



National Park Service
U.S. Department of the Interior
Yellowstone National Park
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Concessionaire Housing and RV Sites Environmental Assessment May 2019



NPS Photo

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PURPOSE AND NEED

Purpose and Need for Action

The National Park Service (NPS) received a proposal from concessionaire partners to construct modular housing units, recreational vehicle (RV) sites, and bath houses at Canyon Village and the West Entrance Warehouse in Yellowstone National Park (YNP). The proposal would be funded by the concessionaire partners, not by the NPS. Concessionaires are commercial companies that operate facilities inside national parks for visitor use and enjoyment, such as hotels, general stores, and gas stations.

The purpose of this project is to develop seasonal housing for concessions employees in areas that have pre-existing infrastructure and where there would be minimal adverse impacts on park resources. Additional housing is needed because concessions staffing levels have increased to accommodate growing visitor use and expanded visitor services; however, housing supply has not expanded commensurate with staffing levels. Some housing is available in gateway communities, but distances to places of work make daily commuting impractical, especially for employees in the park's interior.

The two project locations are located approximately 40 road miles apart, within the boundary of YNP (figure 1). Although the project locations are geographically separated, the project locations have similar habitat and the scope of the projects at each location are relatively similar.

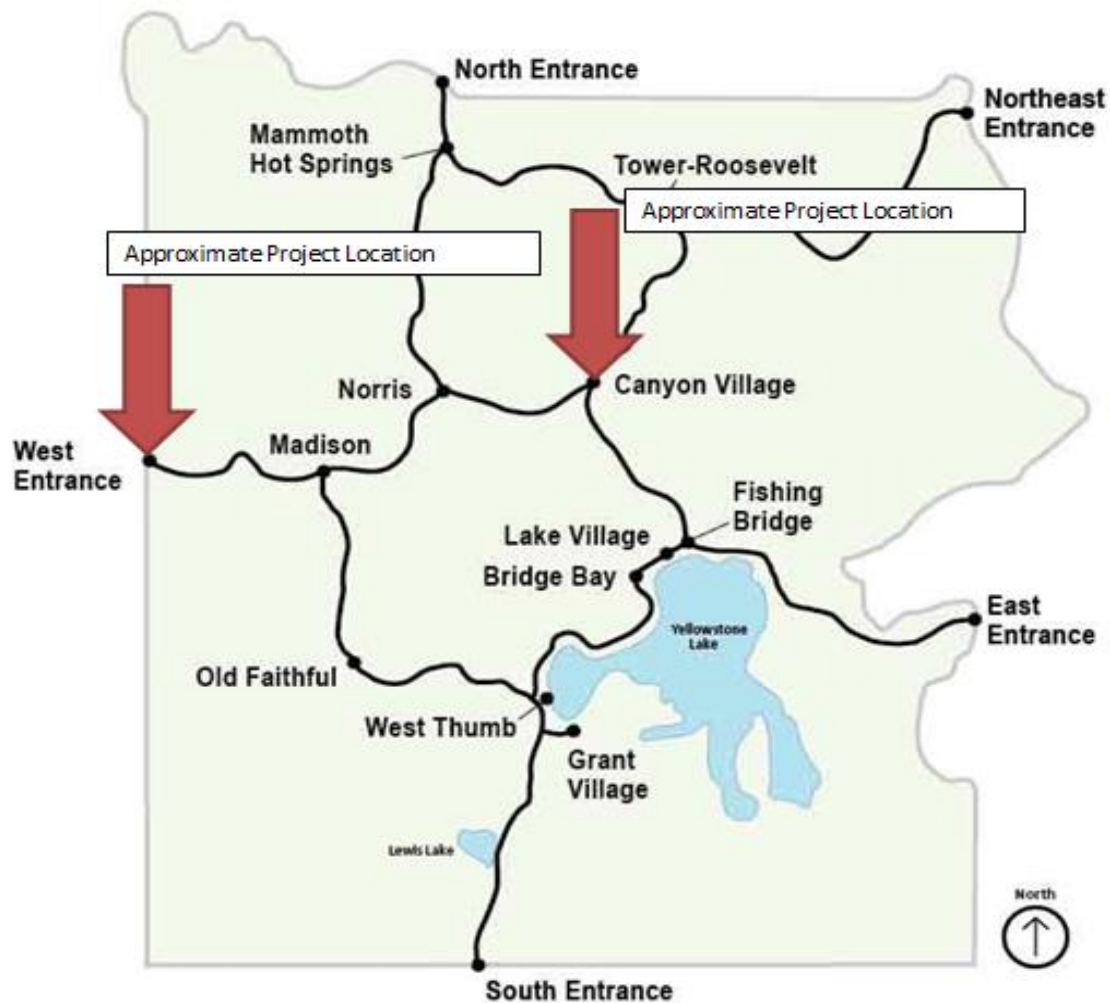


Figure 1. Proposed Project Locations.

Canyon Village operates from mid-May to mid-October and consists of a visitor center, service station, two general stores, food services, seven lodges, guest cabins, a campground, post office, and employee housing. Canyon Village is one of the park's most popular visitor destinations and has the highest number of overnight accommodations in the park. The campground at Canyon Village is approximately 57 acres, with 273 sites. The campground is operated by Xanterra Parks and Resorts, which has proposed the housing project in Canyon Village examined in this Environmental Assessment (EA). Specifically, the proposed project location is at Loop G in the Canyon Campground (figure 2). Loop G has not been used for visitor camping since 1972 due to lack of occupancy and insufficient water pressure. Since that time, the loop has been used as a maintenance storage area and as an overflow RV area for contractors working around Canyon. Two comfort station buildings are located within the loop. Neither is currently functional.

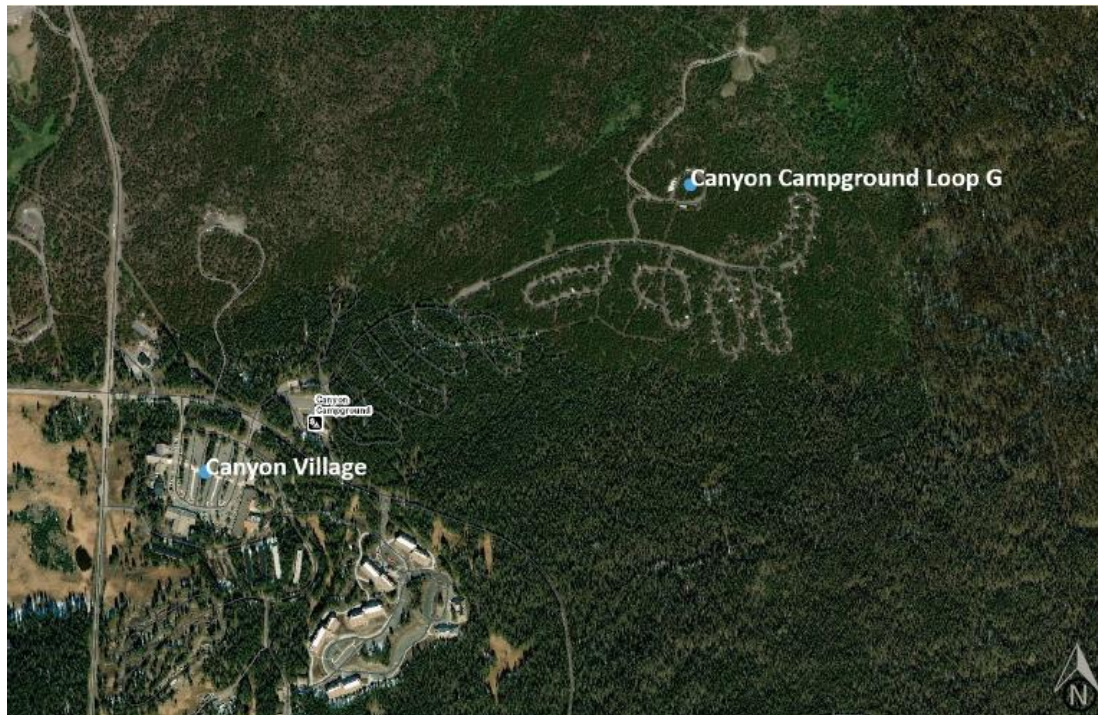


Figure 2. Existing Canyon Campground.

West Entrance Warehouse is operated by Delaware North Corporations (DNC) and is located in the West Entrance Administrative Site, south of the entrance station (figure 3 on page 3). The site is approximately 5.7 acres and includes a large paved area with a warehouse, maintenance shop, human resources office building, and storage shed. The site is also used during the winter season as a staging area for commercial over-snow vehicles and other maintenance operations.



Figure 3. Existing West Entrance Warehouse.

