



## **Backcountry Camp Modifications in North Cascades National Park Environmental Assessment**



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January 2023

U.S. Department of the Interior  
National Park Service

## **ON THE COVER**

In this photo the sun is shining through the morning fog and a backpacker is standing on the Pacific Crest Trail in North Cascades National Park.

NPS photo / Bender

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# CHAPTER 1 - INTRODUCTION

## 1.1: PROPOSAL

The National Park Service (NPS) is proposing two projects in the North Cascades National Park. The first project consists of rerouting a 2,400-foot section of the Brush Creek Trail and the relocation of the Graybeal Hiker and Stock Camps along the Brush Creek Trail. The second project consists of the construction of additional backcountry camp accommodations at Six Mile Camp and Bridge Creek Camp primarily for Pacific Crest National Scenic Trail (PCT) long-distance permit holders (Figure 1).

## 1.2: BACKGROUND

The trails and associated designated campsites related to the proposed action are all located within North Cascades National Park (NOCA) which is one of three units that comprise North Cascades National Park Service Complex (The Complex). Graybeal Hiker and Stock Camps and Brush Creek Trail are in the northern unit of NOCA, and Six Mile Camp and Bridge Creek Camp are in the southern unit of NOCA (Figure 1). All project sites are located within or adjacent to the congressionally designated Stephen Mather Wilderness. Bridge Creek camp is outside of but in close proximity to the wilderness boundary.

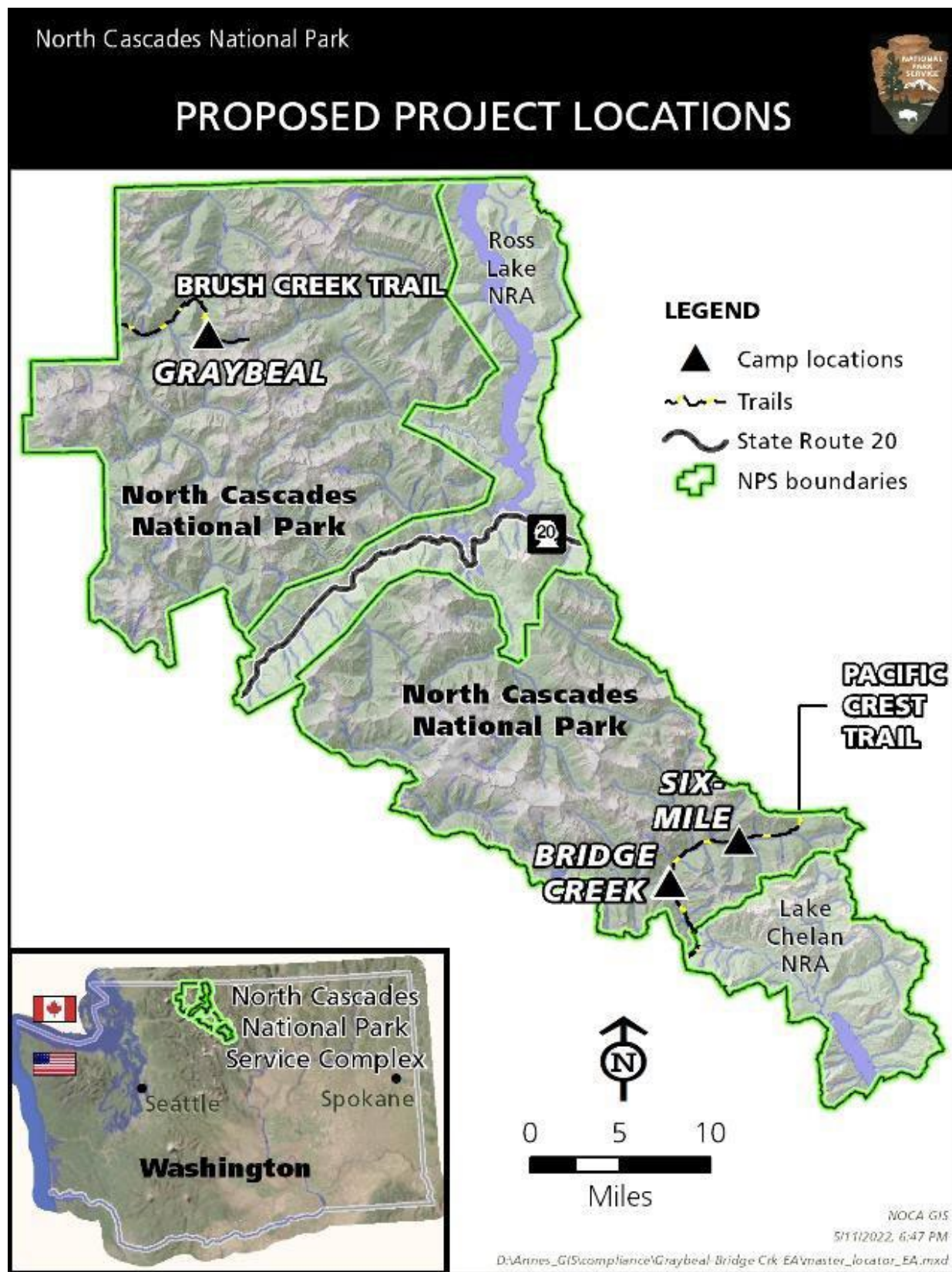
The NPS has maintained these trails and campsites for pack stock and hikers for over fifty years. The trails are maintained to standards established in the park's Trails Handbook (NPS no date)

