



# Environmental Assessment

## Construct New Housing Destroyed by East Troublesome Fire, Rocky Mountain National Park, Grand County, Colorado



## CONTENTS

<b>Chapter 1: Purpose and Need .....</b>	<b>1-1</b>
Introduction .....	1-1
Purpose of and Need for the Action .....	1-3
Current Housing Status .....	1-3
Objectives.....	1-4
Issues and Impact Topics Retained for Further Analysis.....	1-4
Issues and Impact Topics Dismissed from Further Analysis.....	1-5
<b>Chapter 2: Alternatives.....</b>	<b>2-1</b>
Introduction .....	2-1
Common to Both Alternatives .....	2-1
Alternative A: No-Action Alternative .....	2-1
Alternative B: Proposed Action and Preferred Alternative.....	2-2
Alternatives Dismissed from Further Analysis .....	2-7
Mitigation.....	2-8
<b>Chapter 3: Affected Environment and Environmental Consequences.....</b>	<b>3-1</b>
Introduction .....	3-1
General Climate Change Trends.....	3-1
CUMULATIVE IMPACTS .....	3-1
Archeological and Ethnographic Resources .....	3-2
Affected Environment .....	3-2
Environmental Consequences.....	3-3
Viewsheds .....	3-6
Affected Environment .....	3-6
Environmental Consequences.....	3-10
Wildlife (Ungulates) .....	3-13
Affected Environment .....	3-13
Environmental Consequences.....	3-20
<b>Chapter 4: Consultation and Coordination .....</b>	<b>4-1</b>
Introduction .....	4-1
Civic Engagement.....	4-1
Stakeholder Outreach .....	4-2
Section 7 of the Endangered Species Act.....	4-3
Section 106 of the National Historic Preservation Act.....	4-3
Native American Consultation .....	4-3
<b>Chapter 5: References .....</b>	<b>5-1</b>

## Figures

Figure 1-1. Project area.....	1-2
Figure 2-1. Proposed new housing area. ....	2-4
Figure 2-2. Proposed project design schematic.....	2-5
Figure 2-3. Example front elevation of 1-bedroom unit (left) and dormitory (right). ....	2-6
Figure 3-1. Livery trail. ....	3-4
Figure 3-2. Vantage points for the visual assessment. ....	3-7
Figure 3-3. Existing view from the Harbison Meadows Picnic Area, view facing south toward Grand Lake (DHM 2022c). ....	3-8
Figure 3-4. Existing view from the highest point at Grand Lake Lodge, view facing northwest toward Cascade Mountain (DHM 2022c). ....	3-9
Figure 3-5. Existing view from South Columbine Lake Neighborhood, view facing northeast toward Green Mountain (snow-covered Columbine Lake is in the middleground) (DHM 2022c). ....	3-10
Figure 3-6. Rocky Mountain elk habitat in the project area and analysis area. ....	3-17
Figure 3-7. Shiras moose habitat in the project area and analysis area. ....	3-18
Figure 3-8. Mule Deer habitat in the project area and analysis area. ....	3-19

## Tables

Table 1-1. Issues and Impact Topics Dismissed from Further Analysis.....	1-5
Table 2-1 -Alternatives Considered and Dismissed from Analysis.....	2-7
Table 3-5 - Proposed Mitigation .....	2-8
Table 3-1. Rocky Mountain Elk Habitat in the Project Area and Analysis Area .....	3-14
Table 3-2. Shiras Moose Habitat in the Project Area and Analysis Area .....	3-15
Table 3-3. Mule Deer Habitat in the Project Area and Analysis Area .....	3-15
Table 3-4. Ungulate Habitat Loss in the Proposed New Housing Area from Alternative B .....	3-20

## CHAPTER 1: PURPOSE AND NEED

### INTRODUCTION

In 1915, US Congress established Rocky Mountain National Park (park), which encompasses approximately 265,761 acres of the scenic southern Rocky Mountains in Larimer, Grand, and Boulder Counties, Colorado (National Park Service [NPS] 2013). Nearly one-third of the park is above tree line and is higher than 11,400 feet in elevation. The park supports a diversity of ecosystems, including montane, subalpine, and alpine communities. The park also has 147 lakes and 450 miles of streams (NPS 2013). Archeological and historic structures in the park illustrate the park's history from American Indian use, to homesteading ranches, to work by the Civilian Conservation Corps. The park is a premier wildlife-watching destination and provides habitat for elk, bighorn sheep, mule deer, moose, black bear, mountain lion, and raptors. Park visitors can drive the Trail Ridge Road, a designated America's Byway topping out at 12,183 feet, or access over 355 miles of trails in the park for hiking, backpacking, and horseback riding. Mountain climbers, anglers, cross-country skiers, snowshoers, and photographers also enjoy the park (NPS 2013). In 2021, park staff welcomed 4,434,848 visitors to the park (NPS 2022a), with June, July, and August having the most visits (NPS 2022b).

The purpose of Rocky Mountain National Park is to "preserve the high-elevation ecosystems and wilderness character of the southern Rocky Mountains within its borders and to provide the freest recreational use of and access to the park's scenic beauties, wildlife, natural features and processes, and cultural objects" (NPS 2013:1).

On October 21, 2020, the East Troublesome Fire made an 18-mile and over 100,000-acre run, causing widespread destruction in Grand County and consuming thousands of acres in the park's Colorado River District (west unit). Within the park boundaries, the fire destroyed or damaged 29 buildings and caused extensive damage to the trails and wilderness campsites. In the Colorado River District, the park lost the Grand Lake Entrance Remit Office; the historic Timber Creek Road Camp Barn; the Colorado River District Tack Shed; the Harbison Meadows Picnic Area Vault Toilet; the Betty Dick Ranch Garage; and 18 historic buildings at the former Green Mountain-Onahu housing area, including the Onahu Lodge. The fire damaged all the utilities at the former Green Mountain-Onahu housing area and three recreational vehicle (RV) sites. In addition, the fire burned 589 private homes and structures in northern Grand County (East Troublesome Post-Fire BAER Burned Area Emergency Response 2021). In the greater Grand Lake area, the fire destroyed approximately 300 private homes (Jackson 2021).

The NPS generally relies on the private sector to provide housing for employees. However, if housing of reasonable price and quality is not available in the private sector, NPS policy is to provide "only the number of housing units necessary to support the NPS mission" (NPS 2006:139).

To replace the lost seasonal housing, the NPS is proposing to construct a new housing area near the existing Colorado River District housing area. This new housing area would consist of dormitories and 1- and 2-bedroom units (22 beds total); RV sites; and a residential support facility with laundry, showers, and a kitchen. The NPS would also upgrade utilities in the area to support the new housing and demolish, remove, and/or abandon fire-damaged utilities at the former Green Mountain-Onahu housing area. These construction actions make up the NPS's Construct New Housing Destroyed by East Troublesome Fire in Rocky Mountain National Park Project, hereafter referred to as *the proposed project*. Figure 1-1 shows the project area.



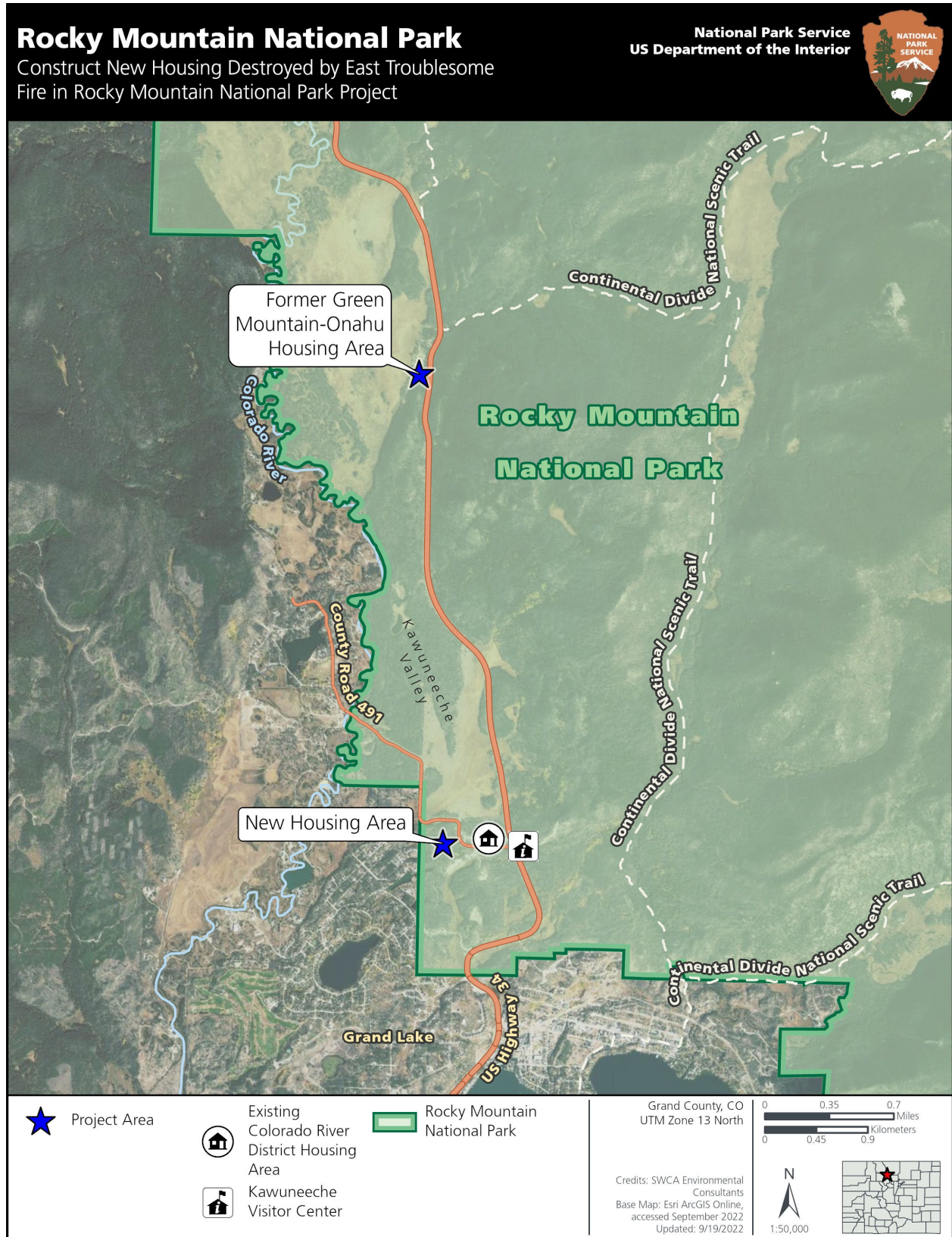


Figure 1-1. Project area.

This environmental assessment evaluates a no-action alternative (Alternative A) and a proposed action alternative (Alternative B), which is the preferred alternative for the proposed project.

## **PURPOSE OF AND NEED FOR THE ACTION**

The purpose of the proposed project is to provide adequate housing to meet the seasonal staffing requirements for the park's Colorado River District.

The need for the proposed project is to address the loss of park seasonal housing in the former Green Mountain-Onahu housing area. This housing is critical for recruitment and retention of seasonal staff, who are employed by the park mid-April through mid-October. Seasonal staff provide visitor services and carry out park operations and include rangers, park guides, fee and campground staff, trail crew members, buildings and utilities staff, administrative assistants, and custodians.

In the former Green Mountain-Onahu housing area, the East Troublesome Fire ruined 13 of the 15 housing units, along with the seasonal utility systems, making the remaining 2 housing units unusable (a total of 25 beds were lost). The NPS has proposed the replacement of 3 of 25 lost beds through a different project; the current proposed project would replace the remaining 22 beds.

## **Current Housing Status**

By policy, the NPS generally relies on the private sector to provide housing for employees. However, if housing of reasonable price and quality is not available in the private sector, NPS policy is to provide "only the number of housing units necessary to support the NPS mission" (NPS 2006:139). The NPS charges rent to employees for any housing that it provides. A housing needs assessment conducted for the park established that seasonal housing units in the Colorado River District are necessary to support the NPS mission (LaShier et al. 2012). The Colorado River District's seasonal housing utilization rate is typically 90% in June, July, and August (NPS 2021a).

Because of the loss of the Green Mountain-Onahu seasonal housing, the NPS has temporarily relocated seasonal staff to the towns of Winter Park and Fraser. The NPS explored renting housing in Grand Lake and Granby, communities both closer to the park than Winter Park and Fraser. However, housing in Grand Lake and Granby was cost-prohibitive because this area is a vacation rental market, and the destruction of homes in northern Grand County from the East Troublesome Fire has further constrained the availability of housing. Rental rates outside the park exceed 70% of the gross monthly income for park seasonal staff (NPS 2021a). To offset the difference between housing costs within the park and housing costs in Winter Park and Fraser, the NPS is subsidizing rents using emergency funding assistance from the Washington D.C. Area Support Office as an interim measure. The leasing of this private sector housing is costing the NPS approximately \$230,000 per season (NPS 2021b).

The use of private sector housing in Winter Park and Fraser for seasonal staff is not a feasible long-term arrangement for several reasons. Winter Park and Fraser are over 30 miles from the Kawuneeche Visitor Center, which requires a 50-minute-plus commute each way for staff. This distance from the park reduces the ability of staff to respond quickly to public safety, law enforcement, and maintenance emergencies. The long commute is also a disincentive for potential employees. In 2021, approximately 15 hiring declinations were related to the lack of park housing in the Colorado River District, and there were 6 hiring shortfalls for the season (NPS 2021b). If the NPS cannot recruit adequate seasonal staffing more vacancies are likely to occur each season, resulting in a reduction in park operations and visitor services. As a result, the ability to maintain and protect park resources would diminish. Additionally, private market rental agreements generally require annual leases, which do not align with six-month seasonal appointments (NPS 2021a). Park staff occupation of private market housing outside the park creates additional supply constraints for

communities already struggling with an expensive housing market. Finally, the Washington D.C. Area Support Office recovery funding currently subsidizing staff housing costs in the towns of Winter Park and Fraser is unaffordable in the long term.

At the former Green Mountain-Onahu housing area, the utility infrastructure could be operated seasonally from approximately June to September (e.g., the NPS had to deactivate the water system each winter to avoid freezing and damage to systems). However, the NPS hires seasonal employees for a period lasting from April to October. Therefore, the NPS had to relocate seasonal employees to areas with active utilities twice each season. The proposed project would eliminate the need to relocate employees because of a lack of utilities and reduce ongoing operational costs by eliminating the need to activate and inactivate utilities.

Seasonal housing must offer appropriate facilities to attract and retain employees. Substandard housing and infrastructure can lead to hiring declinations. Seasonal staff, especially those living in RV sites, need access to showers, laundries, and kitchen facilities (e.g., a residential support facility).

## **Objectives**

The proposed project has three specific objectives:

1. Ensure adequate seasonal housing availability in the Colorado River District. Adequate seasonal housing availability is defined as follows:
  - 22 beds for seasonal staff to replace lost housing
  - Connection to existing utilities to support extended season occupancy
  - 3 RV sites to replace lost housing
2. Provide appropriate facilities to support seasonal staff. Appropriate facilities to support seasonal staff are defined as follows:
  - A residential support facility with laundry, showers, and a kitchen
3. Improve operational efficiency
  - Centralize staff near park management resources
  - Reduce number of water systems being maintained in the park
  - Reduce need to move staff around park during the season
  - Minimize miles driven by park staff

## **ISSUES AND IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS**

Generally, issues and impact topics are retained for consideration and analyzed in detail during the environmental review if

1. the environmental impacts associated with the issue are central to the proposal or critically important,
2. a detailed analysis of environmental impacts related to the issue is needed to make a reasoned choice between alternatives,
3. the environmental impacts associated with the issue are contentious for the public or other agencies, or
4. there are potentially significant impacts to resources associated with the issue (NPS 2015a:15).

If none of the considerations above apply to an issue or impact topic, a detailed analysis is not necessary.

