudum var. *indictum*	protruding buckwheat	4.2
Eschscholzia hypecoides	San Benito poppy	4.3
Malacothamnus aboriginum	Indian Valley bush mallow	1B.2
Navarretia jaredii	paso robles navarretia	4.3
Nemacladus gracilis	slender nemacladus	4.3
Plagiobothrys uncinatus	hooked popcorn flower	1B.2
Pentachaeta exilis ssp. *Aeolica*	slender pentachaeta	1B.2
Clarkia breweri	Brewer's clarkia	4.2

Eriogonum nortonii	Pinnacles buckwheat	1B.3
Lessingia tenuis	spring lessingia	4.3
Triteleia lugens	dark-mouthed triteleia	4.3

3.3.3 Non-Native Plants

Many non-native plant species have become established in Pinnacles National Monument. These plants displace native species and quickly colonize any disturbed area, natural or human caused. The proximity of the park to grazing and ranching practices makes Pinnacles especially vulnerable to the introduction of new invasive species. As of 2004, there are 118 known introduced plant species in the park. Most of these weed species will increase in numbers following a fire or anthropogenic disturbance. Not all non-native species can be managed, so efforts are focused on the most invasive and most controllable of the species present. Currently, yellow star thistle (*Centaurea solstitialis*), summer mustard (*Hirschfeldia incana*), and Italian thistle are the three most in need of management.

3.4 Wildlife

3.4.1 Mammals

Forty-nine mammalian species are known to occur within Pinnacles National Monument. Representative species include: black-tailed deer (*Odocoileus hemionus*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), jackrabbit (*Lepus californicus*), brush rabbit (*Sylvilagus bachmani*), ground squirrel (*Otospermophilus beecheyi*), chipmunk (*Eutamias minimus*), and several species of bat. Badgers (*Taxidea taxus)*, coyotes (*Canis latrans)*, a wide variety of rodents, and mountain lions (*Felis concolor)* inhabit the park.

Three mammals, the house mouse, opossum, and feral pig, have been introduced to Pinnacles. The house mouse (*Mus musculus*) and opossum (*Didelphis virginiana*) are rare and not considered threatening to the park ecosystem. Feral pigs (*Sus scrofa*), on the other hand, are abundant within the region and have caused extensive damage to the park's native vegetation. A fence is now in place to exclude feral pigs from approximately 14,500 acres of the park's 26,265 acres, and pigs within the fenced area have been eradicated.

3.4.2 Birds

Birds are the most visible animals visitors are likely to encounter at Pinnacles National Monument, with over 140 species documented in the park since 1908. The variety of habitat types at Pinnacles attracts a diverse assemblage of birds to the park for seasonal nesting and migratory stopovers, and numerous species live in the park year-round. Much of the bird diversity at Pinnacles is focused along the riparian corridors of Bear Gulch and Chalone Creek, because they provide an abundance of food, water, and shelter for many species. Certain species favor the pine and oak woodlands in the park. Among the gray pines, western tanagers (*Piranga ludoviciana)*, Townsend's warblers (*Dendroica townsendi)*, and hairy woodpeckers (*Picoides villosus*) are evident. In the oak woodlands, California quail (*Callipepla californica)*, oak titmice (*Baeolophus inornatus)*, western scrub jays (*Aphelocoma californica)*, mourning doves (*Zenaida macroura)*, ash-throated flycatchers (*Myiarchus cinerascens)*, and northern flickers

(*Colaptes auratus*) are commonly seen. The dense, low scrub of the chaparral covers the majority of the park, and provides ideal habitat for many birds, including residents like California thrashers (*Toxostoma redivivum)*, spotted towhees (*Pipilo maculates)*, wrentits (*Chamaea fasciata)*, bushtits (*Psaltriparus minimus)*, and seasonal species including sage sparrows (*Amphispiza belli)*.

The rocky summits and peaks of Pinnacles provide nesting habitat and roosts for many raptors, including prairie falcons (*Falco mexicanus*) and golden eagles (*Aquila chrysaetos*), as well as smaller bird species including the vocal canyon wren (*Catherpes mexicanus*) and the acrobatic violet-green swallow (*Tachycineta thalassina*). Other common species include turkey vultures *(Cathartes aura)*, acorn woodpeckers (*Melanerpes formicivorus)* and Steller's jays (*Cyanocitta stelleri)*.

3.4.3 Reptiles

Compared to the rest of Central California, Pinnacles is home to a high diversity of reptiles: eight lizards, fourteen snakes, and one turtle. Species most commonly encountered include the western whiptail (*Cnemidophorus tigris*), coast horned lizard (*Phrynosoma coronatum blainvillii*), western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), striped racer (*Masticophis lateralis*), gopher snake (*Pituophis melanoleuces*) and western rattlesnake (*Crotalus viridis*) (NPS, 1999).

3.4.4 Amphibians

Eight species of amphibians inhabit the park. Pacific tree frog (*Pseudacris regilla*), California red-legged frog (*Rana aurora draytonii*), and western toad (*Bufo boreas*), breed in the park's streams and ponds (NPS, 1999b). While the three lungless salamander species breed on land (NPS, 1999b). Western spadefoot toad (*Spea hammondii*) occasionally breeds in temporary ponds in the park, as does California tiger salamander (*Ambystoma californiense*). Non-native bullfrogs (*Rana catesbeiana*) occasionally invade the park (Johnson, 2007).

3.4.5 Fish

Fish are uncommon in Pinnacles due to the primarily intermittent nature of the streams. The three-spined stickleback *(Gasterosteus aculeatus)* is a native inhabitant of Monument waters. It feeds primarily on aquatic insects (NPS, 1999b). Non-native green-ear sunfish (*Lepomis cyanellus*) exist in isolated pools along Chalone Creek. Occasionally this species and bluegill (*Lepomis macrochirus*) invades Chalone Creek and Sandy Creek. Mosquitofish (*Gambusia affinis*) are currently the only non-native fish in park waters, occurring in the lower reaches of Chalone Creek (Johnson, 2007). This species is believed to negatively impact the Federally Threatened California red-legged frog.

3.4.6 Invertebrates

In addition to the mammals, birds, reptiles and amphibian Pinnacles is also home to a variety of aquatic and terrestrial invertebrates. Of special note are the 400 species of bee that have been identified in the park. Butterflies and moths are also present at a high level of diversity, the latter of which are dependent on woody vegetation, such as mature chaparral shrubs and trees. Two aquatic invertebrate species are endemic to Pinnacles and surrounding areas: the Pinnacles riffle beetle and an undescribed species of annelid worm (Johnson, 2007).

3.4.7 Species of Concern

Pinnacles has potential habitat for 38 Species of Concern including federally protected species in San Benito County. There are three federally listed animal species found within Pinnacles National Monument, the federally threatened California red-legged frog (*Rana draytonii*) and California tiger salamander (*Ambystoma californiense*) and the federally endangered California condor (*Gymnogyps californianus)*.

The California red-legged frog occurs in a fairly distinct habitat, occupying the Chalone Creek, Bear Gulch, and Sandy Creek drainages and a newly re-established population in the Bear Gulch Reservoir. Extensive surveys and monitoring have been conducted over the last 10 years giving the park detailed data on the location of populations and potential habitat and occupation within the park. The adults require dense, shrubby or emergent riparian vegetation closely associated with deep (greater than 2 feet deep) still or slow moving water. California red-legged frogs can enter a dormant state during summer or periods of dry weather in small mammal burrows and moist leaf litter. They have been found up to 100 feet from water in adjacent dense riparian vegetation.

An adult California tiger salamander (CTS) was found within Pinnacles National Monument in the recently acquired Bottomlands on the Eastside, and breeding was documented in a pond in the adjacent hills within the Monument (pers. comm.. Paul Johnson, 2008). Designated critical habitat for this species occurs just outside the Monument, and the grasslands and oak savannas in the Pinnacles Ranchlands are potential breeding habitat. As a result, significant portions of the New Lands will be treated as CTS habitat.

Adult CTS are active above ground at night beginning with the first significant rains in the fall and continuing until the end of the rainy season in March or April. CTS breed in ponds which hold water seasonally. Their larvae require at least ten weeks to transform into terrestrial juveniles. Larvae transform before the ponds dry up, usually from April through July, and migrate to upland areas at night.

Condors historically used this region until the 1970s. By the early 1980s, the total number of both wild and captive California condors had plummeted to just 22. Since then, captive breeding and restoration projects have been successful in increasing the numbers of this species. Presently, there are 278 (149 in captivity and 129 free-flying of which 67 of the free-flying birds are in California. Pinnacles National Monument has 12-14 condors. Within the park, California condors roost on trees, snags, cliffs, and rocky outcrops where launching for flight is optimal. These isolated roosts are also important because they provide protection from predators. Typically, foraging sites are in grasslands or oak-savannah regions at lower elevations, and roosting and nesting sites are located at higher elevations on cliffs.

In addition to these three federally listed species, several other federal and/or state species of concern occur in Pinnacles. Table 3.4 lists the Species of Special Concern that are located within the boundaries of Pinnacles National Monument.

Table 3.4.7 Animal Species of Concern found at Pinnacles. These include federal and state species of special concern as well as local endemics and other species considered to be of concern.

Species of Concern	Scientific Name	Habitat
Pinnacles shield-back katydid	*Idiostatus kathleenae*	Terrestrial, chaparral
Pinnacles riffle beetle	*Optioservus canus*	Aquatic, fast-flowing sections of Chalone Creek
Primrose sphinx moth	*Euproserpinus sp.*	Terrestrial, sandy areas
Southwestern pond turtle	*Clemmys marmorata pallida*	Aquatic, riparian
Silvery legless lizard	*Anniella pulchra*	Terrestrial, loose sandy soil/talus
California horned lizard	*Phrynosoma coronatum frontale*	Terrestrial, open sandy areas
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	Terrestrial, dry open areas in open grassland prairies and rocky hillsides.
Western spadefoot	*Spea hammondii*	Temporary ponds in grasslands
Gabilan slender salamander	*Batrachoseps gavilanensis*	Terrestrial, wide range of habitat
Cooper's hawk	*Accipiter cooperi*	Terrestrial, forested areas
Sharp-shinned hawk	*Accipiter striatus*	Terrestrial, forested areas
Golden eagle	*Aquila chrysaetos*	Terrestrial, cliffs and trees used in nesting
Bald eagle	*Haliaeetus leucocephalus*	Terrestrial, forested areas near ponds
White-tailed kite	*Elanus leucurus*	Terrestrial, grasslands and savannas
Prairie falcon	*Falco mexicanus*	Terrestrial open areas with rocky outcroppings and/or cliffs for nesting
Peregrine falcon	*Falco peregrinus*	Terrestrial open areas with rocky outcroppings and/or cliffs for nesting
Long-eared owl	*Asio otus*	Terrestrial, forested areas
Burrowing owl	*Athene cunicularia*	Terrestrial, grasslands and savannas
Loggerhead shrike	*Lanius ludovicianus*	Terrestrial, grasslands and savannas
Nuttall's woodpecker	*Picoides nuttallii*	Terrestrial, forests and woodlands
Olive-sided flycatcher	*Contopus borealis*	Terrestrial, forests and woodlands
Yellow-breasted chat	*Icteria virens*	Terrestrial, riparian
Grasshopper sparrow	*Ammodramus savannarum*	Terrestrial, grasslands and savannas
Lawrence's goldfinch	*Carduelis lawrencei*	Terrestrial, forests, grasslands, and savannas
Townsend's big-eared bat	*Corynorhinus t. townsendii*	Terrestrial, caves
Western mastiff bat	*Eumops perotis californicus*	Terrestrial, cliffs
Pallid bat	*Antrozous pallidus*	Terrestrial, caves
Hoary bat	*Lasiurus cinereus*	Terrestrial, riparian
Western red bat	*Lasiurus blossevillii*	Terrestrial, riparian
Western small-footed myotis	*Myotis ciliolabrum*	Terrestrial, caves
Long-eared myotis	*Myotis evotis*	Terrestrial, caves
Fringed myotis	*Myotis thysanodes*	Terrestrial, caves
Long-legged myotis	*Myotis volans*	Terrestrial, caves
Big-eared kangaroo rat	*Dipodomys elephantinus*	Terrestrial, chaparral-covered slopes
American badger	*Taxidea taxus*	Terrestrial, creates burrows in dry, open country.