Delaware North Corporation operates twelve general stores within the park. DNC owns several properties in the municipality of West Yellowstone including hotels, apartment buildings, and an RV Park. Some of these West Yellowstone municipal properties provide visitor lodging, while others are used for employee housing. The proposed RV sites examined in this EA would be used by DNC employees who work at general stores in the park interior and at the West Entrance Warehouse from late March through early November.

Impact Topic Retained For Further Analysis

The following topics are carried forward for further analysis in this EA:

- Soils and Vegetation
- Grizzly Bear
- Visitor Use and Experience

Impact Topics Dismissed From Further Analysis

Table 1 lists impact topics that were dismissed from further analysis because they are not of critical importance to this project, do not exist in the analysis area, would not be affected by the proposal, or through the application of mitigation measures there would be no measurable effects from the proposal.

Table 1. Impact topics dismissed.

Topic	Reason Dismissed
Geological Resources	YNP is a geologically active area that is world-renowned for its geothermal activity, which includes hot springs, geysers, mud pots, and fumaroles. The West Entrance Warehouse site is not near any mapped

	<p>hydrothermal features, but there is potential for elevated groundwater temperatures in the area. The Canyon Loop G camping area is surrounded by both proximal relic hydrothermal deposits and more distal active hydrothermal features. However, a geotechnical survey conducted in Loop G found no thermal waters in the project area. In the event that geothermally active substrate is encountered, mitigation measures would be followed. Because geological resources would either not be impacted by the project or because such impacts would be negligible after mitigation measures, this topic has been dismissed from further analysis.</p>
Wildlife	<p>YNP is home to a wide variety of wildlife and roughly 2.2 million acres of habitat. The project would permanently affect 3.80 acres of habitat directly (2.30 acres within the campground and 1.50 acres at West Entrance Warehouse site). Wildlife is often present near the Canyon Village and West Entrance Area, and is accustomed to the presence of vehicles and visitors. Wildlife and birds are expected to continue to use these areas in spite of construction activities, though they may be displaced from the immediate area while construction equipment operates. No blasting would be required for this project. Equipment would operate from as early as May through November. The project is expected to be completed in less than one year. Construction would not occur at night; therefore, night lighting would not be needed. The impacted habitat type is abundant in the project areas and throughout YNP, so no lasting effects on wildlife and birds are expected.</p> <p>Because no population level effects to wildlife are expected, and because habitat in the project areas is miniscule compared to what is available in the surrounding areas and the park as a whole, this impact topic has been dismissed from further analysis.</p>
Threatened and Endangered Species	<p>Species not known or with limited potential of occurring in the project areas are not discussed further in this EA. Excluded species include wolverine (<i>Gulo gulo</i>), proposed; whitebark pine (<i>Pinus albicaulis</i>), candidate; and Canada lynx (<i>Lynx canadensis</i>), threatened. These species have been removed from further analysis by meeting one or more of the following conditions: 1) species does not occur nor is expected to occur in the action areas; 2) occurs in habitats that are not present; and/or 3) the project area is outside of the geographic or elevation range of the species.</p>
Air Quality & Green House Gas Emissions	<p>YNP is designated as a Class I air quality area under the Clean Air Act; meaning, this area receives the highest level of protection with only a small amount of additional air pollution allowed. Air pollutants (i.e., ozone, nitrogen, sulfur, and mercury) directly impact YNP by reducing visibility, contaminating vegetation, soils, and surface waters, as well as disrupting lifecycle and behavior patterns of certain wildlife species.</p> <p>Use of construction equipment during the construction window (May to November) would result in a small increase of greenhouse gas emissions (GHGs) in the project area, including an increase in vehicle exhaust, emissions, and fugitive dust during the construction period. Periodic use (i.e., hourly) of various types of equipment (excavators, backhoes, cranes, pavers, and material delivery trucks) during the construction</p>

	<p>period would produce emissions that would be very small relative to those produced from visitor travel throughout the park, and would make an inconsequential contribution to the park's overall emissions profile. Any increase in GHGs would cease once construction is complete, so no lasting effects would occur from the proposed alternatives; therefore, this topic has been dismissed from further analysis.</p>
Soundscapes	<p>Sounds currently heard in the project areas are a mix of natural and man-made including those generated from wildlife, humans, vehicular traffic, and wind. During construction, mechanical noise would temporarily disrupt the surrounding soundscape. For example, dump trucks, bulldozers, concrete mixers, drills, and backhoes all create noise while in use.</p> <p>Natural sounds (e.g., flowing water, wind blowing through trees, birds calling) predominate in YNP. However, in front-country areas such as the two project locations in this EA, visitors regularly experience the sounds of automobiles and buses, generators, motorized equipment, and other people. Construction projects, often geared toward visitor use improvements, occur periodically throughout the park.</p> <p>Human-caused sounds would increase during the construction window (May to November) in the project areas, including the sounds of mechanical equipment, vehicular traffic, and construction crews. These sounds would be present for one construction season. Construction noise could extend up to a half mile beyond the project area. Noise in the project areas has the potential to impact nesting birds and wildlife. Bird vocalizations when trying to find mates could be muffled and potential nesting sites near this activity may not be used. Birds with active nests would be unlikely to abandon nests, and wildlife may choose sites further away to bear young. This increase in human-caused sounds would cease once construction is complete. Because impacts to soundscape would be temporary and would be confined to a half mile radius around the project area, this topic has been dismissed from further analysis.</p>
Cultural Resources	<p>No archeological or paleontological resources were identified during inventory efforts within the project footprints. No historic properties eligible for listing on the National Register of Historic Places were identified within the project footprints or within a reasonable buffer for construction impact. If previously unknown archeological or paleontological resources are encountered mitigation measures would be followed. Because cultural resources were not identified in the project area, this topic has been dismissed from further analysis.</p>
Ethnographic Resources	<p>The park's 26 associated tribes were consulted on March 19, 2019. No tribes identified any ethnographic resources. Based on this information, the park has determined there are no ethnographic resources in the project areas that would be affected by the project.</p>
Historic Structures	<p>No historic properties are anticipated to be found in the Area of Potential Effect (APE) for direct effects, which will be confirmed in consultation</p>

	with Wyoming State Historic Preservation Office. Therefore, potential impacts on historic structures are not analyzed in further detail in this EA.
Cultural Landscapes	No historic properties are anticipated to be found in the Area of Potential Effect (APE) for direct effects, which will be confirmed in consultation with Wyoming State Historic Preservation Office. Therefore, potential impacts on historic structures are not analyzed in further detail in this EA.
Lightscares	New exterior lighting would be installed under the action alternative. Lighting would be used only where it is needed and would be shielded and directed downward to minimize sky glow. High color rendering light sources would be used to ensure light levels would be minimized but still effective. Interior lighting from windows of the housing units, RVs, and bathhouses would create small changes to the surrounding night-time setting. The number of housing accommodations is small, the site is surrounded by mature trees, and with the light control measures described above, any impacts would be negligible; therefore, this topic has been dismissed from further analysis.
Visitor Use and Experience	<p>West Entrance Warehouse site is approximately 600 feet from the West Entrance Station, an area with constant automobile noise during the summer season. The West Entrance Warehouse site is not near a popular visitor use area such as a trail, campground, or scenic pullout. Visitor services are not available. The RV sites and bath house would not be visible from the West Entrance Station or entrance road through the existing lodgepole pine forest. Therefore, potential impacts to visitor use and experience for the West Entrance Warehouse site are not analyzed in further detail.</p> <p>Impacts to visitor use and experience at Canyon Campground Loop G are analyzed in further detail under Affected Environment and Environmental Consequences.</p>

ALTERNATIVES

Two alternatives, a no-action and action alternative are carried forward for evaluation in this EA. A number of alternate designs and locations were also considered and dismissed (see Alternatives Considered and Dismissed).

Alternative A: No Action

Canyon Village Campground Loop G

Under Alternative A, Canyon Village Campground Loop G would remain in the current configuration. The loop includes designated campsites that serve as an overflow RV area for contractors, two inoperative comfort station buildings, and a storage site for maintenance and campground equipment. No new housing or RV sites would be constructed. The roadway, campsites, and comfort stations occupy approximately 2.0 acres.

West Entrance Warehouse Site

Under Alternative A, West Entrance Warehouse site would remain as is. RV sites would not be constructed. The existing buildings would continue to serve as a warehouse, maintenance shop, human resources office building, and storage shed. The buildings and parking lot occupy approximately 5.7 acres.

