



Sequoia National Park

# Wuksachi Village Wireless Telecommunications Facility

## *Environmental Assessment*

*October 2018*





As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

## **NOTE TO REVIEWERS**

If you wish to comment on this document, you may mail comments to:

Superintendent  
Sequoia and Kings Canyon National Parks  
Attn: Wuksachi Village Cell Tower  
47050 Generals Highway  
Three Rivers, CO 93271

You may also comment for this project online at <http://parkplanning.nps.gov/WuksachiCellTower>. Retrieve the Wuksachi Village Wireless Communications Facility Environmental Assessment under "Open For Comment" to provide comments electronically.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. You can ask us to withhold your personal identifying information from public review, but we cannot guarantee that we will be able to do so.

## **ON THE COVER**

View of the Wuksachi Lodge  
[NPS photo]

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Attachment B: Photo Simulation of the Proposed Wuksachi Village Wireless Telecommunications Facility

Attachment C: Errata and Public Comment Summary

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# 1 Purpose and Need

## Introduction

The National Park Service (NPS) is considering the issuance of a right-of-way permit to Verizon Wireless to construct, operate, and maintain a wireless telecommunications facility providing cellular service near the Wuksachi Village, on the western slope of the southern Sierra Nevada Mountains within Sequoia National Park, Tulare County, California (Figure 1). The proposed action includes installation of a 138-foot tower and associated ground-based structures and equipment, constructed within a 40-foot by 40-foot lease area. The tower location is directly southeast of a water storage facility, and existing associated disturbed area that includes water tanks (Figure 2). The proposed facility also consists of a 15-foot-wide access and utility easement for Verizon Wireless underground electric power; the easement would include an existing paved and unpaved access road to the site.

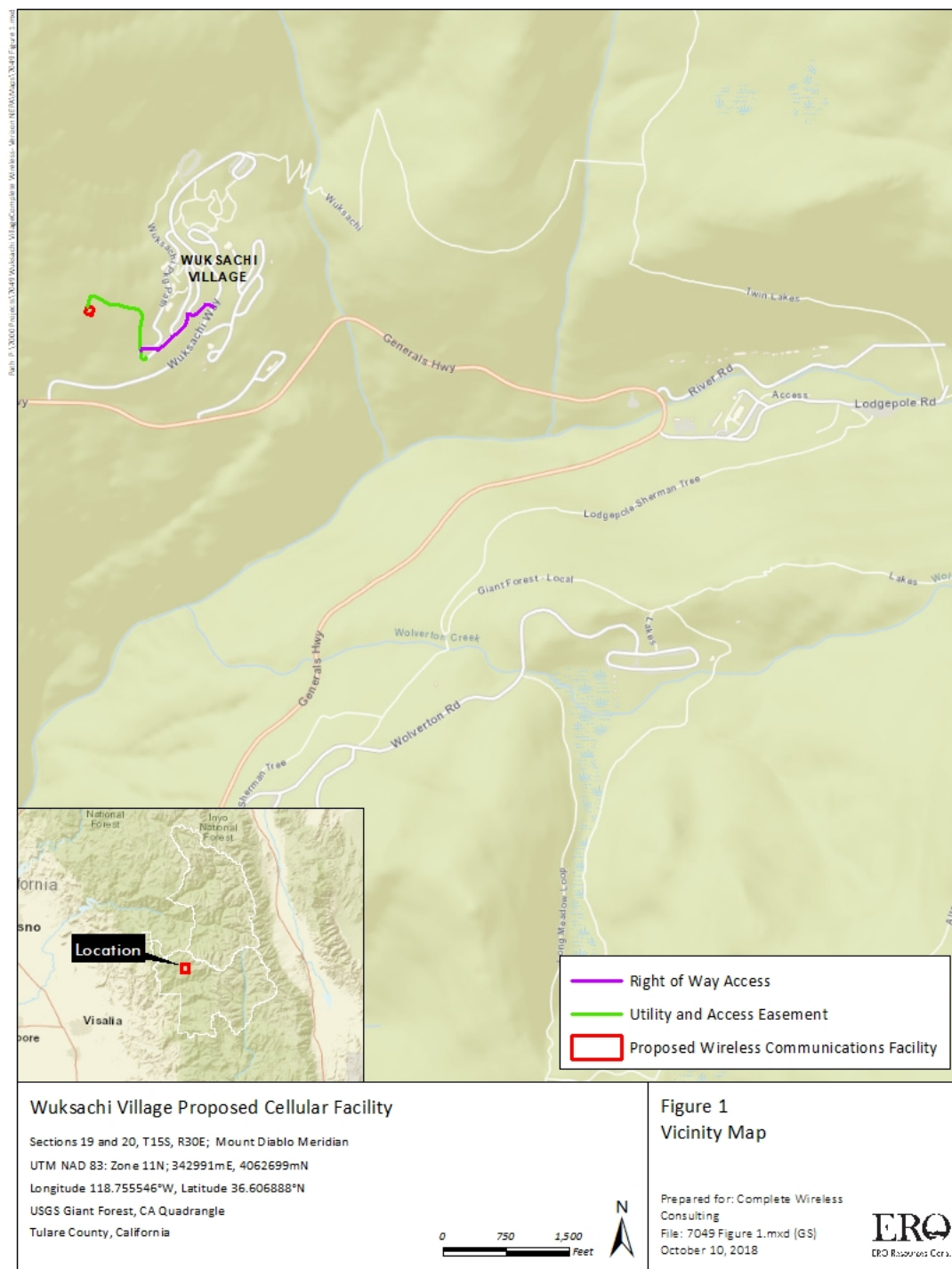
Cellular coverage in Sequoia National Park is very limited, as shown on a map of existing coverage (Figure 3). The nearest Verizon Wireless cell tower and cell coverage is located near Grant Grove, within Kings Canyon National Park; cell coverage extends from the tower near Grant Grove to a point approximately 18 miles from Wuksachi Village, by car.

The wireless telecommunications facility (facility) would provide year-round cellular coverage in the vicinity of the Wuksachi Village and surrounding areas, including Wuksachi Way and portions of the Generals Highway (Figure 4). Cellular coverage would be provided to the Lodgepole Visitor Center and Lodgepole Campground, Wolverton area, and nearby undeveloped areas within the park. The proposed cellular service at Wuksachi Village would consist of Long Term Evolution (LTE) (roaming internet access) initially transmitted over the 700 Megahertz (MHz) band. Both voice and data service would be available.

## Background

The NPS held several meetings and field trips with Verizon, starting in 2015, to identify potential tower locations and evaluate the feasibility of the facility installation. Following these meetings, Verizon Wireless submitted an application to Sequoia National Park on March 2, 2017, to install a wireless communications facility near the Wuksachi Village.

In 1999, the Wuksachi Village (village) was constructed 5 miles north of the Giant Forest to replace the Giant Forest-Camp Kaweah development, which was regarded as too close to the sensitive giant sequoia groves. The village consists of four buildings: a restaurant/gift shop/conference center (commonly referred to as Wuksachi Lodge), and three lodging units for guest accommodations, totaling 102 rooms. In 2017, there were 57,179 overnight stays at Wuksachi Lodge representing 86% of total concession lodging stays in Sequoia National Park.



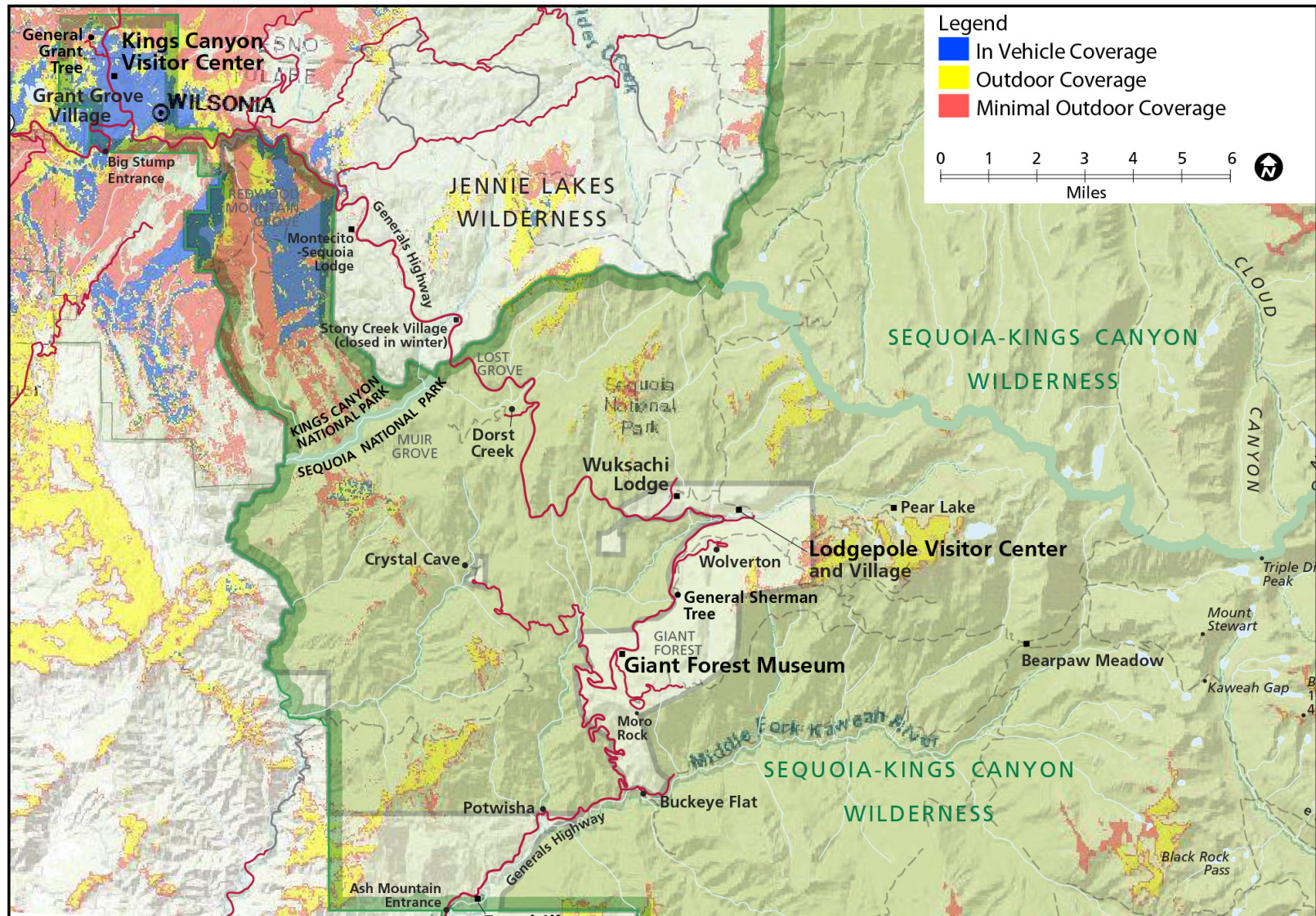
**Figure 1. Location of the Wuksachi Village Wireless Telecommunications Facility in Sequoia National Park**