3.5 Health and Public Safety

3.5.1 Radio Use in Public Safety

The Monument's communications center (dispatch) supports and monitors law enforcement rangers and backcountry personnel via land mobile radio. The dispatch center is critical for the safety and well-being of personnel and visitors, especially in isolated developed areas; public safety operations rely heavily on communications using two-way land mobile radios. Incident responses have highly critical radio needs because the radio is the usually the only form of communication available. The radio system is also critical for enabling NPS to communicate with other agencies that mutually respond to emergency incidents within Pinnacles (e.g., sheriff and Cal-Fire).

Since 2000, PINN has experienced an average of 16 incidents per year, ranging from 11 to 24. Of these, the majority of cases received a basic level of care, with only 10% requiring advanced life support treatment or involved a fatality. Forty-two percent of the cases during this time resulted in an air or ground ambulance transport. Approximately 11% of the patient transports utilized an air ambulance. The vast majority of patients are park visitors.

A sample of 29 Emergency Medical Service (EMS) responses from 2005-2007 (from a reported total of 58 for those same years) were used to determine average response times. From the 29 cases, 38% of the responses occurred greater than one-half trail mile from a trailhead. All other responses occurred in populated areas or on common roads. The average time from initial call to basic EMS level care for all calls was 12.9 minutes. For the 38% of cases involving remote evacuations, the average time from initial call to EMS care was 22 minutes.

The majority of in-park incidents are reported directly to PINN personnel. The remainder are reported by telephone at the Bear Gulch Nature Center or campground, or by cell phone. 911 calls from these land-line telephones are routed to San Benito County Communications Center. Emergency calls placed from cell phones are routed to California Highway Patrol and transferred to the appropriate county, typically San Benito County. Depending on the communications center and their staff, any combination of resources may be sent to the incident. Incidents have occurred within Monument boundaries and been managed by outside agencies without NPS notification.
Use of the radio system for these types of incidents ranges from a few transmissions on some to all-night use and several days for others. Rangers who respond to these incidents rely exclusively on their radios to contact the Communications Center where additional information or help can be dispatched using either a radio or a regular phone.

The steep terrain in many parts of the Monument makes it difficult to near impossible to obtain radio coverage in many parts of the Monument regardless of how many and where radio repeaters are installed. Pinnacle's repeater system is usually accessible from front country areas within the Monument and is much more reliable with base station or vehicle systems. Handheld systems are more reliable when line of sight to the repeater is available. Using a handheld radio, repeaters can be reached from some trails within Pinnacles. Areas that have been identified as having limited or no reception include most gullies and steep canyons throughout the Monument, North Wilderness

trail, Old Pinnacles trail, all caves, and much of the boundary areas. For mutual aid responses, reception from outside Pinnacle's boundaries can have the same limitations. However, the Chalone Peak repeater is visible from much of south San Benito County and the Salinas Valley. Reception can be excellent from as far as 50-75 road miles away, including Hollister, Salinas, King City, and Clear Creek Management Area.

Procedures for online communications with medical control are not established. Establishing online medical control is considered the highest priority in the Monument's EMS plan. Currently, San Benito County has contracted with Hazel Hawkins Hospital in Hollister to provide online medical control, a base station physician, and continuing education training for County EMS providers. The NPS is not included in the contract and would need to complete a separate agreement. Such an agreement would require that all radio transmissions from a Ranger be directed to NPS Dispatch for relay to medical control via land-line due to lack of direct radio contact or mobile phone coverage. If possible, means for direct contact between the care provider and medical control should be established.

3.5.2 Safety of Radio Frequency Transmissions

Everyone is exposed to a mix of electromagnetic energy fields that are both natural and human-made. Common human-made fields include those from appliances in the home, electric transmission lines, telecommunications, and television and radio broadcasting. Radio frequency, or RF energy, is a type of electromagnetic energy that is used to provide telecommunications, broadcast, and other similar services. The main human health effect of RF exposure is the heating of tissue. However, the typical levels of RF fields that humans are exposed to are well below those that produce heat. Currently guidelines for RF exposure are based on the heating effect of radio waves, with an added safety factor.

There is currently no federally-mandated RF exposure standard. Several organizations, however, have issued recommendations for human exposure to RF fields. The Federal Communications Commission (FCC) has adopted guidelines based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP), as well as those developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI). There are two sets of FCC guidelines: one for occupational exposures and one for general public exposures. The occupational exposure standard is lower than the general public exposure standard because workers with the potential to be exposed on the job are trained to be aware of the risks associated with working in electromagnetic fields. Workers can therefore take precautions to limit their exposure.

3.6 Park Operations

In addition to law enforcement and incident response use of the radio system, many other staff members use the radio as their only means of communication while working in the backcountry. Maintenance and trails workers, resource crews, backcountry rangers, and fire personnel, among others, all rely on the radio to coordinate work crews, to check-in with dispatch, and for potential emergency needs that might occur. The Monument tracks all personnel for all overnight use in the backcountry and all law enforcement personnel throughout the Monument via radio to ensure the safety of its employees. However, there are currently several areas within the Monument that lack the radio coverage necessary for administrative operations and timely public safety

response. These areas include the North Wilderness Trail, and Old Pinnacles Trail, High Peaks Trail, Juniper Canyon Trail, South Wilderness Trail, and Bear Gulch Trail.

Park personnel also utilize cell phones for park operations when service is available, particularly when radio communications are not available. Park staff coordinate with outside agencies using cell phones during emergency situations. Visitors can contact park personnel while in the park when requesting assistance.

4.0 Impacts

This chapter contains an analysis of the environmental impacts that could occur under each alternative. Each resource described in Chapter 3 has been analyzed for the direct, indirect, and cumulative impacts that might occur as a result of implementing one of the alternatives. This section analyzes the environmental impacts of project alternatives on Wilderness, Cultural Resources, Vegetation, Wildlife, Heath and Public Safety, and Park Operations. These analyses provide the basis for comparing the effects of the alternatives. NEPA requires consideration of impacts including the context, intensity, duration, type, and measures to mitigate impacts.

Impairment

The NPS is required by law to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. Adverse impacts that constitute impairment are prohibited according to the Organic Act of 1916 and reaffirmed by the General Authorities Act of 1970, as amended. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

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

The impact analysis includes any findings of impairment to park resources and values for each of the alternatives. They are not included for the non-resource topic of Health, Public Safety, and Park Operations.

4.1 Wilderness

4.1.1 Methodology

In this study, direct impacts to wilderness resources will include permanent placement of manmade structures within wilderness boundaries. Impacts to wilderness experience will include visual and sound impacts which may occur to visitors from installation and maintenance of radio repeater equipment. Impacts to wilderness are often difficult to estimate since they are largely based on individual values and expectations. For this

section, impacts were assessed using the following four qualities that are based on 1964 Wilderness Act legislation and are used to describe wilderness character:

Untrammeled - wilderness is ideally unhindered and free from intentional modern human control or manipulation

Natural - wilderness ecological systems are substantially free from the effects of modern civilization

Undeveloped - wilderness has minimal evidence of modern human occupation or modification

Outstanding opportunities for solitude or a primitive and unconfined type of recreation - wilderness provides opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance.

Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts evaluated in this EA may be:

short term, when impacts occur only during construction or last less than one year; or

long term, when impacts are reversed more slowly and when impacts last one year or longer.

Type of impact is defined to be adverse, beneficial, direct, indirect, and cumulative.

Adverse impacts are those that change the affected environment in a manner tending away from the natural range of variability.

Beneficial impacts are those that change the affected environment toward the natural range of variability.

Direct impacts are those that occur at a different time and/or place than the action. Indirect impacts include changes such as species composition, structure of the vegetation, or range of wildlife. Indirect impacts also include impacts occurring offsite, such as erosion-related impacts, or general economic conditions tied to park activities.

Cumulative impacts are those impacts on the environment that result from the incremental (i.e., additive) impact of direct and indirect impacts when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Mitigation of Impacts. Mitigation measures must eliminate or reduce impacts by the following measures:

Avoid conducting management activities in an area of the affected environment.

Reduce the type of impact to an affected environment.

Minimize the duration or intensity of the impact to an affected environment.

Repair localized damage to the affected environment immediately after an adverse impact.

Rehabilitate an affected environment with a combination of additional management activities.

Compensation of a major long-term adverse direct impact through additional strategies designed to improve an affected environment as much as is practical.

4.1.2 Alternative A (No-Action Alternative)

There are both short-term and long-term impacts associated with this alternative. The Chalone Peak Fire Observation tower is outside the Wilderness boundary whereas the Scout Peak comfort station and attached radio repeater is inside the Wilderness boundary. Both structures can be seen from other areas within the Wilderness. Opportunities for solitude would be impacted for a short period of time during maintenance trips to the two existing repeater sites (Chalone Peak and Scout Peak) that occur each year. The long-term impacts associated with this alternative are largely related to the view shed surrounding each repeater site, and the impact on the untrammeled and undeveloped qualities of wilderness. Although the infrastructures (i.e., antenna mounted on a fire observation tower at Chalone Peak and on the comfort station at Scout Peak) are currently visible from a variety of vantage points (see current radio coverage in Figure 4 on p.15), the impact of their visibility would be expected to vary among visitors. Some visitors may be bothered by seeing the repeaters mounted on these facilities. It is also likely that other visitors might not be bothered by the installations. The current system does impact the natural quality of wilderness character because both repeater sites are located on human-made structures that detract from the natural environment and the wilderness experience. Visitors will see the fire observation tower and comfort station first, and then they may see the radio repeater antennas. The adverse impacts from the No Action Alternative on wilderness are considered minor, and would last for a short period of time, i.e., for the duration of the stay, or only when the installation is visible from a visitor's vantage point. Maintenance workers drive in vehicles and then walk to these sites. Visitors that see workers on maintenance visits are likely to have a diminished sense of solitude, but visitors generally see other hikers along wilderness trails also.

Under this alternative, no additional radio repeater will be installed within the wilderness boundaries. There will be no additional view shed impacts from a new radio repeater. . This alternative would result in no impairment because no new infrastructure will be added to the wilderness.

4.1.3 Alternative B (Preferred Alternative- Existing Radio Repeaters and New Radio Repeater at Willow Springs Site)

All adverse impacts described for the No-Action Alternative (i.e., view shed impacts from existing radio repeater antennas also apply to the Alternative B, see Figure 4 p. 15). Additional impacts will occur from installing new radio repeater equipment.

Installation of a new radio repeater at Willow Springs will likely have minor adverse and long-term impacts on Wilderness resources with the installation of a human-made intrusion (i.e., radio repeater) within designated Wilderness. It is not likely visitors will

get a close view of the equipment because it will be located along the pig exclusion fence in a remote area of the park. The only way to approach this site on foot is by hiking along the pig fence for miles. The pig fence is already an intrusion on the wilderness character, and the presence of the new repeater equipment would not be expected to add substantially to this intrusion (refer to Photo 4 page 22). In the unlikely event of a hiker getting a close-up view of the equipment, the results would be likely a minor and short-term impact on wilderness experiences (i.e., intrusion on the natural sites of wilderness) because anyone with a close view of the repeater would have already had a close view of the pig fence for several miles of hiking.

Although a close-up view of the radio repeater by hikers is not likely (see equipment example in Photo 3 page 11), distant views of the repeater antenna pole, or more likely, reflections off it will be possible by hikers along wilderness trails from vantage points within the view shed of the repeater (see areas in Wilderness where the repeater may be seen in Figure 5, p.16). The repeater box and footings will be hidden from distant views by native chaparral shrubs. Visitors will potentially see the Willow Springs radio repeater antenna pole or reflections off it while hiking in designated wilderness along the North Wilderness Trail and Old Pinnacles Trail. These trail areas comprise the analysis area for this section and for the Minimum Requirement Analysis, found in Appendix C. Impacts to wilderness experience from distant views or reflections off of radio repeater pole will likely cause negligible to minor adverse and short-term impacts to visitor wilderness experience. It should be noted that during efforts for scouting potential sites, observers on trails below had a very difficult time seeing a surrogate monopole (i.e., mylar balloon). Investigators said that even with a high quality digital camera with a zoom lens, the surrogate monopole was nearly invisible unless the image was magnified considerably.