Elements Common to the Action Alternative

Two elements are common to Loop G and the West Entrance Warehouse Site:

Night Sky Initiative: In accordance with the NPS Night Sky Initiative, NPS Management Policies and the Yellowstone Outdoor Lighting Standards, outdoor lighting in the project areas would be designed to minimize light pollution and glare. All lights would promote a sense of safety while protecting the dark night sky and supporting energy conservation by using only low wattage LED lights that are fully shielded and have a color at or below 3000K.

Accessibility: Sites would be designed to meet Architectural Barriers Act Accessibility Standards (ABAAS) requirements.

Alternative B: Proposed Action and Preferred Alternative (New Concessionaire Housing at Canyon Village Campground Loop G and RV Sites at West Entrance Warehouse)

Canyon Village Campground Loop G

Alternative B would construct six modular housing units, fourteen RV sites, and renovate two comfort stations for seasonal concessionaire housing in what was formerly Loop G of the Canyon Village Campground (figure 4). Construction would occur from May to November.

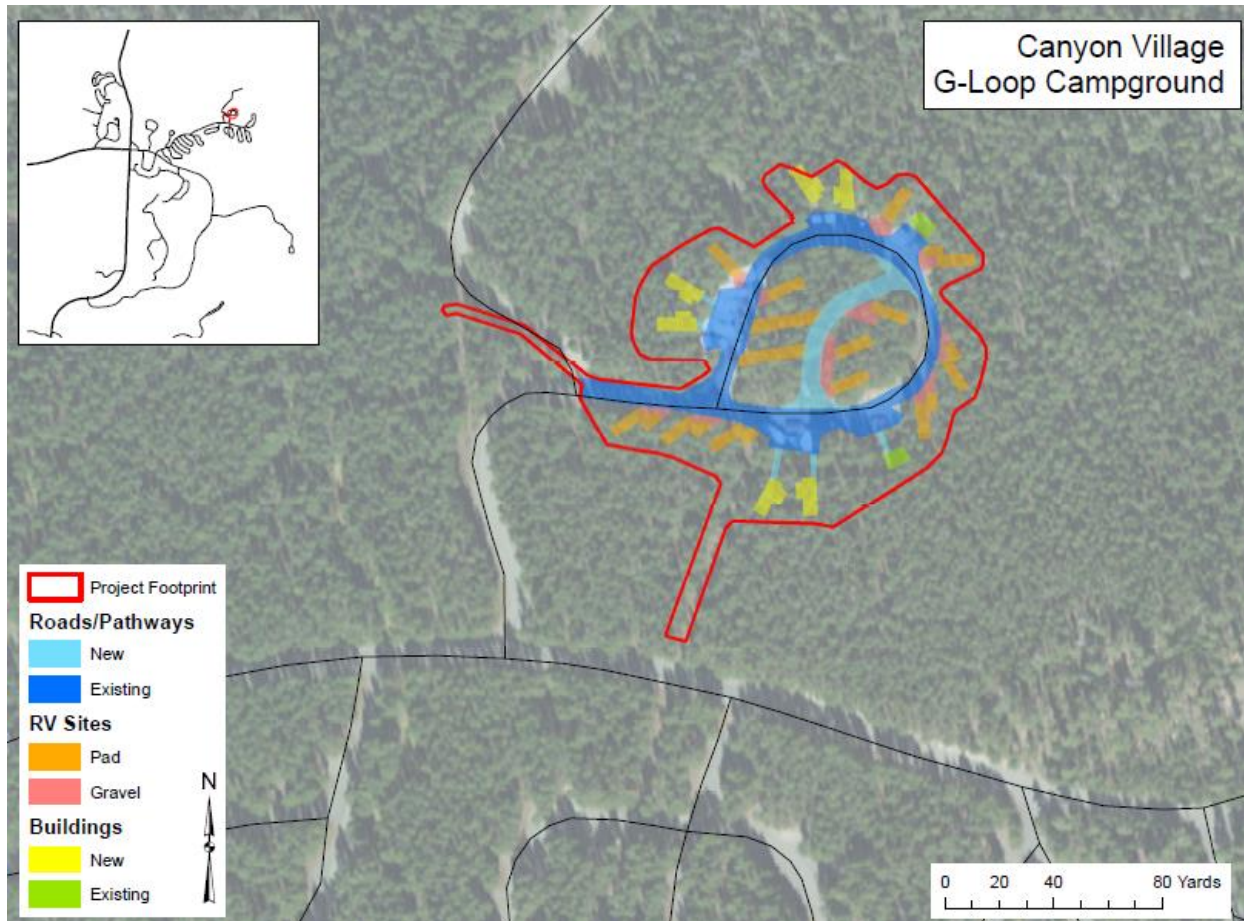


Figure 4. Site plan for Canyon Campground Loop G.

Modular Housing Units

The modular housing units would be single story and approximately 650 square feet in size, including a porch or deck area. The units would be partially assembled off-site and transported to Loop G through either the West or North Entrance during non-peak hours to reduce impacts to visitors and traffic flow. Each unit would require 18-20 concrete piers augured to a depth of 4 feet with a 16-inch diameter for foundational stability. Final assembly of units would be completed on-site. Construction would follow sustainable building practices with one unit constructed to comply with ABAAS. Exterior colors, non-reflective materials, and textures would be chosen to blend units in with the surrounding landscape (see figure 5 on page 9).

RV Sites

Twelve back-in RV sites would be approximately 12 feet wide by 42 feet long. Two pull-through sites would be constructed inside the loop, each measuring approximately 12 feet wide by 50 feet long. Two of

the sites would be 20 feet wide by 40 feet long to comply with ABAAS. All of the RV site pads would be gravel or concrete.



Figure 5. Design of Canyon modular units.

Comfort Stations

The two existing comfort stations would be renovated using sustainable building practices including green materials and energy and water conservation. The north comfort station would consist of unisex bathrooms with showers. The south comfort station would have a laundry facility, storage, and duplex booster system with holding tank to increase water pressure. Each of the comfort stations would be ABAAS compliant. Exterior finishes would be replacement in-kind to match existing appearance of the comfort stations.

Utilities

All utilities would be installed within the existing disturbed areas to the extent possible.

Sewer— A 1,200-foot long, 8-inch diameter PVC sewer line would be installed at a depth ranging from 5 to 15 feet.

Electric— A 410-foot long line would be installed for electrical services at a depth of 2-3 feet.

Water— Water supply is available from the Canyon Village community water system. Due to distance and elevation grades, water pressure at Loop G is low, approximately 24 pounds per square inch (psi). To increase the pressure, one comfort station would house a booster system and pressure tanks. A 1,400-foot long water line of 6-8 inch PVC would be installed at a minimum of 6 feet below the ground surface.

Internet/Phone/Cable— A 4 inch line for internet and phone services would be installed along the existing roadway in Canyon Village Campground (figure 6 on page 10).

Walkways

Approximately 680 feet of pedestrian walkways would be constructed to provide formal connections between housing units and parking spaces. These walkways would prevent user-created social trails in the area. Walkways would be 42 inches wide. The surfaces would be gravel or concrete and would be ABAAS compliant.

Access Road and Parking

The existing 20 foot-wide paved roadway would operate in a one-way direction to allow RV access. A 0.10 acre paved roadway would be constructed inside the loop to allow access to interior RV sites. Up to 21 paved parking spaces would be constructed for housing units and comfort stations. Gravel parking spaces would be constructed adjacent to each back-in RV site. ABAAS parking would be designated for each comfort station and each accessible housing and RV site.

Staging

Staging and stockpiling areas would be located nearby in a previously disturbed area at the former Civilian Conservation Corps (CCC) camp to the southwest of Loop G. This staging area is primarily used in winter by a commercial use authorization (CUA) permit holder that provides a yurt camp for skiers and would not be affected by the construction at Loop G.