The NPS identified impact topics for this environmental review through internal scoping and external civic engagement. Potential project-related issues, resources, and other values (impact topics) the NPS retained for analysis for the proposed project are archeological and ethnographic resources, viewsheds, and wildlife (ungulates). All three were retained due to concerns of the public, the NPS, and/or resource agencies. Chapter 3 discusses these issues, resources, and other values in detail. The NPS originally identified traffic as a potential topic for retention, but the NPS dismissed from further analysis after completion of a traffic analysis and civic engagement during planning.

## ISSUES AND IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

Table 1-1 summarizes the issues and impact topics dismissed from further analysis and provides a brief explanation of the reasons for dismissal. Where impacts are referred to as temporary, they are limited to the period of construction and would not continue once construction activities are completed.

**Table 1-1. Issues and Impact Topics Dismissed from Further Analysis**

<b>Resource/Concern and Potential Impacts</b>	<b>Rationale For Dismissal</b>
<b>Air quality and air quality-related values</b> The proposed project would require the use of heavy construction machinery, which would emit air pollutants through exhaust and temporarily reduce air quality in the immediate area. In addition, grading during construction activities would produce particulate matter (dust), which would also temporarily reduce air quality in the immediate area.	<b>New housing area and former Green Mountain-Onahu housing area</b> Impacts would be temporary and managed through construction specifications that include NPS standard air quality mitigation measures.
<b>Aquatic resources</b> An aquatic resources delineation was conducted in June 2022 to identify aquatic resources in the new housing area. Delineated aquatic resources consist of 1.41 acres of palustrine emergent wetlands dispersed across seven identified wetland communities. Six of the wetland communities could be jurisdictional under the Clean Water Act (DHM Design Corporation [DHM] 2022a).	<b>New housing area and former Green Mountain-Onahu housing area</b> The NPS would avoid impacts on the identified aquatic resources through project design. Using NPS standard water quality mitigations, none of the delineated aquatic resources would be disturbed or impacted during project construction.



Resource/Concern and Potential Impacts	Rationale For Dismissal
<p><b>Historic Resources—Historic Buildings, Historic Structures, Cultural Landscapes</b></p> <p>Before the East Troublesome Fire, the buildings at the former Green Mountain-Onahu housing area were eligible for the NRHP as an historic district, with the Onahu Lodge (Q-0575-H, 5GA.2233) also determined as individually eligible (Gayou 1997a, 1997b). The SHPO concurred with the park's finding that the historic district has lost all integrity.</p> <p>The new housing area (including the housing area, staging area, and existing utility infrastructure area) has no historic buildings or historic structures.</p> <p>To understand the built environment near the new housing area, the NPS inventoried the lands next to the new housing area, including the existing Colorado River District housing area, the administrative facilities, the Grand Lake Entrance, and the Kawuneeche Visitor Center. There are four individually eligible historic buildings in the vicinity, but there is no district or cultural landscape potential. The Grand Lake Lodge (5GA.1750) is a privately owned NRHP-listed property outside the park boundary and less than 1 mile from the new housing area. The NPS included the Grand Lake Lodge in the visual assessment (see Viewsheds section) for analyzing any visual impacts on the historic resource.</p>	<p><b>New housing area and former Green Mountain-Onahu housing area</b></p> <p>The NPS completed a cultural resource inventory for historic resources in and near the project area. The Colorado State Historic Preservation Office (SHPO) concurred with the findings of the survey. There would be no adverse effect on historic resources.</p>
<p><b>Geologic features</b></p> <p>The proposed project would occur near a moraine in the new housing area. Excavation in the moraine could affect its integrity. No geologic features would be impacted at the former Green Mountain-Onahu housing area.</p>	<p><b>New housing area</b></p> <p>Excavated areas would be stabilized using retaining walls that meet NPS structural engineering and design standards. Excavation would be minor and routine and would not affect the integrity of the moraine.</p>
<p><b>Lightscapes</b></p> <p>The proposed project would create lighting and light pollution in a new area of the park.</p>	<p><b>New housing area and former Green Mountain-Onahu housing area</b></p> <p>Dispersed lighting in the park would be reduced from pre-fire conditions because the NPS would move seasonal housing from interior to the park to the new location next to the existing Colorado River District housing area.</p> <p>The proposed project would require dark sky-friendly lighting, which would minimize impacts on lightscapes. New lighting would be part of the existing light dome (sky glow) from neighboring areas and would not contribute a new light dome or a noticeable increase to the existing light dome.</p>
<p><b>Migratory birds</b></p> <p>Migratory birds are likely present in and near the project area and could be affected by construction activities through the destruction of nests or presence of human activity.</p>	<p><b>New housing area and former Green Mountain-Onahu housing area</b></p> <p>The NPS would conduct surveys prior to project construction. Limiting construction activities to outside the nesting season is not feasible because of the short construction timeframe due to seasonal weather conditions. The NPS may implement mitigation measures such as buffers or temporary construction restrictions to protect active nests. These measures would minimize impacts on migratory birds.</p>

Resource/Concern and Potential Impacts	Rationale For Dismissal
<p><b>Nonnative or exotic species</b></p> <p>Construction activities could introduce and encourage the growth of nonnative or exotic plants that displace native species.</p>	<p><b>New housing area and former Green Mountain-Onahu housing area</b></p> <p>Exotic plants are also present in the project area. The NPS would develop and implement an exotic plant management control and revegetation plan consistent with the park's existing vegetation restoration management plan and exotic plant management plan. The design of vegetation management would be site specific to assure success. See mitigation measures and best practices described under Common to Both Alternatives.</p>
<p><b>Soundscapes</b></p> <p>Project construction (e.g., use of heavy machinery, presence of work crews) would temporarily affect the soundscapes of the existing Colorado River District housing area, the surrounding landscape, and visitor uses. The proposed project would shift permanent noise from the former Green Mountain-Onahu housing area (which would become quieter) to the new housing area (which would become noisier).</p>	<p><b>New housing area</b></p> <p>Construction noise would be temporary and would end with the completion of construction. Permanent noise from the proposed project would be similar in type and decibels to noise in the adjacent existing Colorado River District housing area and would not alter the baseline existing condition.</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>Construction noise would be temporary and end with the completion of construction. Upon completion, potential sources for noise (staff housing) in this area would be reduced.</p>
<p><b>Special status plant species</b></p> <p>Twelve Colorado state-listed threatened or endangered plant species were identified as having potential to inhabit the new housing area, with four species identified as highly likely to have known suitable habitat in the new housing area. The project area does not have suitable habitat for any federally listed threatened or endangered plant species.</p>	<p><b>New housing area</b></p> <p>Special status plant surveys were conducted in the new housing area in September 2021 and in June and August 2022 to determine if special status plants were present. Surveys were conducted in different months and seasons to allow for identification of plants with different blooming times. No special status plant species were observed during either survey (DHM 2021, 2022b).</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>Activities would be limited to existing disturbed areas that do not represent potential special status species habitat.</p>
<p><b>Special status wildlife species, including downstream Colorado River species</b></p> <p>The NPS reviewed US Fish and Wildlife Service and State of Colorado species lists for special status wildlife species and habitats to determine if any species or habitats had the potential to occur in the project area; none were identified in the project area.</p> <p>Four threatened or endangered fish species live in the Colorado River basin: Razorback sucker (<i>Xyrauchen texanus</i>), humpback chub (<i>Gila cypha</i>), Colorado pikeminnow (<i>Ptychocheilus lucius</i>), and bonytail (<i>Gila elegans</i>). Although none of these species occur in the Colorado River in the park, the NPS considered the potential impacts on these "downstream" species because these species could be affected if the proposed project affects downstream water quality or quantity.</p>	<p><b>New housing area and former Green Mountain-Onahu housing area</b></p> <p>No special status wildlife species or special status wildlife species habitat were identified in the project area.</p> <p>Downstream Colorado River fish species would not be affected because water quality and quantity would not be changed by the proposed project.</p>

Resource/Concern and Potential Impacts	Rationale For Dismissal
<p><b>Traffic</b></p> <p>The proposed project would increase the number of vehicles using the roads in the Colorado River District housing area, including County Road 491 and US Highway 34, which may result in traffic impacts.</p> <p>During construction, temporary traffic control measures may cause traffic delays. These impacts are not expected to affect traffic and would end at the completion of construction.</p>	<p><b>New housing area</b></p> <p>The NPS conducted a traffic study to assess the impacts of the proposed project on existing traffic and to assist with project planning (SEH 2022). The study evaluates three key intersections: the intersection of County Road 491 and US Highway 34 and the two intersections of County Road 491 and the existing Colorado River District housing area loop road.</p> <p>Although the new housing area would add more vehicles to nearby roads, the increase in traffic would not affect the level of service at the key intersections (SEH 2022). No new signalized intersections, auxiliary lanes, or turn lanes would be required for the proposed project (SEH 2022).</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>Temporary impacts associated with construction activities would occur but would not affect traffic on US Highway 34. After completion of work in this area, the lack of housing would reduce the overall number of vehicles on the highway, but the decrease would not likely be noticeable.</p>
<p><b>Vegetation</b></p> <p>The East Troublesome Fire affected vegetation in the project area (e.g., burned trees). Construction activities would require site clearing and grading, which would damage and destroy the vegetation that remains.</p>	<p><b>New housing area</b></p> <p>Ground clearing within the new housing area is anticipated to be extensive, resulting in near complete loss of existing vegetation, which would be minimal since trees and understory plants within the project area have been extensively burned and most have died. While some lodgepole pine trees and understory plants have started to regrow, this vegetation community does not represent unique or different vegetation from surrounding areas. Absent efforts to restore natural communities associated with construction mitigation, the area is likely to become heavily infiltrated by invasive species. See mitigation measures and best practices described under Common to Both Alternatives.</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>No vegetation removal is anticipated.</p>
<p><b>Visitor use and experience</b></p> <p>There are existing trails adjacent to and partially within the project area. A livery trail runs through the western part of the project area for approximately 1,795 feet and is mostly used in the summer for recreation; some of the livery trail section within the project area would be realigned to accommodate new housing units. A portion of a snowmobile trail, which is used in winter for recreation, is in the project area. There may be short-term closures, delays, and traffic control measures to assure the safety of trail users.</p>	<p><b>New housing area</b></p> <p>Both the livery and snowmobile trails would remain open during construction. Impacts on the snowmobile trail are limited to creating a grade crossing at the new driveway into the housing area and adding safety signs. This work would take place during the summer and have no effect on winter users. The NPS would minimize, to the extent possible, short-term trail closures.</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>The Valley &amp; Colorado River trail is adjacent to the former Green Mountain-Onahu housing area, including the water tank and access route. The trail is currently closed in this location. If the trail reopens before construction in this area were completed, NPS would require mitigations such as traffic control measures in order to assure the safety of trail users.</p>

Resource/Concern and Potential Impacts	Rationale For Dismissal
<p><b>Water quality and quantity</b></p> <p>Nonpoint source runoff containing sediment or other pollutants from construction activities could affect water quality in downstream waters. The proposed project could increase the potential for flooding if runoff is not properly controlled.</p>	<p><b>New housing area</b></p> <p>The NPS would minimize stormwater drainage off-site through project design. Best management practices for drainage and sediment erosion control would be implemented to prevent nonpoint source runoff during construction.</p> <p><b>Former Green Mountain-Onahu housing area</b></p> <p>The NPS would make minor changes, if needed, to ground contours around the demolished utilities such as the burned septic tanks to assure that runoff is not causing erosion or drainage problems.</p>



## **CHAPTER 2: ALTERNATIVES**

### **INTRODUCTION**

This chapter describes in detail two alternatives for the proposed project, consistent with the purpose of and need for the action. These alternatives are the no-action alternative (Alternative A) and the proposed action alternative (Alternative B; proposed action). The NPS identified several other alternatives during internal and public scoping; however, dismissed these alternatives from detailed analysis in the EA because they did not meet the purpose of and need for the action, were not feasible, or would have resulted in unacceptable environmental impacts (see table 2-1).

### **COMMON TO BOTH ALTERNATIVES**

The East Troublesome Fire destroyed 17 of 19 historic buildings within Green Mountain-Onahu Ranch cultural landscape, which had formerly served as a seasonal housing area. Using equipment such as bobcats, passenger trucks, and heavy-duty tracked vehicles, the proposed project would demolish fire-damaged utilities, including aboveground distribution boxes, pedestals, electric service, and an aboveground water storage tank. All activities, including staging areas, would be limited to existing disturbed area. The aboveground utility features would be demolished, and materials would be disposed in accordance with Grand County and NPS guidance; no materials are anticipated to be recycled because they are fire damaged. Belowground features such as septic fields and septic tanks would be mitigated if needed following hazard materials protocols. Then these belowground features would be abandoned in place. The demolition of aboveground fire-damaged utilities and abandonment of belowground features can take place at any time of the year, dependent upon seasonal factors allowing work to occur. The two unburned buildings would not be part of the demolition project and would remain in place. Due to weather and altitude factors which may limit the amount of time available during any given year for demolition, this work may extend past a single year to complete.

The NPS has developed mitigation measures and best practices to reduce resource impacts during construction projects. These measures and practices aim to protect the visitor experience and park resources, including air quality, migratory birds, archeological and historic resources, and water quality (e.g., stormwater control). Best practices for vegetation restoration efforts include nonnative and exotic plant control before and after construction and following a site-specific revegetation plan using native species collected in park. Seeds would be propagated in park or through a contracted seed facility. Park staff and the contractor would sow seed and plant seedlings where appropriate. The revegetation plan would include exotic plant management controls, as appropriate for the species and site, in accordance with the Rocky Mountain National Park Exotic Plant Management Plan Environmental Assessment (February 2019). Traffic control and other safety measures would also be followed, and the NPS aims to minimize the duration of safety-related traffic control or closures.

### **ALTERNATIVE A: NO-ACTION ALTERNATIVE**

Under Alternative A, the NPS would continue to rent housing for Colorado River District staff in Winter Park and Fraser, located on the west side of the park. This housing currently costs approximately \$230,000 per season and is located over 30 miles from the Kawuneeche Visitor Center, requiring at least a 50-minute commute one way for staff. The destruction of seasonal employee housing from the East Troublesome Fire necessitated the use of housing outside the park. The distant location of NPS staff housing from the park would decrease staff readiness and effectiveness by reducing their ability to respond quickly to public safety, law enforcement, and maintenance emergencies. The longer commute time would present challenges to recruit and retain seasonal staff. If the NPS cannot recruit adequate seasonal staffing, additional vacancies

would occur, park operations and visitor services would be reduced, and the ability to maintain and protect park resources would also be reduced or diminished. The park would continue to subsidize the gap between lease unit costs and collected rents. The existing Washington D.C. Area Support Office funding source would not be available in the future because alternative A would not be considered an emergency; therefore, the park would have to provide the funds from another source. Rental revenue for housing park-wide is approximately \$750,000 a year and supports a housing management officer and housing maintenance staff. The extra \$230,000 needed each year would significantly reduce the staff available to maintain existing units. In addition, the amount needed each year could rise with the cost of living, but rental rate increases could only be made following NPS policy.

## **ALTERNATIVE B: PROPOSED ACTION AND PREFERRED ALTERNATIVE**

Alternative B is the proposed action and preferred alternative. Under Alternative B, the NPS would develop a new housing area immediately west of the existing Colorado River District housing area (Figure 2-1). The project area consists of the 43.5-acre new housing area, 7.5-acre existing utility infrastructure area, 5.6-acre potential staging area, and 29.2-acre former Green Mountain-Onahu seasonal housing area. This location of the new housing has adequate size (43.5 acres) to accommodate the 22 beds and RV sites currently needed as part of the proposed project's objectives (see Chapter 1).

The new housing area would consist of 2 four-bedroom dormitories, 6 one-bedroom units, 4 two-bedroom units, and a residential support facility (see Figure 2-2), resulting in a total of 13 new buildings. All buildings would be one-story structures (Figure 2-3). The 1- and 2-bedroom units would have an associated driveway; the 4-bedroom dormitories and the residential support facility would share a minimum 22-space parking lot. All buildings would be code compliant. New housing would meet the Architectural Barriers Act Accessibility Standard, which adds opportunities and amenities that are currently not available for employees. In addition, the NPS would design new housing to be sustainable, energy efficient, resilient to climate change impacts, and to improve operational efficiencies, as follows:

1. Heating and cooling systems and all appliances would be electric.
2. Interior finishes would be highly resilient and would not need regular replacement.
3. High-performance materials would be specified for windows, doors, and insulation.
4. Fire-resistant external materials (e.g., cementitious fiberboard, metal or asphalt shingle roofs) would be installed.
5. Structures in the wildland urban interface would be consolidated, making fuel treatments and wildland fire response easier and safer.
6. Revegetation would use only native plants and follow the National Fire Protection Association's Firewise guidance to reduce the amount of vegetation near buildings.