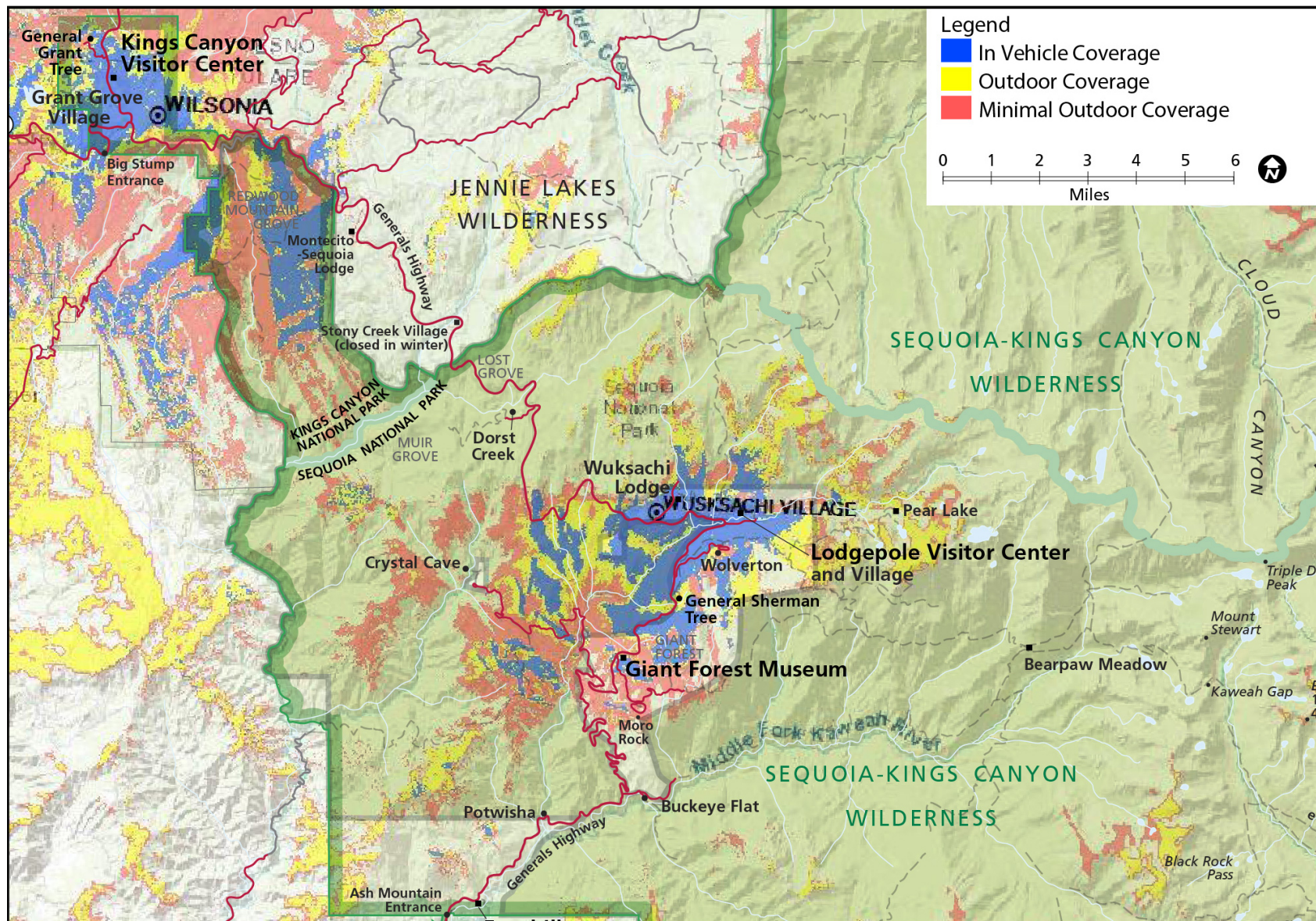


**Figure 2. Proposed Footprint of Wireless Telecommunications Facility in Sequoia National Park**









Current communication services within Sequoia and Kings Canyon National Parks include:

Two-Way Radios. Sequoia and Kings Canyon National Park staff utilize a two-way narrowband land-mobile radio system to support park operations and to provide for visitor and employee safety. Due to the extensive backcountry wilderness nature of the Park, the radio system is actually comprised of two radio networks, the front country “Command” net and the Backcountry net. Nearly all NPS vehicles contain a mobile radio, and most park employees use a portable radio while working and traveling in the field. The system includes several radio repeaters at specific high-elevation locations in and around the park, including fire lookouts. The repeaters are required to extend the relatively short range of field units to communicate over a wider area, allowing for park-wide communications with the park’s Dispatch office, located at the Ash Mountain Headquarters (Ash Mt.) in Three Rivers, CA and various offices at the Park’s other administrative facilities. Internet Protocol (IP) based desktop radio consoles connected via the park’s voice/data communications network receive the signals. There are also base station radio units installed at other park facilities where Park network access isn’t feasible or cost effective to install.

Private Telephone and Internet Access. Landline telephones (AT&T serviced, and park-provided pay phones) are available to the public at several, but not all, developed locations around the park. Employees in NPS housing may either order their own residential internet and/or phone service through AT&T, Frontier Communications (geography dependent), or the various satellite internet providers. Concessioners also use their own Wi-Fi in specific locations, but only for their own business purposes. AT&T is the only company with physical telecommunications infrastructure in the Three Rivers/Ash Mt./Cedar Grove areas (not including satellite-based service). Frontier Communications has the physical infrastructure in the Kings Canyon portion of the Park. Due to capacity and cable facilities limitations, the fastest available digital subscriber line (DSL) speed available via existing phone lines in the Three Rivers area is currently 5 mbps download with 256 kbps upload. However, DSL is not available for most of the areas within the Park boundaries.

Commercial Data and Telephone Service for Official Use: NPS computers connect to a secure network maintained by the Park (wired and Wi-Fi), which is connected to the Department of the Interior Enterprise Services Network managed by Verizon Business under the General Services Administration (GSA) Network contract. Verizon uses both their own infrastructure and AT&T’s infrastructure (Ash Mt. and Cedar Grove) or Frontier Communications infrastructure (Grant Grove) to be able to connect to the Park’s network. AT&T provides fiber optic service to the NPS router at Ash Mt.; the other park administrative centers are limited to a dedicated phone transmission service (referred to as “T1” service) only. The park obtains telephone service directly from AT&T lines for data devices such as fax and credit card readers.

Satellite Technology. In addition to the use of satellite for navigation (GPS), satellite wireless technology has become more readily available and affordable in recent years for communications, including the use of personal locator beacons (PLB), satellite phones and

satellite messengers. Visitors are increasingly using satellite technology as it becomes more affordable and is readily available through outdoor suppliers. People use PLBs for emergency contact only, satellite phones to talk, and messengers for text messaging. The park currently uses a limited number of PLBs in the backcountry and is now using satellite messengers. Satellite wireless signals are present in most locations; however, signal strength varies greatly depending on location and number of available satellites due to tree cover and rock cover (steep terrain).

Cellular Voice/Data. Commercial cell service is currently available at Ash Mt. Headquarters (AT&T Wireless) and at Grant Grove Visitors Center (Verizon Wireless). Limited and spotty coverage is available in other front country portions of the park including Potwisha, Wolverton, Grant Grove, and Red Fir. Isolated “hot spots” may be found along main roads and certain trails and back country wilderness closest to the western edges of the Park. The park utilizes CradlePoint devices on both AT&T and Verizon Cellular networks in Ash Mt. and Grant Grove to provide visitor wireless access to the internet. This allows visitors’ access to the internet if their own cellular service provider is not what is available in that area. However, due to limited infrastructure bandwidth, these services can quickly be overwhelmed during high visitation periods.

This EA will examine the environmental impacts associated with the proposal to install a new cellular facility at Wuksachi Village and expand wireless cell coverage at the park as shown on Figure 4. To provide a baseline for evaluating the impact of alternative actions, a no action alternative that would not permit installation of cellular facilities within the area is included.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) §1508.9), and National Park Service (NPS) Director’s Order (DO)-12: Conservation Planning, Environmental Impact Analysis, and Decision-Making, the 2015 NPS NEPA Handbook, and Director’s Order 53 and Reference Manual 53 (RM-53, NPS 2009): Special Park Uses (NPS 2009). The 2015 NEPA manual was followed where the NEPA handbook and RM-53 differ, in accordance with Director’s Order 12, section 4.2 of the NEPA handbook and the NPS Directives System.

## **Purpose and Need for Action**

The purpose and need for this environmental analysis is to respond to wireless telecommunication applications in accordance with the Telecommunications Act of 1996. The NPS action is needed to give consideration, consistent with NPS Management Policies, to the benefits of having wireless cell service for visitor communication, emergency law enforcement and public safety, and to give consideration, consistent with NPS Management Policies, as to whether the proposal is consistent with the park’s mission. A fully informed decision as to whether to grant right-of-way permits will be made by performing an environmental analysis to characterize and analyze the environmental impacts of the proposed action.



## **Issues and Impact Topics**

Sequoia National Park conducted public scoping from April 2 to May 4, 2018. A total of 29 comments were received about the project during the comment period. Of the total comments received, four were in support of the project, citing benefits to safety for park visitors and staff and to the public overall, two comments were neutral, and 23 commenters were opposed to the installation. Five commenters opposed to the installation were concerned about impacts to visual resources. Four commenters were concerned about health and safety, including the potential for distracted driving along the curvy Generals Highway, and increased collision rates. Two commenters were concerned about the effects of radiation exposure from cell phone use on human health.

The majority of commenters opposed to the installation (17 in total), were concerned about expanding technological connectivity into wilderness areas, causing a degradation of wilderness character and reduced opportunities for solitude. The commenters expressed that expanded wireless coverage would increase the sights and sounds of civilization in wilderness areas due to phone use by fellow visitors in proximity and would negatively impact visitor experience.

### ***Issues Selected for Detailed Analysis***

The following issues will be evaluated for each alternative:

**Visual Resources:** Building a cell tower near the Wuksachi Village could disrupt the natural scenic vistas, if in view from nearby roads, buildings and hiking trails.

**Health and Safety:** Building a cell tower could create conditions that increase distracted driving on the Generals Highway, which could raise the number of vehicle accidents and wildlife collisions. Improved communication could shorten the response time in the event of a medical emergency, especially after business hours. Access to cell service could also result in visitors and NPS and concessioner staff feeling more connected with loved ones outside the park, and safer.

**Wilderness Character and Visitor Experience:** Access to cell service and cell phone use in the Sequoia-Kings Canyon Wilderness may cause noise such as ringtones, music, and chatter, impacting wilderness character and altering the wilderness experience. Cell phone use could enhance visitor experience by providing information in real-time during visits, such as maps and educational content.

### ***Issues Considered but Dismissed***

The following issues were identified, considered, and dismissed from further analysis:

**Health Effects from the Tower's Radio Frequency (RF) Exposure:** According to FCC review (Attachment A), it has been determined that the facility is unlikely to exceed specific federal guidelines that protect the public from the effects of RF emissions. The Wuksachi tower and mounted antennas would be free-standing (not mounted on a building), with no antennas below 10 meters (32.8 feet), and the service provided by the tower would conform to FCC regulations. An evaluation of categorical exclusion for the proposed Wuksachi facility is attached (Attachment A).

Verizon Wireless would install required signage at the entrance to the lease area and in the vicinity of their equipment.