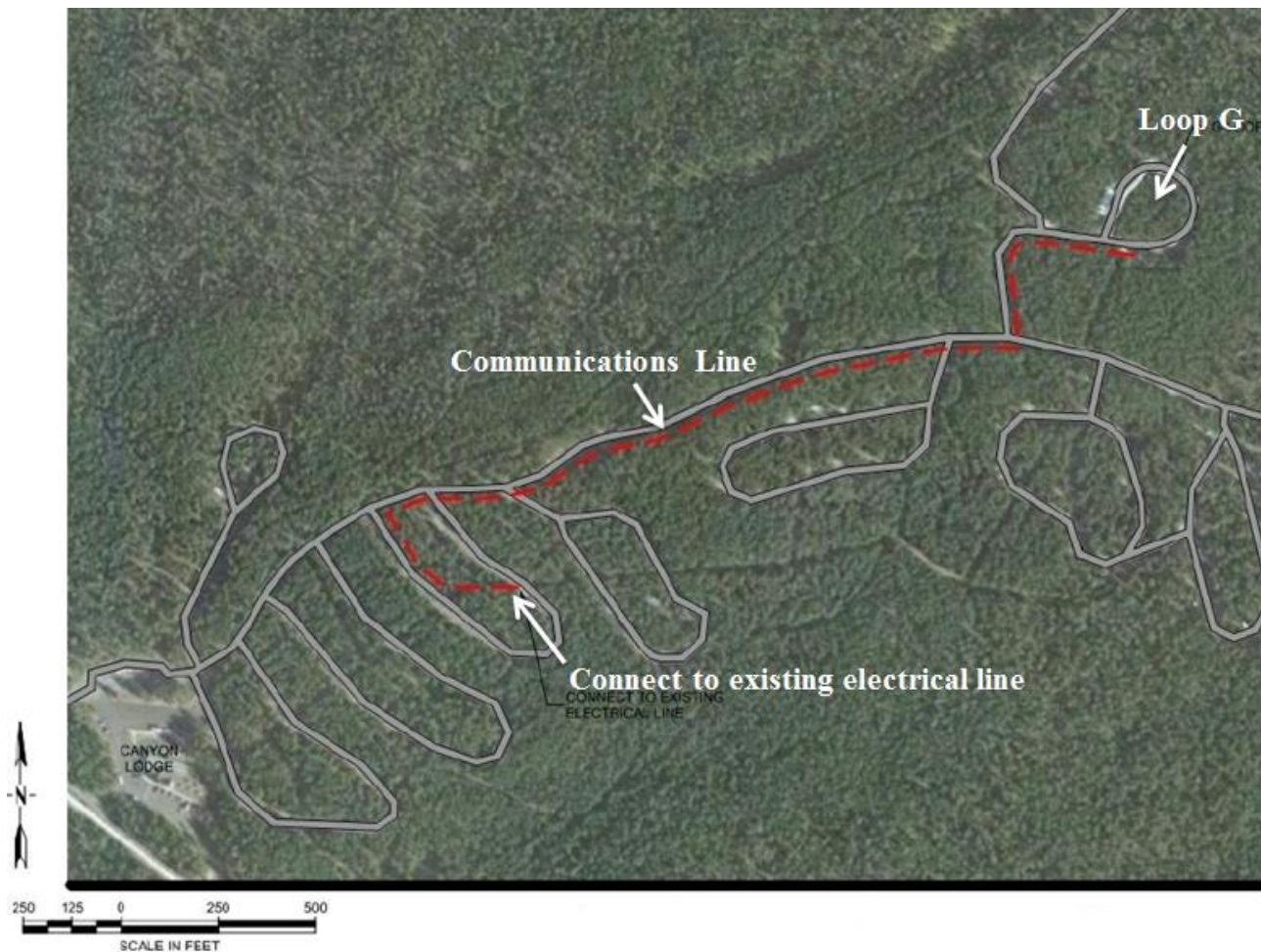


Figure 6. Communications Line route.

West Entrance Warehouse Site

Twenty-five RV sites and one bathhouse with laundry (figure 7) would be constructed on the perimeter of the West Warehouse Site. Construction on the perimeter of the site would minimize disruption to warehouse operations and semi-truck traffic delivering to the warehouse. The warehouse, maintenance shop, human resources office building, and storage shed would remain in current locations. Construction would occur from May to November.

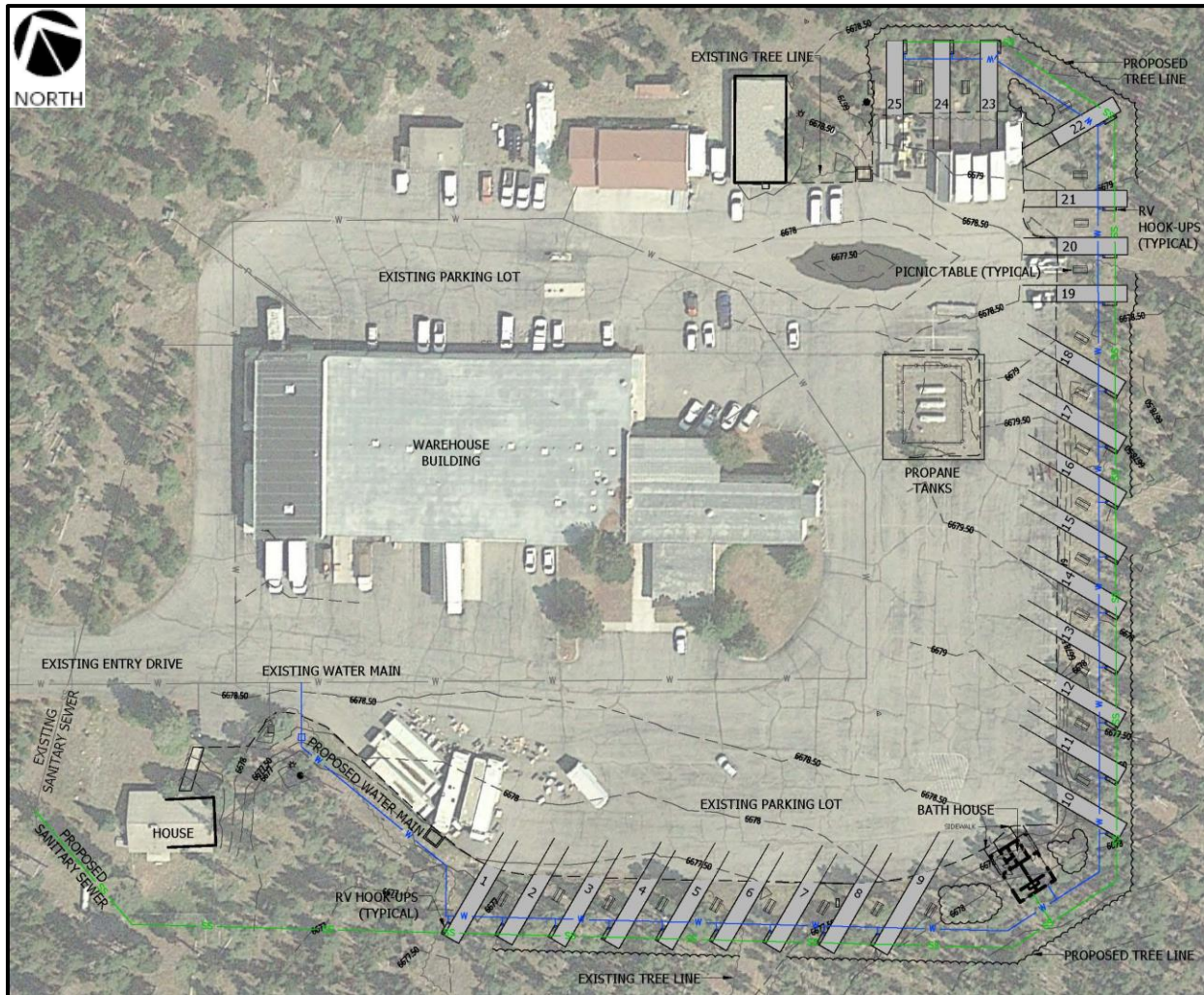


Figure 7. Site Plan for West Entrance Warehouse site.

RV Sites

Each site would have a gravel or concrete surface and be approximately 10 feet wide by 42 feet long, with two sites designed to comply with ABAAS.

Access Road and Parking

The paved road into the West Warehouse site would remain in the existing road alignment. Parking for the RV sites would be provided on the existing asphalt surface and designated with traffic paint lines. Parking spaces for RV sites 21 and 22 would be constructed of gravel because these two parking spaces cannot be placed on asphalt due to the changing edge of the existing asphalt lot. Guest parking is readily available on the existing asphalt lot.

Bath House

A 700 square foot, ABAAS compliant unisex bathhouse and laundry facility would be constructed between RV sites 9 and 10. The building would be constructed using sustainable building practices including green materials and energy and water conservation. Building materials would be non-reflective and blend in with the surrounding landscape.

Utilities

Sewer— A 2,300-foot long sewer line, approximately 5-15 feet in depth, would begin at an existing manhole and run along the back of the RV sites. Sewer piping would either be ABS plastic or cast iron and would be 8 inches in diameter. Placement of the sewer system would require disturbance of up to 20 feet on either side of the sewer alignment. The system would tie into the West Yellowstone community wastewater treatment system. West Yellowstone's system of sewer mains has sufficient capacity, but the sewer lagoon is near full capacity and is unable to accommodate any new discharge. West Yellowstone is currently in the process of developing a new sewer lagoon in consultation with the Montana Department of Environmental Quality.

Water— Water would be supplied from the West Yellowstone community water system. The water line would parallel the sewer line and be placed no less than 10 feet from the sewer line. The water line would be approximately 1,100 feet in length at a depth of 6 feet. The line would be a 4-inch pipe with up to 3 fire hydrants spaced throughout the project area (near sites 1, 25, and the bath house).