The buildings within the new housing area would be similar in scale, massing, and materials to residences in the existing Colorado River District housing area. The buildings would also be consistent in size with private residences in the adjacent neighborhood to the west (DHM 2022c). Housing characteristics would include one-story structures, gable metal roofing with wood-appearing aesthetics, and horizontal elements tucked behind existing berms and vegetation. Buildings would be clustered together and sited to protect existing mature vegetation not affected by the fire. Buildings would also be sited to take advantage of natural topography, such as the protection of an adjacent hillside to the north (DHM 2022c).

The project area is near existing utility infrastructure, including gas, electrical, sewer, and communications. Alternative B would consolidate Colorado River District housing, creating operational efficiencies. The proposed project would reduce response times for employees because they would live near their offices. The

proposed project would also reduce operation and maintenance costs because housing would no longer be tied to utilities that can only be operated for a four-month period at the former Green Mountain-Onahu housing area (see Chapter 1). Seasonal employees would have access to housing utilities for the entire hiring period of April to October and would not have to relocate multiple times a season as they did at the former Green Mountain-Onahu housing area.

The project area would require modification to allow housing to be built. An existing livery trail would be realigned to the west of the new housing area (approximately one-quarter of the historic trail alignment would be destroyed with construction of the new housing area). Site modification would also include removal of vegetation and dead trees, removal of living trees, and sloping and grading of the site within the limits of construction (Figure 2-2). Areas within the project area near wetlands would not be disturbed, but it is assumed as a worst-case scenario that all vegetation within the limits of construction would be removed. Efforts to retain living trees would be made as practical.

The new housing area would consist of a combination of dormitories and 1- and 2-bedroom units that would total 22 beds, RV sites, and associated parking. The NPS would also build a residential support facility, with services for seasonal employees (laundry, showers, and a kitchen) as part of the new complex. The NPS would construct infrastructure such as roads, water, sewer, underground telecommunications, and underground electrical systems and connect them into existing adjacent year-round systems. New utility construction would include a well, service lines, valves, laterals, fire hydrants, cleanouts, manholes, pedestals, vaults, and communication conduits. The new utilities would connect to the existing utility infrastructure of the Colorado River District housing area.

Available funding constrains this project to only replace housing lost in the fire, even though the park has identified that existing housing needs in the park are greater than what was available prior to the fire. In considering potential rebuilding sites, the need for additional housing to be constructed within the footprint of the replacement housing was one consideration in identifying potential sites. Within this site, the NPS has identified room for up to four additional housing units and up to nine additional RV sites that could be constructed. The environmental effects of the four additional housing units and nine additional RV sites would take place within the current project's disturbed area, but the full environmental effects cannot be analyzed until funding is available and more details are known such as the number, location, and configuration of units and the alignment of the utility connections to those units. However, the analysis in this Environmental Assessment as it relates to archeological and ethnographic resources, historic resources, and (wildlife) ungulates considered the entire proposed site and therefore includes the potential sites for the four additional housing units and nine RV sites. Funding for additional housing has not been identified and the additional housing units are considered speculative until more funding is made available. If such funding should ever be available, the construction of the additional units would be evaluated under its own environmental analysis.

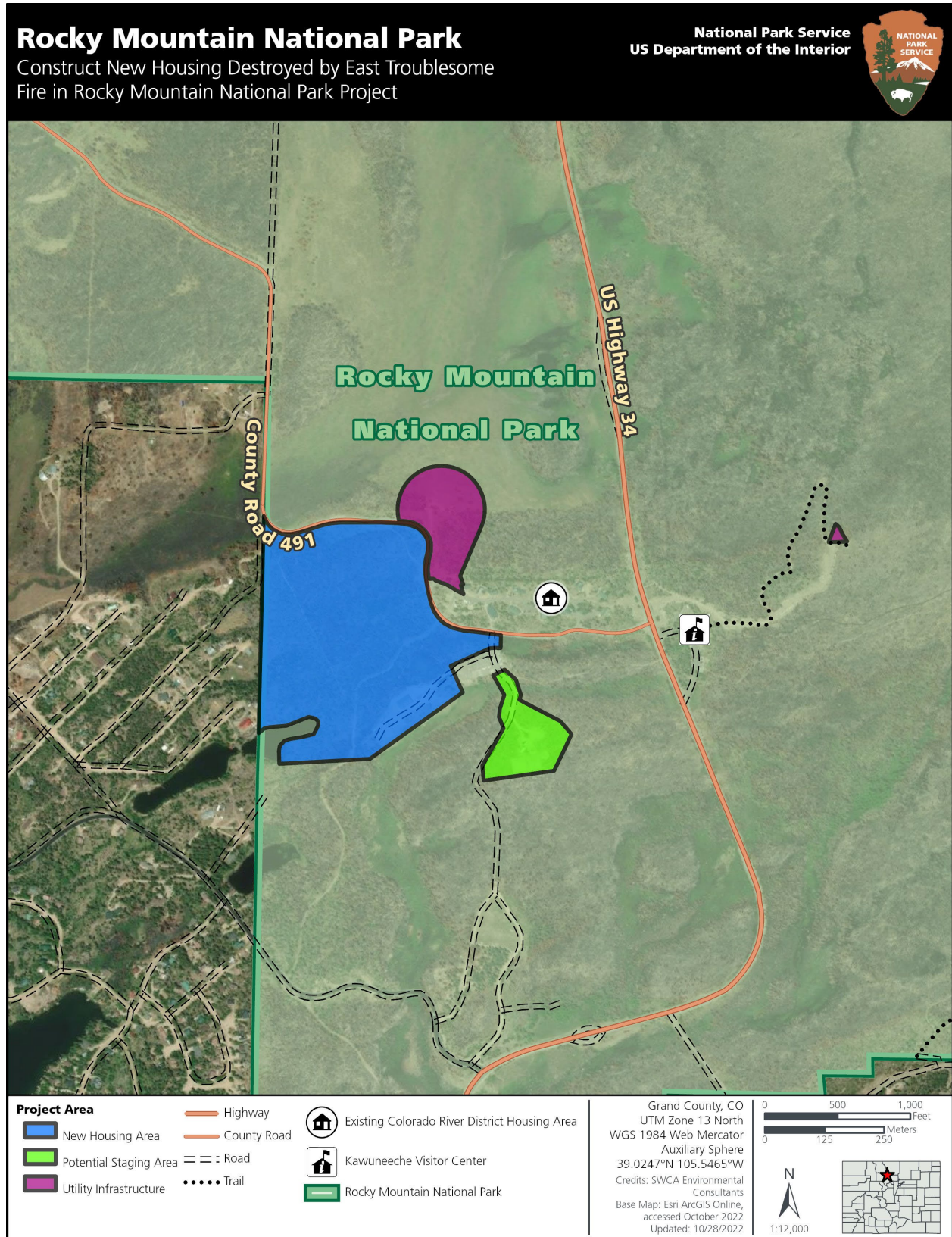


Figure 2-1. Proposed new housing area.





**Figure 2-2. Proposed project design schematic.**



Figure 2-3. Example front elevation of 1-bedroom unit (left) and dormitory (right).

## ALTERNATIVES DISMISSED FROM FURTHER ANALYSIS

Table 2-1 describes alternatives considered for project implementation but dismissed from further analysis, along with a brief explanation of the reasons for their dismissal.

**Table 2-1 -Alternatives Considered and Dismissed from Analysis**

Alternatives Considered for Project Implementation	Rationale for Dismissal
Rebuild Housing at Former Green Mountain-Onahu Housing Area	<p>This alternative would have too great of an impact to park resources and would not meet the purpose and need of the project for the following reasons:</p> <p>Reconstruction at the former Green Mountain-Onahu housing area would require expanding the footprint beyond the existing site and increase impacts to cultural or natural resources. New building sites and utility construction in this historic district may affect archeological resources. The park would need to avoid all former building locations to protect remaining cultural resources. This avoidance would require expansion outside the previously disturbed area. The only buildable expansion area is to the west, into the adjacent meadow which would impact water resources and wetlands. In addition to impacts to cultural resources (archeological resources) and natural resources (water resources and wetlands), new housing in the meadow could have greater impacts to wildlife (ungulates, fisheries) and viewsheds than the proposed site. The health of wetlands near the former Green Mountain-Onahu housing area are in decline, though the park is still researching what the causes of this decline are.</p> <p>Communications are challenging because there is no fiber-optic connection or cellular service at the former Green Mountain-Onahu housing area and installation of new fiber communications would vastly extend the footprint and cost of reconstruction at this site. Constructing new fiber or cellular telecommunications service at for former Green Mountain-Onahu housing area would be prohibitively expensive and could have impacts to the cultural and natural viewsheds of the Kawuneeche Valley.</p> <p>Park employees (except for emergency personnel) could not directly respond to urgent maintenance or visitor needs; they would first need to drive to the Colorado River District administrative area to pick up a vehicle and supplies.</p> <p>Reconstruction would fail to address the operational deficiencies identified in the Purpose and Need. Utilities would have to be completely reconstructed to operate for more than four months. It would require replacing the entire feeder line for the water system from the distribution because the current system is not buried deep enough for year-round operation.</p> <p>Maintaining the utility system in this location would increase the costs to the park because of the need to install and maintain more utility infrastructure, and staff would continue to be housed in scattered sites.</p>

Alternative Sites Near the Existing Colorado River District Housing Area	Five alternative sites near the existing Colorado River District housing area were evaluated for the proposed project. These sites were near the existing housing but to the north, south, and west on undeveloped land. These alternatives provide similar benefits as the proposed action but were dismissed because of higher potential impacts on natural resources, more complexities with site access, more constructability issues, and higher visibility to visitors.
Purchase Housing Outside the Park	By statute, the NPS cannot purchase housing outside the park boundary and would require changing law. For this reason, this alternative is not carried forth for analysis.

## MITIGATION

Table 3-5 outlines the activities the NPS would take to mitigate impacts on resources.

**Table 3-5 - Proposed Mitigation**

Resource Topic	Mitigation Commitments
Air quality and air quality–related values	NPS standard air quality specifications associated with construction would be required in the construction contract. This includes limited idling of equipment and vehicles.
Aquatic resources, water quality and quantity	NPS standard water quality specifications associated with construction would be required in the construction contract, including an approved Storm Water Pollution Prevention Plan.
Archeological and ethnographic resources and historic resources	NPS would require on-site monitoring during construction activities that may uncover unknown archeological resources. The NPS would follow established protocols for management of any discovered cultural resources.
Lightscapes	Dark sky–friendly lighting would be required for all outdoor lighting.
Migratory birds	The NPS would conduct surveys prior to project construction to determine if there are nesting sites that may be affected by construction activities. The NPS would implement mitigation measures around active nesting locations to protect nests to the extent practicable. Potential mitigations may include avoiding felling trees with stick nests or establishing appropriate buffer areas to avoid flushing birds until fledging takes place.
Nonnative or exotic species	The NPS would develop and implement an exotic plant management control and revegetation plan to minimize the risk of introducing or encouraging nonnative and exotic species growth.



*This page intentionally left blank.*

## **CHAPTER 3:**

### **AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

#### **INTRODUCTION**

The project area is shown on Figure 1-1 in Chapter 1 and consists of the 43.5-acre new housing area, 7.5-acre existing utility infrastructure area, 5.6-acre potential staging area, and 29.2-acre former Green-Mountain Onahu seasonal housing area. Within the 43.5-acre new housing area, project construction and development would cause approximately 2.4 acres of permanent surface disturbance and up to 7.8 acres of temporary surface disturbance. The analysis area for each issue or impact topic is a larger geographic area that includes the project area and provides context for discussion of the proposed project's impacts. Analysis areas vary by issue or impact topic.

Under its Organic Act, the NPS has the authority to develop and direct mitigation for impacts on resources under its jurisdiction. This is in addition to the requirements that may be created through the need to comply with laws and regulations managing resource impacts that are overseen by other agencies. To meet these obligations, the NPS has 1) developed Management Policies and Director's Orders that identify the authorities (laws, regulations, and executive orders) directing how impacts and mitigation to resources shall be managed and 2) outlined the policies and procedures by which the NPS shall comply with these authorities. A full listing of the NPS policies is available from the NPS Office of Policy website at <https://npspolicy.nps.gov/index.cfm>.

#### **GENERAL CLIMATE CHANGE TRENDS**

Climate change, or long-term shifts in temperatures, rainfall, and other weather patterns across the globe, would also affect resources in the analysis areas. In Colorado, the temperature has increased by +2 degrees Fahrenheit since the early 20th century, with winter warming characterized by a much below-average occurrence of extremely cold days since 1990 (Rice et al. 2018). Although future conditions cannot be precisely predicted in the park, increases in temperature (especially in winter and early spring and especially for minimum temperatures), reduced snowpack, earlier snowmelt, more intense storms, and increased dryness due to increased evapotranspiration are generally expected (NPS 2009). More precipitation will likely fall as rain instead of snow, and lake and stream temperatures are expected to rise. Climate change will have complex effects on the ecological interactions of plant, insect, and animals; animals and plant communities may shift to higher elevations. Invasive nonnative species will likely find more opportunities to invade and thrive. Permafrost areas are likely to shrink, and tundra animal and insect species are likely to be especially vulnerable to extirpation (NPS 2009). With increasing temperatures across Colorado, visitor use levels could increase in the park if Colorado Front Range residents use the park to escape higher temperatures. Climate change is incorporated into the Affected Environment sections for each resource evaluated.

#### **CUMULATIVE IMPACTS**

Cumulative impacts are analyzed for each issue or impact topic carried forward. A cumulative impact is "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 nonfederal) or person undertakes such other actions" (40 Code of Federal Regulations 1508.7). The cumulative impacts of the proposed project are determined by combining the incremental impacts of the alternatives with the overlapping impacts of other past, present, and reasonably foreseeable future actions.

During internal scoping, the NPS identified the following reasonably foreseeable future actions (planned actions), including the following fire-recovery construction projects, which are considered in the cumulative effects analysis of this document; no past or present actions were identified:

- Replace Obsolete Housing Project (proposed triplex): This project would involve the construction of one triplex housing unit in the existing Colorado River District housing area. The triplex is meant to replace three dwellings that were in the former Green Mountain-Onahu housing area that were destroyed by the East Troublesome Fire. The triplex would include utility connections, site improvements, and parking.
- Colorado River District Barn Reconstruction (barn): The NPS is planning to construct a barn for the Colorado River District trails and packing program. The barn would be in the same location as the previous facility, which burned in the East Troublesome Fire. The barn would include space for up to 12 stock animals, hay storage, offices, and a workshop.
- Colorado River District Remit Office Reconstruction (Grand Lake Entrance Station): This project consists of constructing a new ranger office at the Grand Lake Entrance to replace the building that was lost in the East Troublesome Fire. This project includes facility construction, utility connections, and associated site work.
- Private Post-Fire Reconstruction (Sun Valley neighborhood): These are private (non-park) activities outside the park boundary and consist of reconstruction of housing destroyed in the East Troublesome Fire.

## ARCHEOLOGICAL AND ETHNOGRAPHIC RESOURCES

### Affected Environment

The project area has been occupied by humans since the Paleoindian era (13,400–7500 BP), which is the “earliest definitively recognized temporal stage in the South Platte River and Northern Colorado River Basins” (Engleman et al. 2020). This era is “characterized by a mobile settlement strategy and a subsistence strategy generally focused on big game hunting” (Engleman et al. 2020). Evidence of Archaic era (ca. 8400–2000 BP) occupation includes sites within what is now Rocky Mountain National Park within a few miles of the proposed project (Engleman et al. 2020). The earliest material culture evidence from the Late Prehistoric stage (1850–400 BP, AD 150–1540) demonstrates Ute presence in north-central Colorado from 1000 to 1400 BP, based on the occurrence of culturally modified trees, brush-structure architecture known as wickiups, and Uncompahgre Brown ware pottery (Engleman et al. 2020). Ethnographic studies indicate the Utes occupied the area for thousands of years. Between ca. 1800 and 1860, the Ute and Northern Arapaho residential groups “occupied the Park and vicinity year-round,” whereas the Shoshone, Cheyenne, Apache, and Comanche visitor groups “seasonally migrated to the Park” (Engleman et al. 2020).