Knowing a new man-made piece of equipment (e.g., radio repeater) is present within the wilderness could have a “philosophical” adverse reaction to some visitors to the monument. This will be expected to vary among visitors.

The use of a helicopter for transporting equipment and workers to the site during installation and maintenance visits will impact the sense of solitude of visitors upon seeing and hearing the helicopters in wilderness areas. The sounds from powered hand tools and/or generators used during installation will also likely impact the sense of solitude in wilderness areas. Both impacts would be considered minor and short-term visual and noise intrusions into the wilderness experience.

4.1.4 Alternative C (Existing Radio Repeaters and New Radio Repeater at Harris Site)

The radio repeater would be installed in a clear, unvegetated area adjacent to a dirt road just outside the wilderness boundary (see Photo 5 page 24 and Figure 9 page 23). Therefore, no direct impacts to Wilderness resources will occur with installation of the radio repeater proposed in this alternative. The radio repeater antenna pole or reflections off it will potentially be seen along wilderness trails from vantage points within the view shed of the repeater (see Figure 6, page17). In addition, visitors and others driving along the dirt road may see the radio repeater antenna. The repeater box and footings will be hidden from distant views by native chaparral shrubs. Viewing the manmade pole will likely diminish the wilderness experience by impacting the view of the

natural landscape. Therefore, the repeater will likely have negligible to minor and long-term adverse impacts on the wilderness experience through possible distant views or reflection impacts to visitors on wilderness trails.

Installation and maintenance visits to the radio repeater site will be accomplished using ground vehicles. Therefore, visual and noise impacts during installation and maintenance will not be as substantial because helicopter transportation will not be required. The sounds from powered hand tools used during installation will likely impact the sense of solitude in wilderness areas. This would be considered a minor and short-term visual and noise intrusion into their wilderness experience.

4.1.5 Alternative D (Existing Radio Repeaters and New Radio Repeater at Smith Road Site)

The radio repeater would be installed in a clear, unvegetated area adjacent to a dirt road just outside the wilderness boundary (see Photo 6 page 26 and Figure 10 page 25). Therefore, no direct impacts to Wilderness resources will occur with this alternative. The radio repeater antenna pole or reflections off it will potentially be seen along wilderness trails from vantage points within the view shed of the repeater (see Figure 7 page 18). In addition, visitors and others driving along the dirt road could see the radio repeater antenna. The repeater box and footings will be hidden from distant views by native chaparral shrubs. Viewing the manmade pole will likely diminish the wilderness experience by impacting the view of the natural landscape. Therefore, the repeater will likely have negligible to minor and long-term adverse impacts on the wilderness experience through distant view impacts to visitors on wilderness trails.

Workers will be able to access the site using ground transportation on the dirt road. Therefore, visual and sound impacts from helicopter use will not be an impact with this alternative. However, the sounds from powered hand tools used during installation may be heard by hikers, and this would likely impact the sense of solitude in wilderness areas. This impact would be considered a negligible to minor and short-term adverse visual and noise intrusion into their wilderness experience.

4.1.6 Mitigation

To mitigate for visual intrusions, repeater equipment will be located to maximize coverage of equipment with native chaparral vegetation to reduce distant views of the equipment. The radio repeater pole and antenna will be painted a non-reflecting, natural color to blend in with the surrounding chaparral shrubs. No chaparral shrubs are to be cut or removed during installation of the radio repeater. Helicopter work for the repeater will only take place between Monday and Thursday to avoid high visitor visibility and noise impacts during weekends.

4.1.7 Cumulative Impacts

Installing a radio repeater within designated Wilderness as proposed in Alternative B will add cumulative impacts to Wilderness resources in the monument. Currently, man-made intrusions within designated Wilderness in the monument include, the pig exclusion fence, comfort stations, weather stations, and trail improvements. All of these structures are impacting Wilderness resources as well as diminishing the natural quality of the wilderness experience. In addition, other structures outside the wilderness but visible from the wilderness (e.g. roads, parking areas, and buildings) contribute to

wilderness view shed impacts A proposed new visitor center, entrance station, maintenance facility, and housing complex on the Westside may be partially visible from some portions of the Wilderness. Taken cumulatively, addition of a new radio repeater would further impact the undeveloped quality of wilderness to varying degrees. The cumulative impacts on the wilderness character, by installing the radio repeater are considered minor and long-term.

The proposed project would increase park staff presence in Wilderness areas of the Monument. Search and rescue, fire management, backcountry trails projects, pig fence monitoring, pig trapping, law enforcement, and research are ongoing activities that require equipment movement and a park staff presence in wilderness areas. Helicopters are used to move pig traps around in wilderness areas. Installation and maintenance work proposed in Alternative B, C, and D will further diminish the wilderness experience by introducing more helicopter trips and more humans and human-made infrastructure into or in wilderness view sheds. Maintenance visits to the Willow Springs repeater site would further increase park staff presence in the wilderness.

4.1.8 Impairment Analysis

None of the alternatives would be expected to impair wilderness resources or wilderness experience in the Monument. The radio repeater antenna and pole will be largely hidden from view by chaparral vegetation, and the thirteen foot antenna will not be easily seen from distances. The repeater pole and antenna will be painted with non-reflecting paint to minimize visual impacts from reflections.

4.1.9 Conclusion

The long-term impacts associated with the existing radio repeaters at Chalone Peak and Scout Peak are largely related to the view shed impacts surrounding each repeater site, and the impacts on the untrammeled and undeveloped qualities of wilderness. Although the infrastructures (i.e., antenna mounted on a fire observation tower at Chalone Peak and on the comfort station at Scout Peak) are currently visible from a variety of vantage points (see view shed analysis in Figure 4 page 15), they are not considered to be significantly impacting visitor view sheds. The structures the antennas are mounted on are much greater intrusions than the repeater equipment.

Alternative B will likely have minor and long-term adverse impacts on Wilderness resources by introducing a new human-made structure (i.e., radio repeater equipment) into designated Wilderness. The site is in a previously disturbed area adjacent to an existing human-made structure (i.e., pig exclusion fence). Alternative C and D will have no direct adverse impacts on Wilderness resources because both proposed microwaves sites and the radio repeaters will be outside of designated Wilderness. The radio repeater pole and antenna in all the Action Alternatives will potentially be seen or reflections seen from vantage points within the Wilderness, and the appearance of another human-made structure will have a minor long-term adverse impact on visitor wilderness experience by degrading the natural views in the wilderness. These impacts will be lessened by painting the repeater pole and antenna a non-reflective color.

Because of the inability of people to transport the heavy equipment on foot, or with pack horses, delivery of equipment for the Willow Springs radio repeater via helicopter was deemed the minimum tool necessary to implement the project. Opportunities for experiencing natural sights, sounds, and solitude during this time would be reduced or

disrupted for visitors seeing and hearing the helicopter. To mitigate for the likely adverse impacts on the wilderness experience, equipment transportation and installation activities will be scheduled for Monday –Thursday to reduce the numbers of potential hikers viewing these activities.

4.2 Cultural Resources

4.2.1 Methodology

The assessment of impacts on cultural resources and historic properties was made in accordance with regulations of the Advisory Council on Historic Preservation (36 CFR 800) implementing Section 106 of the National Historic Preservation Act. Following a determination of the areas of potential effect, cultural resources were identified within these areas that are either listed in, or eligible for listing in, the National Register of Historic Places.

An assessment was made of the nature and extent of effects on cultural resources anticipated from implementing proposed undertakings at the new radio repeater site and the microwave monopole sites. Cultural resources can be affected by actions that alter in any way the attributes that qualify the resources for inclusion in the National Register. Adverse effects can result when the integrity of a resource's significant characteristics is diminished. Consideration was given both to the effects anticipated at the same time and place of the undertaking, and to those potentially occurring indirectly at a later time and distance.

To provide consistency with requirements of NEPA, the effects on cultural resources are also described in terminology intended to convey the duration, intensity, and beneficial or adverse nature of potential impacts. Impacts could be of short-term, long-term, or permanent duration. (Analysis of the duration of impacts is required under NEPA; however, duration is not required and is not usually considered in assessing effects in terms of the National Historic Preservation Act). The intensity of impacts is defined as follows:

Negligible – impact(s) is at the lowest levels of detection—barely perceptible and not measurable.

Minor adverse – impact(s) would alter a pattern(s) or feature(s) of the historic landscape but would not diminish the overall integrity of the landscape.

Minor beneficial impact – preservation of landscape patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the Treatment of Historic landscapes.

Moderate adverse impact – impact(s) would alter a pattern(s) or features(s) of the historic landscape, diminishing the overall integrity of the landscape.

Beneficial impact – rehabilitation of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the Treatment of Historic landscapes.

Major adverse impact – impact(s) would alter a pattern(s) or features(s) of the historic landscape, diminishing the overall integrity of the resource.

Beneficial impact – restoration of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the Treatment of Historic landscapes.

Short-term – effects on the natural elements of a historic landscape may be comparatively short-term (less than a year) until new vegetation grows or historic plantings are restored.

Long-term – because most cultural resources are essentially non-renewable, any effects on archeological, historic, or ethnographic resources would be long term. Effects on the historic landscape would persist for more than one year.

4.2.2 No Action Alternative

Both the Chalone Peak fire tower and the Scout Peak comfort station are contributing cultural resources of the High Peaks Trails Cultural Landscape Inventory (a Determination of Eligibility which is in process). Much of the repeater infrastructure on the fire tower at Chalone Peak is hidden from view as hikers approach the fire tower; however, the antenna is visible from inside the lookout and from some selected viewpoints around the lookout. The radio repeater is considered a minor and long-term adverse impact on the historic property view shed. However, the antenna is not considered to diminish the overall integrity of fire observation tower landscape. Similarly, the Scout Peak radio repeater is easily seen by hikers along the High Peaks Trail and Juniper Creek Trail. Mounting the antenna on this structure is also considered a minor and long-term impact on the historic cultural landscape.

4.2.3 Alternative B (Preferred Alternative – Existing Radio Repeaters and New Radio Repeater Site at Willow Springs)

All adverse impacts described existing radio repeaters described for the No-Action Alternative (i.e., potential view shed impacts from antenna and helicopters and workers during maintenance visits) also apply to Alternative B. In addition, installing new equipment will add the following impacts.

Installation of the radio repeater at Willow Springs may have additional view shed impacts to the proposed eligible High Peaks Trails Cultural Landscape. This structure is expected to have negligible to minor and long term adverse impacts on the view shed of this historic landscape. Given the distance between the proposed repeater and the High Peaks trail, it is unlikely the antenna and pole will be visible to hikers, but rather reflections off the antenna and pole is more likely.

Archeological surveys (i.e., 1 meter wide transects) at the proposed new radio repeater site did not reveal any archeological or other cultural resource artifacts. No surface stains, depressions, lithics, modified cobbles, water features, or carbon, historical metals, ceramics, or anything attributed to any time period (except modern) was visible. Therefore, installation of this structure would not be expected to impact archeological resources.

4.2.4 Alternative C (Existing Radio Repeaters and New Radio Repeater Site at Harris Site)

All adverse impacts described for the No-Action Alternative (i.e., potential view shed impacts from antenna and helicopters and workers during maintenance visits) also apply to Alternative C. In addition, installing new equipment will add the following impacts.

Installation of the new radio repeater at the Harris Site is not likely to have additional view shed impacts to the proposed eligible High Peaks Trails Cultural Landscape. The repeater site is in the far northern border of the Monument, far away from the High Peaks Trail. Reflections off the antenna and pole may be seen by hikers. This structure is expected to have negligible to minor and long term adverse impacts on the view shed of this historic landscape based on the potential for reflection impacts on visitor view sheds.