A decrease in water flow at West Yellowstone's primary water source, Whiskey Springs, has forced the municipality to issue a moratorium on new commercial and multifamily water connections. YNP will work with West Yellowstone to secure necessary permits prior to any new water use for the RV sites.

Electric/Phone/Cable— Lines for these services would be located between the water line and the edge of the existing asphalt. Approximate length of these lines is 1,080 linear feet.

Storm Water Drainage

The existing parking lot was constructed with fill material, so its raised profile creates natural drainage away from the warehouse site. Existing drainage patterns would not be altered. All RV pads would drain at a 2% grade away from the parking lot and into the surrounding lodgepole forest.

Staging

Staging and stockpiling areas would be located within the footprint of the project area. No new areas would be developed for construction staging and stockpiling of materials and equipment.

Mitigation Measures

The following mitigation measures have been identified to minimize the degree, extent, and/or severity of adverse impacts and would be implemented during the project.

General Construction Best Management Practices

- Ground disturbance, staging, and stockpiling areas would be located in parking areas or in previously disturbed sites within the project footprint, away from core visitor use and residential areas to the greatest extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Construction zones would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. Fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- The NPS project manager would be responsible for ensuring the project remains within the construction limits.
- Fugitive dust generated by construction would be controlled by spraying water on the construction site if necessary. Any water used for dust control would be taken from hydrants in park administrative areas or a local source approved by the park.
- To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks.
- Fuel would be stored in fuel trucks or aboveground storage tanks, and all fuel storage would be in staging areas.
- Tools, equipment, barricades, signs, demolition debris, and rubbish would be removed from the project work limits upon project completion.

Soils

- Topsoil conservation measures would be employed in accordance with *YNP Vegetation Management for Construction Disturbance Guidelines* (YNP 1997). Topsoil would be stripped and replaced wherever possible to enhance revegetation following the construction phase.
- Disturbed soils are more susceptible to erosion and until revegetation takes place, standard erosion control measures such as silt fences and/or sandbags shall be used to minimize any potential soil erosion.

Vegetation

- The concessionaire would be required to provide annual funding for NPS native plant revegetation and non-native plant management in accordance with the 2013 Invasive Vegetation Management Plan.

- Disturbance to existing vegetation at the sites would be avoided to the greatest extent possible. During construction, a temporary construction limit fence would be placed at the project footprint to protect native vegetation.
- Vehicles, equipment, and staging for materials would occur within the project footprint.
- Equipment used would be cleaned to reduce the spread of non-native plant species.
- All equipment and materials would be staged on hardened surfaces, such as roadways and parking areas, in order to avoid damaging vegetation.

Wildlife including Threatened and Endangered Species

- To avoid impacts to migratory birds during nesting season, all tree, shrub, and grass removal activities must not occur between March 1 to August 15th for raptors, and May 1 to August 1st for songbirds. If tree, shrub, and grass removal would occur within the specified dates, the Bird Program Manager would need to be contacted to schedule a survey of the project site prior to trees being removed.
- All outdoor food storage would adhere to park policies already in place to ensure no unattended food sources are available to wildlife.
- All contractors and employees would be given an orientation about working in grizzly bear country and briefed on proper food storage and safety measures. Orientation would include information about park regulations regarding food storage, disposal of garbage and other bear attractants, safety measures, and approaching or harassing wildlife.
- Contract provisions would require the cessation of construction activities if a species were discovered in the project areas, until park staff re-evaluates. This would allow modification of the contract for any protection measures determined necessary to protect the discovery.
- The Concessionaire would purchase and install bear proof lockers for BBQ grill storage at each modular and RV site at the West and Canyon project locations.

Soundscapes and Air Quality

- To reduce noise and emissions, construction equipment would not be permitted to idle for more than 10 minutes while not in use according to the Superintendent's Compendium, based on CFR 36 § - 5.13 Nuisances.
- Appropriate dust mitigation suppression controls, such as spraying water at the construction site and covering loaded trucks, would be implemented if needed.

Cultural Resources

- If previously unknown archeological or paleontological resources are discovered during construction in the parking areas and campground loops, all work in the immediate vicinity (200 feet) of the discovery would be halted until the resources are assessed by an archaeologist meeting the NPS Qualification Standards and the Secretary of the Interior's Professional Qualification Standards. If finds are determined to be potentially eligible for the National Register

of Historic Places, an appropriate mitigation strategy would be developed in accordance with pertinent laws, regulations, and policy.

- In the unlikely event human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) and NPS Director's Order 28 would be followed.
- The NPS would ensure that all contractors and subcontractors would be informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors would also be instructed on procedures to follow incase previously unknown archeological resources are uncovered during construction.

Geological Resources

- If any of the following conditions are encountered, work would stop and the park geologist would be contacted immediately: a pre-existing hole in the ground the size of a basketball or larger; standing or flowing water, either hot or cold; or a rotten egg smell.

Visual Quality

- Existing vegetation and natural topography would be preserved as much as possible to screen new infrastructure.

Visitor Use and Experience

- Campground guests would be informed of construction. Access to Loop G would be closed to ensure visitor safety throughout construction period.
- Construction activities would only be permitted during normal park operating hours (8 a.m. - 6 p.m.).
- Transportation of equipment, vehicles, materials, and modular housing units would be conducted during times of low visitor traffic, such as before 7 a.m., in order to reduce the impacts to visitors along park road corridors.

Alternatives Considered and Dismissed

The following alternatives were considered for project implementation, but ultimately dismissed from further analysis because they are technically or economically infeasible, do not resolve the purpose and need for taking action, are duplicative of other less environmentally damaging or expensive alternatives, conflict with a previously approved plan, or are beyond the scope of this EA.

Canyon Village Campground

Employee housing at former Civilian Conservation Corps (CCC) Camp

The CCC camp was considered as an alternative location because of its seclusion from visitor services at Canyon Village and having been previously developed as a camp area for CCC crews. Upon further investigation, it was determined the site does not have adequate utility connections nearby and would require more disturbance and resource impacts than the site at Loop G. It would also displace an existing Commercial Use Authorization holder for backcountry ski yurts. Therefore, this alternative does not resolve the purpose and need for taking action.

Employee housing at Loop A

Loop A is a former guest cabin loop located south of the Canyon Village Complex. Loop A is currently being restored to natural conditions following the removal of the Loop A cabins as part of the Canyon Village redevelopment. This alternative does not resolve the purpose and need for taking action, and would result in greater permanent adverse impacts on park resources, thus it has been dismissed from further analysis.

West Entrance Warehouse Site

House seasonal concession employees at RV Park in West Yellowstone

Yellowstone General Stores owns and operates a small RV park in the town of West Yellowstone, which is currently being used to house employees for both the park contract and their commercial businesses in town. This RV Park is already filled to capacity during the summer season and expansion is impractical due to property size. This alternative is technically infeasible and has been dismissed from further analysis.

Construct Housing in the West Entrance National Park Service Administrative Area

The administrative area is being held open for future housing projects for NPS employees as per the 1992 Community Housing Plan. This area is also outside of the concessionaire's land assignment, so construction would conflict with a previous park plan. Therefore, this alternative has been dismissed from further analysis.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing setting or baseline conditions) and analyzes the potential environmental consequences (direct, indirect, and cumulative impacts or effects) that would occur as a result of implementing the alternatives. For this document, the park considered the impacts of each alternative relative to the development footprint in which they are located. The footprint of the Canyon Village developed area is approximately 480 acres, including 9.5 miles of roadways and 147 buildings. The West Entrance area development footprint currently measures approximately 70 acres and includes the warehouse area, entrance station area, and the NPS Administrative Area. In total, there are 1.7 miles of roadway and 33 buildings

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). In order to determine the cumulative impacts, it was necessary to examine past, present, and reasonably foreseeable future actions in YNP. Cumulative impacts are considered for the no action and the preferred alternative. The following projects were identified for the purpose of conducting the cumulative effects analysis:

Past Actions

- Canyon Lodging Redevelopment Project (2013) – YNP replaced guest lodging by removing guest cabins constructed in the 1950s from Loop A and C. Five older lodges with 408 lodging units were also removed. In 2017, these guest facilities were replaced with five larger 3-story lodges, as well as parking areas for each lodge.
- Canyon Village Non-Fire Fuels Treatment Project (2013) – YNP treated 120 acres at Canyon Village to protect existing structures and improve visitor, resident, and firefighter safety by creating a "safety zone." The project removed all hazardous ground and ladder fuels within 0-30 feet of structures.
- Canyon Village Campground G Loop Water Leak Repair (2016) – YNP repaired a water leak in G-Loop at the first RV pedestal hook-up. Water lines are at least fifty years old and spring leaks on a regular basis. The existing line was dug by an excavator/backhoe to a depth of 4 feet, with a trench approximately 20 feet in length, and impact area of 10 feet on either side of the trench and about 3 feet wide. The trench was backfilled and compacted, and the work site was reclaimed.
- Canyon Lodge Rehabilitation (2016) – YNP reconfigured the lodge to accommodate the needs of large crowds and long lines of visitors by removing post-historic walls that crowd the fireplace; removing the 1960 interior stairs; reintroducing the Mission 66-era finishes, colors, and textures; constructing rear restroom additions; and providing air ventilation while retaining the historic functions.
- West Entrance RV Site Additions (2010) – YNP added three RV sites to the government housing area to accommodate growth in the NPS workforce at the West Entrance. The sites were located in the government housing area in an area of previous disturbance on a road with existing RV sites. Approximately 20 trees were removed to accommodate the 50 feet by 15 feet RV pads. Electric and water utilities were trenched to the RV pads.