There are no known archeological sites with tribal association in the former Green Mountain-Onahu housing area or the new housing area including the housing area, staging area, and existing utility infrastructure area. The NPS continues to consult with tribes on the significance of sites in the vicinity.

The NPS completed an intensive (Class III) archeological survey of the Green Mountain Ranch and Onahu Ranch properties in 2019. The Colorado SHPO concurred with the survey findings, which indicated 5GA.4762, a potential district associated with the Green Mountain and Onahu Ranches. The NPS is conducting a Class III resurvey of the Green Mountain Ranch and Onahu Ranch historic district to analyze post-fire impacts and to identify new resources. Regardless of the results of this survey and consultation with tribes and SHPO, the NPS would avoid impacts on culturally significant resources as it demolishes and abandons the utilities.

In 1895, sisters Annie and Kitty Harbison filed homestead claims in the future Grand Lake Entrance vicinity and earned patents from the US federal government in 1902 (Daniels and Mark 2022). The Harbison family amassed lands north of today's Harbison Meadows and south of today's County Road 491. The Harbison family constructed residential cabins, haybarns, storage sheds, and a sawmill. They owned water rights and constructed the Harbison Ditch along with roads, fences, and corrals. The Harbison family started to sell lands to the NPS in 1938; full acquisition of their lands was complete by 1952. Consistent with park efforts to construct facilities on previously disturbed areas, the park removed most of the buildings by the 1970s and converted the Harbison lands to housing, maintenance and administrative facilities, and a picnic area. In addition to sites associated with Harbison Ranch, the project area has sites demonstrating prior use as park administration or visitor areas including former roads and informal picnic spots.

The NPS completed an intensive (Class III) archeological survey of the new housing area (including the housing area, staging area, and existing utility infrastructure area) during the summer of 2022. Seventeen cultural resources were recorded as a result, all of which are historic in age and reflect the ranching and recreational history of the area. Only two of the seventeen are eligible for the NRHP and therefore considered as historic archeological sites. The Harbison Ditch (5GAS.2943) and a former road segment (5GA.2250.2) near the existing utility infrastructure area are outside the limits of disturbance for the project and would not be affected. The livery trail (Figure 3-1) would be rerouted to the west of the housing area; it is not a historic resource.

#### Archeological and Ethnographic Resources Trends

The NPS continues to identify new archeological and ethnographic resources and conduct reanalysis of known sites. The NPS conducts only limited testing of archeological sites to preserve the features of these sensitive resources in situ. Tribal members, the local community, and the SHPO help the park assess the significance of these resources. After the East Troublesome Fire in Kawuneeche Valley and the Colorado River District, archeologists identified many new sites spanning all periods of occupation. Exposure of these sites leaves them vulnerable to loss through vandalism.

Climate change could increase the frequency and severity of wildfires and storms, with the potential of uncovering currently unknown archeological resources throughout the park and causing damage to existing sites. As future weather and climate change alter the park landscape, additional precontact and historic resources whose exact locations are not yet known may be uncovered in the park. As resources are discovered, the NPS will consult with tribes and SHPO to best determine how to document and preserve exposed resources. Future changes directly attributable to climate change remain speculative.

### **Environmental Consequences**

#### Common to Both Alternatives

At the former Green Mountain-Onahu housing area, activities would consist generally of removal of aboveground fire-damaged utilities. However, there would be surface disturbance around the demolition of the aboveground water storage tank and in the previously disturbed area that was the septic tanks and septic fields.

To protect archeological resources during demolition at the former Green Mountain-Onahu housing area and at the new housing area (including the housing area, staging area, and existing utility infrastructure area), an archeological monitor would be present for ground-disturbing activities associated with the proposed project. Should archaeological resources be discovered, work within the identified area would be stopped until appropriate steps to mitigate damage to the archaeological resource are completed.

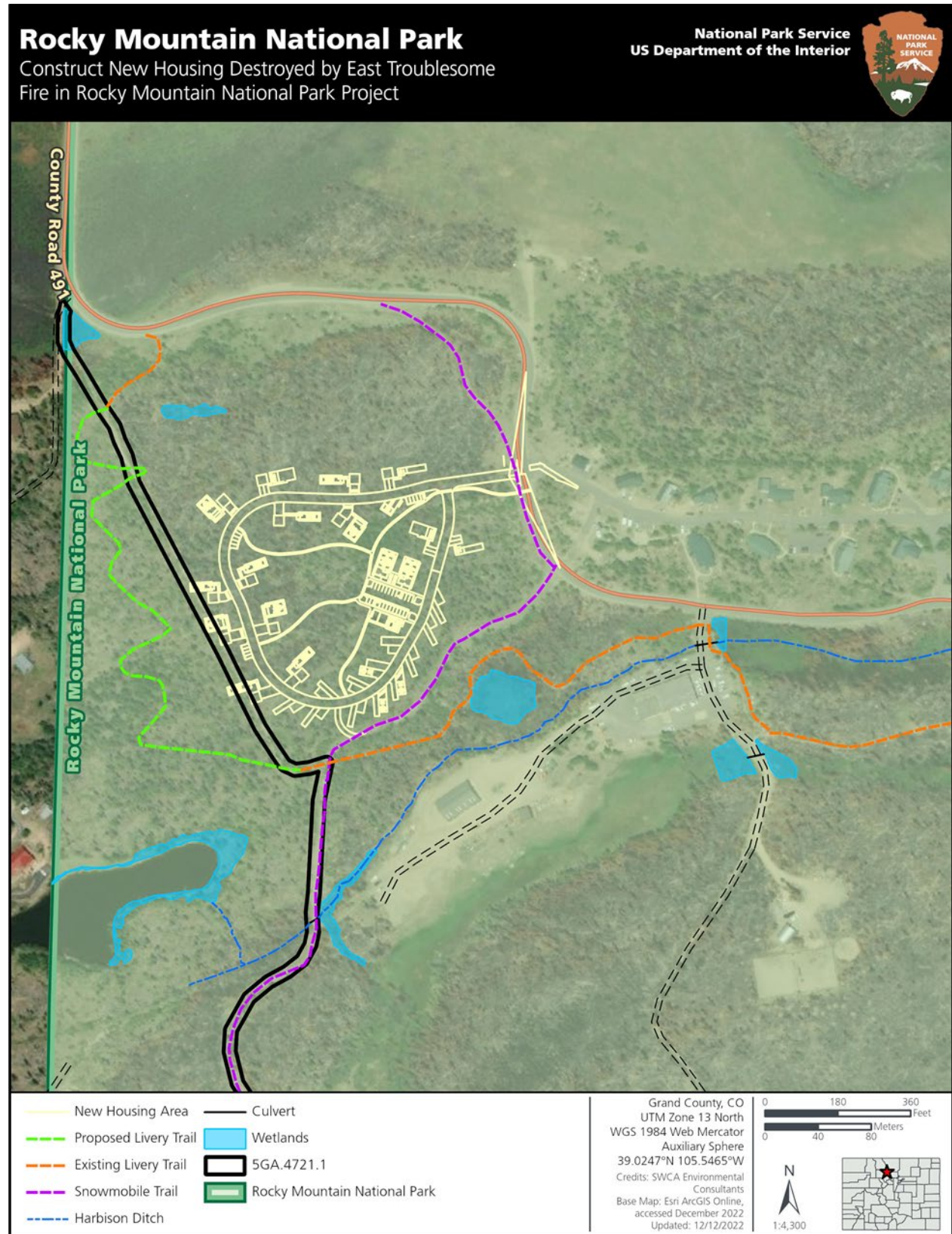


Figure 3-1. Livery trail.

### Alternative A: No-Action Alternative

Under Alternative A, the NPS would continue to rent housing for Colorado River District staff in communities west of the park. There would be no surface-disturbing activities under this alternative and no impacts on archeological or ethnographic resources.

### Alternative B: Proposed Action Alternative

The proposed project includes ground-disturbing activities that may affect archeological and ethnographic resources. Site preparation and construction of the one- and two-bedroom units, dormitories, residential support facility, and roads would result in surface disturbance at the new housing area. In addition, aboveground and underground utilities would be modified to support the new housing. Although staging areas are not finalized, the NPS has identified potential staging areas such as within the limit of disturbance of the new housing area and in the NPS storage area near the park's maintenance facility (see Figure 2-1), which is a previously disturbed area.

The NPS completed an intensive (Class III) archeological survey of the new housing area (including the housing area, staging area, and existing utility infrastructure area) during the summer of 2022. Seventeen cultural resources were recorded as a result, all of which are historic in age and reflect the ranching and recreational history of the area. Only two of the seventeen are eligible for the NRHP and therefore considered as historic archeological sites. The Harbison Ditch (5GAS.2943) and a former road segment (5GA.2250.2) near the existing utility infrastructure area are outside the limits of disturbance for the project and would not be affected.

### Cumulative Impacts

Reasonably foreseeable future actions with the potential to impact archaeological and ethnographic resources in the new housing area and the former Green Mountain-Onahu housing area include fire-recovery construction projects (barn, proposed triplex, Grand Lake Entrance Station). Construction and park management activities have disturbed and altered archaeological and ethnographic resources in the past and future activities are likely to have additional impacts though the park evaluates these impacts carefully to identify means to avoid, minimize and mitigate for impacts that do occur.

When the impacts of Alternative A are combined with those of past, present, and reasonably foreseeable actions, the cumulative impacts to archaeological and ethnographic resources from Alternative A would contribute the loss of archaeological and ethnographic resources from removal of the remaining debris from the former Green Mountain-Onahu housing site. However, this would not change the baseline level of disturbance impacting archaeological and ethnographic resources under Alternative A because no new housing construction would occur in the park under this alternative. Therefore, Alternative A would contribute to but would not appreciably change the level of adverse impacts already occurring.

When the impacts of Alternative B are combined with those of past, present, and reasonably foreseeable actions, cumulative impacts to archaeological and ethnographic resources would be adverse, with other actions contributing the majority of the impacts. This is because under Alternative B, the remaining debris from the former Green Mountain-Onahu housing area would be removed. The loss of these archaeological and ethnographic resources is not expected to result in measurable impacts on the overall condition of archaeological and ethnographic resources within the park. Existing archaeological and ethnographic resources within the park are not expected to be affected.

In conclusion, cumulative effects to archaeological and ethnographic resources would continue to be adverse, but Alternative B would contribute minimally to these impacts. Cumulatively, Alternative B would



contribute to but would not meaningfully increase adverse cumulative impacts from because there would be no change to archaeological and ethnographic resources.

## VIEWSHEDS

### Affected Environment

The NPS conducted a visual assessment to evaluate and analyze the visual impacts of the new housing area. The analysis was conducted after the East Troublesome Fire, with the resulting loss of potential screening from trees and other vegetation that might have reduced visual impacts prior to the fire. Because pine forest recovery takes time (lodgepole pine [*Pinus contorta*] may take 50 to 60 years to grow more than 50 feet tall) (Anderson 2003), the new burned condition is assumed as a constant for the visual assessment. To identify the potential visual effects, the NPS used a 1-mile radius surrounding the proposed project. This 1-mile radius allows for an evaluation of potentially visible areas both inside and outside the park boundary.

Using a geospatial model, the NPS determined the housing is potentially visible to the northeast inside the park boundary and west-southwest outside the park boundary (Figure 3-2). The geospatial map considered topography and the one-story height of the proposed buildings. Using the geospatial map of potential visibility, the NPS selected three representative points for further analysis (DHM 2022c). The assessment includes a description of the visual character of the landscape, a viewshed analysis, and a line-of-sight analysis.

#### Visual Character

The proposed project is within a transitional zone between montane and subalpine ecosystems that typically includes large meadow valleys, adjacent hilly slopes, and a diversity of plant and animal species (DHM 2022c). A uniform-aged lodgepole pine forest with dense tree stands spreads throughout the landscape, reducing overall visibility in the area. Invasive plants such as cheatgrass (*Bromus tectorum*) create a visual plane and often dominate the natural understory (DHM 2022c). Native plants such as sedges (*Carex*), bunchgrasses (*Fescue*), and lupines (*Lupinus*) also make up the visual components of the lodgepole pine forest. Most of the mature lodgepole pine and spruce (*Picea*) in the new housing area were badly burned or have fallen because of the East Troublesome Fire (DHM 2022c).

The new housing area is immediately adjacent to the existing Colorado River District housing area and is near high visitation areas like Grand Lake Entrance Station, Harbison Meadows, and the Kawuneeche Visitor Center. Visitors to this area include trail users, horseback riders, snowmobile users, and people in vehicles (DHM 2022c). Residents in an adjacent neighborhood west and outside the park boundary are also near the new housing area; the housing density in this neighborhood is approximately 1.6 houses per acre (DHM 2022c).

The NPS selected three vantage points for the viewshed and line of sight analyses: Vantage Point 1: Harbison Meadows Picnic Area (to the north within the park boundary), Vantage Point 2: Grand Lake Lodge (to the southeast and outside the park), and Vantage Point 3: South Columbine Lake Neighborhood (to the southwest and outside the park) (see Figure 3-2).