An archeological survey (i.e., 1 meter wide transects) at the proposed new radio repeater site did not reveal any archeological or other cultural resource artifacts. No surface stains, depressions, lithics, modified cobbles, water features, or carbon, historical metals, ceramics, or anything attributed to any time period (except modern) was visible. The site is located on a large bench-top in the northwest part of Monument. It is the most pronounced elevation in area. The site is bisected by two-track road (rarely used) which may have been a fire break at one time. There is little to no vegetation or matrix in road. The road is surrounded by solid covering of native chamise (*Adenostoma fasciculatum*) that stands 1.5 m high. Chamise is the dominant vegetation across the hill and surrounding landscape. Some periodic woody plants reported mixed with the chamise include manzanita (*Arctostaphylos spp*.), bush poppy, and buckwheat. The soil under the chamise is very thin (.5 to 1 cm. deep) with areas of exposed bedrock apparent in the area. The hilltop site appears to be composed of rhyolite that is crumbling with freeze/thaw.

The road that bisects the hilltop exposes the rhyolite bedrock, forming a visible white two track across the hill. Located cultural resources in the area included a fire dozer berm, a milled wood post, and a short segment of 3-strand, barbed wire fence with metal pickets. The fence, berm, milled wood, and possibly the road/fire break, all appear to be contemporary—within 50 years. This land was acquired from Bureau of Land Management (BLM) in 2000 and was grazed by neighboring ranches. The road is still used as an NPS service road. The repeater will not be situated on or adjoining the road. Other cultural materials identified above are contemporary and therefore at this time not eligible for NR nomination.

4.2.5 Alternative D (Existing Radio Repeaters and New Radio Repeater Site at Smith Road Site)

All adverse impacts described for the No-Action Alternative (i.e., potential view shed impacts from antenna and helicopters and workers during maintenance visits) also apply to Alternative C. In addition, installing new equipment will add the following impacts.

The site is located on a large bench-top in the northwest part of Monument. It is the most pronounced elevation in area. The bench top is bisected by a popular former BLM service road which may have been a fire break at one time. The immediate site where the repeater would be installed has been previously cleared of woody vegetation and would not require extensive additional vegetation clearing. The road has no soil matrix, exposing exfoliating white granite bedrock. The soil matrix under the chamise is thin (1 - 2 cm. deep)--composed of chamise needles atop bedrock. The road that bisects the hilltop exposes the decomposed granite bedrock, forming a visible white two track across the hill. Ground visibility is very good. Some sheet wash and gullying in the

road. Vegetation directly adjacent to the site is characterized by moderately dense chaparral dominated by chamise (*Adenostoma fasciculatum*).

A cultural resource survey of the site did not reveal any contemporary, historical, prehistoric, or modern cultural resources visible in survey area. Archeological transects (i.e., 1 meter wide transects) at the proposed new radio repeater site did not reveal any archeological or other cultural resource artifacts. No surface stains, depressions, lithics, modified cobbles, water features, or carbon, historical metals, ceramics, or anything attributed to any time period (except modern) was visible. The radio repeater at Smith Road would likely only be noticeable to hikers as an occasional reflectance off the antenna. Therefore, the only likely cultural resource impacts the radio repeater at Smith Road will have are negligible to minor, adverse, and long-term visual impacts to the historic landscape from visitors occasionally seeing reflectance off the antenna during sunny days.

4.2.6 Mitigation

To make the repeater antenna pole less visible to visitors hiking along the High Peaks Cultural Landscape Trail as well as other trails, the antenna and pole will be painted with natural color and non-reflective paint.

It is recommended that nearby granitic outcrops be avoided during installation of the hillside microwave monopole. Granitic outcrops in the landscape are geologically part of the Monument's volcanic history, and such outcrops could yet prove to have been used for transient activities (such as a quarry for groundstone, plant gathering, etc.).

For Alternative C and D, the only potential cultural resource older than 50 years is the service road at the proposed repeater sites. This area should be avoided during repeater installation. If any new cultural materials are exposed during construction, then all construction stops pending archeological inspection

4.2.7 Cumulative Impacts to Cultural Resources

Existing radio repeaters at Chalone Peak and Scout Peak in the No-Action Alternative are presently having visual impacts to the High Peaks Trail Cultural Landscape. Views along this trail system are also being diminished by the Westside buildings, roads, and parking areas. A proposed 30 foot monopole associated with a climate monitoring station will further diminish the views along the Westside. Further cumulative cultural landscape adverse view shed impacts from the new radio repeater proposed in the Alternatives B, C, and D are expected to be minor and long term.

None of the Alternatives are expected to have cumulative impacts on archeological resources. However, the short-term increase in pedestrian activity around the radio repeater site associated with installation, maintenance, and repair could cause soil compaction and trampling of native vegetation, which could result in exposure of artifacts or erosion of artifact-bearing soil.

4.2.8 Impairment Disclosure

No impairment to Cultural Resources is expected under any of the alternatives. The size and distance of the new radio repeater is not likely to be readily seen along historic trails, particularly when the antenna is painted with a non-reflective paint.

4.2.9 Conclusion

The High Peaks Trails System is expected to be determined eligible as a historic cultural landscape in the near future. A determination of eligibility is presently in progress. This determination will supplement the East Entrance District CLI which has already received SHPO concurrence. Installation of a new radio repeater proposed in Alternatives B, C, and D will have view shed impacts to this landscape. Views from this landscape are already diminished by the presence of existing human-made structures such as buildings, roads, and parking lots. Additional view shed impacts to the eligible historic trail system from the radio repeater and microwave monopole are considered as minor and long term.

Archeological surveys at the proposed radio repeater sites did not reveal any archeological artifacts, and installation of the new structure is not expected to impact archeological resources.

4.3 Vegetation

Vegetation impacts were assessed using field surveys and professional judgment.

4.3.1 Methodology

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. The following definitions were used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives:

Context is the setting within which an impact is analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality.

Intensity is a measure of the severity of an impact. The intensity of an impact may be:

negligible, when the impact is localized and not measurable or at the lowest level of detection;

minor, when the impact is localized and slight but detectable;

moderate, when the impact is readily apparent and appreciable; or

major, when the impact is severely adverse and highly noticeable.

4.3.2 Alternative A (No-Action Alternative)

Installation of the current repeaters on existing infrastructures at Chalone Peak and Scout Peak did not involve the removal or disturbance of plants to accommodate the equipment. Repeater antennas are attached onto existing structures. Although no invasive weeds have been found at the sites to date, they could be spread during maintenance visits. Weed seeds can be carried by work boots, clothing, or other materials. The impacts to vegetation under the current no-action system are likely negligible, adverse, and of short duration.

4.3.3 Alternative B (Preferred Alternative- Existing Radio Repeaters and New Repeater at Willow Springs Site)

All adverse impacts described for the No-Action Alternative (i.e., potential introduction of invasive species during maintenance visits) also apply to this Alternative. In addition, installing new equipment will add the following impacts.

The proposed radio repeater site at Willow Springs is in an open, denuded, and previously trampled area along the pig fence trail (see Photo 4 page 22). There is enough bare soil to install the repeater without having to cut chaparral shrubs. A vegetation survey of the site revealed surrounding vegetation comprised of chamise (*Adenostoma fasciculatum*) and black sage (*Salvia mellifera*). No species of concern were observed near the site.

Invasive weeds could be spread at the site during construction or maintenance visits; the seeds could be carried by helicopter skids, construction equipment, work boots, clothing, or other materials. Overall, installation of the new radio repeater will likely have only negligible to minor, adverse, and short duration impacts on vegetation.

4.3.4 Alternative C (Existing Radio Repeaters and New Radio Repeater at Harris Site)

All adverse impacts described for the No-Action Alternative (i.e., potential introduction of invasive species during maintenance visits) also apply to the Alternative C. In addition, installing new equipment will add the following impacts.

This site is located just outside the Wilderness boundary of Pinnacles. A cleared dirt road runs east-west along the ridge and could provide foot or four-wheel drive access to the site from the western boundary of the park (see Photo 5 page 24). The vegetation within the site is characterized by moderately dense chaparral dominated by chamise (*Adenostoma fasciculatum*). No tree species were within 100 meters of the Harris repeater site. Other shrubs form less than 10% of the cover in the area and include California buckwheat (*Eriogonum fasciculatum*, bush poppy (*Dendromecon rigida*), and big-berried manzanita (*Arctostaphylos glauca*). The herbaceous layer within the site was sparse (<1% cover). The few herbaceous species present in the site included the native annuals Navarretia (*Navarretia* sp.) and chia (*Salvia columbariae*). There were strikingly few exotic species within or adjacent to the site, despite the presence of a road. Other diminutive plant species may be present at other times of the year, but were not apparent at the time of the survey.

4.3.5 Alternative D (Existing Radio Repeaters and New Radio Repeater at the Smith Road Site)

All adverse impacts described for the No-Action Alternative (i.e., potential introduction of invasive species during maintenance visits) also apply to the Alternative D. In addition, installing new equipment will add the following impacts.

A cleared dirt road runs east-west along the ridge and could provide foot or four-wheel drive access to the site from the western boundary of the park. The vegetation within the site is characterized by moderately dense chaparral dominated by chamise (*Adenostoma fasciculatum*) (see Photo 6 page 26). No tree species were within 100

meters of the Smtih Road repeater site. Other shrubs form less than 10% of the cover in the area and include California buckwheat (*Eriogonum fasciculatum*, bush poppy (*Dendromecon rigida*), and big-berried manzanita (*Arctostaphylos glauca*). The herbaceous layer within the site was sparse (<1% cover). The few herbaceous species present in the site included the native annuals Navarretia (*Navarretia* sp.) and chia (*Salvia columbariae*). There were strikingly few exotic species within or adjacent to the site, despite the presence of a road. Other diminutive plant species may be present at other times of the year, but were not apparent at the time of the survey. Overall, installation of a radio repeater at this site would likely only have negligible impacts on vegetation.

4.3.6 Mitigation

No surrounding chaparral shrubs will be cut during installation of the new radio repeater. Pre- and post construction mitigation measures will be implemented at the new radio repeater site to prevent the introduction and spread of invasive species into native chaparral vegetation. All hand tools and heavy equipment used for construction will be cleaned of all soil that may have seeds in it. In addition, weed surveys will be conducted every year for a minimum of three years at each site to eradicate any incipient weedy populations before they can spread along the pig fence trail or into native chaparral vegetation.

Additional construction and disturbance may introduce non-native species to the site, which currently has no non-native species. Establishment of the repeater at this site would have a long-term, negligible, adverse impact to vegetation in the park.

Three-years of post surveys should be conducted after construction to detect incipient populations of priority non-native plant species and promptly treat (common to all).

4.3.7 Cumulative Impacts

Any brush clearing (if needed) at the new radio repeater site will increase the cumulative impacts to vegetation in the Monument. Other sources of vegetation impacts in the park include off trail trampling of vegetation in climbing areas; feral pig rooting destruction of vegetation; and recent vegetation clearing for the weather station. Adverse cumulative impacts on vegetation from this project are expected to be negligible to minor and long-term.

4.3.8 Impairment Analysis

The project will not impair vegetation resources in the monument because there will be only a limited need for vegetation clearing at any of the action alternative radio repeater sites.

4.3.9 Conclusion

The biggest threat to native vegetation at the un-vegetated repeater site is the potential introduction of invasive species during installation and/or maintenance visits. Invasive species could then spread along the pig fence trail and eventually spread out into native chaparral habitat. However, good mitigation procedures will be in place to minimize and/or respond to this potential impact.

4.4 Wildlife

4.4.1 Methodology

The following thresholds were used to determine the magnitude of effects on wildlife and special status species that would result from implementation of any of the alternatives. Impact thresholds for non-listed species are identical to those outlined at the beginning of this chapter in the Methodology section.

No effect. The proposed action would not affect a listed species or designated critical habitat.
May affect / not likely to adversely affect. Effects on special status species are discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or are completely beneficial.
May affect / likely to adversely affect. When an adverse impact to a listed species may occur as a direct or indirect result of proposed actions and the effect is not discountable or beneficial.
Is likely to jeopardize proposed species / adversely modify proposed critical habitat (impairment). The appropriate conclusion when the NPS or the US Fish and Wildlife Service identifies situations in which the proposal would jeopardize continued existence of a proposed species or adversely modify critical habitat to a species within or outside the Complex.