**Effects to Flora and Fauna from the Tower's Radio Frequency (RF) Exposure:** In response to public comments during the EA public review period, SEKI scientists reviewed the latest and most comprehensive information available, including a website on "EMF Research" provided by the commenter (<http://www.emfresearch.com/emf-wildlife/>). There are many published reports in the scientific literature concerning possible biological effects of RF-EMF exposure to biota, particularly insects and plants. However, much of the research into the effects of RF-EMF energy on wildlife and plants has been scattered in approach and uneven in quality, and in some cases different studies find contradictory results. A 2018 report by the EKLIPSE project (Malkemper et al. 2018) evaluated 97 peer-reviewed scientific papers published since 2000 on the effects of anthropogenic-produced electromagnetic radiation on flora and fauna. The report did not find a well-established finding (in which there is a high level of agreement and high level of quality and quantity of evidence) that electromagnetic radiation has a detrimental effect on invertebrates (diversity, abundance, behavior, or reproduction), and that although there is agreement that electromagnetic energy can pose a risk to physiological orientation mechanisms for insects, the research is incomplete. In summary, the additional studies reviewed were determined to not be relevant in providing an understanding of the influence on EMFs on the environment from the proposed Verizon cell tower. See the public comment response summary, Attachment C, Errata.

The NPS considered but dismissed from further analysis other possible effects to resources that are not known to exist in the area, including **paleontological resources** and **threatened and endangered species**.

The NPS also considered but dismissed the following resources from further analysis, due to mitigating measures and best management practices that have been incorporated into the proposed action, detailed in Chapter 2:

**Geologic features and soils:** The project would disturb less than an acre of land (approximately 0.23 acre). Given the minor amount of disturbance, this issue has not been retained for analysis.

**Cultural resources:** The site was surveyed (Far Western Anthropological Group 2018) and no cultural resources were present. The proposed tower is not within view from the historic Generals Highway, with the exception of the turn off to Wuksachi Way from the highway where it is partially within view, but well-screened. No adverse effects on historic properties are expected; this issue has not been retained for analysis.

**Air quality:** Emissions from construction equipment and dust would occur, but effects would be temporary during construction and mitigated as described in Chapter 2.

**Water quality and aquatic ecosystems:** The nearest stream (Clover Creek, tributary to the Marble Fork Kaweah River) is greater than 0.5 mile from the project area, and potential effects to water

quality and aquatic ecosystems are not expected. Potential effects would be mitigated by measures outlined in Chapter 2.

**Night sky:** Construction activities would only occur during daylight hours; no effects are expected to the night sky during construction. Once installed, lighting would be used only for emergency maintenance.

**Soundscapes:** Sound due to construction would be short-term during the construction period and distant (around 600 to 900 feet) from parking areas and buildings. At the closest point, trenching may occur approximately 250 feet from a Wuksachi Lodge building; however, this activity would be short in duration (one to two weeks) and mitigated as discussed in Chapter 2. Effects to visitor experience due to noise from cell phone and media use are discussed under Visitor Experience.

**Wildlife:** Effects to wildlife as a result of the proposed project would be short-term and mitigated. The construction site is in a developed area that is previously disturbed and frequented by humans. While there may be temporary disturbance to individuals associated with construction activities, there would be no long-term disruption and no impact that would result in a change to species composition or habitat. Timing restrictions would be imposed on vegetation removal to mitigate impacts to birds, as discussed in Chapter 2.

**Vegetation:** Two live trees would be removed from the lease area as a result of the project; otherwise, the proposed action would occur within the disturbed corridor adjacent to the road and water tanks, within a confined area, and effects to vegetation would be mitigated as discussed in Chapter 2.

## 2 Alternatives

This section describes a No Action alternative and the action alternative(s), as well as a brief description of alternatives considered but dismissed from further analysis.

### Alternative 1: No Action

Under the No Action alternative, the NPS would not issue a ROW permit for the Wuksachi Cellular Facility, and cellular service would not be added to the Wuksachi and Lodgepole areas. Current communication practices would continue, including use of land lines, two-way RF communication, and pay phones.

### Alternative 2: Installation of a Wireless Telecommunications Facility at Wuksachi Village

Under the proposed action, a wireless telecommunications facility would be installed within a 40-foot by 40-foot lease area adjacent to two existing water tanks (40 feet in diameter and 12 feet high) at the terminus of an existing access road. The facility would include a 138-foot tall “monopine” tower, mounted on a 4- to 5-foot-diameter by 10-foot-deep mat foundation, a covered 28-foot by 13-foot steel equipment platform (containing a standby propane generator, downward facing work

lights, outdoor equipment cabinets, wireless GPS antennas, and various utility equipment mounted on H-frames), and a 500-gallon propane tank mounted on a 5-foot by 10-foot, by 2- to 3-foot-thick concrete pad. Antennas mounted on the tower or steel platform would include:

- Nine wireless antennas (6 feet in diameter) and nine Remote Radio Head (RRH) units installed at 132 feet above ground level (AGL)
- A wireless surge protector (18 inches by 1 foot by 1 foot) installed at 128 feet AGL
- A wireless microwave dish (6 feet in diameter) and ice shield, installed at 120 feet AGL
- Proposed and future wireless microwave dishes and ice shields (6 feet in diameter), installed at between 44 and 111 feet AGL
- Two Verizon wireless GPS antennas mounted on an H-Frame on the steel equipment platform

In addition, the tower would support NPS telecommunications equipment, including two 24-inch diameter microwave dishes; a ground-based repeater cabinet for the microwave dishes would be installed adjacent to the equipment platform. Co-location would be permitted by other wireless providers; AT&T communications is interested in co-location on the tower.

The proposed antenna height (138 feet) is the minimum height required to have line-of-sight view of the next, nearest tower, and to provide coverage to target areas, particularly the Lodgepole and Wuksachi areas where park and concessioner staff reside.

To screen the tower and mounted antennas from view, branches would be installed on the constructed tower to simulate a pine tree; the branches would extend out from the tower center, making the simulated tree structure 25 feet in diameter at the base and about 143 feet tall. The tower steel would be painted brown and all antennas and mounted units would be painted flat green, with needle socks installed (see Attachment B, photo simulation).

About 1,436 feet of buried electrical cable would be installed to connect the tower facility to an existing electric transformer, located within the turn-around loop southwest of Wuksachi Village. The trenched electrical cable would extend from an electric meter on an existing building within the turn-around-loop, parallel the access road, enter the lease area from the north, and connect via underground power to a 200-amp electrical service mounted on the steel equipment platform within the lease area. Approximately 35 feet of underground propane supply would be installed between the propane tank and the steel equipment platform (see Figure 5 and Figure 6).

The Wuksachi Wireless Telecommunications Facility would provide cellular coverage along the Generals Highway in the west-central area of the park (Figure 4). Cellular coverage would target NPS and concessioner staff residences and visitor use areas at Wuksachi Village, Lodgepole and Wolverton, and extend south and west of these areas, toward the General Sherman Tree. Minimal outdoor coverage would be available at the Giant Forest Museum. At its greatest reach, outdoor cellular coverage (including minimal coverage) would extend approximately 6 miles west, south, and east from the tower, with spotty coverage in the intervening surrounding areas (Figure 4).

## **Construction**

Construction for the wireless telecommunications facility would span 6 to 10 weeks and would occur during the work week only; work on weekends, holidays, or evenings would not occur. Construction would comprise of staging tower steel and equipment near the site, site preparation, installation of a mat foundation for the tower, installation of concrete footers for the steel equipment platform, and installation of a concrete pad for the propane tank (installed on top of the mat). The mat foundation would be installed to a depth of 10 feet. The tower would be mounted above the foundation in 20-foot lengths. Simulated tree branches would be installed along the length of the tower, and antennas and other technical hardware would be mounted on the tower. Technical equipment would be installed on the steel equipment platform.

To connect the tower facility to a power source, a trench would be excavated (about 3 feet wide by 5 feet deep) along the access route directly adjacent to the edge of pavement for approximately 1,238 feet, then for another 173 feet along a circular turn-around and to a point of connection at an existing building, where a new electrical panel would be mounted. An additional 25 feet of trenching for buried cable near the tower site, and 35 feet of trenching for buried propane within the lease area would be required (Figure 5). Trenching would take up to two weeks. Use of heavy-duty ditch equipment is planned for trenching, due to the likely presence of rock. After excavation, electrical conduit would be laid in the trench, and sand bedding would be placed under and on top of electrical conduit. The trench would be back-filled with native fill, and the disturbed trench area and disturbed areas within the lease area restored to previous conditions (i.e., graded and revegetated) in coordination with the park.



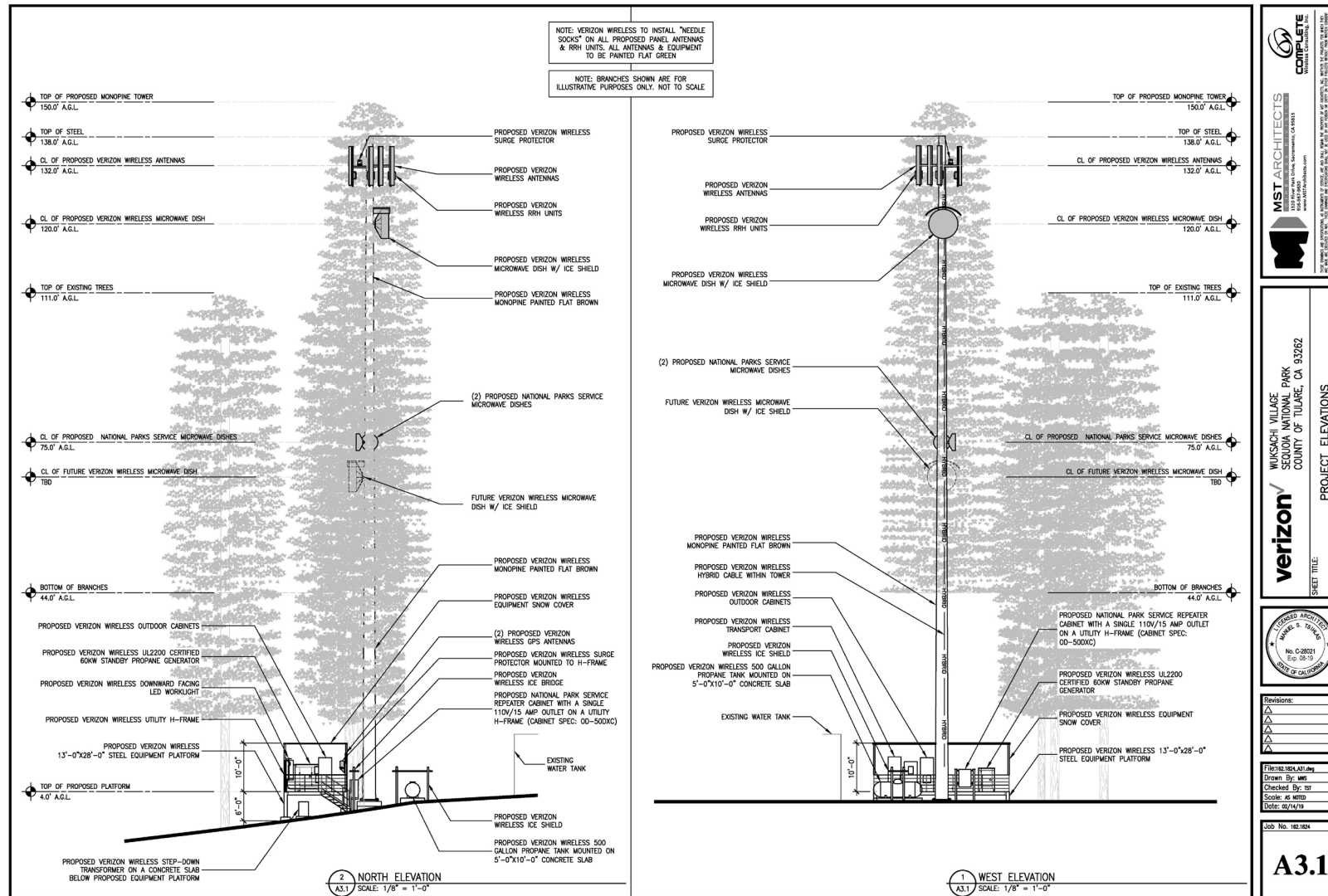


Figure 6. Facility Profile



### ***Construction Equipment, Access and Staging***

A preliminary list of equipment required to construct the facility includes:

1. Backhoe, with hammer hoe attachment and compactor
2. Concrete mixing unit truck
3. Trencher
4. Plate compactors
5. Generator
6. Metal saw
7. Grinders
8. Impact hammers
9. Crane
10. Work trucks
11. Semi-trucks for tower and steel delivery
12. Man lift

A total of approximately five to eight vehicles would access the project area and staging areas daily during the construction period, including up to three pick-up trucks for personnel and additional specialized construction equipment. Specialized construction equipment would include concrete trucks, transportation (hauling) equipment, lift equipment for raising the tower (including a crane), heavy-duty trenching equipment, and earth moving equipment for excavation and post-construction grading.

Access routes and timing for over-sized equipment (such as the crane) would be coordinated with the NPS to avoid visitor traffic and congestion, as much as possible. To avoid road congestion between Wuksachi village and the Three-Rivers area, vehicles and equipment would likely enter the park from the north via the Generals Highway to Wuksachi Way. Once on Wuksachi Way, construction vehicles would enter Wuksachi Village and follow an unnamed road to a turn-around loop, then enter an existing access road leading to the construction site. Staging for tower steel and other supplies and equipment would be provided in an 18-foot by 24-foot fenced-off area, situated on auxiliary parking lot pavement in the Wuksachi Village area. The specific staging area location would be selected based on coordination with the park.

### ***Site Preparation/Tree Removal and Post Construction***

Tree and vegetation removal would either occur after September 1 or would be coordinated with the NPS to ensure the vegetation is clear of wildlife use to avoid effects to nesting birds. Two standing dead trees (a 42-inch diameter at breast height [dbh] Jeffery pine, and a 38-inch dbh sugar pine) would be removed from within the facility lease area, and two 14-inch dbh existing live white fir trees would be removed, in accordance with NPS approval and procedures. Southwest of the tower, a 22-inch dbh white pine would remain, and a 28-inch dbh Jeffrey pine may require pruning but would remain. A 46-inch Jeffrey pine southeast of the lease area would be evaluated as a potential hazard and may be removed. All branches and debris would be managed in accordance with NPS procedures.

Excavation for a 10-foot deep mat foundation, and additional minor amounts of grading/levelling within the lease area would be required to prepare the site for construction; all permanent impacts would be confined to the 40-foot by 40-foot lease area. At the end the construction phase, disturbed surfaces (including the trenched area) would be regraded to natural contours and monitored/managed to prevent weed infestation, for a period of three years.

### ***Operation and Maintenance***

A one- or two-member maintenance crew would regularly service the communications tower and equipment after construction was complete. Site visits would generally be quarterly but may be as frequent as monthly. Visits would occur during daytime hours unless there is an emergency.

### ***Mitigating Measures and Best Management Practices***

#### **A. Protect Geologic Features and Soils**

Potential Issue: Construction activities such as trenching, and excavation for the tower foundation could disturb area soils and geologic resources through soil removal or modification of the area's topography.

Mitigating Measures and Best Management Practices:

- The extent of disturbance for facility foundation construction and for trenching in the project area will be kept to the minimum necessary for project completion.

#### **B. Protect Water Quality and Aquatic Ecosystems**

Potential Issue: Construction activities such as geo-testing, trenching, digging for the tower foundation, and dust control could increase the potential for erosion and run off into downstream areas. Water for dust abatement uses area water resources, which can be limited during periods of drought. Construction equipment can discharge fuel or other hazardous materials.

Mitigating Measures and Best Management Practices:

- Water needed for construction and dust control will not be diverted from surface waters within the parks. Dependent on drought conditions, water may be available from existing developed water systems within the parks for a fee. Or, water may be trucked in from an approved source outside of the parks.
- Any water source for dust suppression (other than a municipal source) from outside the park will need to be approved by the NPS.
- Equipment cleaning will not be performed within the parks' boundaries.
- Concrete will be mixed on-site within a self-contained mixing unit. Clean-out basins will be employed to catch any excess and removed from the park.

- Fuel and other hazardous materials will be stored and transferred/used within a containment barrier constructed at least 100 feet from any waterbody or storm drain system.
- A hazardous spill plan will be in place, stating what actions will be taken in the case of a spill; notification measures; and, preventive measures to be implemented such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.
- Hazardous spill clean-up materials will be on site at all times.
- All equipment used for the project will be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment will be checked daily.
- Where appropriate and available, "environmentally friendly" grease, hydraulic oil, and bar and chain oil will be used. These lubricants are vegetable or mineral oil based, less toxic, and biodegradable.
- Every day, prior to commencement of work, all machinery will be inspected for leaks, leaked material removed from the environment, and if a leak is found, the machinery will not be used until repaired.
- Machinery maintenance involving potential contaminants will occur outside the parks.

### **C. Protect Air Quality**

Potential Issue: Construction equipment discharges air pollutants during operations. Construction activities including driving, trenching, and hauling can generate dust.

Mitigating Measures and Best Management Practices:

- Any power tool or engine will not be permitted to idle for five or more minutes, and will adhere to the SEKI "no idling policy" whenever and wherever mechanically feasible.
- California State vehicle idling regulations will be adhered to; e.g., five-minute limit for heavy diesel equipment.
- Periodic water sprinkling will be used to control dust.
- All haul trucks carrying construction materials or debris will be covered.

### **D. Protect the Night Sky**

Potential Issue: Lighting during project work could affect the night sky, nocturnal animals, and visitors by creating an unnatural scene.

Mitigating Measures and Best Management Practices:

- All work will be conducted during daylight, and no night construction/lighting will be used.
- Installed work lights for emergency use will be shielded and on a switch timer.

**E. Protect Soundscapes and Protect Visual Resources**

Potential Issue: Noise generated by heavy equipment during project work could affect wildlife and visitors. The presence of a cell tower (an unnatural object) can impact the area's visual resources.

Mitigating Measures and Best Management Practices:

- Verizon will consider noise effects when scheduling project work. Construction will only occur between 8 am to 6 pm, Monday through Friday, excluding all Federal holidays, unless weather or schedule dictate that weekend work be authorized to complete the site. Exceptions will need to be requested and authorized through the SEKI Project Liaison, and will be considered on an emergency basis only by the park superintendent.
- Verizon will use the quietest equipment to accomplish the task efficiently and safely. If required based on equipment, a Soundscape Protection Plan will be prepared for SEKI approval.
- Quiet hours for trenching will be between 6 pm and 8 am, and on weekends and holidays. Trenching will occur over a one- to two-week period.
- Verizon will adhere to the SEKI "no idling policy" whenever and wherever mechanically feasible, and not permit any power tool or engine to idle for 5 or more minutes.
- Verizon and contractors will install and maintain mufflers and sound attenuation devices on all equipment and vehicles and use only well-maintained and properly functioning equipment and vehicles.
- To protect the viewshed, the tower will be placed away from trails and amenities.

**F. Protect Native Wildlife**

Potential Issue: The presence of humans and equipment, and associated construction noise, could disturb wildlife in the area and cause displacement. Construction crews could generate trash/food waste that result in wildlife obtaining human food, leading to habituation.

#### Mitigating Measures and Best Management Practices:

- All Verizon employees and contractors will attend park-led instruction on food storage requirements as part of the environmental briefing. Verizon will coordinate with the SEKI Project Liaison to schedule.
- The contractor will install temporary animal-resistant containers that have been pre-approved by the NPS. All food will be stored in animal-resistant food storage containers except when it is being consumed. Food stored in vehicles will be in animal-resistant containers. Spilled food will be cleaned up immediately. Food-storage and garbage disposal requirements will be followed at all times.
- Construction vehicles (interiors) will be kept clean and clear of food debris while on-site.
- Verizon employees and contractors will notify the NPS Representative if a bear loiters in the area or if fisher (*Pekania pennanti*—a forest-dwelling member of the weasel and otter family) sightings occur.
- Feeding or approaching wildlife is prohibited and will not occur.
- Any wildlife collisions will be reported to park personnel.
- Tree removal will occur outside of nesting season for migratory birds and raptors (after September 1, or in early spring). Clearing vegetation during the summer (prior to September 1) would need to be cleared with the SEKI senior wildlife biologist.

#### **G. Prevent Introduction and Spread of Nonnative Plants**

Potential Issue: Construction areas where there is ground disturbance are prone to invasion by nonnative vegetation. Equipment and fill materials brought in from outside the area could include nonnative plant seeds.

#### Mitigating Measures and Best Management Practices:

- Straw products (i.e., “certified weed-free straw” and other straw products) are not authorized on project work sites due to the high risk of importing nonnative plants and seeds. Instead, use an excelsior (aspen fiber) or coir (coconut fiber) product for erosion control, sediment filtration, or other needs.
- Topsoil will not be imported.
- If fill is needed, Verizon will coordinate with the SEKI Project Liaison to ensure fill is obtained from a pre-approved quarry.
- Equipment will be pressure washed to remove all dirt and plant parts before entering the park for the first time, paying special attention to undercarriage and grill/radiator; subsequent entries will not require pressure washing unless the vehicle shows signs of mud, plant material, or other substances. Project manager

will inspect equipment for compliance prior to entry into the park and reject equipment that is not adequately clean.

- Control of invasive nonnative vegetation in the project area is required for one to three years after project activities are completed.
- Before moving vehicles or equipment to a new job site, vehicles or equipment will be visually inspected and cleaned (including the undercarriage) thoroughly to remove all mud, dirt, and plant parts.
- Clothing, boots, tools and other equipment will be inspected so that invasive plant seed and plant parts are removed and disposed of. Disposal consists of removing the seed and plant parts from clothing and equipment at a spot near the infestation, or bagging the seeds and plant parts and disposing in bagged garbage.
- Any stockpiled fill will remain free of nonnative plants at all times.
- If imported materials (fill) are needed, they will be obtained from an approved source for the purpose of preventing nonnative plant introductions. Consult with the SEKI Project Manager at least a month in advance of project work to be sure sources of fill are approved by the NPS.
- On-site fill (mineral) materials will be used, when it can be extracted from the project site without causing additional adverse impacts to the native vegetation, soils, or hydrology.