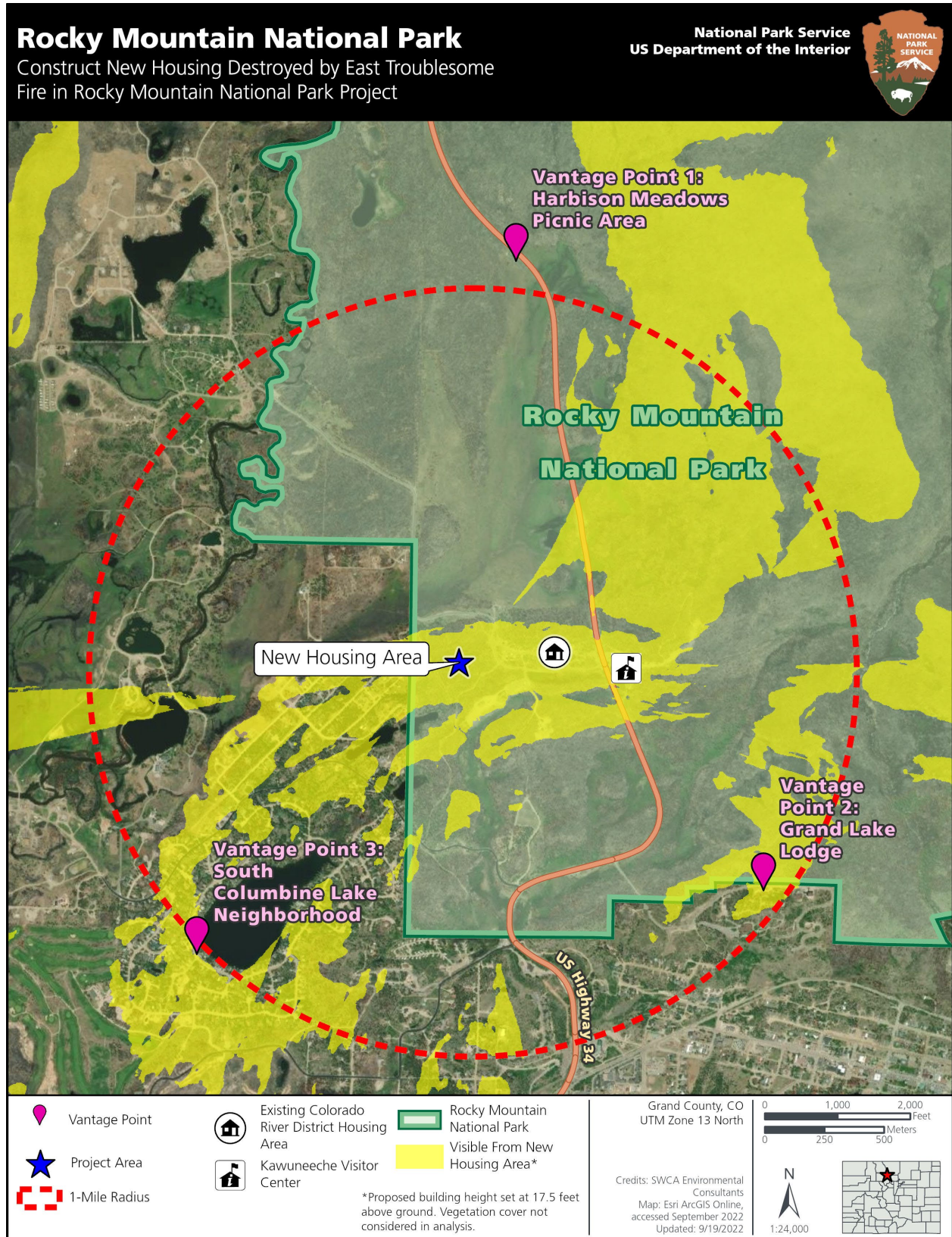


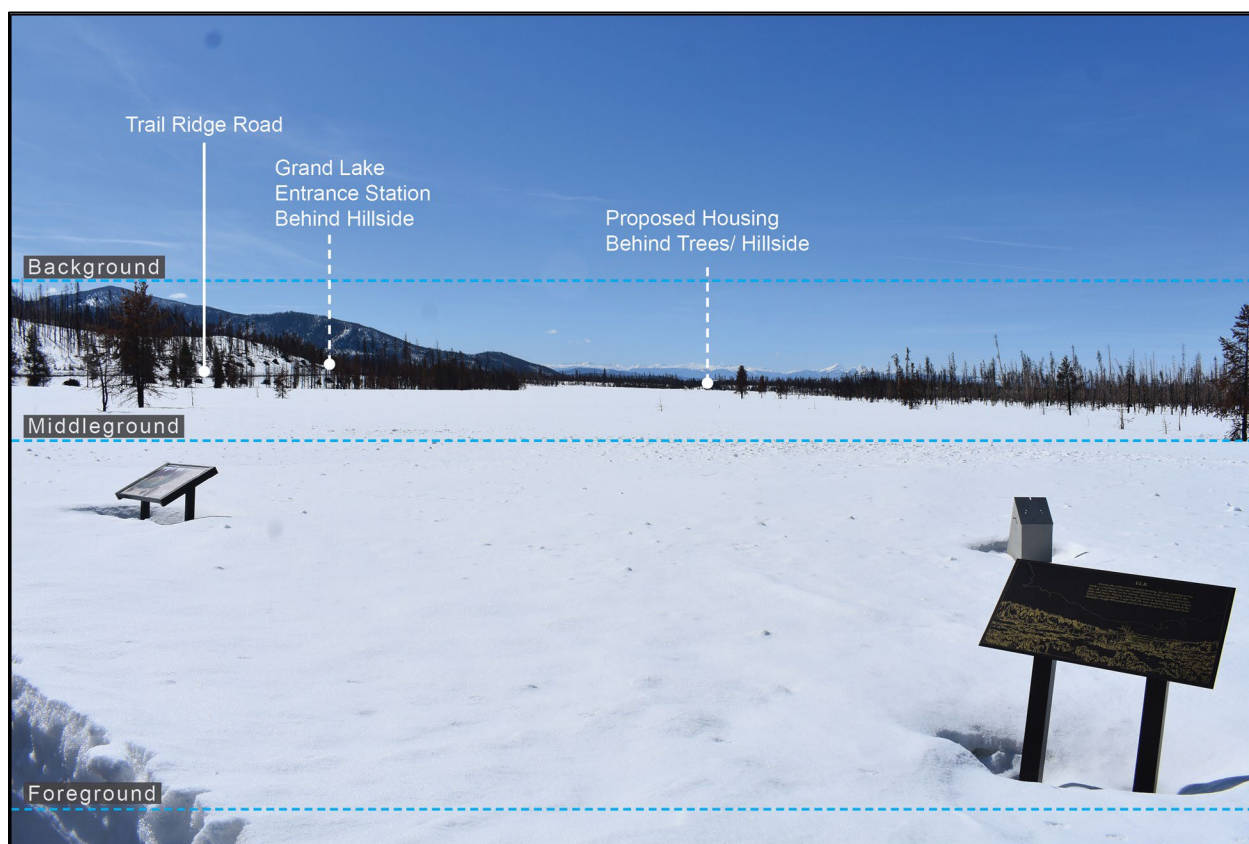
Figure 3-2. Vantage points for the visual assessment.



### Viewshed and Line of Sight Existing Conditions

#### *Vantage Point 1: Harbison Meadows Picnic Area*

Vantage Point 1 is at the Harbison Meadows Picnic Area, north of the Grand Lake Entrance Station and inside the park boundary along US Highway 34. Views looking south toward the new housing from the parking lot at the Harbison Meadows Picnic Area are expansive as an observer looks from foreground to background (Figure 3-3) (DHM 2022c). Interpretive signage and the edge of the asphalt parking lot are visible in the foreground, making way to a vast open meadow in the middleground. The Grand Lake Entrance Station is hidden behind a hillside to the southeast in the middleground (DHM 2022c). Lodgepole pine and spruce trees, many affected by the East Troublesome Fire, line the perimeter of Harbison Meadows in the middleground and define the edges of the meadow. The meadow extends farthest south directly central to the viewer's perspective, making it difficult to see anything other than color change in the background. Background views to the southeast include Shadow Mountain and adjacent foothills. The Gore Range can be seen in the far distance (DHM 2022c). The Harbison Meadows Picnic Area receives high levels of visitation and foot traffic because it is the first destination a visitor sees upon entry to the park.

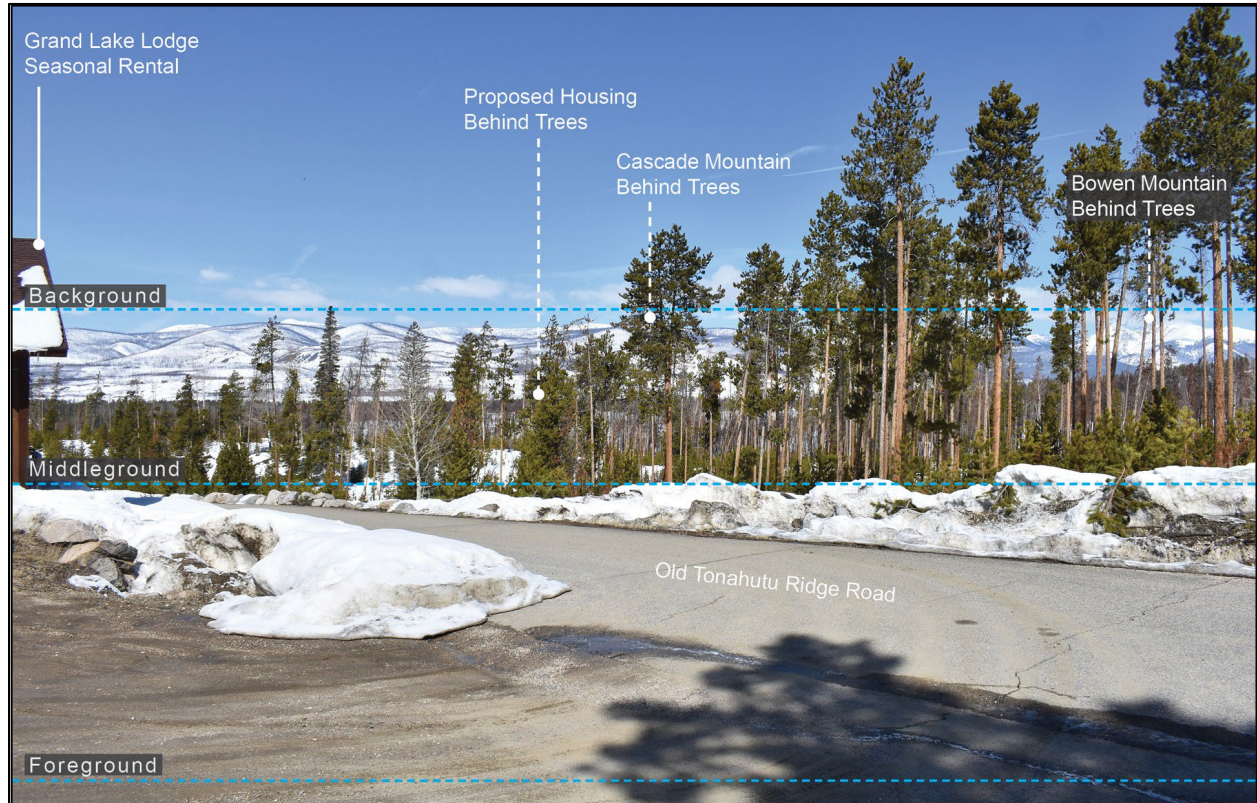


**Figure 3-3.** Existing view from the Harbison Meadows Picnic Area, view facing south toward Grand Lake (DHM 2022c).

#### *Vantage Point 2: Grand Lake Lodge*

Vantage Point 2 was selected because Grand Lake Lodge (just outside the park boundary) is a historic property. The view from the front porch of Grand Lake Lodge is spectacular and well known to locals and guests; however, Vantage Point 2 is from the rear of the lodge at the property's highest point. Vantage Point

2 has scattered views to the northwest toward the new housing area (Figure 3-4) (DHM 2022c). Views in the foreground include several structures on the Grand Lake Lodge property used for laundry services and winter season guest rentals. Old Tonahutu Ridge Road is prominent in the foreground. The middleground is dominated by a mature forest of lodgepole pine and spruce, which screens views to the north and northwest; large portions of the forest appear dead from wildfire burn or beetle kill. Background views toward Bowen Mountain are filtered by the burned lodgepole pine and spruce forest. Views of Cascade Mountain and the surrounding mountains become visible to the west as the hillside descends from the vantage point and vegetation recedes. Grand Lake Lodge staff and visitors frequent this area, and viewers are present throughout the year (DHM 2022c).

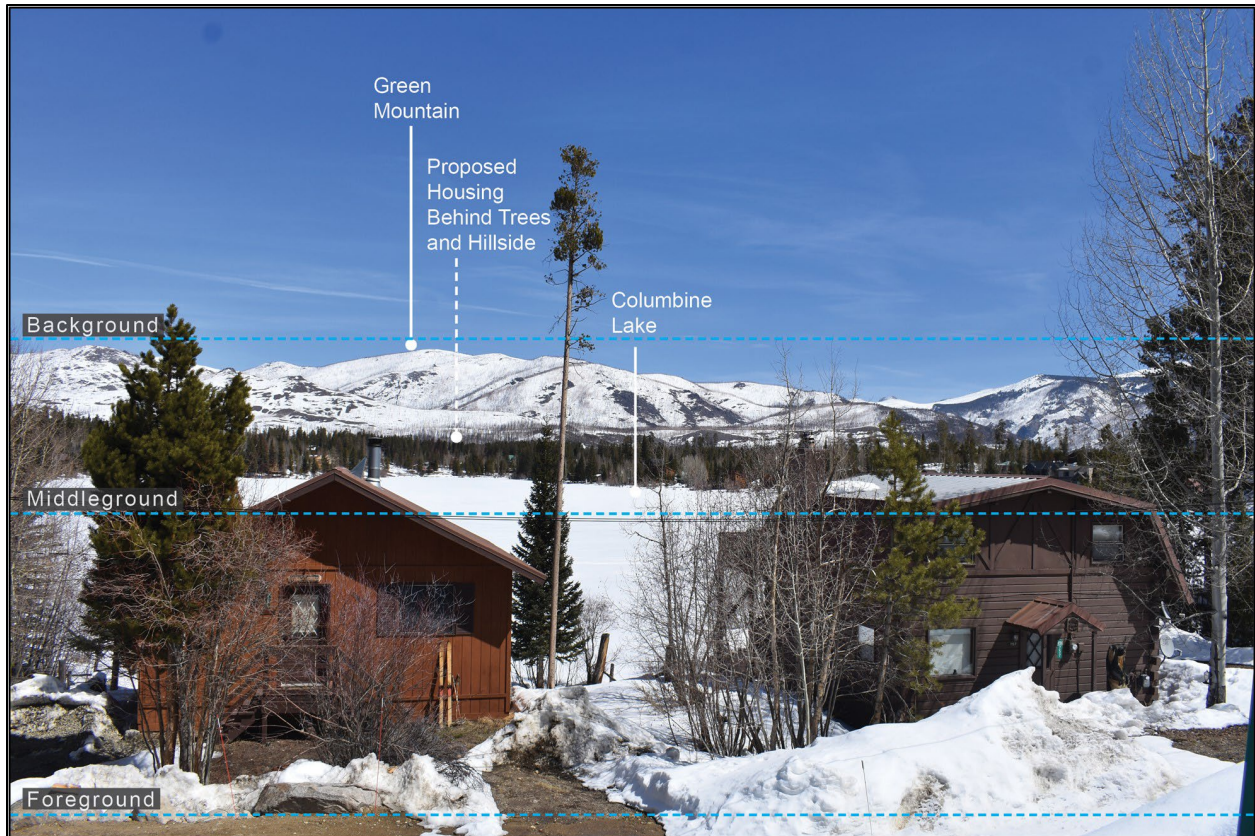


**Figure 3-4. Existing view from the highest point at Grand Lake Lodge, view facing northwest toward Cascade Mountain (DHM 2022c).**

#### *Vantage Point 3: South Columbine Lake Neighborhood*

Vantage Point 3 is just outside the park boundary and provides expansive views to the northeast from the south side of Columbine Lake. Views in the immediate foreground include private residences with gravel driveways below Columbine Drive, deciduous and evergreen vegetation, and other residential amenities (Figure 3-5) (DHM 2022c). Columbine Lake is visible in the middleground just beyond the structures in the foreground. Additional buildings and vegetation are visible on the far side of the lake. Background views to the northeast include open views of Green Mountain and the adjacent foothills at the park's west entrance (DHM 2022c). Grand Lake Lodge visitors and staff frequent the vantage point to use the residential amenities, and it has viewers throughout the year.





**Figure 3-5. Existing view from South Columbine Lake Neighborhood, view facing northeast toward Green Mountain (snow-covered Columbine Lake is in the middleground) (DHM 2022c).**

### Viewshed Trends

One of the key values of Rocky Mountain National Park is its “outstanding scenic beauty” (NPS 2013). Scenic views and viewsheds are important park resources. In general, most scenic views in and around the park are high quality, though air quality impacts on visibility are of moderate concern to the NPS (NPS 2017). General land use around the park mostly retains the important qualities of the views, though the park has recently experienced some adjacent development that has affected scenic views (NPS 2017). The historic trend is to allow development outside the park and within the park viewshed. Absent known controls, it is reasonable to presume that continued development outside the park boundaries would result in further changes to the viewshed from the park, and more human development is expected to be visible than under current conditions.

Climate change could cumulatively affect some important qualities of scenic views. The existing vegetation composition may be altered by increased stresses caused by changing climatic conditions, increasing viability of invasive species, and damage from disease and fauna such as the mountain pine beetle (*Dendroctonus ponderosae*). However, future changes directly attributable to climate change remain speculative.

### **Environmental Consequences**

The primary visual resources with the potential to be affected by the alternatives are the visual character of the natural landscape (which was recently changed by the East Troublesome Fire) and the views and visual experience of an observer in the high-elevation montane and subalpine ecosystem.



The visual assessment established degrees of impact for each vantage point through mapping, three-dimensional modeling, photograph documentation, and graphic rendering (DHM 2022c). The degrees of impact are as follows:

- Beneficial: Changes that enhance or improve the visual experience of the observer (e.g., creation of new views that highlight a visual resource not previously visible)
- Negative: Changes that harm, disrupt, or have a damaging impact on a visual resource (e.g., development of large-scale buildings in a natural environment that degrade a previously unimpacted view/visual experience)
- Neutral: Net zero changes in experience toward a visual resource (e.g., minor changes to view but the overall character of the visual resource is protected and maintains its quality) (DHM 2022c)

#### Alternative A: No-Action Alternative

Under Alternative A, the NPS would continue to rent housing for Colorado River District staff in communities on the west side of the park. There would be no impacts from the three vantage points because no housing would be constructed in the new housing area.