4.4.2 No Action Alternative

The most probable impact that the current radio system may have on wildlife is the collision of birds into the existing mounted repeater antennas. The species most vulnerable to collisions are the neotropical migratory songbirds that breed in North America in the spring and summer and migrate to the southern US, the Caribbean, or Latin America during the fall and winter. These species seem to be most vulnerable because they migrate at night. Of the neotropical migrants, thrushes, vireos, and warblers are the most vulnerable to collisions with communication monopoles and towers in North America (Manville 2000). Collisions with existing repeaters within the monument have never been documented, and are less likely to occur because of the absence of lighting, the narrowness and short stature of the antennas (under 40 feet), and the lack of guy wires. Overall, adverse impacts to migrant birds from the existing radio equipment are expected to be negligible and long-term based on expected low probability of bird collisions with the repeater equipment.

4.4.3 Alternative B (Preferred Alternative – Existing Radio Repeaters and New Radio Repeater at Willow Springs Site)

The factors that would impact wildlife under the No-Action Alternative also apply to the Preferred Alternative. Furthermore, use of helicopter during new radio repeater installation and maintenance visits would further impact wildlife. The expected adverse impacts to wildlife at the new radio repeater proposed in this alternative are as follows:

Collisions of migrating neo-tropical birds with the radio repeater are not likely due to the size of the pole, the lack of guy wires, and the lack of lighting. Any collisions with birds would likely be rare.

During installation and on maintenance visits, a helicopter will deliver equipment and construction personnel to the site. Installation of the radio repeater is expected to

require a 10-hour day. Maintenance visits will require approximately two hours of helicopter use. Direct collision between helicopters and larger birds has also been known to occur. Though not documented within the Monument, a number of physiological and behavioral responses to helicopter over-flights have been documented throughout the US (NPS 1994). Some wildlife, such as deer, birds, and small rodents, might be disturbed by the helicopter and installation noise, and may distance themselves from the activity. Some of the known impacts of stress include heart-rate acceleration, energy loss, susceptibility to disease, and changes in metabolism and hormone balances This would result in minor, adverse impacts of a short duration.

The proposed repeater is not within a known raptor nesting area, although it is approximately 500 feet from one. The repeater pole will be small and should not interfere at all with raptor nesting once in place. Maintenance activities by pedestrian staff would not be expected to cause undue disturbance to nesting raptors in the area either. Staff walk past this site on a monthly basis as they monitor the integrity of the pig exclusion fence, and no response has been observed from the falcons nesting nearby. The raptor monitor also monitors the nesting falcons from a vantage point near the repeater site, and has not noted any disturbance.

This site is near the Willow Springs Slide. Since Endangered California Condors often perch on or at the top of cliffs, proximity of the site and likelihood of a condor colliding with the monopole was considered. Prairie Falcons have also used these cliffs for nesting or roosting over several years. Therefore, the exact repeater site would not be constructed in immediate proximity to the cliff in order to reduce the risk of collisions to a negligible level. A minimum distance of 150 meters from the cliff edge and the repeater would be selected for construction under this alternative.

The new radio repeater proposed in this alternative will not likely effect mobile sensitive animal species (e.g., insects, birds, snakes, birds, most mammals) that can move out of the way of construction and maintenance activities. Impacts could include flushing the species out of the area by increased construction and maintenance activity. Once the communication structure is in place, most of the sensitive species known to occur in Pinnacles will also be able to move around or fly over the equipment. However, small, slow moving amphibians could be impacted by repeater construction/maintenance activities.

Overall, the adverse impacts to wildlife from the repeater installation would be expected to range from negligible to minor and long-term.

4.4.4 Alternative C (Existing Radio Repeaters and New Radio Repeater at Harris Site)

The factors that would impact wildlife under the No-Action Alternative also apply to this Alternative. In addition, use of helicopter during radio repeater installation would further impact wildlife. The expected adverse impacts to wildlife at the radio repeater site proposed in this alternative are as follows:

No signs of T & E or sensitive wildlife species or their habitation were observed at the site. Indeed, no significant sighting of wildlife habitation at the site was observed. However, the survey occurred during a time of year when many wildlife species have

either migrated to other regions or are dormant below the ground or under cover. Nevertheless, the wildlife habitat at the site is similar to that found over many thousands of acres of the Monument, so the relative impact of a few square feet of ground disturbance is expected to be negligible. No cliffs or trees suitable for raptor nesting were present within a significant distance of the site. Among the alternatives, this site is also the least proximate to areas most frequented by endangered California Condors.

Overall, the adverse impact to wildlife from the repeater installation would be expected to range from negligible to minor and long-term.

4.4.5 Alternative D (Existing and New Radio Repeater at Smith Road Site)

The factors that would impact wildlife under the No-Action Alternative also apply to this Alternative. In addition, use of helicopter during radio repeater installations would further impact wildlife. The expected adverse impacts to wildlife at the radio repeater site proposed in this alternative are as follows:

No wildlife species were observed at the site. However, the survey occurred during a time of year when many wildlife species have either migrated to other regions or are dormant below the ground or under cover. A few rodent burrows were found in unvegetated areas approximately 30 feet below the site, but none were seen closer than that. Installation and maintenance activities would not be expected to impact these burrows due to their distance from the site. No cliffs or trees suitable for raptor nesting were present within a significant distance of the site. The nearest cliffs suitable for raptor nesting are approximately 0.5 mile to the west. The wildlife habitat at the site is similar to that found over many thousands of acres of the Monument, so the relative impact of a few square feet of ground disturbance is expected to be negligible.

The Smith Road repeater site is located just east of a ridge top approximately 50 feet uphill from the pig fence. The site is outside of the Wilderness but still in a good location for providing radio coverage. Visitors who are walking along the pig fence opening would not directly encounter the radio repeater. It would be approximately 50 feet uphill, and just behind the ridgeline. They would have only a limited view of the repeater box, probably only from a distance, and only the antenna monopole would be visible when they are at the pig fence near the site. Therefore, direct views of the equipment would be unlikely.

Overall, the adverse impact to wildlife from the repeater installation would be expected to range from negligible to minor and long-term.

4.4.6 Mitigation

Prior to radio repeater installation, all occurrences of rare species would be determined using on-site surveys conducted by Park biologists. In the event rare species are observed, construction will be suspended until the individuals move out of the project area. If a rare species is suspected to be inhabiting the site, the installation location will be shifted slightly to avoid the animal while preserving the beneficial attributes of the installation.

Installation of radio repeater equipment will be performed from August to December when raptors are not territorial or nesting in the area. Helicopter operations in that area

from January to July could provide a more significant disturbance to nesting raptors. If a helicopter visit were required for maintenance (e.g., Alternative B), it would take place from August to December.

To minimize attractiveness of condors and other raptors to the radio repeater site, contractors will be required to maintain a clean and uncluttered construction site throughout the installation of equipment. Condors sometimes become inquisitive when new structures appear in areas with which they are already familiar. They also have been documented at times investigating areas with collections of shiny objects. Minimizing the number of debris such as small metal objects or broken bits of plastic in the construction area will reduce the chance that condors will land in the area and retrieve such objects.

4.4.7 Cumulative Impacts to Wildlife

Recent additions of towers to Pinnacles include weather station equipment on the east and west districts of the monument. The addition of a new radio repeater antenna and pole could increase the likelihood of bird collisions. However, the size and construction of this new equipment has been selected to minimize these impacts. Therefore, the project will likely have negligible to minor cumulative adverse effects on bird collisions. The increased use of helicopters for installation and possibly maintenance visits will also have minor and short-term impacts on wildlife in the monument

4.4.8 Impairment Disclosure

No impairment to Wildlife is expected under any of the alternatives. No wildlife will likely be directly harmed during installation of the new radio repeater. No lights or guy wires will be used for the radio repeater, so bird collisions are not likely to be rare on this structure.

4.4.9 Conclusion

The number of wildlife species that could be impacted under the Action Alternatives are expected to be negligible to minor and short term. Bird collisions with these structures are likely to be low based on the low height of the structures and the lack of lighting and guy wires on any of the structures. The radio repeater will be powered by solar panels and none will have any noise making generators. The use of helicopters and workers during installation and possibly maintenance work will likely disturb nearby wildlife for a short duration. Avoidance of helicopter use during the raptor breeding season will prevent disturbance to nesting raptors. Overall, Alternative B, C, and D may affect, but are not likely to adversely affect wildlife in the monument.

4.5 Health and Public Safety

4.5.1 Methodology

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. The following definitions were used to

evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives:

Context is the setting within which an impact is analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality.

Intensity is a measure of the severity of an impact. The intensity of an impact may be:

negligible, when the impact is localized and not measurable or at the lowest level of detection;

minor, when the impact is localized and slight but detectable;

moderate, when the impact is readily apparent and appreciable; or

major, when the impact is severely adverse and highly noticeable.

4.5.2 No Action Alternative

4.5.2.1 Health

The existing radio repeater system consisting of two repeaters and three base stations is of low wattage (emitting approximately 15 watts at the repeaters and 60 watts at the base stations), transmitting up to about six percent of the time. At ground level this is well below the individual Maximum Permissible Exposure (MPE), as defined by FCC guidelines. At such low wattage levels and frequency, there are no known or anticipated impacts to human health regarding overexposure to radio frequency energy.

4.5.2.2 Public Safety

The antenna poles at the existing Chalone Peak and Scout Peak radio repeater sites could attract lightning which would be a safety concern for visitors or staff using the facilities during storm events. However, appropriate grounding has been installed at each site to prevent injury or damage from lightning strikes. The impacts to health under this alternative would be negligible to minor, adverse and of a short duration.

Under the current radio repeater configuration, several areas within the Monument lack the radio coverage necessary for administrative operations and timely public safety response. Many of these areas are along high visitor use trails including the North Wilderness Trail and Old Pinnacles Trail. When personnel are within these areas, they either forego using a radio, or travel some distance to find radio reception. In areas with adequate reception, radio transmissions are usually successful and effective. Under this alternative, the impact of the current system on public safety and park operations would be minor to moderate, adverse, and of long duration due to the lack of coverage in some areas. An example of the negative effect of poor radio coverage during medical incident is shown in Appendix E.

4.5.3 Alternative B (Preferred Alternative – Existing Radio Repeaters and a New Radio Repeater at Willow Springs Site) .

4.5.3.1 Health

Under the proposed system, the three new radio repeater would be away from areas frequented by hiking visitors. The system would be low wattage and well below permissible exposures as previously described in the No Action Alternative. At such low wattage levels and frequency, there are no known or anticipated impacts to human health regarding overexposure to radio frequency energy. Health impacts from radio wave exposure are likely to be negligible and of long-duration. .

The repeater pole will potentially attract lightning strikes which would pose a public safety issue. Appropriate grounding will need to be installed at each site to prevent injury or damage from lightning strikes. The radio repeater site is in an isolated, difficult to reach area. The impacts to health under this alternative would be negligible, adverse, and of long duration.

4.5.3.2 Public Safety

Currently, there is no NPS radio coverage along Old Pinnacles Trail, and there are numerous radio coverage "dead zones" along the North Wilderness Trail. GIS view shed analysis suggests installation of a radio repeater at the Willow Springs site will provide radio coverage along approximately 0.4 miles of the Old Pinnacles Trail, and an additional 0.3 miles of new radio coverage along the North Wilderness Trail. These radio coverage improvements will provide the greatest beneficial long-term impacts to public safety compared with the other Alternatives by providing the greatest amount of new radio coverage, which could be critical during emergency situations.

4.5.4 Alternative C – (Existing Radio Repeaters and a New Repeater at Harris Site).

4.5.4.1 Health – Impacts on Health for the Alternative are the same as for Alternative B (see 4.5.3.1 on page 60).

4.5.4.2 Public Safety – GIS View shed Analysis suggests that installation of a radio repeater at the Harris Site will provide up to 0.4 miles of new radio coverage along the North Wilderness Trail. This expanded radio coverage along a high use trail will have long-term beneficial impacts on visitor safety by improving communications capabilities of park staff to respond to emergency situations along this region of the Monument

4.5.5 Alternative D – (Existing Radio Repeaters and a New Repeater at the Smith Road Site)

4.5.5.1 Health – Impacts on Health for the Alternative are the same as for Alternative B (see 4.5.3.1 on page 60).

4.5.5.2 Public Safety – GIS View shed Analysis suggests that installation of a radio repeater at the Harris Site will provide up to 0.4 miles of new radio coverage along the North Wilderness Trail. This expanded radio coverage along a high use trail will have long-term beneficial impacts on visitor safety by improving communications capabilities of park staff to respond to emergency situations along this region of the Monument.