## **H. Protect Native Vegetation**

Potential Issue: The project would result in the removal of seven trees (two live trees and five standing dead trees) from the project site. The project construction limits include a corridor that is approximately 6 feet wide by 1,410 feet long (0.20 acre) directly adjacent to an existing access road, and 40 feet by 40 feet (0.04 acre) of undisturbed ground for the telecommunications facility.

Mitigating Measures and Best Management Practices:

- Verizon or contractor will contact the NPS for direction on managing slash before and during vegetation clearing. Debris and slash may be removed from site or mulched on site (unless this creates unwanted noise), lopped and scattered, or a combination.
- Harm to native vegetation and soils will be minimized by designing and sequencing project work to protect or salvage native vegetation and topsoil, as appropriate.
- Protective barriers will be installed around individual and groups of trees or other vegetation identified for protection at the canopy drip line or further away.
- Construction will be limited to the mapped project area documented in the Environmental Assessment. No expansion of the planned footprint may occur.

- Grade to natural contours. Salvaged topsoil will be spread in as near the original location as possible.
- Litter and duff will be removed from project areas and stored for later replacement over topsoil. Surface will be returned to natural conditions (e.g., “duff” will be replaced over surface).
- Mulch disturbed soils with wood chips, soil retention blankets, or native litter and duff.
- Depending on the extent of topsoil and location of topsoil, topsoil will be removed from areas of construction, stored, and replaced at the end of the project.

## **I. Protect Cultural Resources**

Potential Issue: Subsurface disturbance (trenching or footer excavation) could unearth unknown resources.

Mitigating Measures and Best Management Practices:

- A cultural resources survey has been conducted within the area of potential affects, and no historic properties have been found within the project area.
- Should previously unknown historic or prehistoric resources be unearthed during project implementation, work will be halted in the discovery area, the site secured, and SEKI’s Cultural Resources Program Manager will be notified. A qualified cultural resource management specialist will examine the area as soon as possible and will follow the procedures of 36 CFR Part 800.13[c].
- In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during project activities, the regulations implementing the Native American Graves Protection and Repatriation Act (43 CFR Part 10) will be followed.
- Should construction activities or project work inadvertently unearth a cultural resource, work will stop in the area and the SEKI Cultural Resources Program Manager will be notified. Consultation with the CA State Historic Preservation Office (SHPO), tribes, and/or other interested parties will be conducted, as necessary and appropriate.
- Verizon will ensure that all project workers are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties.
- Verizon will ensure that all project workers are instructed on how to respond to an inadvertent discovery.



## **J. Minimize Visitor Impacts**

Potential Issue (short term): The project has the potential to disturb visitors in the area with noise, construction-related traffic, and dust. Potential Issue (long term): The project has the potential to affect visitor's wilderness experience.

Mitigating Measures and Best Management Practices:

- A communications plan will be developed for this project and approved by SEKI's Public Affairs Office.
- Verizon will consult with SEKI's Public Affairs Office at a minimum of three weeks prior to project work to allow adequate time for public notification.
- Verizon will consult with the SEKI Project Liaison for preferred staging area location and preferred point of entry for construction traffic at a minimum of three weeks prior to project work.
- Verizon will consult with SEKI Project Liaison to identify the best route for vehicles to enter and exit the park at a minimum of three weeks prior to project work. Oversized equipment (such as a crane, needed to erect the tower) may be scheduled to enter the park in the early morning or late evening, to avoid traffic disruptions.
- Impacts to wilderness as a result of wireless cellular coverage will be reduced by directing antennas away from wilderness areas as much as possible, and towards the target coverage areas including the Wuksachi Village, Lodgepole and Wolverton area.
- Educational materials will be developed on wilderness ethics, which would include information on the importance of limiting cell phone use in wilderness. Overnight wilderness users will also be provided with information about wilderness ethics and limiting their use of cell phones as part of the wilderness permitting process.

## **K. GIS and Data Management**

- Updated coordinates for the facility installation will be provided to the SEKI Project Liaison including any new or relocated non-NPS equipment and/or infrastructure on lands administered by the NPS (i.e., electrical panel, buried cable, and buried propane lines). The SEKI Project Liaison will provide the data to the GIS/ Data Management Office upon project completion.
- GPS coordinates of the perimeter of any ecological restoration site will be provided to the GIS/ Data Management Office upon project completion.

## **L. General Measures**

- A NPS Representative will be designated to conduct on-site inspections during construction operations and to provide information on resource-related concerns and other park information.
- Contractors will develop a Safety Plan and a Safety Communications / Transportation Plan and share this with the National Park Service for comment and compliance with park health and safety regulations 30 days prior to any construction activities.
- All tools, equipment, barricades, signs, surplus materials, and rubbish will be removed from NPS property upon project completion.
- All construction debris will be removed from the project site and hauled outside of the parks to be disposed of properly at an appropriate disposal location.
- A preconstruction survey with photo documentation will be conducted to document original road conditions. All road and off-road surfaces damaged due to work on the project will be repaired to original condition as much as is feasible.
- A litter control program will be implemented during construction to eliminate the accumulation of trash.
- An environmental briefing/orientation with construction supervisors and staff will occur prior to project implementation. This briefing will be led by the project proponent (Verizon) or designee, and will be attended by the SEKI Project Liaison and/or other NPS representatives, and the contractor/lead supervisor. The briefing will consist of reviewing all Mitigating Measures/BMPs listed as well as other relevant information contained in plans submitted to the NPS and the Environmental Assessment for the project.

## **M. Wuksachi Village Cell Tower Construction- Permittee-Specific**

- The permittee will coordinate with the FCC to ensure potential RF exposure is within FCC's limits for human exposure and will provide documentation to the NPS.
- Electrical panels installed by Verizon in coordination with the NPS to be sure specifications are agreed upon.
- The permittee will design trenching to avoid utility conflicts associated with underground water lines and other underground utilities. Final design/alignment will be approved through the SEKI Project Liaison or designee.
- The permittee must submit final documentation (i.e., County permits, approval forms, design / drawings, GIS coordinates) to the SEKI Project Liaison or Management Assistant for final park Superintendent approval.
- After a project has been approved, the permittee will contact the SEKI Project Liaison or Management Assistant three weeks in advance of project

implementation for notification purposes and to set up a time and place for preconstruction environmental briefing and for equipment inspection.

- The SEKI Project Liaison or Management Assistant will notify Wuksachi Village and Lodgepole area staff with anticipated project schedule three weeks prior to project implementation.
- The permittee will contact the SEKI Management Assistant with the date a project is completed (month / day / year).
- The permittee will submit as-builts / updated plans to the SEKI Management Assistant upon project completion.

### **Alternatives Considered but Dismissed**

During initial site visits, alternative locations for the antenna were assessed, including use of the Wuksachi Village main lodge building for mounting the antenna, and potential tower locations in the Lodgepole and Wolverton area. All alternative locations evaluated were dismissed due to the site topography (i.e., site located in canyon area) and limited height of the building, which would not allow for adequate coverage, and/or lack of available electrical power. Alternative tower styles were also considered, including a lattice tower and a monopole (see photo simulation, Attachment B). Both styles are still potentially available for consideration instead of a replica pine tree tower, depending on the outcome of the public input on this environmental assessment. There would be a slight difference in visibility of either type of tower, but no important difference in site impacts.

### 3 Affected Environment and Environmental Consequences

This section analyzes both beneficial and adverse impacts that would result from implementing either alternative as described in Chapter 2. This document addresses the direct and indirect potential environmental effects, and the cumulative effects, that would result from the No Action Alternative and the Preferred Alternative.

In accordance with the NPS DO 12 NEPA Handbook, connected, similar, and cumulative actions are actions that result as a direct or indirect consequence of the alternatives, and can be undertaken by federal, state, or local entities. Connected actions are closely related to the proposed action. Similar actions are those that have similar geography, timing, purpose, or other similar features to the proposed action. There are no connected or similar actions associated with this project that are not already included as part of the proposed action.

Cumulative actions are those actions that have additive, or cumulative, impacts on a particular resource. Cumulative actions may have occurred in the past, may be occurring now, or are reasonably foreseeable to occur in the future. The cumulative actions that are considered relevant to this project and the affected resources are:

- Existing development in the Wuksachi Area: The Wuksachi Village area was constructed in 1999 and is one of the two primary concessions areas in Sequoia National Park. The facility affected the area's viewshed, both from the front country portions of the park, and from the wilderness. The facility provides key visitor services in the area, including lodging, a restaurant, gift shop, and conference center.
- Co-location or additional towers at Wuksachi Village: The proposed tower would provide service to Verizon Wireless customers. It is likely that in the future, another carrier would want to co-locate on the tower, or construct their own tower in the vicinity of this project. The NPS requires that all cellular facilities be designed to allow for co-location. Co-location is preferable over the construction of a new facility.
- Existing telecommunications facility at Park Ridge, Grant Grove in Kings Canyon National Park: The existing telecommunications facility at Park Ridge provides coverage in the Grant Grove front country area, adjacent U.S. Forest Service administered lands, and provides limited coverage in both NPS and USFS wilderness areas, and in areas along the Generals Highway. There is no documentation that the existing cellular facilities have changed response time for medical or other types of emergencies, and there is no documentation that any change to highway safety has occurred as a result of the use of cell phones.

Park visitors in the Grant Grove area and adjacent U.S. Forest Service areas who wish to use their cell phones benefit from the facility, while those who wish to be away from the sights and sounds of modern technology may be adversely affected by other visitors using cell phones. The use of cell phones in wilderness adversely affects wilderness character by

reducing opportunities for solitude, and by increasing the sights and sounds of modern technology in wilderness.

- Existing cellular coverage in the eastern areas of Sequoia and Kings Canyon Wilderness: There currently is limited cellular coverage in portions of the wilderness on the eastern edge of the parks from cellular facilities located in the Owens Valley. This adversely affects wilderness character in a limited area of the wilderness as described above.

## Visual Resources

### ***Affected Environment***

Wuksachi Village is situated in the higher elevations of Sequoia National Park's "front country," a montane environment dominated by coniferous trees such as ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), and lodgepole pine (*Pinus contorta*), as well as white fir (*Abies lowiana*) and red fir (*Abies magnifica*). Giant sequoia (*Sequoiadendron giganteum*) groves are within 5 miles of the proposed facility at Wuksachi Village. At the Wuksachi Village and surrounding areas, views are expansive and visually pleasing, with scattered groves of coniferous trees, native vegetation, and rustic-style buildings framed by a backdrop of mountain views. A storage facility (two water tanks) for Wuksachi Village's drinking water system is present west of the village, accessed from Wuksachi Way. The facility includes two large (12-foot-high by 40-foot-diameter) aboveground water tanks and a paved and gravel access road approximately 1,200 feet long. The facility is on a ridge above the Wuksachi Village, and general not within view of the Village buildings, trails, and parking areas.

### ***Environmental Consequences***

*Impacts of Alternative A (No Action).* Under the No Action alternative, there would be no changes to visual resources in the Wuksachi and Lodgepole area. There would be no cumulative effects.

*Impacts of Alternative B (Proposed Action).* Under the Proposed Action Alternative, a 138-foot tower would be constructed directly adjacent to the water storage facility west of Wuksachi Village. The tower would be a "monopine" structure (Figure 6) with branches installed to simulate a pine tree and screen the tower and antenna. A photo simulation of the tower from six vantage points is attached (Attachment B). According to the photo simulation a small portion of the tower's upper-most branches are view from the turn-off onto Wuksachi Way from the Generals Highway, from three viewpoints within Wuksachi Village, and from two viewpoints (very distant) from the Wolverton area. From each view point, the tower's form, shape, line, and color appear to blend with the surrounding trees.