#### Alternative B: Proposed Action Alternative

Under Alternative B, the NPS would develop a new housing complex immediately west of the existing Colorado River District housing area as described in Chapter 2. The buildings within the new housing area would be similar in scale, massing, and materials to residences in the existing Colorado River District housing area. The buildings would also be consistent in size with private residences in the adjacent neighborhood to the west (DHM 2022c). Housing characteristics would include one-story structures, gable metal roofing with wood-appearing aesthetics, and horizontal elements tucked behind existing berms and vegetation. Buildings would be clustered together and sited to protect existing mature vegetation not affected by the fire. Buildings would also be sited to take advantage of natural topography, such as the protection of an adjacent hillside to the north (DHM 2022c).

At the new housing area, staging area, existing utility infrastructure area, and former Green Mountain-Onahu housing area, there would be temporary visual impacts during construction and demolition of aboveground fire-damaged utilities. Much of the neighborhood outside the park is under construction post-fire, so these temporary construction visual impacts are similar in scale and scope to the surrounding area. The only permanent visual impacts would be in the new housing area (43.5 acres). The potential visual impacts from the construction of the new housing area are described below for each vantage point.

#### *Vantage Point 1: Harbison Meadows Picnic Area*

Views to the foreground, middleground, and background would be unchanged (DHM 2022c). The viewer would not see the new housing from the Harbison Meadows Picnic Area because of its distance from the vantage point, the presence of existing vegetation that provides screening, and a steep hillside north of the project area (see Figure 3-3) (DHM 2022c). Views of the foreground and middleground would remain the same as the existing view. The background view with the new housing area would remain unchanged because objects are not easily identified and color swaths provide the only distinguishing characteristic from that distance (DHM 2022c). Views of Shadow Mountain and the surrounding Gore Range to the south would remain unimpacted. Therefore, the degree of impact for Alternative B from Vantage Point 1 would be neutral (DHM 2022c).

### *Vantage Point 2: Grand Lake Lodge*

Views to the foreground and middleground would be unchanged (DHM 2022c). Views of the new housing area from Vantage Point 2 would be heavily screened and difficult to identify for an observer at the vantage point (see Figure 3-4) (DHM 2022c). The primary factors reducing visibility are long-distance proximity and significant screening by the forest in the middleground. The new housing area is far in the distance and at a lower elevation than the vantage point, which allows for the screening by the middleground vegetation. Foreground views of buildings and structures at Grand Lake Lodge would remain uninterrupted (DHM 2022c). Although closer to the project area than Vantage Point 1, views from Vantage Point 2 have similar visual limitations such as lack of detail, color distinction, and sense of scale to the background zone. Views toward Cascade and Bowen Mountains in the background would remain the same. Therefore, the degree of impact for Alternative B from Vantage Point 2 would be neutral (DHM 2022c).

### *Vantage Point 3: South Columbine Lake Neighborhood*

Views to the foreground and middleground would be unchanged (DHM 2022c). Columbine Lake neighbors may notice the new housing area in the background, but visibility would be low because of screening from a hillside south of the new housing area (DHM 2022c). The long-distance proximity, screening vegetation, and presence of buildings on both sides of Columbine Lake also limit views of the new housing area from the vantage point. Vantage Point 3 is at an elevation slightly lower than the new housing area. As seen in the middleground north of Columbine Lake in Figure 3-5, a combination of mature vegetation and houses begins to blend together as the viewer's perspective fades into the background (DHM 2022c). Views of the foreground and middleground would remain the same. Background views to Green Mountain and adjacent foothills in the park would remain unchanged. Therefore, the degree of impact for Alternative B from Vantage Point 3 would be neutral (DHM 2022c).

In summary, under Alternative B, all three vantage points would have a neutral degree of impact. This assessment considers distance, vegetative cover, topography, and building design and siting (DHM 2022c). The proposed building design would reduce the visual impact because the housing units would be consistent with the visual character of adjacent existing residences in scale, size, massing, color, orientation, and site layout (DHM 2022c).

### Cumulative Impacts

Reasonably foreseeable future actions with the potential to impact viewsheds surrounding the new housing area and the former Green Mountain-Onahu housing area include fire-recovery construction projects (barn, proposed triplex, Grand Lake Entrance Station) and fire-recovery and new construction activities by private entities in a residential community outside of the park boundary (Sun Valley neighborhood). Finally, there were alterations to the natural environment caused by the fire and the natural processes of recovery and change that are underway.

When the impacts of Alternative A are combined with those of past, present, and reasonably foreseeable actions, the cumulative impacts to viewsheds from Alternative A would contribute temporary incremental impacts on viewsheds from demolition of the aboveground fire-damaged utilities and abandonment of the belowground features at the former Green Mountain-Onahu housing area. However, this would not change the baseline level of disturbance impacting viewsheds under Alternative A because no new housing construction would occur in the park under this alternative. Therefore, Alternative A would contribute to viewshed impacts during the demolition and abandonment activities, but it would not appreciably change the level of adverse impacts already occurring.

When the impacts of Alternative B are combined with those of past, present, and reasonably foreseeable actions, cumulative impacts to viewsheds would be adverse, with other actions contributing the majority of the impacts. This is because under Alternative B, temporary impacts associated with construction and incremental impacts associated with the new housing units would occur. The impacts to the viewsheds are not expected to result in measurable impacts on the overall viewsheds within or adjacent to the park.

In conclusion, under cumulative effects to viewsheds would continue to be adverse, largely driven by reconstruction and development outside the park boundary by private entities, but Alternative B would contribute minimally to these impacts. Cumulatively, Alternative B would contribute to but would not meaningfully increase adverse cumulative impacts because there would be no change to viewsheds.

## **WILDLIFE (UNGULATES)**

### **Affected Environment**

The analysis area for ungulates consists of the project area plus an approximate 6-mile surrounding radius. This area was chosen because it is large enough to incorporate ungulate movement and portions of known migration pathways. Three ungulates have habitat in and near the project area and may migrate through or near the project area: Rocky Mountain elk (*Cervus canadensis nelsoni*), Shiras moose (*Alces alces shirasi*), and mule deer (*Odocoileus hemionus*). A literature review for these species was conducted to gain a better understanding of ungulate use in the project area and to provide a summary of research to help understand the potential effects of the proposed project on ungulates (DHM 2022d). Sources reviewed focused specifically on migration routes and frequency of use, rut and associated activities, and seasonal use in and near the project area. Limited information was available on the movements of ungulates through the area (DHM 2022d).

Elk have been the focus of long-term park management because of previous unchecked population growth (Ketz et al. 2016). The NPS's management objective is to restore a healthier balance between elk and the habitat they use, while maintaining elk viewing opportunities. The elk winter range population size has been under the recommended limit of 600–800 in recent years (Ketz et al. 2016; NPS 2015b, 2019). The Rocky Mountain National Park/Estes Park elk population migrates seasonally between primary winter range and primary summer range (including the Kawuneeche Valley) (DHM 2022d). Elk within the Troublesome Elk Herd (as described by Colorado Parks and Wildlife) use a portion of the park throughout summer and fall but migrate outside the park during the winter to mostly Bureau of Land Management and private land west and south of the park. Elk typically forage in meadows and alpine tundra, eating mostly grasses but also consuming the bark and twigs of trees and shrubs (Armstrong 2022).

A Shiras moose population was established in Colorado by the Colorado Division of Wildlife (now Colorado Parks and Wildlife) through a series of introductions beginning in the late 1970s (NPS 2020b). Moose from Utah and Wyoming were released in Walden, Colorado, in 1978 and 1979. They were first observed in the park in the Kawuneeche Valley in 1980 and have since expanded their range to suitable habitat throughout the park. Moose use wetland habitat extensively in the summer. They move within a relatively small home range in response to temperature, the availability of forage, and the availability of thermal cover (NPS 2020b). Moose around the analysis area heavily use willow (*Salix* spp.) and sedge-dominated habitat in the Kawuneeche Valley during the summer and move to high-elevation wet meadows and subalpine forests during the winter (NPS 2020b). Moose are likely to move through the vicinity of the project area seeking their preferred willow (*Salix* spp.) and sedge (*Carex* spp.) habitat (DHM 2022d) and were observed in the project area in the summer of 2022.

Mule deer browse open, shrubby areas of the park between dusk and dawn (NPS 2018). In winter, mule deer move from productive summer range to limited and lower quality winter range at lower elevations (DHM

2022d). They browse shrubs, trees, and occasional grasses and forbs, bedding down during the day in tree cover. Studies in the park have indicated that shrubs make up 73% of the species' diet, with broad-leaved herbs making up 26%. Several hundred mule deer are believed to reside in the park, and the population is likely stable or increasing (NPS 2018). Mule deer use is limited within the project area (DHM 2022d).

### Elk, Moose, and Deer Habitat

The literature review found the project area provides habitat for elk, mule deer, and moose and overlaps with several Colorado Parks and Wildlife–mapped seasonal ranges (DHM 2022d). Vegetation in the project area is dominated by lodgepole pine as the overstory species, with minimal understory establishment (DHM 2022d). Additional vegetation communities are associated with the large meadows of the Kawuneeche Valley and wetlands. Herbaceous vegetation characteristic of the wetland communities north and south of the project area includes blue joint reedgrass (*Calamagrostis canadensis*), scratchgrass (*Muhlenbergia asperifolia*), tufted hairgrass (*Deschampsia cespitosa*), Colorado rush (*Juncus confusus*), arctic rush (*Juncus arcticus*), slenderbeak sedge (*Carex athrostachya*), and clustered field sedge (*Carex praegracilis*). Willows (*Salix* spp.) are not typically a distinguishing feature in the wetland communities near the new housing area; however, based on field observation, scattered regeneration of willows following the fire is occurring. Much of the elk and moose preferred habitat is in the montane riparian willow wetlands of the Kawuneeche Valley; habitat in the new housing area is currently of lower quality (DHM 2022d).

Tables 3-1 through 3-3 provide the types and acreages of elk, moose, and mule deer habitat in the project area and analysis area. The project area is shown on Figure 1-1 in Chapter 1 and consists of the 43.5-acre new housing area, the 7.5-acre existing utility infrastructure area, the 5.6-acre potential staging area, and the 29.2-acre former Green Mountain-Onahu housing area (85.8 acres in total). The analysis area consists of the project area plus an approximate 6-mile surrounding radius. Figures 3-6 through 3-8 show the types and location of elk, moose, and mule deer habitat in the project area and analysis area. The figures also show a migration pattern for each species, a subjective indication of the general direction of herd movements.

**Table 3-1. Rocky Mountain Elk Habitat in the Project Area and Analysis Area**

Elk Habitat Type	Project Area (acres)	Analysis Area (acres)
Production area	85.8	14,312.9
Severe winter range	25.5	1,483.0
Summer concentration area	82.9	7,331.0
Summer range	82.9	66,256.8
Winter concentration area	22.7	1,389.2
Winter range	83.9	6,723.3

**Notes:**

Production area: The part of overall elk range occupied by females for calving from May 15 to June 15.

Severe winter range: Area where 90% of elk individuals are located when annual snowpack is at its maximum or when temperatures are at a minimum in the two worst winters out of ten.

Summer concentration area: Areas where elk concentrate from mid-June through mid-August.

Winter concentration area: The part of elk winter range where densities are at least 200% greater than the surrounding winter range density during the average five winters out of ten or during a site-specific period of winter.

Source: DHM (2022d).

**Table 3-2. Shiras Moose Habitat in the Project Area and Analysis Area**

Moose Habitat Type	Project Area (acres)	Analysis Area (acres)
Concentration area	85.8	39,001.7
Priority habitat	20.5	23,364.0
Winter range	61.6	22,791.6

Notes:

Concentration area: The part of the overall range where moose densities are at least 200% greater than the surrounding area.

Priority habitat: Habitat types associated with moose food and cover requirements. Significant loss of these habitats would change moose distribution and/or would adversely affect the population.

Winter range: The part of the overall range where 90% of moose individuals are located during the winter months.

Source: DHM (2022d).

**Table 3-3. Mule Deer Habitat in the Project Area and Analysis Area**

Mule Deer Habitat Type	Project Area (acres)	Analysis Area (acres)
Summer range	85.8	72,382.6

Note:

Summer range: The part of the overall mule deer range where 90% of the individuals are located between spring green-up and the first heavy snowfall.

Source: DHM (2022d).

## Ungulate Trends

### *East Troublesome Fire Trends on Habitat*

The East Troublesome Fire burned a significant amount of riparian willow habitat used by elk, moose, and mule deer (DHM 2022d). For elk, this resulted in a short-term loss of thermal cover and willow forage. A portion of the elk herd that summers in the Kawuneeche Valley (part of the East Troublesome herd) moves to winter range in areas outside the park that were burned by the fire; this herd may suffer short-term reductions in carrying capacity due to the temporary loss of forage and cover (NPS 2020b). However, as grasses and forbs continue to regenerate after the fire and the forest floor increases in productivity, herd carrying capacity is expected to increase (NPS 2020b).

The willow and wetland terrain along Onahu Creek (near the former Green Mountain-Onahu housing area) burned entirely, as did much of the willow along the nearby Colorado River (NPS 2020b). These two locations previously held high concentrations of moose and may have served as calving and nursery areas. The large scale of this burned area may cause animals to select habitat differently in the short term. However, moose should benefit as native seed in the forest floor generates and responds to an open canopy (NPS 2020b).

### *General Trends*

The abundance and distribution of elk using park winter range are in good condition (NPS 2017). Moose can be a concern for park management if populations increase to levels that have an adverse impact on willow and riparian communities (NPS 2017). Ongoing work to better understand moose effects on winter and summer ranges is occurring, as well as data collection to inform carrying capacity estimates (NPS 2020b). No trend data for mule deer in the park were identified.

The human population of Grand County has increased, resulting in more human activity (e.g., hiking, biking, jogging, walking dogs) in areas that provide elk habitat. The presence of humans and pets in important habitat areas often displaces ungulates from these habitat areas to areas with less human activity (DHM



2022d). This movement of ungulates to new areas could be increasing the use of transitional ranges that elk and mule deer typically occupied during spring and early winter (DHM 2022d).

Based on the ungulate literature review results, elk, moose, and mule deer populations generally appear to be stable within the park. Although the East Troublesome Fire resulted in habitat, cover, and forage losses for elk and moose, grass and forb regeneration in burned areas is expected to limit impacts to the short term. (DHM 2022d).

Climate change could adversely affect ungulate populations and habitat carrying capacity by decreasing water availability, increasing the presence of invasive species, increasing temperatures and dryness, changing vegetation communities, and forcing habitat shifts to higher elevations. However, the ways in which climate change will affect ungulates and ungulate habitat in the future remain speculative.