- West Entrance Corral Addition (2013) – YNP added a new round corral to the existing corral structure at the West District Corrals. The purpose of the corral was to increase safe training capabilities for riders and stock. Approximately 30 lodgepole pines were removed.

Present Actions

- Canyon Rim Overlooks and Trails – This project is updating and repairing many of the overlooks and trails located on the north and south rims of the Grand Canyon of the Yellowstone to address aging and deteriorating infrastructure, provide improved accessibility to visitors, improve pedestrian flow, address safety issues, and improve the visitor experience in the area while retaining the area's historic integrity.
- Parkwide Non-Native Plant Management – This project utilizes chemical and mechanical treatments to control existing population of invasive plants by eradicating them, reducing their size and density, or containing their spread.

Foreseeable Future Actions

- NPS Housing – This project would replace obsolete housing in the government areas at West Entrance and Canyon. The project is needed because the current housing is past its useful life and is in poor and rapidly deteriorating condition.
- Canyon General Store Dormitory Replacement or Renovation – This project would upgrade the 50 room dormitory constructed in 1956. The dormitory is in poor condition and needs to be brought up to code for life safety and fire protection. ABA accessible rooms would be added.
- Canyon General Store Restrooms Addition – This project would expand and remodel the public restrooms at the Canyon General Store from one stall to six stalls and meet accessibility requirements. The new bathrooms would be approximately 900 square feet and extend the second floor over the open space of the existing back wing of the building.
- Canyon Corral Cabins Construction – This project would add four additional cabins and a bathhouse for wranglers at the Canyon livery operation. Presently there is no housing at the corrals for wranglers and they reside in dormitories at Canyon Village.
- Canyon Pub and Recreation Hall – This project would build a new pub and recreation hall in an existing parking lot and volleyball court to replace the under-sized one in the basement of the Canyon Lodge.
- Canyon Concessionaire Dormitory – This project would construct a 60-80 room dormitory at a location yet to be determined. Employee manager housing is needed because the A-loop cabins were demolished as part of the Canyon Area Lodges Replacement Project.
- West Non-Fire Fuels Treatment Project – This project would treat 95 acres within the West Entrance government area using heavy equipment starting in summer 2019. Heavy equipment such as feller bunchers, log trucks, and masticators could be used. The project would improve defensible space adjacent to structures in order to protect human life, property and resources from wildfire. All vegetation including dead and downed fuels larger than 4 inches in diameter within 120 feet of structures would be removed.

Vegetation and Soils

Affected Environment

Canyon Village Campground Loop G

The project area is dominated by a forest of lodgepole pine, which is common throughout the Canyon Village Area and park. A sparse understory of plant species includes grouse whortleberry, arnica, and elk sedge (figure 8). Non-native species were not discovered within 50 feet of the pavement perimeter during a site survey in summer 2018. However, several non-native species such as clover, timothy, Canada thistle, and Kentucky bluegrass do exist within the Canyon Village Area. Special status plant species and wetlands were not observed within the project site.

Soils in the project area consist of sand, silt, or clay underlain by poorly graded and clayey sand. Topsoil is generally shallow. There are lenses and pockets of impervious silt throughout the Canyon area which restrict water percolation. Soils are derived primarily from rhyolitic bedrock and thus, nutrient-poor. They are also extremely acidic due to geothermal alteration of parent material. Depth to bedrock ranges from 8 to 45 feet or more. The water table is consistently near ground surface and surface drainage is poor. Heavy winter snowfall and short summers contribute to this high water table. Soils are susceptible to frost heaving due to the fine particle size, high moisture content, and deep frost level. Slopes in Loop G are generally less than 15%.

On August 8, 2018, a geotechnical survey was conducted at the proposed project site. The purpose of the geotechnical survey was to assist with design and specifications of the modular housing unit foundations, RV sites, parking, and new road. In general, the soil profile was glacial till consisting of about 1 to 3 feet of loose to medium dense, moist silty sands, overlying moist to very wet, soft to hard, weathered rhyolite bedrock. Rhyolite was encountered between about 1/2 to 8 feet below the surface, with the average depth encountered at about 3 1/2 feet below the surface. Groundwater was not encountered during the drilling of the borings, although some of the bedrock was wet.



Figure 8. Typical vegetation within Loop G.

West Entrance Warehouse Site

Native vegetation at the West Entrance Warehouse project site is dominated by a forest of lodgepole pine, which is common in the West Entrance Area and throughout the park. A sparse understory of species includes yarrow, knotweed, arnica, and elk sedge (figure 9). Non-native species include smooth brome, timothy, hoary alyssum, Kentucky bluegrass, and cheatgrass. Special status plant species and wetlands were not observed within the project site.

Soils in the project area were formed on glaciofluvial outwash plains and consist of well-drained gravelly coarse sandy loam derived from rhyolite. There are also small areas of recent stream and fan alluvium. Main soils are skeletal Inceptisols with coarse textures and dark surface layers, and skeletal Mollisols with coarse textures. Slopes are less than 5%. A geotechnical survey was not completed at this site.

Impacts of Alternative A: No Action

Canyon Village Campground Loop G

New disturbance to vegetation and soils would not occur at Loop G. The site would continue to be used as a maintenance storage area and as an overflow RV area for contractors. Alternative A would not include any ground disturbance, excavation, or construction related activities.

West Entrance Warehouse Site

New disturbance to vegetation and soils would not occur at the West Entrance Warehouse site. The site would continue to be used as the warehouse area for Yellowstone General Stores. Alternative A would not include any ground disturbance, excavation, or construction related activities.

Cumulative Effects and Conclusion: Cumulative effects on vegetation are based on the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions. Other actions in the Canyon Village and West developed areas include developing facility and visitor lodging, road construction, trail and overlook construction, fuels reduction projects, and ongoing utility maintenance. These actions have physically altered soils and made them more susceptible to soil erosion, compaction, loss of productivity, and have created suitable conditions for non-native plant species, all of which are permanent adverse impacts. On-going revegetation and non-native plant treatment efforts have minimized the adverse effects of development.

There would be no new impacts to vegetation and soils under Alternative A; therefore, this alternative would not contribute to the cumulative impacts of other projects in the Canyon Village and West Entrance Areas.



Figure 9. Typical vegetation at West Entrance Warehouse site.

Impacts of Alternative B: Proposed Action and Preferred Alternative (Canyon Village Campground Loop G and West Entrance Warehouse Concessionaire Housing)

Canyon Village Campground Loop G

Construction actions would include grading, trenching, building, pouring gravel and pavement, and utility installation. These actions would adversely affect approximately 2.6 total acres of vegetation and soils. Specifically, the project would permanently affect 2.3 acres; this includes the removal of 1.3 acres of lodgepole pine forest. Construction of modular housing units, RV sites, parking spaces, and roadway would result in conversion of natural surface to man-made surfaces in the area of permanent effects. Removal of mature lodgepole pines could also have an adverse impact on the remaining adjacent trees in the project area due to increased risk of downing by wind. Temporary impacts, such as soil disturbance from trenching, would affect 0.3 acres in the project area. These temporary impacts would last only for one construction season (May to November). Areas of temporary impact would be revegetated and restored to natural conditions upon project completion.

The project's total area of permanent disturbance, 2.3 acres, would create only a small, adverse impact on vegetation because lodgepole forest is abundant in the Canyon Village area and throughout the park. Soils in the project area are nutrient-poor and acidic, and also common throughout the Canyon Village area and park.