*Cumulative Impacts.* The proposed installation would add, cumulatively, to the number of human-made installations in the park that alter the viewshed in and around the Wuksachi area. Cumulative impacts would only occur for the instances where the tower is visible and recognizable as a human-made structure (see photo simulation, Attachment B); this impact would be localized to the area within the viewshed of the Wuksachi area, however the impact would be long term; altering the

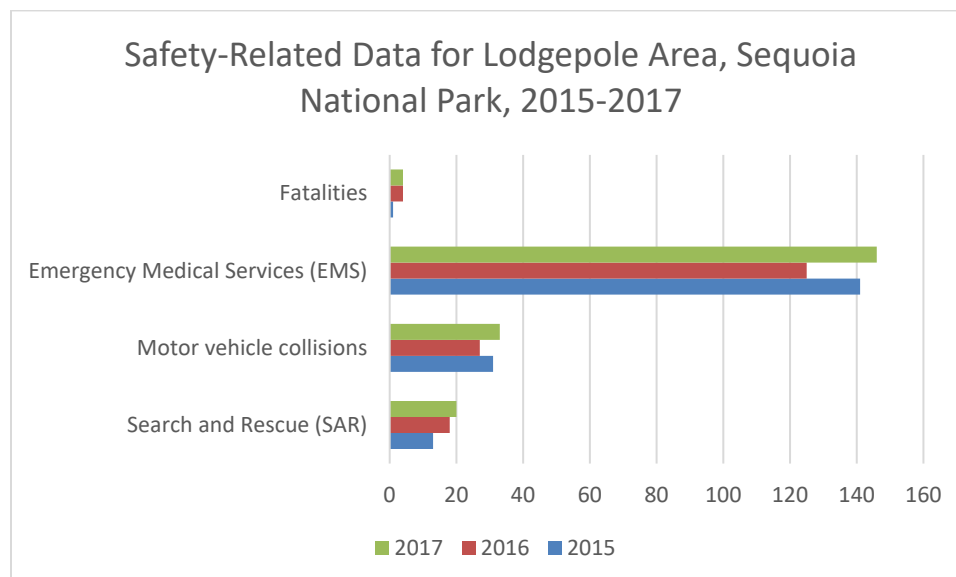
viewshed for as long as the cellular facility exists. If the facility is approved, additional companies may wish to co-locate on the tower, adding antennas to the built tower. Due to the design of the tower, the additional antennas would not be noticeable and would not add cumulatively to the adverse effect. In the event that a cellular company is approved to construct a new tower in the same location, the effects on the viewshed would be adverse due to two or more towers in the same location. Depending on the type of tower constructed and its height, additional towers in the same location would result in long term adverse and potentially significant cumulative effects to the area's viewshed.

## Health and Safety

### *Affected Environment*

Safety and health of the public, employees, contractors, volunteers and other park visitors are core National Park Service values (NPS 2006). Director's Order (DO) 53 (RM-53, 2000) contains the procedures applicable to the permitting of wireless communications facilities in NPS units, which includes direction to consider the safety of the visiting public as a factor when reviewing applications.

Peak visitation at Sequoia National Park occurs from approximately late May through early September; this is the time when most emergency calls are placed, and search and rescue operations are needed. Safety incidents in the Lodgepole area are monitored; the following data (Figure 7) summarizes safety-related incidents in the park over the past three years. In 2017, annual visitation to the park peaked at 1,291,256; during the 2017 year in the Lodgepole area, there were 20 Search and Rescue calls, 33 motor vehicle collisions, 146 emergency medical service calls, and four fatalities.



**Figure 7. Annual safety-related data for Lodgepole Area, Sequoia National Park (Fox 2018)**

There is no cellular service along the Generals Highway in Sequoia National Park, including the Wuksachi or Lodgepole areas, to facilitate communication during an emergency situation. Currently,

emergency calls are received during business hours through personal contact with park staff or private service staff employees. Calls or requests are directed to the Park's public safety answering point (PSAP), located in Ash Mountain at park headquarters, and dispatched to responders via radio communication. Outside of business hours, visitors use pay phones or land lines to access emergency services. Once the call reaches the PSAP, park rangers and responders are called on two-way RF radio, office or home phones (land lines), or paged via radio communications to respond. Calls received via mobile devices are generally very limited due to spotty or non-existent cell coverage, but when placed, are routed to the California Highway Patrol PSAP. Call information is then transferred to the Park's PSAP.

Telephone service is limited to land line telephones in NPS offices, concessioner businesses, and to limited public pay phone service. Visitors may use personal locator beacons (PLB), satellite phones and satellite messengers, as well. To facilitate emergency response, the NPS operates and maintains land mobile two-way RF communications systems. Areas where RF communications are difficult due to topography include the Lodgepole Valley, Wuksachi Village, Sherman Tree and Giant Forest visitor use areas (pers. comm., NPS Ranger Dave Fox, August 24, 2018).

### ***Environmental Consequences***

*Impacts of Alternative A (No Action).* Under the No Action alternative, there would be no changes to existing health and safety conditions in the Wuksachi and Lodgepole area. The public would continue to rely on in-person contact, pay phones, or limited/spotty cell phone coverage to report emergencies, and the NPS's PSAP would continue to rely on RF radio, office or home phones, or pagers to initiate response.

*Impacts of Alternative B (Proposed Action).* Under the Proposed Action alternative, the Wuksachi Wireless Telecommunications Facility would be constructed, providing cellular coverage along the Generals Highway in the west-central area of the park. Cellular coverage would include NPS and concessioner staff residences and visitor use areas at Wuksachi Village, Lodgepole and Wolverton, and extend south and west of these areas, toward the General Sherman Tree. Minimal outdoor coverage would be available at the Giant Forest Museum. At its greatest reach, outdoor cellular coverage (including minimal coverage) would extend approximately 6 miles to the northeast and 6 miles to the southwest, with spotty coverage in the intervening surrounding areas (Figure 4).

Effects to health and safety in National Parks as a result of cellular service are not well-documented and likely include both potential beneficial and detrimental effects. Mobile phone use is beneficial for emergency response and can result in improved patient outcomes, according to a study conducted in the United Kingdom (Wu 2012). At Sequoia National Park, potential beneficial effects of cellular service include improved communication between California State Patrol PSAP and the NPS PSAP and the emergency response personnel who live in Lodgepole and Wuksachi areas where RF communications are limited, as well as improved communications among emergency response personnel during an incident. Another important benefit is that cellular service would serve as a fallback communications system should the park RF communications fail. Additionally, the facility would vastly improve the Park's ability to communicate safety-related information in real time with



park and concessions staff, and visitors, allowing the park to relay information regarding the Fire Hazard index, Air Quality index, weather, and restricted areas or incidents.

The link between cell phone use, and both pedestrian and vehicular accident rates is well-established (National Safety Council [NSC] 2012; Simpson et al. 2013). Potential detrimental effects include increased health and safety hazards due to distracted drivers and distracted pedestrians, which is a concern particularly along the curved section of the Generals Highway; this concern was raised during the scoping period. In addition, there may be an increase in risks taken by visitors due to the presence of cell service and communication ability, assuming a phone call can be made if help is needed (Carlson 2016).

Comments received during the public scoping period raised concerns about exposure to radio frequency-modulated electromagnetic fields (RF-EMF) as a result of the proposed cellular installation at Wuksachi Village. Cell phones emit low levels of RF energy considered “non-ionizing” radiation; RF energy at these low levels does not produce heating, which is known to cause adverse health effects (FDA 2018). A large number of studies have been conducted regarding the potential harmful effects of exposure to non-ionizing RF-EMF from cell phone use. The studies range from effects on general human health, such as incidence of headaches (Cho 2017), to assessing the effects on brain metabolism (Volkow 2011). Studies have also been conducted to determine if cell phone use is correlated with an increase in cancer rates (Miah 2017). The World Health Organization (WHO) has established an International Electromagnetic Fields Project (IEFP) to provide information on how RF exposure effects human health, and to establish research needs; WHO has also classified radio frequency fields with a set of environmental agents that are “possibly carcinogenic to humans” (FDA 2018).

Although a large number of studies have been performed to assess whether cellular phone use poses a risk, and studies are on-going, WHO has determined that currently there is no established link between cell phone use and human health risks (WHO 2005 and 2014). In addition, the Federal Communications Commission (FCC 2018) has established RF exposure limits from hand-held wireless devices; these limits are defined in terms of a maximum allowable Specific Absorption Rate (SAR) of 1.6 watts per kilogram (referring to the mass or weight of the person holding the device). According to the FCC, ongoing research has not provided a basis to establish different safety thresholds (FCC 2016 and 2018).

*Cumulative Impacts.* A total of 203 health and safety incidences were recorded in the Lodgepole / Wuksachi area in 2017, including search and rescue calls (20), emergency service calls (146), motor vehicle collisions (33), and fatalities (4) (Fox 2018). There is no documentation that the proposed facility and the use of cell phones would either increase or decrease the number of health and safety incidents in the Lodgepole/Wuksachi area. However, the proposed facility may add cumulatively to the number of health and safety incidents reported annually due to increased connectivity and more opportunities for visitors to use their cell phones to report incidents.

## **Visitor Experience and Wilderness Character**

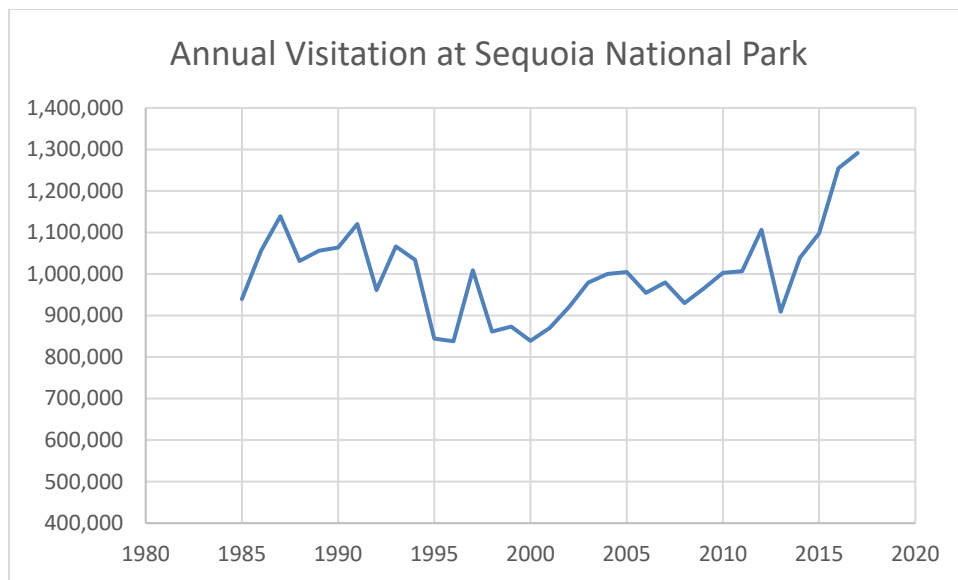
### ***Affected Environment***

Sequoia and Kings Canyon National Parks lie side-by-side in the southern Sierra Nevada range in south eastern California, encompassing 1,353 square miles. The parks contain the world's largest trees (by volume), mountains, foothills, deep and vast canyons, and the highest point in the lower 48 states - Mt. Whitney (14,505 feet). Sequoia National Park was initially established in 1890 as a result of public interest in protecting the giant sequoia trees, including the world's largest tree (General Sherman Tree); both the General Sherman Tree and the Giant Forest (just south of the project area) remain prime visitor attractions today.