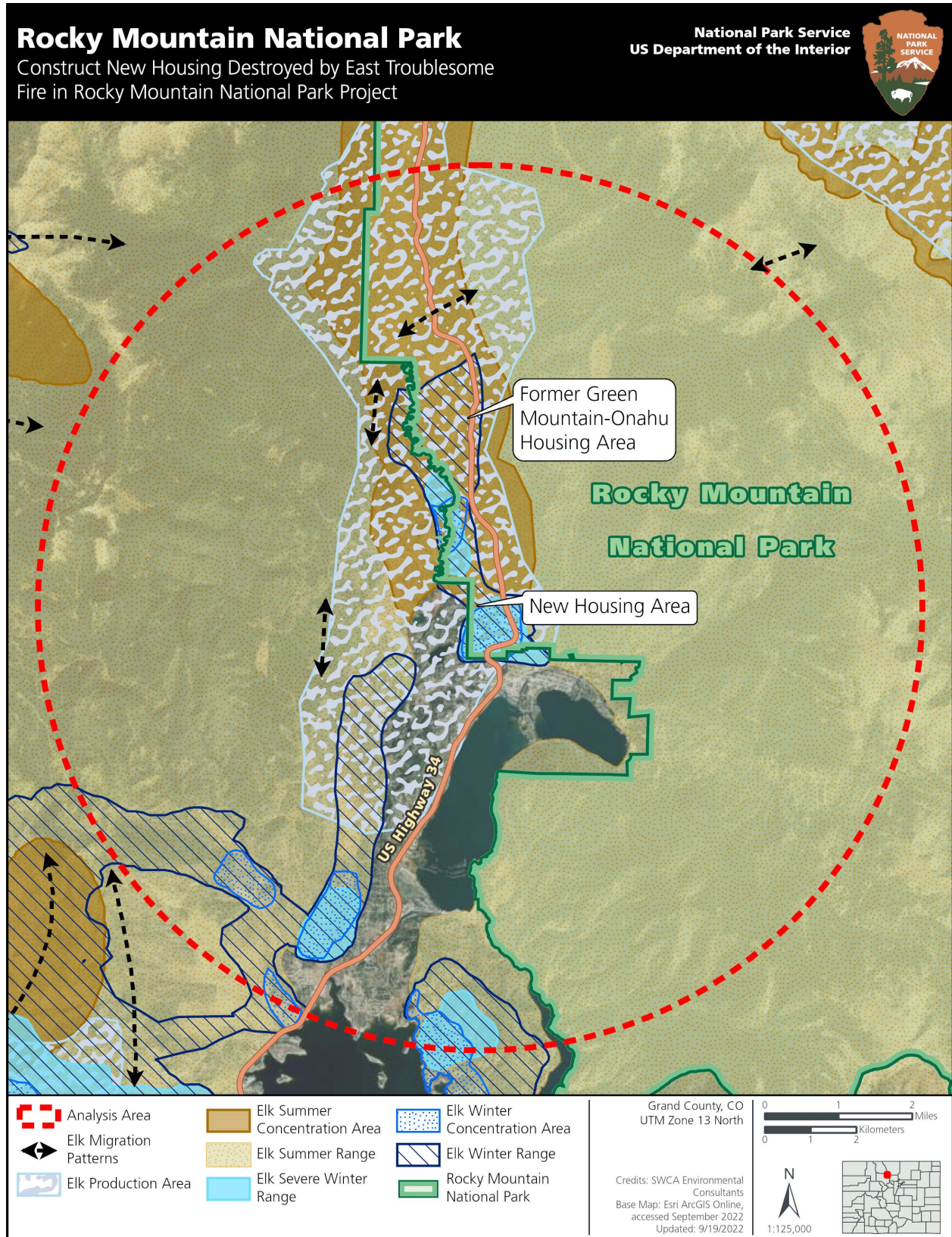


Figure 3-6. Rocky Mountain elk habitat in the project area and analysis area.



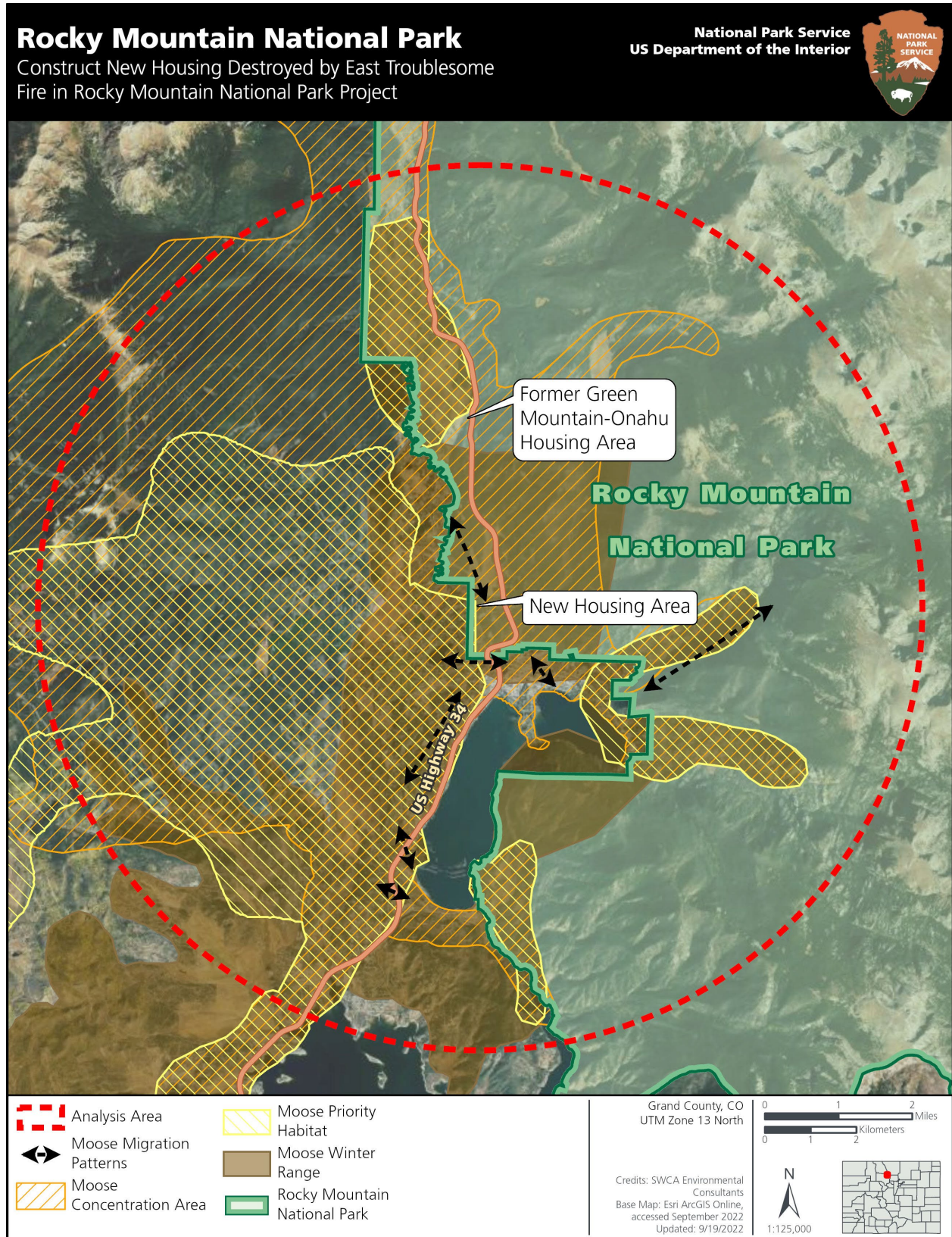


Figure 3-7. Shiras moose habitat in the project area and analysis area.



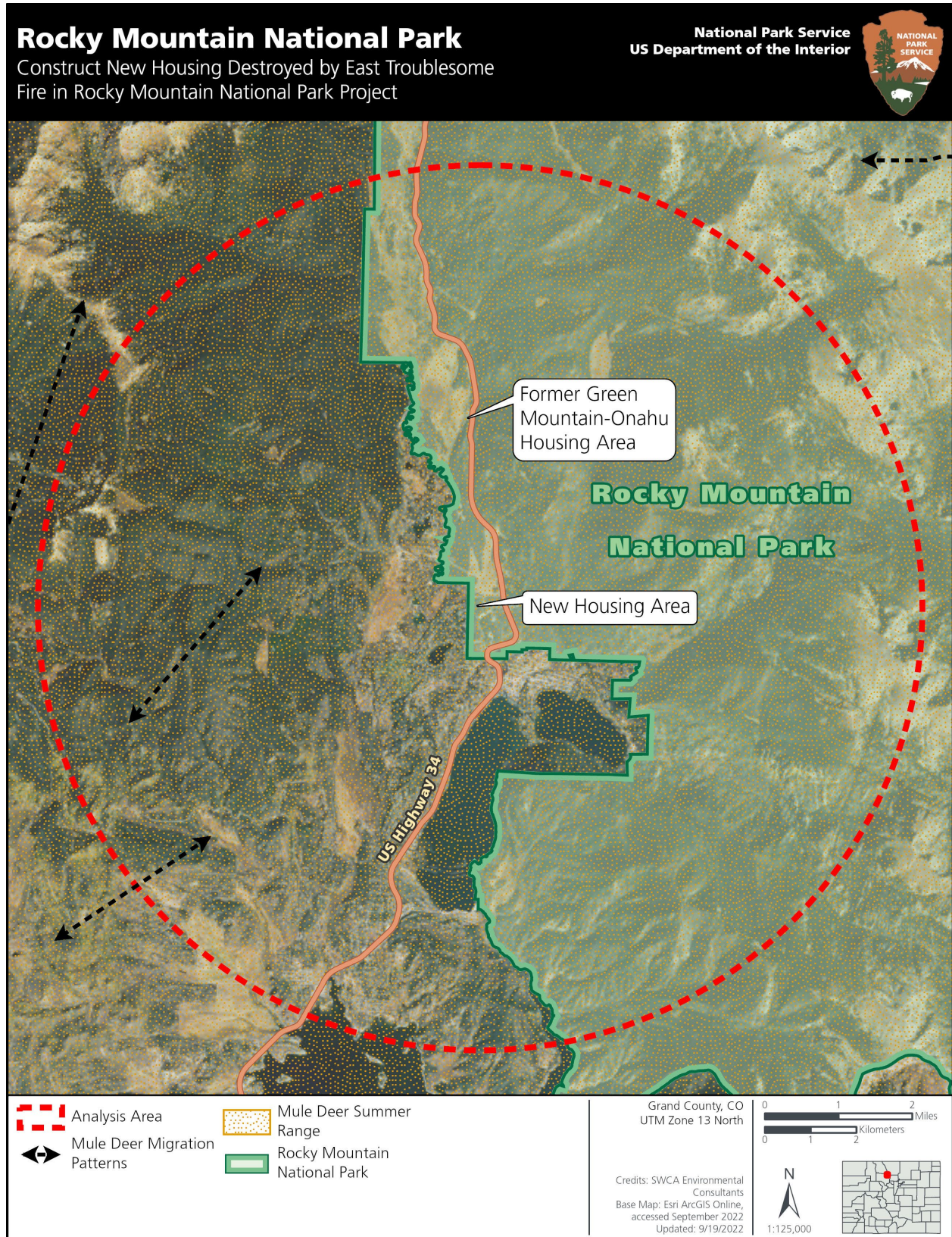


Figure 3-8. Mule Deer habitat in the project area and analysis area.

## Environmental Consequences

### Alternative A: No-Action Alternative

Under Alternative A, the NPS would continue to rent housing for Colorado River District staff in communities on the west side of the park. Alternative A would have no new impacts (e.g., habitat loss, habitat fragmentation, or permanent human noise) on ungulates in the project area because no new housing construction would occur. The common to all alternative actions taken regarding demotion of aboveground utilities and abandonment of belowground features at the former Green Mountain-Onahu housing area would not result in any measurable impact to wildlife species. It is unlikely ungulates will be present in this area, as it is currently fenced off and there is little to no available forage remaining due to the fire. The surrounding area currently offers more desirable conditions for ungulates.

### Alternative B: Proposed Action Alternative

Within the 43.5-acre new housing area, project construction and development would cause approximately 2.4 acres of permanent surface disturbance and up to 7.8 acres of temporary surface disturbance (temporarily disturbed areas would be reseeded). However, it is assumed that the entire 43.5 acres of the new housing area would not be ungulate habitat after project construction, because of the permanent presence of infrastructure and human activity and because it is assumed this analysis assumes that ungulates would not become acclimated to human presence. The entire new housing area is therefore considered permanent habitat loss for this analysis. Project activities in the existing utility infrastructure area (7.5 acres) and potential staging area (5.6 acres) would take place on previously disturbed land; it is assumed these areas are not currently preferred ungulate habitat and that completion of the proposed project would not change ungulate habitat or behavior in these areas. These areas are not included in the permanent habitat loss analysis.

Permanent ungulate habitat loss would occur in the new housing area. Table 3-4 provides more detail on the habitat types in which this habitat loss would occur, and the related percentage of habitat loss in the analysis area.

**Table 3-4. Ungulate Habitat Loss in the Proposed New Housing Area from Alternative B**

Ungulate Species and Habitat Type	Permanent Habitat Loss in the Proposed New Housing Area (acres)	Percentage of Habitat Loss in the Analysis Area
<b>Rocky Mountain Elk</b>	–	–
Production area	43.5	0.30%
Severe winter range	19.7	1.33%
Summer concentration area	40.5	0.55%
Summer range	40.5	0.06%
Winter concentration area	17.1	1.23%
Winter range	41.6	0.62%
<b>Shiras Moose</b>	–	–
Concentration areas	43.5	0.11%
Priority habitat	15.5	0.07%
Winter range	43.5	0.19%



Ungulate Species and Habitat Type	Permanent Habitat Loss in the Proposed New Housing Area (acres)	Percentage of Habitat Loss in the Analysis Area
Rocky Mountain Elk	–	–
Mule Deer	–	–
Summer range	43.5	0.06%

Impacts on ungulates would include the permanent loss of habitat, as shown in table 3-4, from project surface disturbance, vegetation removal, and the development and presence of housing units and other project elements. Permanent removal of vegetation alters the landscape and may result in changes to forage and cover used by wildlife and an overall reduction in available habitat (DHM 2022d). However, this loss is minimal in the context of the analysis area, and higher quality forage for ungulates is present in the nearby Kawuneeche Valley meadows (outside the project area); therefore, the proposed project's habitat loss is less likely to affect the overall health of elk, moose, and mule deer populations. Temporarily disturbed areas would be reseeded with native plant species and monitored for success.

Completion of the proposed project could impede movement of ungulates and would fragment habitat in an area that was otherwise intact prior to construction. Fragmentation of habitats creates disjunct islands of land that are less likely to be inhabited by larger species. Fragmentation can inhibit the safe movement of animals from one area to another (DHM 2022d). However, these effects would be reduced and would not affect the movement of elk because minimal habitat occurs in the project area when compared to the analysis area (see table 3-4), large tracts of high-quality habitat are present outside the project area, and ample connected habitat corridors are present in the park and surrounding areas (DHM 2022d).

The permanent presence of residents (and any pets) could encourage ungulates to relocate from the housing area. Human activities can cause changes to ungulate feeding and sleeping patterns or cause an individual animal to flush when a human or pet is encountered (DHM 2022d). These stresses can result in a decrease in energy reserves for an individual animal, which can affect an animal's health and ability to survive (DHM 2022d). Although individual animals would likely be affected by the development of the proposed project (including the new housing, staging area, and infrastructure) and aboveground utility demolition at the former Green Mountain-Onahu housing area, the health of overall ungulate populations is not expected to decrease because ungulate habitat in the project area is of lower quality than other nearby habitat.

Temporary effects on ungulates from human activity and noise during construction and development of the housing would include auditory and visual disturbances to individual animals present in or near the new housing area, which could cause physiological stress to the individuals. If ungulates are present in the project area during construction activities, some individuals may leave or avoid the immediate area, resulting in a temporary or permanent spatial redistribution of individuals or habitat-use patterns. Analysis of movement and species use of the project area indicated that the species use the area for rutting, breeding. However, the area is not different in either geology or vegetation from the surrounding areas such that the construction is anticipated to have a measurable impact on any of these life processes. These effects would be particular to individual animals. The new housing area is adjacent to the existing Colorado River District housing area; animals currently using this habitat may be habituated to human presence (e.g., elk are commonly found bedding down in residential areas and near US Highway 34 [DHM 2022d]).

Construction impacts could also occur from the use of temporary fencing for safety purposes and vegetation recovery. Fences act as barriers to wildlife species and can limit migration routes and access to habitats (DHM 2022d). Wildlife can also become entangled in plastic construction fencing, resulting in injury or death (DHM 2022d), but the park does not use plastic fencing. However, no formal migration routes were mapped by Colorado Parks and Wildlife directly in the project area (DHM 2022d). Therefore, while movement of

individual elk may be affected by fencing, effects to overall population abundance and movement are not anticipated.