4.5.6 Cumulative Impacts to Health and Public Safety

Electromagnetic fields (EMFs) exist everywhere in the environment. Although EMF is both natural and human-made, in the last century exposure to human-made EMF has steadily increased as demands for energy, telecommunications and broadcasting, and other advancing technologies has increased. In response to concerns that electromagnetic pollution is causing significant risks to human health, the FCC Office of Engineering and Technology produced Bulletin 56, which provides information on the biological effects and potential hazards of radio frequency electromagnetic fields. The bulletin reported that the environmental levels of radio frequency energy that are encountered by the general public are far below levels necessary to produce significant heating and increased body temperature (FCC 1999). Situations in which these levels are exceeded do exist, often in the workplace, near high-powered radio frequency sources.

4.5.7 Conclusions

There are no known or anticipated impacts to human health regarding overexposure to radio frequency energy from either the existing or new radio repeaters. The new repeater proposed in the Action Alternatives will provide benefits to public safety by providing expanded radio coverage in high use areas currently lacking radio coverage. Enhanced communications for park staff will improve emergency response capabilities and thereby provide benefits to public safety.

4.6 Park Operations

4.6.1 Methodology

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. The following definitions were used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives:

Context is the setting within which an impact is analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality.

Intensity is a measure of the severity of an impact. The intensity of an impact may be:

negligible, when the impact is localized and not measurable or at the lowest level of detection;

minor, when the impact is localized and slight but detectable;

moderate, when the impact is readily apparent and appreciable; or

major, when the impact is severely adverse and highly noticeable.

4.6.2 No Action Alternative

Under the current radio repeater configuration, several areas within the Monument lack the radio coverage necessary for administrative operations and timely public safety response. Many of these areas are along high visitor use trails including the North Wilderness Trail and Old Pinnacles Trail. When personnel are within these areas, they either forego using a radio, or travel some distance to find radio reception. In areas with adequate reception, radio transmissions are usually successful and effective. Under this alternative, the impact of the current system on park operations would be moderate, adverse, and of long duration due to the lack of coverage in some high use visitor areas. An example of the negative effect of poor radio coverage during medical incident is shown in Appendix E.

4.6.3 Alternative B (Preferred Alternative - Existing Radio Repeaters and a New Radio Repeater at Willow Springs Site)

Installation of the radio repeater at Willow Springs will increase radio reception along Old Pinnacles Trail and the North Wilderness Trail. This will result in the greatest benefits to park operations, particularly for staff doing fieldwork in these areas. Communications between east and west district offices will be improved.

4.6.4 Alternative C – (Existing Radio Repeaters and a New Repeater at Harris Site).

Installation of the radio repeater at the Harris site will increase radio reception along the North Wilderness Trail. This will result in beneficial impacts to park operations particularly for staff doing fieldwork in that area. Communications between east and west district offices will be improved.

4.6.5 Alternative D – (Existing Radio Repeaters, and a New Repeater at the Smith Road Site).

Installation of the radio repeater at the Smith Road site will increase radio reception along the North Wilderness Trail. This will result in beneficial impacts to park operations particularly for staff doing fieldwork in that area. Communications between east and west district offices will be improved.

4.6.6 Cumulative Impacts to Park Operations

The improvements in radio coverage along high priority trails will provide cumulative benefits to park operations in the Monument.

4.6.7 Conclusions.

Park radio coverage in high use areas currently lacking radio coverage will be improved by Alternatives B, C, and D. Installation of the radio repeater at the Willow Springs site in the Preferred Alternative (Alternative B) will provide some new coverage along Old Pinnacles Trail and the North Wilderness Trail. Installation of the radio repeater at Harris Site and Smith Road Site as proposed in Alternative C and D will likely improve radio coverage along the North Wilderness Trail.

Table 4. Comparison of Alternative Impacts.

	Wilderness	Cultural Resources	Vegetation	Wildlife	Health & Public Safety	Park Operations
Alternative A (No-Action)	**Negligible to Minor Impacts to Wilderness Experience when visitors see** existing radio repeater equipment at Chalone Peak and Scout Peak	Scout Peak radio repeater antenna and pole are visible on the comfort station in the High Peaks historic district, and this is likely **causing negligible to minor long-term adverse view shed impacts**	Negligible impacts from potential introduction of non-native species during maintenance visits	Birds may potentially (but not likely) collide with antennas and /or poles at existing repeaters at Scout Peak and Chalone Peak; these **adverse impacts are likely to be negligible and long-term**.	Poor radio coverage along high priority trails will **continue to have minor to moderate long-term adverse impacts on public safety;**	Poor radio coverage along high priority trails **will continue to have moderate long-term adverse impacts on park operations;**
Alternative B (Microwave, Existing, and New Radio Repeater at Willow Springs)	New radio repeater installed inside Wilderness boundary will **likely have a minor long-term adverse impacts on Wilderness resources by introducing a new human-made structure in the Wilderness;** hikers will potentially see distant views, but more likely reflections off the radio repeater pole **which will have minor impacts on wilderness experience through view shed impacts**; Helicopters, power equipment, and generators used during microwave monopole and radio repeater installations will have **minor and short-term adverse impacts on wilderness experience from short term noise and visual impacts.**	Scout Peak radio repeater adverse impacts (see above) Hikers in High Peaks historic trail may see reflections off the radio repeater antenna or pole which will **likely have minor adverse impacts .**	Installation of radio repeater will be on a cleared site, **so at most only negligible adverse and short-term impacts.**	Bird collisions with the new radio repeater may occur , but this will not likely be very many due to small pole size, lack of lighting, and lack of guy wires; **Adverse impacts to birds from collisions with the new radio repeater structure is likely to be negligible to minor and long-term.** Some wildlife may be disturbed by helicopter, power tools, and/or generator use and noise during radio repeater installation, and may distance themselves from the activity; added stress from the noise (e.g., accelerated heartbeat, energy-loss, change in metabolism, etc**.) is likely to be negligible to negligible minor and short-term**	Expanded radio coverage along high priority trails **will have long-term beneficial impacts on public safety**	Expanded radio coverage along high priority trails **will have long-term beneficial impacts on park operations**
Alternative C (Microwave, Existing, and New Radio Repeater at Harris Site)	New radio repeater will be installed outside wilderness boundary; visitors are not likely to seeing distant views of the radio repeater antenna and pole; reflections off the antenna will likely cause **short-term minor adverse impacts to Wilderness experience through view shed impacts** Helicopter use, along with power tools and generators during radio	Scout Peak radio repeater adverse impacts (see above) Hikers may see reflections off the radio repeater pole which will **likely have negligible to minor adverse visual impacts .**	Installation of radio repeater will be on a cleared site**, so at most only negligible adverse and short-term impacts.**	Bird collisions with the existing and/or new radio repeater may occur some, but will not likely be very many due to small pole size, the lack of lighting, and the lack of guy wires. **Adverse impacts to birds from collisions with the new radio repeater structures is likely to be negligible to minor and long-term.** Some wildlife may be disturbed by helicopter, power tools, and/or generator use and noise during radio	Expanded radio coverage along high priority **trails will have long-term beneficial impacts on public safety.**	Expanded radio coverage along high priority **trails will have long-term beneficial impacts on park operations.**

	Wilderness	Cultural Resources	Vegetation	Wildlife	Health & Public Safety	Park Operations
	repeater installation s will have **minor and short-term adverse impacts on wilderness experience from short term noise and visual impacts.**			repeater installations, and may distance themselves from the activity; added stress from the noise (e.g., accelerated heartbeat, energy-loss, change in metabolism, etc**.) is likely to be negligible to minor and short-term**		
Alternative D (Microwave, Existing, and New Radio Repeater at the Smith Road Site)	New radio repeater will be installed outside wilderness boundary, so no direct impacts to wilderness resources; visitors are not likely to seeing distant views of radio repeater antenna reflections off the antenna or pole will **experience short-term negligible to minor adverse impacts to wilderness experience through view shed impacts** Helicopter use during new radio repeater installation will have **minor and short-term adverse impacts on wilderness experience from short term noise and visual impacts.**	Scout Peak radio repeater adverse impacts (see above) Hikers will potentially see reflections off the radio repeater pole which will **likely have negligible to minor adverse visual impacts**	Installation of radio repeater will be on a cleared site**, so at most only negligible adverse and short-term impacts**	Bird collisions with the new radio repeater may occur, but their will not likely be very many due to small pole size, the lack of lighting, and the lack of guy wires. **Adverse impacts to birds from collisions with the new radio repeater structures are likely to be minor and long-term.** Some wildlife may be disturbed by helicopter, power tools, and/or generator use and noise during radio repeater installation, and may distance themselves from the activity; added stress from the noise (e.g., accelerated heartbeat, energy-loss, change in metabolism, etc**.) is likely to be negligible to minor and short-term**	Expanded radio coverage along high priority **trails will have long-term beneficial impacts on public safety**	Expanded radio coverage along high priority **trails will have long-term beneficial impacts on park operations**

5.0 Consultation and Coordination

5.1 Agencies Consulted

State Historic Preservation Office. In compliance with all appropriate elements of the National Historic Preservation Act, the scoping notification was sent to the California State Historic Preservation Office (SHPO) informing them of the proposed project. This environmental assessment will be sent to the SHPO requesting their review and comment.

US Fish and Wildlife Service. The US Fish and Wildlife Service was sent the scoping notification for this project. The final version of this environmental assessment will be sent to the Service, requesting their concurrence with the determinations made for federally listed species.

5.2 List of Preparers and Contributors

This environmental assessment was prepared by Haynes Currie, Environmental Protection Specialist from the Pacific West Regional Office; Contributors include: Albert Faria, Chief Ranger and Project Lead; Barbara Butler, Landscape Architect from the Pacific West Regional Office; Eric Brunnemann, Superintendent; Timothy Babilis, cultural resource specialist from the Pacific West Regional Office, Mark Rudo, Archeologist from Pacific West Regional Office, Debbie Simmons, Chief of Maintenance, Denise Louie, Chief of Resources, Paul Johnson, Wildlife Biologist, Brent Johnson, Park Botanist, Gavin Emmons, Wildlife Biologist, and Daniel George, Wildlife Biologist.

5.3 List for Public Review of EA

A list of recipients including individuals, groups, agencies, organizations, who will be sent copies of the environmental assessment during the 30 day public comment period is shown below. Copies of the EA will be available at area libraries, and the EA will be available on the park's website at (http://www.nps.gov/pinn/index.htm).