The NPS conducts a hazard tree abatement program for designated campsites in accordance with National Park Service Pacific West Region Directive PW-062 (NPS 2015). The objective of this directive is, "to provide parks with a framework for a hazard tree program that will minimize threats to life and property from the failure of hazard trees within developed areas, consistent with the NPS mission of conserving parks' natural and cultural resources." The directive expressly addresses designated campsites in wilderness, "Where wilderness or backcountry campsites or other developments are designated and assigned by the NPS, e.g., permitted campsites, these areas should be identified for inclusion in the hazard tree management program, and such sites should be surveyed, and hazards abated/mitigated."

Camping along the maintained trail system in the backcountry of The Complex is allowed only in designated camps and an overnight permit is required which limits the number of parties using a campsite each night. Depending on the size of the campsites, each can accommodate parties of 4 to 12 people. The system of designated camps and overnight permits is intended to contain, concentrate, and limit recreational use to specific areas and times, with the goal of reducing impacts to natural and cultural resources and providing a sense of solitude for users. The NPS endeavors to establish and maintain trails and campsites that are designed and sited to minimize the amount of maintenance and repairs required though time. More information about the backcountry permit system can be found on the [Wilderness Trip Planner on the park's website](#) (NPS 2022).

Amenities of the backcountry campsites typically include spaces allocated for a cooking/campfire area, tent pads, primitive toilets, and when applicable, stock animal areas with hitching rails. Some camps are equipped with wildlife-resistant food storage lockers ("bear boxes") and some stock camps have a metal storage box, which are utilized by trail crews to store tools and supplies. The designated camps are connected to the main trail system by short access trails and there may be multiple campsites within each camp area for different groups.

Figure 1. This map shows the approximate locations for the proposed actions in North Cascades National Park Service Complex.





### **1.2.1: Brush Creek Trail and Graybeal Camps**

Brush Creek Trail is 5.2 miles long and connects the Chilliwack Trail with Little Beaver Trail providing passage over Whatcom Pass (Figure 2). The trail ranges in elevation from 2750 to 5200 feet. The NPS endeavors to maintain this route for stock accessibility but it has been blocked for stock access mid-way on the trail due to repeated flood damage since 2003. In addition, wildfire in 2022 also severely damaged portions of the trail which will further limit stock access until those segments can be repaired. The Pacific Northwest National Scenic Trail (PNT) also follows this route.

The Graybeal Hiker and Stock Camps are located along the Brush Creek Trail and are within a few hundred yards of each other located approximately two miles up the Brush Creek Valley from the junction with the Chilliwack Trail (Figure 2).

Both camps are available to anyone for overnight camping by permit. In addition to members of the public and guided groups, the campsites are also utilized by park staff, including rangers, resource management staff, and trail maintenance crews working in the area. These camps are used by backcountry travelers who, for example, may be headed to Whatcom Pass and the alpine areas accessed from there, hiking the Copper Loop Trail, or are traversing the Pacific Northwest National Scenic Trail. The camps receive moderate use and are full on average of 20% of available nights during the peak season from July through September. Use varies from year to year (Figure 3 and Appendix A) and is dependent on factors such as presence of deep and persistent snowpack that is characteristic of the North Cascades, wildfire, wildfire smoke, global pandemics, and other factors.