Project design may reduce impacts on ungulates. Individual houses distributed over a greater area within a development have larger impact zones (DHM 2022d). Clustering units in a smaller area reduces the acreage of impact and the overall impact zone of a development (DHM 2022d). Clustered housing also preserves larger tracts of land outside direct impact areas. Although the proposed project consists of new permanent and temporary disturbance in the project area, it would be clustered and confined to approximately 10.2 acres. Extensive habitat is present outside the project area that would allow for wildlife movement, foraging, and cover (DHM 2022d). Other design considerations, such as use of native landscaping plants that are non-toxic to ungulates and wildlife-safe fencing practices, would also reduce adverse impacts on ungulate species.

### Cumulative Impacts

Reasonably foreseeable future actions with the potential to impact wildlife species in the new housing area and the former Green Mountain-Onahu housing area include fire-recovery construction projects (barn, proposed triplex, Grand Lake Entrance Station) and reconstruction of residential areas on private lands outside the park. Habitat degradation and reduction along with general wildlife disturbance from noise and human activities have impacted or may impact wildlife in the project area.

When the impacts of Alternative A are combined with those of past, present, and reasonably foreseeable actions, the cumulative impacts to wildlife from Alternative A would contribute temporary incremental impacts on ungulate population from demolition of aboveground fire-damaged utilities and the former Green Mountain-Onahu housing area and temporary anthropogenic noise and equipment use. However, this would not change the baseline level of disturbance impacting wildlife. Wildlife habitat and migration patterns would not be impacted under Alternative A because no new housing construction would occur in the park under this alternative. Therefore, Alternative A would contribute to but would not appreciably change the level of adverse impacts already occurring.

When the impacts of Alternative B are combined with reasonably foreseeable actions, cumulative impacts to wildlife would be adverse, with other actions contributing the majority of the impacts. This is because under Alternative B, a small percentage of lower quality ungulate habitat would be lost in the analysis area (see table 3-4). The loss of this habitat is not expected to result in measurable impacts on the overall health and welfare of the ungulate populations within the park that are expected to remain stable. Existing high-quality habitat within the park is not expected to be affected, and post-fire habitat regeneration trends are not expected to substantially change under this alternative.

In conclusion, under cumulative effects to ungulate populations, habitat and migration would continue to be adverse, but Alternative B would contribute minimally to these impacts. Cumulatively, Alternative B would contribute to but would not meaningfully increase adverse cumulative impacts because there would be no change to ungulate populations, a slight change to ungulate habitat (small loss of lower quality habitat and slightly increased use of higher quality habitat outside the project area), and no change in migration patterns.

## **CHAPTER 4: CONSULTATION AND COORDINATION**

### **INTRODUCTION**

This chapter describes the civic engagement, agency consultation, and Native American consultation conducted during the National Environmental Policy Act (NEPA) process for the proposed project.

NEPA regulations require an “early and open process to determine the scope of issues for analysis” (40 Code of Federal Regulations 1501.9). The internal scoping process for the project began in December 2021.

### **CIVIC ENGAGEMENT**

During early project design, NPS staff met with key stakeholders, which included local utility companies, Grand County, the Town of Grand Lake, and Colorado Parks and Wildlife, to discuss any concerns or questions they had about the proposed project. In addition to these informal conversations, pre-NEPA civic engagement included the following:

1. A stakeholder engagement plan
2. A newsletter mailed to 810 neighbors on June 24, 2022
3. An email with project information sent to stakeholders and other local and consulting agencies on June 24, 2022
4. A press release issued on June 28, 2022
5. Tribal invitations sent on May 12, 2022
6. A virtual stakeholder meeting on Tuesday, July 12
7. A virtual public meeting on Tuesday, July 12, 2022 (33 attendees)
8. A virtual tribal meeting on July 14, 2022
9. An open comment period from July 1 to 31, 2022

The pre-NEPA civic engagement information directed interested parties to the park’s website (<https://www.nps.gov/romo/getinvolved/proposal-to-construct-new-housing-destroyed-by-the-east-troublesome-fire.htm>) and to the NPS Planning, Environment and Public Comment website where they could find a project description, a link to a StoryMap about the proposed project and related resources, supporting documents, and information on attending the virtual public meeting.

During the pre-NEPA civic engagement comment period, the NPS received 26 correspondences in response to the topic question “What issues or concerns should park staff consider as the project planning proceeds?” Commenters primarily provided input on wildlife, traffic, cultural resources, the range of alternatives, and building design components. Pre-NEPA comments are summarized as follows:

#### **General Support or Opposition**

Most commentors expressed general support for the proposed project to address the park’s housing needs and ability to recruit and retain essential staff. Two commenters expressed opposition about the need for the proposed project and regarding the opportunity for less development and structures in the park.

### Range of Alternatives - Other Ideas for Housing

No new potential alternatives were identified that were not already identified for analysis in the EA. Commentors suggested the NPS buy, lease, or build housing outside the park in nearby communities, rebuild lost housing in the former location, and construct RV sites.

### Traffic

One commentor expressed concern that the proposed project and possible future expansion would increase the amount of traffic.

### Protection of Natural and Cultural Resources

There were no new issues raised or topics to be considered in the potential affected environment that are not already identified for analysis in the EA. Two commenters expressed concerns the proposed project would result in impacts on wildlife habitat, including housing density. One commenter expressed concern about a cultural resource associated with the Harbison family. The NPS is conducting a study of this resource using information provided by the commenter. The site is not in the construction area and would not be affected by the proposed project.

### Building and Site Design Components

Multiple comments were received on building aesthetics, expressing preference for rustic and/or historic appearance, as well as building layout to emphasize and preserve personal privacy in shared units and to create a desirable living space. Several comments encouraged various design components such as sustainable and fire-resistant materials and landscaping, and building efficiencies (low energy). Other comments included an interior sprinkler system, solar, satellite communication capability, and metal roofs. One commentor requested the crossing of the entrance driveway and snowmobile trail include a gentle grade for safety purposes.

## **STAKEHOLDER OUTREACH**

The NPS conducted outreach to the following stakeholders to identify potential issues of concern and availability of data as they relate to the proposed project:

### **Government Agencies**

- Colorado SHPO
- Grand County Board of County Commissioners
- Grand County Manager
- Grand County Planning and Zoning
- Grand County Road and Bridge
- Grand County Water Protection Department
- Northern Water
- Three Lakes Water and Sanitation District
- Town of Grand Lake Board of Trustees
- Town of Grand Lake Chamber of Commerce

- Town of Grand Lake Fire Protection District
- Town of Grand Lake Manager
- US Army Corps of Engineers, Albuquerque District, Northwest Colorado Branch
- US Bureau of Reclamation, Eastern Colorado Area Office
- US Fish and Wildlife Service, Colorado Ecological Services Field Office
- US Forest Service, Arapaho and Roosevelt National Forests

#### Other Organizations

- Columbine Lakes Homeowners Association
- Grand Lake Trail Grooming, Inc.
- Harbison Ditch Management
- Winding River Resort

The NPS held a virtual meeting on Tuesday, July 12, 2022, from 2:00 to 3:00 p.m. Mountain Standard Time (MST) to provide project information. During the meeting, one stakeholder asked questions about the existing livery trail near the west side of the project area and how stock use may be affected. One stakeholder expressed interest in how the work may affect the existing snowmobile trail and whether the trail would be realigned.

## **SECTION 7 OF THE ENDANGERED SPECIES ACT**

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that the actions they authorize, fund, or carry out do not jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. As described in Table 1-1, no plant or wildlife species listed or proposed for listing under the ESA or designated critical habitat were identified in the project area.

## **SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT**

Compliance with Section 106 of the National Historic Preservation Act is being conducted in coordination with the Colorado SHPO, affected tribes, and the public concurrently during the NEPA planning process.

## **NATIVE AMERICAN CONSULTATION**

The following Native American tribes were contacted and invited to participate in the planning process:

1. Southern Ute Indian Tribe of the Southern Ute Reservation
2. Ute Mountain Tribe of the Ute Mountain Reservation
3. Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
4. Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation
5. Cheyenne and Arapaho Tribes
6. Comanche Nation
7. Ute Indian Tribe of the Uintah and Ouray Reservation
8. Arapaho Tribe of the Wind River Reservation

9. Shoshone Tribe of the Wind River Reservation

A virtual meeting was held on Thursday, July 14, from 2:00 to 3:00 p.m. Mountain standard time specifically for interested Native American tribes. Consultation will continue throughout the NEPA planning process.



## CHAPTER 5: REFERENCES

Anderson, Michelle D.

- 2003 "Botanical and Ecological Characters. Species: *Pinus contorta* var. *latifolia*." US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed September 21, 2022.  
<https://www.fs.usda.gov/database/feis/plants/tree/pinconl/all.html#BOTANICAL%20AND%20ECOLOGICAL%20CHARACTERISTICS>.

Armstrong, David M.

- 2022 "Colorado Department of Wildlife. Species Profiles." Accessed May 3, 2022.  
<https://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx>.

Daniels, Megan, and Trevor Mark

- 2022 "Intensive Level Architectural Survey of the Grand Lake Entrance Area in Rocky Mountain National Park, Grand County, Colorado." Cultural Resources Report No. 21-732. Salt Lake City, Utah: SWCA Environmental Consultants.

DHM Design Corporation

- 2021 "Suspected Special Status Plant Species Summary of Findings Report – DRAFT, Reconstruct Housing and Infrastructure Destroyed by Fire Preliminary Field Surveys # 316133, Rocky Mountain National Park, Grand County, Colorado." Final report prepared for National Park Service. December 13, 2021.
- 2022a "Aquatic Resource Delineation Report Construct New Housing Destroyed by East Troublesome Fire, Rocky Mountain National Park, Grand County, Colorado." Final report prepared for National Park Service. August 12, 2022.
- 2022b "Special Status Plant Species and Noxious Vegetation Report, Construct New Housing Destroyed by East Troublesome Fire, Rocky Mountain National Park, Grand County, Colorado." Final report prepared for National Park Service. August 16, 2022.
- 2022c "Visual and Line of Sight Assessment Report Reconstruct Housing and Infrastructure Destroyed by Fire #316133, Rocky Mountain National Park, Grand County, Colorado May 2022." Final report prepared for National Park Service. May 2022.
- 2022d "Ungulate (Elk and Moose and Mule Deer) Literature Review Construct New Housing Destroyed by East Troublesome Fire in Rocky Mountain National Park, #316133 Rocky Mountain National Park, Grand Lake County, Colorado." Final report prepared for National Park Service. June 2022.

East Troublesome Post-Fire BAER Burned Area Emergency Response

- 2021 "One year later: Partners reflect on East Troublesome Fire Recovery." *East Troublesome Post-Fire BAER Burned Area Emergency Response*. October 14, 2021. InciWeb – Incident Information System. Accessed February 10, 2022. <https://inciweb.nwcg.gov/incident/article/7267/67604/>.

Engleman, Jenny, Sean Larmore, Katherine Mayo, Marcus Espinosa

- 2019 "Class III Surveys of Select Trails, Rocky Mountain National Park, Grand County, Colorado." SHPO Report ID: GA.NP.R28. Denver, Colorado: ERO Resources Corporation.

Engleman, Jenny, Katherine Mayo, and Sean Larmore

- 2020 "Class III Archeological Inventory for Housing Projects at Rocky Mountain National Park. Grand and Larimer Counties, Colorado." SHPO Report ID: MC.NP.R83. Denver, Colorado: ERO Resources Corporation.

Gayou, Gheda

- 1997a Colorado Cultural Resource Survey Management Data Form for Site 5 GA 2234. Prepared by the National Park Service, Denver, Colorado. Copies available from the Colorado Historic Society, Office of Archaeology & Historic Preservation, Denver, Colorado.
- 1997b Colorado Cultural Resource Survey Management Data Form for Site 5 GA 2233. Prepared by the National Park Service, Denver, Colorado. Copies available from the Colorado Historic Society, Office of Archaeology & Historic Preservation, Denver, Colorado.

Jackson, Dan

- 2021 "Rocky Mountain National Park. October 21-24, 2020, East Troublesome Fire Event: Impacted Buildings Inventory." On file at SWCA Environmental Consultants, Salt Lake City, Utah.

Ketz, A.C., T.L. Johnson, R.J. Monello, and N.T. Hobbs

- 2016 "Informing management with monitoring data: the value of Bayesian forecasting." *Ecosphere* 7(11):e01587. 10.1002/ecs2.1587.

LaShier, Keith E., Eve M. Meek, Charles L. Horne III, Jennifer H. Owji, Kelly L. Terrell, and Margaret R. Vinciguerra

- 2012 "Rocky Mountain National Park Housing Needs Assessment and Certification." Report NPS11T3. On file at SWCA Environmental Consultants, Salt Lake City, Utah.

National Park Service (NPS)

- 2006 "Management Policies 2006." Accessed February 10, 2022.  
<https://www.nps.gov/orgs/1548/upload/ManagementPolicies2006.pdf>.
- 2009 "Climate Change in Rocky Mountain National Park." Preservation in the Face of Uncertainty. Accessed August 9, 2022.  
<https://www.nps.gov/subjects/climatechange/parkclimatescience.htm#154B5675A36EEBD47DEC18C2E560627C>.
- 2013 "Foundation Document. Rocky Mountain National Park. Colorado." Accessed May 16, 2022.  
[https://www.nps.gov/romo/learn/management/upload/ROMO\\_Foundation\\_Document.pdf](https://www.nps.gov/romo/learn/management/upload/ROMO_Foundation_Document.pdf).
- 2015a "National Park Service NEPA Handbook." Accessed February 11, 2022.  
<https://www.nps.gov/subjects/nepa/policy.htm>.
- 2015b "Elk and Vegetation Management Plan." Accessed May 3, 2022.  
<https://www.nps.gov/romo/learn/management/elk-and-vegetation-management-plan.htm>.
- 2017 "State of the Park Report Rocky Mountain National Park." State of the Park Series No. 50. National Park Service, Washington, DC. Accessed May 16, 2022.  
<https://irma.nps.gov/DataStore/Reference/Profile/2248390>.
- 2018 "Mule Deer." Accessed May 3, 2022. [https://www.nps.gov/romo/learn/nature/mule\\_deer.htm](https://www.nps.gov/romo/learn/nature/mule_deer.htm).
- 2019 "Elk & Vegetation Management Plan." Accessed May 3, 2022.  
<https://www.nps.gov/romo/learn/management/elkvegetation.htm>.

- 2019 Rocky Mountain National Park Exotic Plant Management Plan Environmental Assessment. February 2019.
- 2020a "Emergency Stabilization and Burned Area Rehabilitation Plan. East Troublesome Fire." On file at SWCA Environmental Consultants, Salt Lake City, Utah.
- 2020b "Cultural Landscape Inventory." Green Mountain and Onahu Ranches. Rocky Mountain National Park. Incomplete draft.
- 2021a "Housing Analysis." Rocky Mountain National Park, Colorado River District. Presentation. On file at SWCA Environmental Consultants, Salt Lake City, Utah.
- 2021b "ROMO 316133 Reconstruct Housing and Infrastructure Destroyed by Fire." Project Concept Review. Bureau Investment Review Board. Presentation. National Park Service. Interior Region 7 – IMR. Rocky Mountain National Park. On file at SWCA Environmental Consultants, Salt Lake City, Utah.
- 2022a "NPS Stats." National Park Service Visitor Use Statistics. Park Reports. Rocky Mountain National Park (ROMO) Reports. Annual Park Recreation Visits (1915 – Last Calendar Year). Accessed March 7, 2022. <https://irma.nps.gov/STATS/Reports/Park/ROMO>.
- 2022b "NPS Stats." National Park Service Visitor Use Statistics. Park Reports. Rocky Mountain National Park (ROMO) Reports. Recreation Visits By Month (1979 – Last Calendar Year). Accessed March 7, 2022. <https://irma.nps.gov/STATS/Reports/Park/ROMO>.
- Rice, J.R., L.A. Joyce, C. Regan, D. Winters, and R. Truex
- 2018 "Climate change vulnerability assessment of aquatic and terrestrial ecosystems in the U.S. Forest Service Rocky Mountain Region." Gen. Tech. Rep. RMRS-GTR-376. Fort Collins, Colorado: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- SEH
- 2022 "Traffic Impact Study. ROMO Reconstruct Housing and Infrastructure Destroyed by Fire Housing Project #2." 164611. ROMO 316133. PEPC: 99824. August 8, 2022.

*This page intentionally left blank.*