Erin Ziegler	California Wilderness Coalition	1221 Broadway, Ste. 1700	Oakland	CA	94612
California/Nevada Region	Wilderness Society	P.O. Box 29241	San Francisco	CA	94129-0241
Milford W Donaldson, FAIA, SHPO	Office of Historic Preservation	PO Box 942896	Sacramento	CA	94296-0001
Ryan Hensen, Policy Director	The California Wilderness Coalition	PO Box 993323	Redding	CA	96099
Valentin J Lopez	Ohlone/Costanoan Indians	3015 Eastern Ave, Apt 40	Sacramento	CA	95821
Ventana Wilderness Society		19045 Portola Dr. Ste F-1	Salinas	CA	93908
Ventura Field Office	US Fish and Wildlife Service	2493 Portola Rd Suite B	Ventura	CA	93003
Nicole Nedeff	Wild. Land Trust	PO Box 163	Carmel Valley	CA	93924
Friends of Pinnacles National Monument		208 Woods St.	Santa Cruz	CA	95062

6.0 Literature Cited

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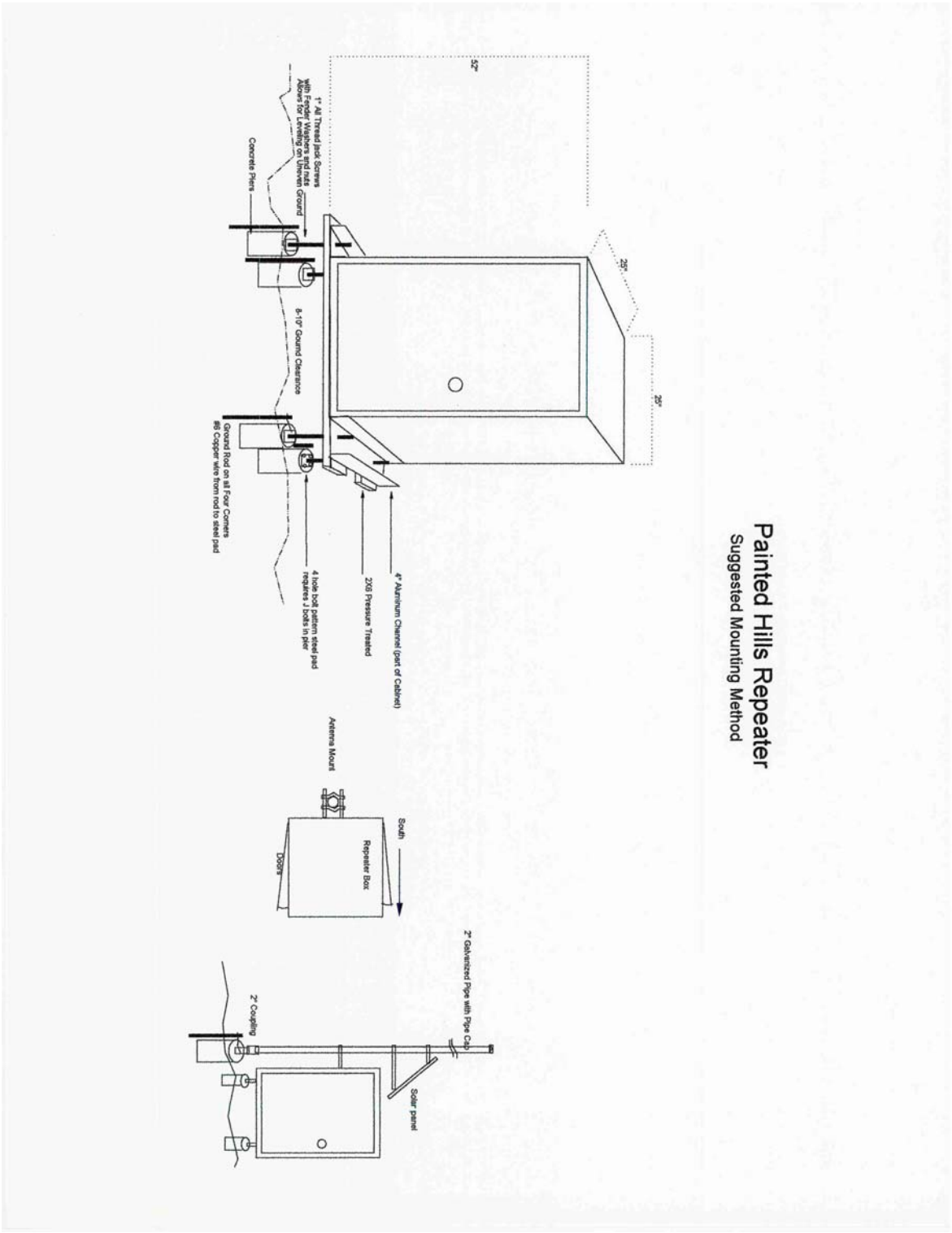
Appendix A – Photos and Diagrams



Design Specifications for the proposed new radio repeater

Appendix B – Correspondence/Memos

National Park Service
U.S. Department of the Interior

Pinnacles National Monument

Memorandum

Date: June 8, 2008

To: Albert Faria, Chief Ranger

From: Brett Hergert, Park Ranger
Emergency Medical Services Coordinator
Safety Officer

Subject: Radio reception failures, SAR #08-156

On the afternoon of June 7 I responded to a request for emergency medical assistance on the east side of the Balconies cave. The call was of high urgency, as the patient was reported to have lost consciousness for an extended time due to unknown causes.

I'm familiar with the poor or non-existent radio reception in the area and immediately ordered a fellow responder, Scott S., to accompany me to assist with communications. We found the patient on the trail between the east Balconies Cave/Balconies Cliffs trail junction and the east entrance to the Balconies Cave. I could not receive or transmit on any repeater channel from that location.

I transcribed my orders for more resources and sent Scott up the Balconies Cliffs trail to access the highest trail elevation in an attempt to make radio contact. After trying several locations, running over ½ mile and several hundred vertical feet of elevation gain, he was able to relay most messages using the Chalone repeater. Unfortunately, from that location, he and I could not communicate. Over the course of the next several hours, he would then run from one location to the other in order to hear my requests and then move again to transmit.

My report for this incident will be completed soon, but I wanted to notify you in advance in the hope of addressing this issue sooner and in more detail. Based on my experience in field testing for potential repeater sites, this incident would likely have operated solely on any of the proposed sites in the north and northeast areas of the Monument. It is highly likely that contact could have been made from the patient's location and a human repeater would not have been necessary to this extent, or at all.

I believe these communication failures delayed the evacuation and transport of this patient to definitive medical care.

Thank you for your attention to this problem.

United States Department of the Interior

NATIONAL PARK SERVICE

SCOPING NOTICE

Pinnacles National Monument Environmental Assessment
Radio Coverage Improvement Project

The purpose of this notice is to advise interested agencies, organizations, and individuals of the proposed radio coverage improvements project at the Pinnacles National Monument and to solicit comments on the issues and resources that should be addressed in the Environmental Assessment (EA).

The objective of the project is to provide the Park with increased radio coverage for safety, medical, and operations needs. Currently, the radio system in the park has a number of dead areas in the Park including a number of popular hiking trails such as the North Wilderness Trail, South Wilderness Trail, Old Pinnacles Trail, Bear Gulch Trail, Juniper Canyon Trail, the Chaparral Ranger Station area, and also in the newly acquired Pinnacles Ranchlands. These are high use areas with the potential for active law enforcement or medical emergency responses. There are currently two radio repeaters operating in the Park. However, neither of these has the line of site to service large areas in the north of the park. The problem is compounded by radio fading in other areas, and poor communications with the regional radio dispatch at Sequoia National Park.

The park is proposing to install one additional radio repeater at a suitable location to improve radio coverage within the Park, and to improve communications with the regional dispatch office. Surveys were conducted by regional radio specialists and Park staff to locate suitable sites. One site near Willow Springs in designated wilderness provided the best improvements to radio coverage in the Park. The site is located in a disturbed area adjacent to the pig exclusion fence (see attached photo). Due largely to line of site limitations, other sites surveyed did not provide enough radio coverage improvements to be further considered in the EA. As a result, the Park is moving ahead with the preferred alternative (i.e., Willow Springs site inside the wilderness) and the no-action (no change) alternative in the EA.

The proposal will include siting and construction of a solar-powered radio repeater consisting of a 4.5 ft x 2 ft x 2 ft aluminum repeater box anchored into the soil with four ground rods; a 12-13 ft high x 2 inch diameter galvanized pipe onto which an approximately 2ft x 2ft aluminum antenna and a 4 ft x 2ft solar panel are attached (see attached photo). The location of the preferred alternative site is shown in the attached map.

NPS expects to have the EA prepared and made available for public review and comment by summer 2008 for a 45-day review period. The EA will be available on the park's website (http://www.nps.gov/pinn/index.htm). The project work is tentatively scheduled to begin in fall 2008. If you would like to receive a copy of the EA or have questions, comments, or concerns about the proposal please write to the address below:

Superintendent
Pinnacles National Monument
5000 Highway 146
Paicines, CA 95043-9762

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

August 18, 2009 Reply In Reference To: NPS090810A

Eric Brunnemann
Superintendent
Pinnacles National Monument
5000 Highway 146
Paicines, CA 95043-9770

RE: Environmental Assessment for Proposed Communications Improvements, Pinnacles National Monument

Dear Mr. Brunnemann:

Thank you for your letter dated 7 August 2009 submitting the draft report *Pinnacles National Monument Communications Improvement Project Environmental Assessment* (July 2009) for my review. It is not the practice of this office to review environmental documents. However, after reading through the letter, I agree that this project has the potential to cause an adverse effect to historic properties within Pinnacles National Monument. If the finding of effect for this project is a Finding of Adverse Effect, then you are correct that an agreement document will be necessary.

I look forward to receiving documentation regarding this undertaking in compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation at 36 CFR Part 800.

Thank you for considering historic properties as part of your project planning. Please use the reference number above in future correspondence. If you have any questions or concerns, please contact Mark Beason, at (916) 653-8902 or mbeason@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

AMAH MUTSUN TRIBAL BAND
3015 EASTERN AVENUE #40
SACRAMENTO, CA 95821

August 13, 2009

Mr. Albert Faria, Chief Ranger
Pinnacles National Monument
5000 Highway 146
Paicines, California 95043

Dear Mr. Faria,

Thank you for providing the Environmental Assessment for the Pinnacles National Monument's Communications Improvement Project for review by the Amah Mutsun Tribal Band. We understand that per the Environmental Assessment there is no known archaeological or prehistorical site on the proposed construction landscape. Based on our review of the Environmental Assessment we have determined that it is doubtful that culturally important materials will be located on the construction sites. In the event that cultural material is found, please notify the Amah Mutsun Tribal Band immediately.

Our Tribal interest regarding this notification is to ensure that the requirements of 26 CFR.800.13 (B) are complied with. Archaeological resources that may be discovered include: ceremonial sites, mythological sites, social/cultural meeting sites, and resources, gathering sites (i.e. basket materials and traditional food items, trails, historical events and sites and others). In the event that any of the above items are found we request that our Tribe be contacted immediately.

On behalf of the Amah Mutsun Tribal Band I want to thank you for the opportunity to review this proposal.

Sincerely,

Valentin Lopez, Chairman
Amah Mutsun Tribal Band
(916) 743-5833

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
81440-2009-I-0464

September 9, 2009

Memorandum

To: Superintendent, Pinnacles National Monument, Paicines, California

From: Assistant Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

Subject: Informal Consultation on the Communications Improvement Project at Pinnacles National Monument

We have reviewed your letter dated August 7, 2009, and received by our office on August 10, 2009, requesting our concurrence with your determination that the subject project is not likely to adversely affect the federally endangered California condor (*Gymnogyps californianus*). You have determined that the proposed project will not affect the federally threatened California red-legged frog (*Rana draytonii*) or California tiger salamander (*Ambystoma californiense*). The National Park Service (NPS) proposes to install three new structures as part of a communication improvement project at Pinnacles National Monument, Paicines, California.

The proposed project would consist of:

1. Installation of a new 30-foot microwave dish monopole approximately 0.5-mile from the Westside maintenance building. Construction would occur over 5 – 10 days. A helicopter would transport workers and equipment to the project site.

2. Installation of a new 30-foot microwave dish monopole installed at the Westside maintenance building.

3. Installation of a new radio repeater near Willow Springs. Construction would occur over one day. A helicopter would transport workers and equipment to the project site.

There are between 12 and 14 free-flying California condors at Pinnacles National Park (NPS 2009). Within the Park, California condors roost on trees, snags, cliffs, and rocky outcrops in high elevations and forage in grassland or oak savannahs in lower elevations (NPS 2009).

Installation of communication towers could affect California condors through collision with the towers and electrocution during perching on the towers. California condors could also be harassed by or collide with helicopters associated with tower installation. California condors could also be attracted to and ingest trash associated with the construction projects.

You have proposed the following measures to avoid and minimize impacts to California condors during project activities (NPS 2009):

1. All occurrences of rare species will be determined using on-site surveys conducted by NPS biologists. In the event rare species are observed, helicopter flight and/or construction will be suspended until the individuals move out of the project area.

2. Installation of radio repeater and microwave monopoles will be performed from August to December when raptors are not territorial or nest in the area.