In 2022, several wildfires of the [Chilliwack Complex burned nearly 7,000 acres in the Chilliwack watershed](#) including a significant portion of forests on the north valley wall of Brush Creek. Portions of the Brush Creek Trail and the existing camps, as well as the hillslopes above, were burned or otherwise affected by the fire and are anticipated to be closed for the 2023 summer season and possibly beyond. This occurred as the NPS was finalizing details for relocating Graybeal Hiker and Stock Camps, however the effects of the fire have cast doubt on the originally proposed locations of these camps and more flexibility for siting these camps is included in the proposed action because of anticipated fire effects

Figure 2. Map showing Brush Creek Trail and surrounding area and camps.

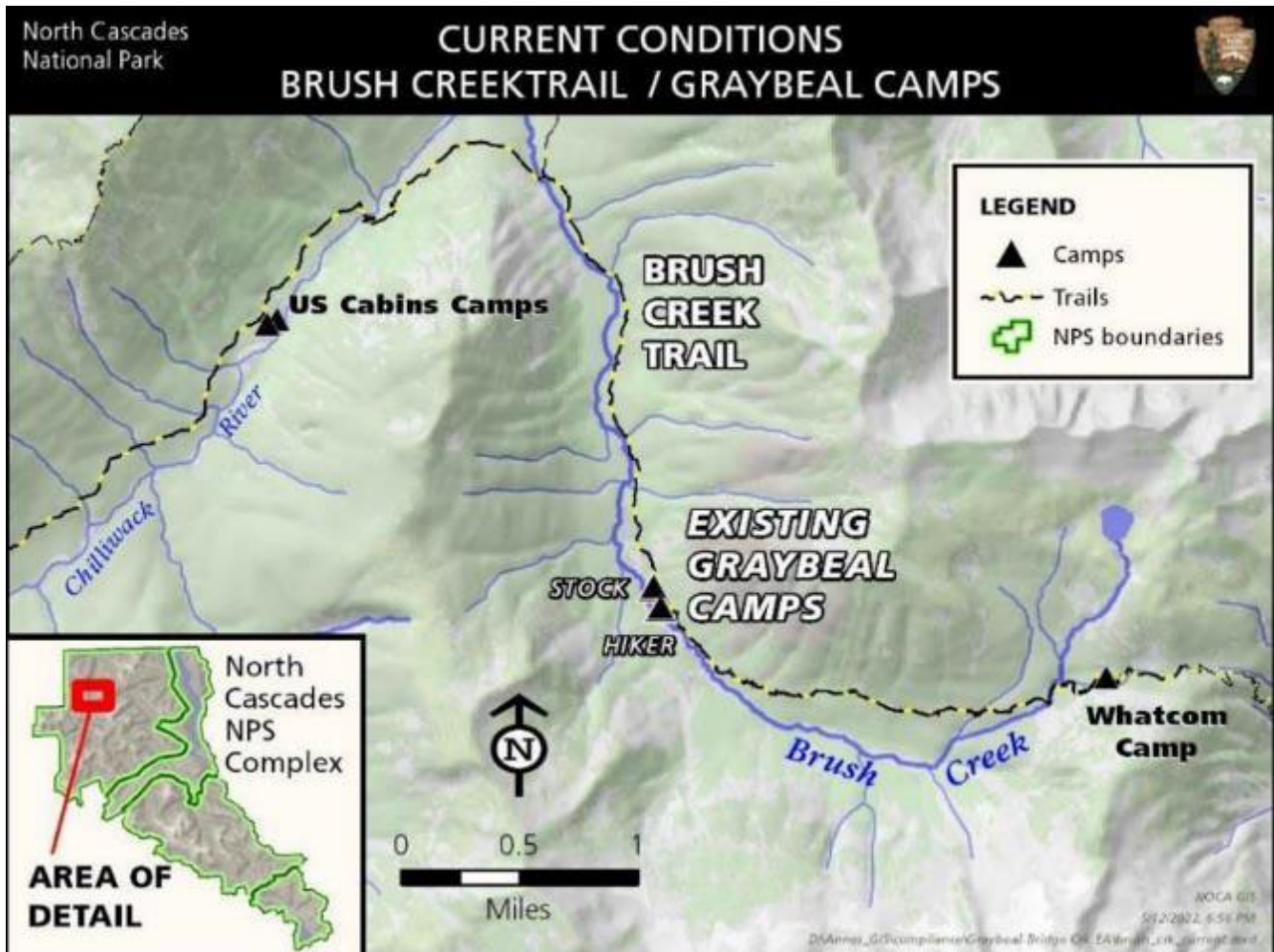
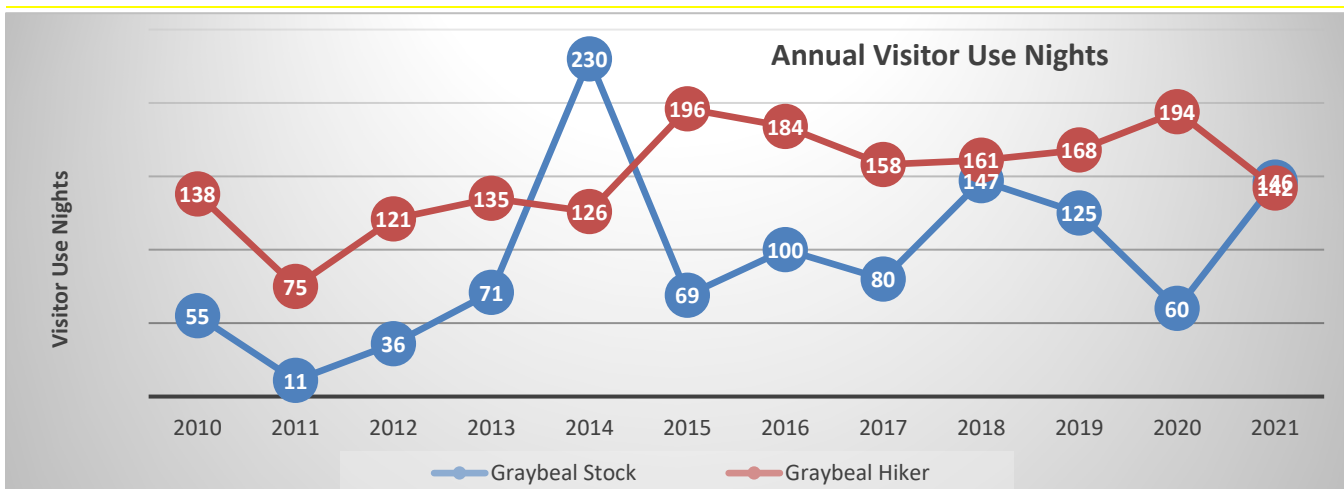