Visitors to the park participate in a variety of recreational activities, including camping, hiking, scenic driving, mountain climbing, skiing, snowshoeing, and walks to nearby viewpoints. Cross-country skiing, snow play, snowshoeing and sledding are popular winter activities; cross-country skis and snowshoes can be rented at Wuksachi Village. Wilderness experiences outside the developed areas of the Park include day hiking and backpacking.

Visitor services in the vicinity of the proposed wireless telecommunications facility include overnight lodging at Wuksachi Village, the Lodgepole Visitor Center, two campgrounds in the Lodgepole area, multiple paths and trails within the Wuksachi Village area, and a number of trailheads including a trailhead connecting Wuksachi Village to the Twin Lakes and Lodgepole area, three trailheads near the Lodgepole area, a trailhead in the immediate vicinity of the Wolverton parking area accessing the Long Meadow Loop, the Giant Forest Trail, the Wolverton Cutoff, and the Sequoia and Kings Canyon Wilderness. The Giant Forest Museum is located along the southern edge of the proposed wireless coverage area.

Annual visitation at Sequoia National Park has fluctuated over the past 30 years, then peaked in recent years, with record numbers of visitors to the park recorded in 2016 (1.24 million) and 2017 (1.29 million) (NPS 2018) (Figure 8). In 2017, 23% of visitors stayed overnight. A total of 57,179 overnight stays occurred at Wuksachi Lodge, and 56,257 at the Lodgepole campground. A total of 21,148 overnight stays in the wilderness were recorded (NPS 2018).



**Figure 8. Annual Visitation Trends at Sequoia National Park (NPS 2018)**

Seasonal visitation occurs primarily during the months of April through October, with winter visitation accounting for only 17.5% of all visitation in 2017 (NPS 2018). The Generals Highway accessing the Wuksachi Village area is generally open during the winter, unless impassable due to weather. The Generals Highway is typically closed from a point north of Wuksachi Lodge to a point near Grant Grove during the winter months.

There is currently no reliable cellular coverage within Sequoia National Park’s developed areas. As a result, visitors obtain park information, including weather and safety advisories, parking area availability, educational programming, and maps of park facilities from visitor centers, signage, and direct contact with park facilities and personnel.

A total of 837,806 acres, or 96.7%, of the Sequoia and Kings Canyon National Parks are managed as wilderness, accessible only by foot or horseback (NPS 2016). The Wilderness Act of 1964 established that wilderness areas “shall be devoted to the public purposes of recreational, scenic, scientific educational, conservation, and historical use” (NPS 2006). Components of wilderness character include qualities such as “untrammeled, undeveloped, solitude or primitive and unconfined recreational quality.” These qualities have been assessed and mapped recently for Sequoia and Kings Canyon National Parks (Tricker 2014). Of the total overnight stays logged in 2017 inside Sequoia National Park (300,949 stays), 7% (21,148 stays) were issued backcountry permits and presumably occurred in the wilderness areas. Based on analysis of coverage imagery displayed in Figure 3, it appears that cellular coverage currently extends into an estimated 16,000 acres of Sequoia and Kings Canyon western wilderness areas, or 2%, of the total acreage managed wilderness within the park. There is also limited cellular coverage on the eastern side of Sequoia and Kings Canyon along the Sierra Crest from cellular sites located outside the park within the Owens Valley area.

## ***Environmental Consequences***

*Impacts of Alternative A (No Action).* Under the No Action alternative, there would not be a wireless communication facility installed at Wuksachi Village. Visitor experience and wilderness character would not change from existing conditions. There would be no cumulative effects.

*Impacts of Alternative B (Proposed Action).* Installation of a wireless telecommunications facility near Wuksachi Village would alter the experience of visitors to the park in both positive and negative ways.

Positive impacts to visitor experience from the use of technology could include increased comfort due to connectivity with others, an ability to access the Park's web services, obtain programming and educational resources, and an enhancement of visitor's experience due to the to share in "real time" their visit with others. Visitors would have access to practical information, such as parking space availability, the presence of wild fire and other hazards, and on-line maps and planning tools, enabling visitors to be informed, plan ahead, and make best use of their time while at the park.

Negative impacts to the visitor experience in the park, as provided in the public scoping comments, would include noise and distraction from phone use which would degrade the experience for visitors that have a personal preference to experience park visits free of cell phone use by others. The facility would be installed outside the Park's wilderness boundary, and no direct physical effects to wilderness would occur. However, increasing connectivity to the wilderness reduces the contrast between wilderness and other lands, and negatively impacts wilderness character. This viewpoint was expressed by comments during the scoping period (17 out of 29 total comments received). Opportunities for solitude would be reduced within the proposed new cellular coverage area, as visitors to wilderness would potentially be disrupted or affected by people talking on their cell phones, streaming music, or otherwise using technology in a way that affects the experiences of others. These impacts would be limited to wilderness regions where cell coverage would be available (approximately 4% of total wilderness would receive additional coverage, or 36,000 acres, based on GIS analysis of predicted coverage maps).

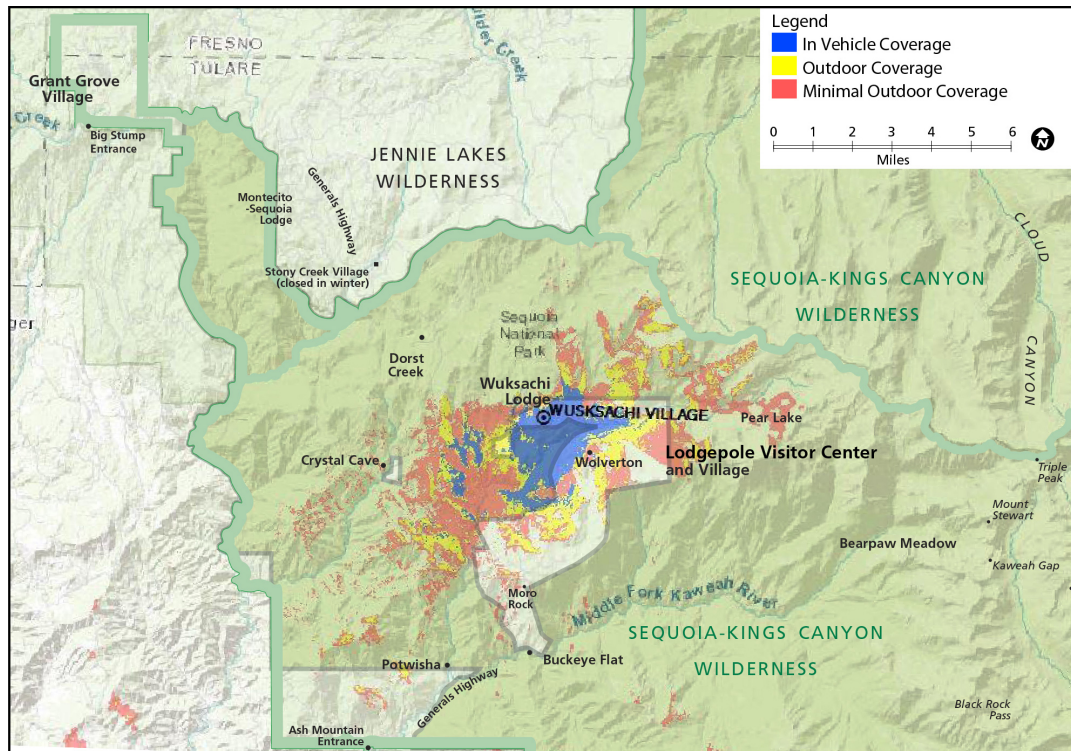
The proposed wireless coverage area would extend into wilderness boundaries to the northeast and southwest of the Lodgepole, Wuksachi and Wolverton area. An estimated 36,000 additional acres of wilderness would receive cell coverage, bringing the total percentage of wilderness covered in Sequoia and Kings Canyon National Park's western wilderness areas to approximately 52,000 acres, or 6%, of acreage managed as wilderness. The majority of wilderness areas classified as optimal quality (Tricker 2014) are east of the proposed coverage area and would remain free of cellular coverage. Some of the areas included in the coverage area are mapped as somewhat less optimal (but still optimal) for overall wilderness characteristics (Tricker 2014), presumably due to proximity to developed areas.

In order to reduce the impacts to wilderness from the facility, antennas have been directed away from wilderness boundaries as much as possible. For comparison purposes, maps (Figures 9a and 9b) depicting coverage with and without wilderness avoidance (i.e., without directing antennas away from wilderness) demonstrates coverage into wilderness could be much more pervasive especially to

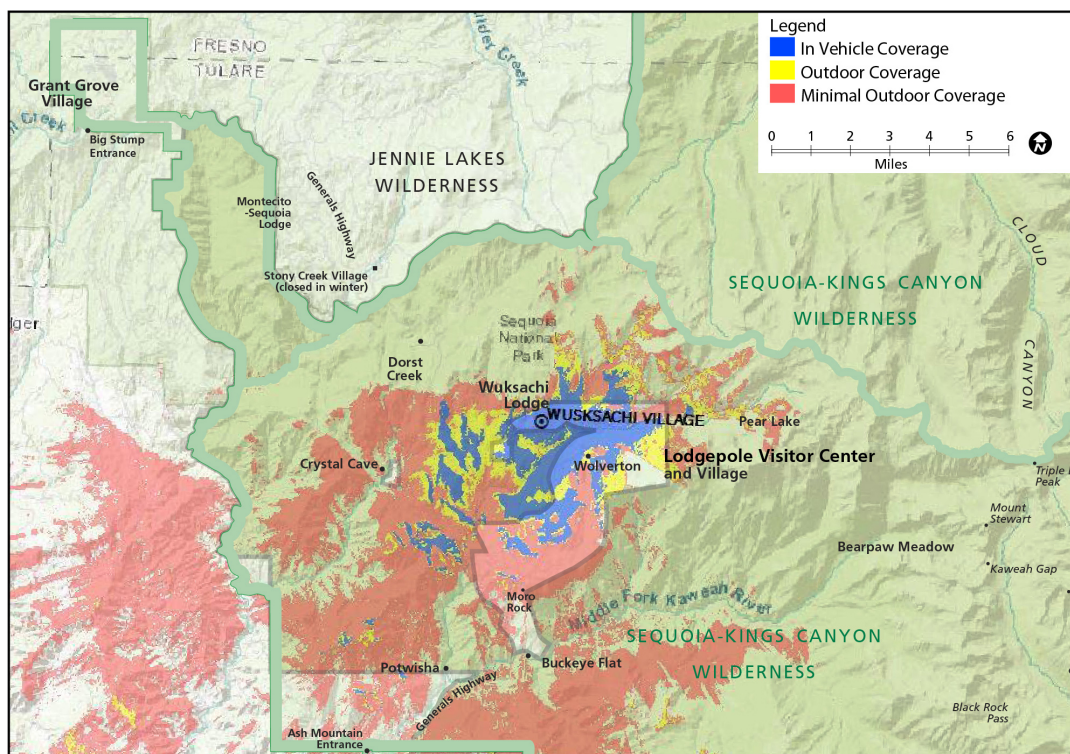
the northeast of the facility and would extend outdoor coverage into larger regions of the backcountry.