3. To discourage birds from being attracted to the microwave monopoles, a cone will be attached at the apex of the poles to dissuade any bird from using it as a perch. Dishes or other communication devices will be mounted below the apex of the monopole in order to minimize the attractiveness of each as a roosting location for California condors and other birds.

4. The construction contractor will maintain a clean and uncluttered construction site throughout the installation of equipment.

5. The monopoles will be painted a non-reflecting natural color to reduce reflectance which might attract birds.

We concur with your determination that the subject project is not likely to adversely affect the California condor. Our concurrence is based on the expected effects of the proposed activities, the limited size of the project, and the proposed minimization and avoidance measures. Therefore, further consultation, pursuant to section 7 of the Act, is not necessary. If the proposed action changes in any manner that may affect a listed species or migratory birds, or any listed species is affected while conducting the project, you must contact us immediately to determine whether additional consultation is required. If you have any questions regarding this memorandum, please contact Christopher Diel of my staff at (805) 644-1766, extension 305.

LITERATURE CITED

National Park Service (NPS). 2009. Pinnacles National Monument communications improvement project: environmental assessment. Paicines, California.

Appendix C – Minimum Requirement Analysis

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEETS

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Please refer to the accompanying MRDG *Instructions* for filling out this guide.

The spaces in the worksheets will expand as necessary as you enter your response.

Step 1: Determine if any administrative action is necessary.

Description: Briefly describe the situation that may prompt action.

Pinnacles National Monument (Pinnacles) proposes to improve its internal radio communications capabilities presently considered deficient in many areas of the Monument. To improve these conditions, Pinnacles NM proposes to install a new radio repeater to improve radio coverage in the central and northern portions of the park. The Monument hopes to install the new structure during 2009-2010 seasons. .

The existing park operations radio communication system, comprised of two radio repeaters and three base stations has a number of "dead" zones in the central and northern portions of the Monument. Some of these "dead" areas currently lacking radio coverage occur along popular visitor use areas such as the North and South Wilderness Trails, Old Pinnacles Trail, the Bear Gulch Trail, Juniper Canyon Trail, Chaparral Ranger Station area, and in the newly acquired lands. All of these heavily used areas have potential needs for active law enforcement and medical emergency responses. In addition, radio communication along the pig fence is spotty in many areas, and better coverage is desired for employee safety and improved park operations.

To determine if administrative action is necessary, answer the questions listed in A - F on the following pages.

A. Describe Options Outside of Wilderness

Is action necessary within wilderness?

Yes: x **No:** ☐

Explain: Field Radio Testing by NPS regional radio specialists did not find a suitable site outside the designated wilderness that would provide coverage in high priority areas. One site, located near Willow Springs within the wilderness boundary did provide good coverage in areas needing radio coverage.

An additional GIS view shed analysis was performed at other locations to determine if a suitable site outside the wilderness boundary could be found. Although placement of a radio repeater at some of these sites would likely provide some radio coverage in high priority areas, none of the sites outside of wilderness provided as good coverage in high priority areas as the Willow Springs Site. Placement of a repeater at locations outside of wilderness would not provide adequate radio coverage given the steep topography surrounding them and the line-of-sight needs for the repeater to the system control point.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: **No:** x **Not Applicable:** ☐

Explain:

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: **No:** x **Not Applicable:** ☐

Explain: There is no mandate that requires placement of radio infrastructure in designated wilderness.

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and

Yes: x **No:** ☐ **Not Applicable:** ☐

Explain: Director's Order #15 states that "the principal method of communicating by wireless in National Park Service units will be by utilizing units of the Service's private land mobile radio systems. The

development, maintenance, and utilization of these private radio systems is essential to ensure that in critical, life safety situations, the NPS unit will have unfettered access to reliable, secure radio communications designed specifically to meet the essential geographic service area requirements of the NPS." Given these requirements, taking action in wilderness is necessary in order to ensure the NPS has reliable radio communications.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammeled: **Yes:** ☐ **No:** **x**

Explain:

Undeveloped: **Yes:** ☐ **No:** **x**

Explain:

Natural: **Yes:** ☐ **No:** **x**

Explain:

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Yes: ☐ **No:** **x**

Explain:

Other unique components that reflect the character of this wilderness:

Yes: ☐ **No:** **x**

Explain:

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes:** ☐ **No:** **x**

Explain:

Scenic: **Yes:** ☐ **No:** x **Not Applicable:** ☐

Explain: The proposed project will impact the scenic values associated with designated wilderness. Infrastructure at the the new radio repeater site will diminish the scenic and historic view shed surrounding the sites, as well as from distant vista points, which are associated with expansive natural landscapes and mountain peaks.

Scientific: **Yes:** ☐ **No:** x **Not Applicable:** ☐

Explain:

Education: **Yes:** ☐ **No:** ☐ **Not Applicable:** x

Explain:

Conservation: **Yes:** ☐ **No:** x **Not Applicable:** ☐

Explain:

Historical use: **Yes:** ☐ **No:** ☐ **Not Applicable:** x

Explain:

Step 1 Decision: **Is any administrative action <u>necessary</u> in wilderness?**

Yes: x **No:** ☐ **More information needed:** ☐

Explain: Administrative action is necessary because although adverse impacts to wilderness character would occur if the proposed action was implemented, there is sufficient reason to proceed because no alternatives for repeater locations outside of designated wilderness have been found. In addition, the proposed action would provide reliable radio coverage, which is essential to perform law enforcement, employee and public safety, and management functions.
If action is <u>necessary</u>, proceed to Step 2 to determine the <u>minimum</u> activity.

Step 2: Determine the <u>minimum</u> activity.

For this portion of the analysis, three options were initially developed to accomplish the proposed actions. The options range from traditional or primitive tools only (reliance on human or animal power), to unrestricted use of modern tools (mechanical or motorized transport and motorized equipment

For each option, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

Option # 1- Primitive Tools Only

Description: Under this option, installation of the new radio repeater would be conducted on foot, using pack horses, and only with traditional hand tools or mechanized tools. Given the size of the equipment, which includes a 4' x 4' x 3' tall equipment box, an antenna and a pole measuring 13 feet, solar panels measuring 56" x 26," and a large amount of associated radio equipment (duplexers, batteries, charger/regulators, etc.), the proposed work could not be accomplished using primitive tools only. Additionally, the electrical sensitivity of some of the equipment precludes the use of backpacking or stock for transport. Most of the radio infrastructure is so large and bulky that it could not be carried by stock. Furthermore, none of the proposed sites are accessible by stock. The use of primitive tools only to complete this project is rejected as an option.

Estimated Livestock and Worker Requirements

- Use of three to four pack horses for one day to delivering equipment to the repeater site.
- Installation will require two to three park staff and/or contractors one day of work using hand tools.
- Two maintenance trips per year following installation

Effects:

Wilderness Character

"Untrammeled" -This alternative will affect the untrammeled quality of wilderness by asserting modern human control and manipulation. One equipment transportation trip using pack horses for the initial installation. Two pack horse trips per year to bring in batteries and replacement parts.

"Undeveloped" - This alternative will continue to impact the undeveloped quality of wilderness by installing new infrastructure at one site and replacing current infrastructure in several highly visible places in the backcountry. The structures will intrude into an historic enclave in a vast wilderness landscape devoid of human-made structures.

"Natural" - This alternative will have localized impacts on the natural conditions of soil, bedrock, and vegetation through their removal to accommodate infrastructure. Additional soil and/or vegetation may be disturbed if visitors are drawn to the structures out of curiosity or to get a better view. This alternative will continue to impact the undeveloped quality of wilderness by installing new infrastructure

at one site and replacing current infrastructure in several highly visible places in the backcountry. The structures will intrude into an historic enclave in a vast wilderness landscape devoid of human-made structures.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
The opportunity for visitors to experience solitude will be diminished during equipment installation and maintenance of the proposed project. Pack horses and installation workers will be noticeable to visitors, and this will likely disrupt those who are seeking solitude and a primitive type of recreation.

Heritage and Cultural Resources

The use of pack horses to deliver the equipment and use of hand tools for installation provides a contrast between wilderness and other areas where humans and their work dominate the landscape.

Special Provisions

N/A

Safety of Visitors, Personnel, and Contractors

Because of the use of livestock during equipment transportation necessary to implement this option, there is concern for the safety of personnel and contractors who will be traveling in and assisting with loading and unloading the pack horses.

Economic and Time Constraints

Loading and transportation of equipment to the repeater site with pack horses will require approximately 6 hours. The Monument owns the horses, so no expenses will be incurred using the animals.

Additional Wilderness-specific Comparison Criteria

N/A

Option # 2- Combination of Primitive Tools and Modern Tools

Under this option, installation of the new radio repeater would be conducted using a mix of primitive tools and a helicopter and modern tools. Under this option, the equipment for the radio repeater would be delivered with a helicopter. One helicopter trip would be required to deliver the equipment. Construction would be completed using hand tools where feasible; trenching, if necessary would be completed by hand, and electronics and solar panels would be moved into place by hand.

Estimated Equipment and Worker Requirements

- One helicopter trip to deliver equipment and tools to site
- One day to install the equipment by two to three workers.

Effects:

Wilderness Character

"Untrammeled" This alternative will affect the untrammeled quality of wilderness by asserting modern human control and manipulation.

"Undeveloped" This alternative will continue to impact the undeveloped quality of wilderness by installing new infrastructure at a site in designated wilderness. The repeater will be located near the manmade pig exclusion fence.

"Natural" This alternative will have localized impacts on the natural conditions of soil, bedrock, and vegetation through their removal to accommodate infrastructure.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
The opportunity for visitors to experience solitude will be diminished during equipment installation and maintenance of the proposed project. Helicopter use during installation, will be noticeable to visitors and will likely disrupt those who are seeking solitude and a primitive type of recreation.

Heritage and Cultural Resource

~~Maintaining Traditional Skills~~

Because of the use of helicopter delivery, this alternative provides a negligible contrast between wilderness and other areas where humans and their work dominate the landscape.

Special Provisions
N/A

Safety of Visitors, Personnel, and Contractors
Because of the use of a helicopter for delivering equipment, concern for the safety of personnel and contractors who will be traveling in and assisting with loading the helicopter. There are also safety risks for personnel who will be handling heavy equipment.

Economic and Time Constraints
It is estimated that helicopter time would be approximately 10 hours, with a total estimated cost of $8,000.

Additional Wilderness-specific Comparison Criteria
N/A

Step 2 Decision: What is the Minimum Activity?

Selected alternative: Option #2, a combination of primitive tools and modern tools.

Rationale for selecting this alternative: This option was deemed to be the minimal course of action because pack horses were not considered as capable of getting the equipment to the site over the steep terrain. Therefore, use of a helicopter for transporting materials and equipment will be necessary. Implementation of this option would require the use of one helicopter for one day. Although there will still be impacts to wilderness character under this alternative, they are minimized to the extent possible.

Monitoring and reporting requirements:

Check any Wilderness Act Section 4(c) uses approved in this alternative:

motorized equipment structure or installation

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:	/s/ Denise Louie	Denise Louie	Wilderness Coordinator	
Recommended:	/s/ Albert Faria	Albert Faria	Chief Ranger	
Recommended:	/s/ Haynes Currie	Haynes Currie	Environmental Protection Specialist	5/15/08
Recommended:	/s/ Jim Purvis	Jim Purvis	Regional Radio Specialist	
Approved:	/s/ Eric Brunnemann	Eric Brunnemann	Superintendent	

N/A

Safety of Visitors, Personnel, and Contractors
Because of the use of a helicopter for delivering equipment, concern for the safety of personnel and contractors who will be traveling in and assisting with loading the helicopter. There are also safety risks for personnel who will be handling heavy equipment.

Economic and Time Constraints
It is estimated that helicopter time for hillside microwave dish monopole installation would be approximately 40 hours, with a total estimated cost of $32,000. The helicopter time for installation of the Willow Springs radio repeater installation is estimated at approximately 8 hours or $8,000.00. Maintenance visits to hillside microwave monopole and Willow Springs radio repeater are expected to require 4 hours or $4,000.00

Additional Wilderness-specific Comparison Criteria
N/A