West Entrance Warehouse Site

Construction actions would include grading, trenching, building, pouring gravel and pavement, and utility installation. These actions would adversely affect approximately 2.0 total acres of soils and vegetation. Specifically, the project would permanently affect 1.5 acres; this includes the removal of up to 0.5 acres of lodgepole pines. Construction of RV sites would result in conversion of natural surface to man-made surfaces in the area of permanent effects. Removal of mature lodgepole pines could also have an adverse impact on the remaining adjacent trees in the project area due to increased risk of downing by wind. Temporary impacts, such as soil disturbance from trenching, would affect 0.5 acres in the project area. Temporary impacts would last only for one construction season (May to November). Areas of temporary impact would be revegetated and restored to natural conditions upon project completion.

The project's total area of permanent disturbance (1.5 acres) would create only a small, adverse impact on vegetation because lodgepole forest is abundant in the West Entrance area and throughout the park. Soils in the project area are nutrient-poor and acidic, and also common throughout the West Entrance area and the park.

Cumulative Effects and Conclusion: Cumulative effects on vegetation and soils are based on the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Past projects in the developed areas have physically altered soils and made them more susceptible to soil erosion, compaction, loss of productivity, and have created suitable conditions for non-native plant species, all of which are permanent adverse impacts. On-going revegetation and non-native plant treatment efforts have minimized the adverse effects of development.

The footprint of the Canyon Village developed area is approximately 480 acres, including 9.5 miles of roadways and 147 buildings. Other actions in the developed area include developing facility and visitor lodging, road construction, trail and overlook construction, fuels reduction projects, and ongoing utility maintenance. The West Entrance area development footprint currently measures approximately 70 acres and includes the warehouse area, entrance station area, and the NPS Administrative Area. In total, there are 1.7 miles of roadway and 33 buildings. In recent years, the addition of three RV sites and the expansion of the existing horse corrals have resulted in disturbance of approximately one acre of vegetation and soils.

Past, present, and reasonably foreseeable future projects, in combination with the impacts of the preferred alternative—2.3 acres at Canyon Village and 1.5 acres at West Entrance—would result in permanent adverse impacts on soils and vegetation in the project areas. These impacts would be limited in geographic scope, and small on a 2.2 million acre parkwide scale.

Grizzly Bear

Affected Environment

The United States Fish and Wildlife Service (USFWS) has identified the following listed, candidate, or proposed threatened and endangered species as potentially occurring in the project areas (USFWS 2018). The species, and their status, include:

- Grizzly bear (*Ursus arctos horribilis*), threatened

Management of grizzly bears in YNP has been successful in enabling grizzly bear recovery and reducing bear-human conflicts (e.g., property damage, incidents of bears obtaining human food, bear-inflicted human injuries) and human-caused bear mortalities in the park (Gunther 1994 and Gunther and Hoekstra 1998). Bears that are familiar with humans have the potential to become habituated to human presence, leading to further habituation and increased potential for bear-human encounters. Standard best practices for public and bear safety already implemented at the Canyon Campground and West Entrance include bear safety public outreach and bear-proof garbage cans, dumpsters, and food storage boxes. These actions have been highly successful at keeping human-bear conflicts and human-caused bear mortality very low over the last 48 years.

The grizzly bear has been added and removed from the threatened species list several times in the past twelve years. In 2007, the Greater Yellowstone Ecosystem distinct population segment of grizzly bear population was removed. In 2009, a federal district judge overturned the delisting ruling, claiming the *Conservation Strategy for Grizzly Bear in the Greater Yellowstone Ecosystem* was unenforceable, and did not adequately consider potential loss of whitebark pine nuts due to climate change. In 2017, the USFWS removed the Yellowstone population of grizzly bear from the threatened species list. In 2018, a federal district judge returned the Yellowstone-area population of grizzly bears to the threatened species list.

The project areas are not located within known areas of high use for grizzly bear. The 2016 Conservation Strategy for Grizzly Bear in the Greater Yellowstone Ecosystem was developed to provide guiding management and monitoring of the Yellowstone grizzly bear population and its habitat upon recovery and delisting. The Strategy allows for increases in administrative (meaning NPS and concessions) overnight capacity to manage increasing park visitation within the existing developments, which includes a buffer of approximately 100 yards around existing developed area footprints. The project areas in this EA are within the guidelines established in the Strategy of being within 100 yards of existing development, and are thus not considered ‘secure habitat.’ From 2009 – 2018, only four grizzly bear sightings within 500 meters of the project area at Canyon Village Campground Loop G were reported to NPS staff. During the same period, only one sighting was reported near the West Entrance Warehouse.

Impacts of Alternative A: No Action

Canyon Village Campground Loop G

There would be no action under Alternative A, and therefore no new impacts to grizzly bears.

West Entrance Warehouse Site

There would be no action under Alternative A, and therefore no new impacts to grizzly bears.

Cumulative Effects and Conclusion: Cumulative effects on threatened and endangered species are based on the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Other actions have primarily occurred within the developed footprints at Canyon and West,

and have not resulted in loss of secure habitat for grizzlies. Increased visitation to the park has led to an overall increase in human activity, but implementation of mitigation measures (such as proper attractant storage and removing carcasses from the vicinity) and regular monitoring by park staff have minimized adverse impacts to grizzly bears such that the effects from other actions have not affected grizzlies at the population level nor measurably changed their distribution.

There would be no new impacts to grizzly bears under Alternative A; therefore, this alternative would not contribute to the cumulative impacts of other projects in the Canyon Village and West Entrance Areas.

Impacts of Alternative B: Proposed Action and Preferred Alternative (Canyon Village Campground Loop G and West Entrance Warehouse Concessionaire Housing)

In accordance with Section 7 of the Endangered Species Act, the NPS contacted the USFWS for informal consultation on potential impacts to threatened and endangered species. Based on the analysis below, the NPS has determined that the proposed action “**may affect, but is not likely to adversely affect**” grizzly bears. Consultation is currently ongoing and will be completed prior to identifying a selected action and publishing a Finding of No Significant Impact for this project.

Canyon Village Campground Loop G

There are no bear management areas in the vicinity of Canyon Campground Loop G (Gunther et al. 1998). The housing and RV sites would be constructed largely within a previously disturbed area with some existing levels of human activity during the summer months. This area is not ‘secure habitat’ as defined in the Strategy, and has little overall value as grizzly habitat. Implementation of the project therefore has little potential to cause bear displacement in the project area or immediate vicinity.

There is potential that bear-human conflicts may occur with a small added influx of workers around the site during the construction phase. This potential would be reduced by implementing contractor education, and the “working in grizzly bear country” protocols. Implementation of the project would result in additional residents living in the Canyon Campground area, approximately 20 people, which may lead to increased habituation of wild bears and increased grizzly-human conflicts. The chance of this would be small due to standard bear management practices, such as removing nearby carcasses and implementation of food and attractant storage requirements that all park residents must follow.

West Entrance Warehouse Site

There are no bear management areas in the vicinity of the West Entrance Warehouse Site (Gunther et al. 1998). The RV sites would be constructed partially within a previously disturbed area with high levels of human activity during the summer and early fall. The project location is not ‘secure habitat’ as defined in the Strategy, and has little overall value as grizzly habitat. Implementation of the project therefore has little potential to cause bear displacement in the project area or immediate vicinity.

There is potential that bear-human conflicts may occur with a small added influx of workers around the site during the construction phase. This potential would be reduced by implementing contractor education, and the “working in grizzly bear country” protocols. Implementation of the project would result in people living around the West Warehouse, approximately 25 people from May to October annually, which may lead to increased habituation of wild bears and increased grizzly-human conflicts. The chance of this would be small due to standard bear management practices, such as removing nearby carcasses and implementation of food and attractant storage requirements that all park residents must follow.

Cumulative Effects and Conclusion: Cumulative effects on grizzly bears are based on the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

Previous actions have primarily occurred within disturbed sites at Canyon Village and the West Entrance Warehouse, and have not resulted in loss of secure habitat for grizzlies. Increased visitation to the park has led to an overall increase in human activity, but implementation of mitigation measures (such as proper attractant storage and removing carcasses from the vicinity) and regular monitoring by park staff have minimized adverse impacts to grizzly bears such that the effects from other actions have not affected grizzlies at the population level nor measurably changed their distribution. There would be little if any change in the degree to which bears would be displaced from the project areas due to the proposed action, and cumulative impacts to grizzly bears from Alternative B combined with past, ongoing, and reasonably foreseeable actions would not affect bears at the population level or change the overall distribution of grizzly bears in the vicinity or in the park.

Visitor Use and Experience

Affected Environment

Canyon Village Campground Loop G

Canyon Village is one of the most popular destinations in the park. It also has the park's largest concentration of overnight accommodations. Canyon Village operates from late-May to late-September and consists of a visitor center, service station, two stores, food services, seven lodges, a campground, post office, and employee housing.