*Cumulative Impacts.* The proposed action would result in additional areas of the park available for cell phone use, adding to the impacts already being experienced by visitors in the existing developed areas. Visitors who visit national parks to be away from the sights and sounds of technology are already affected at Grant Grove where cellular coverage exists, and at places in the park where spotty coverage exists from towers located outside the park's boundaries. If future co-location on the tower occurs, there would be other carriers available and other carriers providing coverage. This adds to the potential disruptions to park visitors. Impacts to visitor experience in the front country would depend on the perception of the visitor regarding technology and cell phone use within the park. The proposed project would cumulatively enhance visitor experience by providing additional educational content to that already offered by existing visitor services.

In wilderness areas, the proposed action would add cumulatively to the impacts of existing developed areas on wilderness character. Limited, spotty coverage also already exists in wilderness areas along the eastern boundary of the park from cell towers in the Owens Valley area, affecting wilderness character in those areas. In the NPS and adjacent U.S. Forest Service wilderness areas, there would be additional acreage where cell phone use would be possible, resulting in cumulative adverse impacts on wilderness character from reduced opportunities for solitude. The areas affected by increased cellular service are limited to areas closest to the boundaries of the wilderness on the west and east sides of the park; ample opportunities for solitude would still exist in the majority of the NPS and U.S. Forest Service wilderness areas.



**Figure 9a. Proposed Wireless Coverage in Sequoia National Park, with Wilderness Avoidance Measures. Antennas are Directed Downward to Minimize Coverage in Wilderness**



**Figure 9b. Scenario of Wireless Coverage in Sequoia National Park with No Wilderness Avoidance Measures**



## 4 Consultation and Coordination

### Tribal Consultation

An archeological survey was completed for the project area and no cultural resources were found. The NPS will send the EA and a letter to the California State Historic Preservation Office for their notification and review.

### State of California Office of Historic Preservation

The NPS sent the EA and a letter to the California State Historic Preservation Office on December 17, 2018 for their notification and review. NPS determined that the telecommunications facility will have no effect on Generals Highway and, because no other historic properties are located within the APE, proposes a Finding of No Historic Properties Affected for this undertaking. The SHPO concurred with the parks' determination in a January 14, 2019 letter.

### Sequoia and Kings Canyon National Park

Juanita Bonnifield, Cultural Resources Program Manager  
Nancy Hendricks, Chief of Planning and Compliance  
Ginger Bradshaw, Environmental Protection Specialist  
Dave Fox, District Ranger  
Chris Carpenter, Project Manager  
Paul Schwarz, Sanitarian (Retired)  
Jane Allen, Archeologist (Tribal Liaison)  
Blaine Spaulding, Telecommunications Manager  
Heyo Tjarks, Restoration Ecologist  
Sintia Kawasaki-Yee, Public Affairs Officer  
Erik Frenzel, Wilderness Coordinator  
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## 5 References

- Carlson, T., J. Shultis, and J. Van Horn. 2016. *The Use of New Technology in Wilderness: Emerging Issues and Need for Policy and Management*. Society for Wilderness Stewardship - White Paper on Stewardship Issues. Available at: <http://wildernessstewardship.org/sites/default/files/custom/Technology%20White%20Paper%20Final.compressed.pdf>. Accessed June 25, 2018.
- Far Western Anthropological Research Group, Inc. 2018. Class III Cultural Resources Inventory for the Wuksachi Village Communication Facility Project, Tulare County, CA. February 2018.
- Federal Communications Commission (FCC). 2016. *Consumer Guide: Human Exposure to Radio Frequency Fields, Guidelines for Cellular and PCS Sites*. Available at: <https://transition.fcc.gov/cgb/consumerfacts/rfexposure.pdf>. Accessed December 13, 2018.
- Federal Communications Commission (FCC). 2018. *Wireless Devices and Health Concerns*. <https://www.fcc.gov/consumers/guides/wireless-devices-and-health-concerns>. Accessed June 23, 2018.
- Fox, D. 2018. NPS Park Ranger for Sequoia National Park. Email correspondence with Cassandra August 24, 2018.
- Malkemper, E., T. Tscheulin, A. Vandbergen, A. Vian, E. Balian, and L. Goudeseune. 2018. The impacts of artificial Electromagnetic Radiation on wildlife (flora and fauna). Current knowledge overview: a background document to the web conference. A report of the EKLIPSE project.
- Miah, T. and D. Kamat. 2017. *Current Understanding of the Health Effects of Electromagnetic Fields*. *Pediatric Annals*. 2017; volume 46 (4). Accessible from: <https://doi.org/10.3928/19382359-20170316-01>. Posted April 17, 2017.
- National Park Service (NPS). 2006. National Park Service Management Policies 2006. Ch. 1.9 and Ch. 6.
- National Park Service (NPS). 2009. National Park Service Reference Manual 53: Special Park Uses. Appendix 5-Rights-of-Way, A5-14.
- National Park Service (NPS). 2015. National Park Service NEPA Handbook.
- National Park Service (NPS). 2016. *Fact Sheet 2016: Sequoia and Kings Canyon National Park*. <https://www.nps.gov/seki/learn/news/upload/FINAL-SEKI-FACT-SHEET-2016.pdf>
- National Park Service (NPS). 2018. National Park Service Visitor Use Statistics- Sequoia National Park. <https://irma.nps.gov/Stats/reports/park>. Accessed August 18, 2018.



- National Safety Council (NSC). 2012. *Understanding the Distracted Brain: Why Driving While Using Hands-free Cell Phones is Risky Behavior*. National Safety Council White Paper, April 2012.
- Stimpson, J.P., F.A. Wilson, and R.L. Muelleman. 2013. *Fatalities of pedestrians, bicycle riders, and motorists due to distracted driving motor vehicle crashes in the U.S., 2005-2010*. Public Health Report, Nov-Dec 2013; Vol. 128, No. 6, pp:436-42.
- Tricker, J., P. Landres, G. Fauth, P. Hardwick, and A. Eddy. 2014. *Mapping wilderness character in Sequoia and Kings Canyon National Parks*. Natural Resource Technical Report NPS/SEKI/NRTR-2014/872. Fort Collins, CO: U.S. Department of the Interior, National Park Service, Natural Resource Stewardship and Science. 82 p. May 2014.
- U.S. Fish and Wildlife Service (FWS). 2018. *Recommended Best Practices for Communication Tower Design, Construction, Operation, Maintenance, and Decommissioning*. FWS Migratory Bird Program. Available at: <https://www.fws.gov/migratorybirds/pdf/management/usfwscommtowerguidance.pdf>. April 2018.
- U.S. Food and Drug Administration (FDA). 2018. *Radiation-emitting products, cellphones, current research results*. <https://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116335.htm>. Accessed June 23, 2018.
- Volkow, N.D., D. Tomasi, and G. Wang. 2011. *Effects of Cell Phone Radiofrequency Signal Exposure on Brain Glucose Metabolism*. Journal of the American Medical Association. Volume 305, No. 8. pp:808–813.
- World Health Organization (WHO). 2005. *Electromagnetic fields and public health effects of EMF on the environment*. ([https://www.who.int/peh-emf/publications/facts/envimpactemf\\_infosheet.pdf](https://www.who.int/peh-emf/publications/facts/envimpactemf_infosheet.pdf)). Accessed December 13, 2018.
- World Health Organization (WHO). 2014. *Electromagnetic fields and public health: mobile phones*. <http://www.who.int/en/news-room/fact-sheets/detail/electromagnetic-fields-and-public-health-mobile-phones>. Accessed August 1, 2018.
- Wu, O., A. Briggs, T. Kemp, A. Gray, K. MacIntyre, J. Rowley, and K. Willet. 2012. *Mobil phone use for contacting emergency services in life-threatening circumstances*. The Journal of Emergency Medicine, March 2012; Volume 42, No. 3, pp: 291-298.
- Yong Min Cho, Hee Jin Lim, Hoon Jang, Kyunghye Kim, Jae Wook Choi, Chol Shin, Seung Ku Lee, Jong Hwa Kwon, and Nam Kim. 2017. *A follow-up study of the association between mobile phone use and symptoms of ill health*. The Korean Society of Environmental Health and Toxicology. 2017; Volume 32: e2017001. Published online: December 29, 2016. Available at: DOI: <https://doi.org/10.5620/eh.t.e2017001>.

**Attachment A:**  
**FCC Categorical Exclusion for RF Effects**

**Attachment B:**  
**Photo Simulation of the Proposed Wuksachi Village Wireless**  
**Telecommunications Facility**

**Attachment C:**  
**Errata and Public Comment Summary**

**Attachment D:**  
**Native American Heritage Commission (NAHC) List of Tribes and**  
**Tribal Organizations**

### NAHC List of Native American Tribes and Tribal Organizations

American Indian Council of Mariposa County	Mono Lake Indian Community
Benton Paiute Reservation	Native American Heritage Commission
Big Pine Paiute Tribe of Owens Valley*	North Fork Mono Tribe
Big Sandy Rancheria of Mono Indians*	North Fork Rancheria of Mono Indians*
Bishop Paiute Tribe*	Northern Band of Mono Yokuts
Bridgeport Indian Colony	Picayune Rancheria of the Chukchansi Indians*
CA Tribal Emer. Resp. & Relief Agency	Santa Rosa Rancheria – Tachi Yokuts*
California Indian Basketweavers Association	Sierra Foothill Wuksachi Tribe
Chalon Indian Council of Bakersfield	Sierra Mono Museum
Chaushilha Yokuts	Sierra Mono Museum Board
Choinumni Tribe	Sierra Nevada Native American Coalition
Chumash Indian Council of Bakersfield	Southern Sierra Miwuk Nation
Chumash Native Nation	Squaw Valley Tribe
Cold Springs Rancheria of Mono Indians*	Table Mountain Rancheria*
Dumna Wo-Wah Tribal Government	Tejon Indian Tribe*
Dunlap Band of Mono Indians	The Choinumni Tribe of Yokuts
Dunlap Band of Mono Indians – Historic Preservation Society	The Mono Nation
Eshom gathering	Traditional Choinumni Tribe
Eshom Valley Band of Indians / Wuksache Tribe	Tubatulabal Tribe
Fort Independence Community of Paiute*	Tubatulabal Tribe, White Blanket Allotment
Fort Mojave Indian Tribe*	Tule River Indian Tribe*
Haslett Basin Traditional Committee	Tule River Indian Tribe, Fire Dept.
Kawaiisu Tribe	Tule River Tribal Elders Committee*
Kern River Paiute Council	Tule River Yokuts Language Project
Kern Valley Indian Com. Tribal Council	Tule River-Yokut Archaeology Advisory Team
Kings River Choinumni Farm Tribe	White Blanket Allotment
Kitanemuk & Yowlumne Tejon Indians	Wukchumni Tribal Council
Lone Pine Paiute-Shoshone Tribe*	Wuksache Tribe
Monache Intertribal Association	

\* Federally recognized tribes. Tribal chairs were notified to comment or consult regarding the proposed undertaking and mailed a copy of the EA.