The campground is situated in a lodgepole pine forest and has 273 spaces (a mixture of RV and tent sites), each equipped with a picnic table and fire pit (figure 10). The campground often fills to capacity during summer. Campground facilities include shared food storage boxes, restrooms, showers, laundry, RV dump station, and dishwashing stations. There are no electricity, water, or sewer hook-ups at any of the campsites.



Figure 10. Typical visitor campsite at Canyon Campground.

West Entrance Warehouse Site

The West Warehouse Site was dismissed from further analysis because it is within an administrative area not accessible to the public (see page 6)

Impacts of Alternative A: No Action

Canyon Village Campground Loop G

Under Alternative A, Loop G would not be repurposed for seasonal employee housing. The site would continue to be used for maintenance storage and an overflow RV area for contractors working on projects in and around the Canyon Village area. The two comfort stations would not be renovated. There would be no changes for visitors using campsites near Loop G.

Cumulative Effects and Conclusion: Cumulative effects on visitor experience are based on the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Other actions at Canyon, including Canyon Lodge Redevelopment (2013), Canyon Lodge Rehabilitation (2016), and the Canyon Rim Overlooks and Trails Projects (2017), were implemented to improve lodging opportunities and the overall visitor experience.

There would be no new impacts to the visitor experience under Alternative A; therefore, this alternative would not contribute to the cumulative impacts of other projects in the Canyon Village area.

Impacts of Alternative B: Proposed Action and Preferred Alternative (Canyon Village Campground Loop G)

There are approximately ten visitor campsites within 100 yards of Loop G (figure 11 on page 27). Existing lodgepole pine trees screen much, but not all, of Loop G from view of those campsites. Construction would occur while the campground is open to visitors. There are no anticipated closures to the campground during the construction phase. The visitors camped at the ten campsites shown on figure

11 would likely see and hear construction activity during the construction phase of the project; a small, temporary adverse impact on the visitor experience. These impacts would occur for one construction season, May to November.

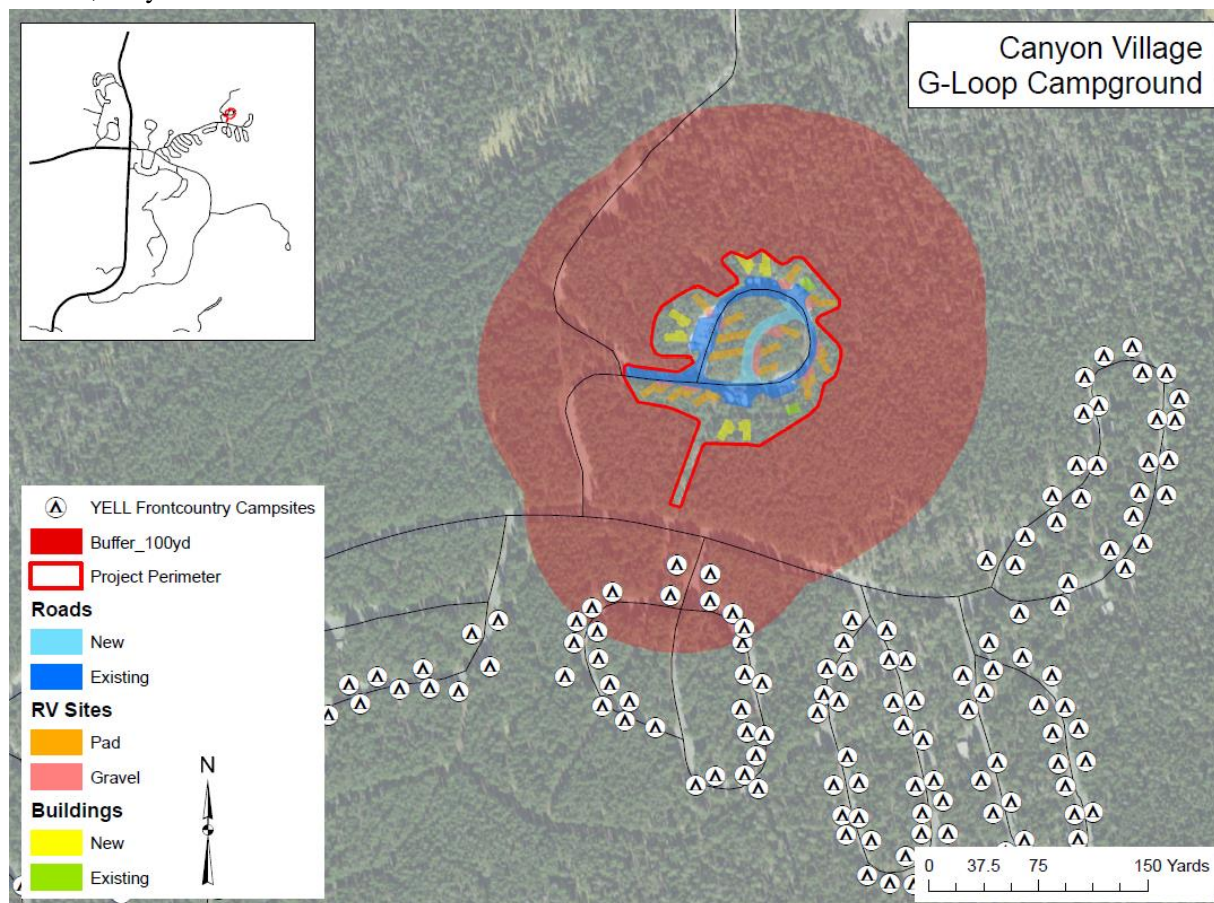


Figure 11. Location of visitor campsites adjacent to Loop G.

Once the project is completed, visitors staying in the ten campsites shown on figure 11 may experience small adverse impacts to their camping experience, such as seeing some of the modular homes in Loop G and their lighting, and hearing activity from residents in the housing area. These impacts would continue as long as Loop G is in use. In order to reduce visual impacts, exterior colors and non-reflective materials and textures would be used to blend units in with the surrounding landscape. Additionally, vegetation and natural topography would be preserved as much as possible to screen new infrastructure from the existing visitor campground loops. To reduce impacts to soundscape, Loop G residents would be required to abide by the quiet hours regulation enforced throughout the rest of the campground.

In summary, the proposed project at Loop G would result in visual and auditory intrusions from sounds, lights, and activities for campers in ten nearby campsites, and cause a permanent adverse impact. These adverse impacts are expected to be small after mitigation measures are applied.

Cumulative Effects and Conclusion: Cumulative effects on the visitor experience are based on the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. In the larger Canyon Village area, several projects in recent years have created permanent beneficial impacts for visitors. These include the Canyon Lodge Rehabilitation (2016) and the Canyon Lodging Redevelopment Project (2013), both of which improved overnight accommodations for visitors. The Canyon Rim Overlooks and Trails Project improved hiking, photography, and sight-seeing

opportunities for millions of visitors a year to the Canyon area. In all three projects, temporary closures during construction activities caused small, adverse impacts on the visitor experience, typically lasting less than two construction seasons.

Past, present, and reasonably foreseeable future projects in Canyon Village have generally resulted in improved visitor overnight and day-use facilities. These projects, when combined with the impacts of the preferred alternative, would have a minimal adverse impact on visitor use and experience because of the sounds, lights, and activity of surrounding campers. If implemented, this project would temporarily adversely impact campers in the Canyon Campground during the construction phase of the project. After completion, there would be minimal impacts to a small number of camper sites located in close proximity to the project area after mitigation measures are applied.

COMPLIANCE REQUIREMENTS, CONSULTATION, AND COORDINATION

List of Agencies and Persons Contacted

Name	Title, Agency
Ray McPadden	Chief, Branch of Environmental Quality & Compliance, NPS (YELL)
Dale Reinhart	Concessions Branch Chief, NPS (YELL)
Willie Burkhardt	Concessions Specialist, NPS (YELL)
Kyle Meakins	Environmental Protection Specialist, NPS (YELL)
Vicki Regula	Environmental Protection Specialist, NPS (YELL)
Zehra Osman	Cultural Resource Specialist & Landscape Architect, NPS (YELL)
Heidi Anderson	Botanist, NPS (YELL)
Stefanie Wacker	Vegetation Ecologist, NPS (YELL)
Beth Horton	Archeologist, NPS (YELL)
Daniel Stahler	Wildlife Biologist, NPS (YELL)
Lauren Walker	Wildlife Biologist, NPS (YELL)
Jefferson Hungerford	Geologist, NPS (YELL)
Mary Hopkins	Wyoming State Historic Preservation Officer
Tyler Abbot	United States Fish and Wildlife Service, Wyoming Field Supervisor

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