Figure 3. Total overnight use from backcountry permit data for Graybeal Hiker and Stock Camps. The data represented in this graph is visitor use nights (VUN) which is the sum of all nights spent by all people at each camp. Appendix A has more extensive data for additional camps in the area.





### 1.2.2: Pacific Crest Trail and Six Mile and Bridge Creek Camps

Approximately 17.9 miles of the PCT is located within NOCA at elevations that range from 1400 feet to 4000 feet (Figure 4). Travelling north, users reach the Bridge Creek Camp 5.0 miles north of High Bridge. A further 5.3 miles north they pass by Six Mile Camp. About 15.8 miles north of High Bridge northbound PCT travelers exit NOCA and enter the Methow Valley Ranger District of the Okanogan-Wenatchee National Forest.

This segment of trail is maintained for foot and stock use. It currently contains twelve designated campsites (Figure 4). This section of trail also provides the shortest and least difficult hiker and stock access from the Washington State Route 20 highway to the town of Stehekin, and it connects to several other trails such as the Upper Stehekin Valley Trail and the McAlester-Rainbow Loop. This section of trail is popular with a variety of users including PCT long-distance hikers, backpackers, day users, and stock. (Note: currently there is only a foot bridge available and no stock bridge or ford available on the PCT near North Fork Camp in NOCA. The NPS is addressing this issue separately from this proposal).

Peak use on the trail is typically between late June and mid-September and varies by user group. Overall general use (stock, day use, backpacking) peaks during weekends and especially the 4<sup>th</sup> of July and Labor Day Holiday weekends (Figure 5). Long-distance PCT hikers use this section of trail typically between mid-June and mid-October every year with a smaller wave of southbound hikers in July and a larger wave of northbound hikers from mid-August to mid-September (Figure 6).

An additional characteristic of visitor use, particularly PCT hikers is the draw of the town and post office at Stehekin. Many hikers take the shuttle back and forth from High Bridge on the Stehekin Valley Road to Stehekin and back (Figure 4).

Figure 4. Map showing Pacific Crest Trail in NOCA.

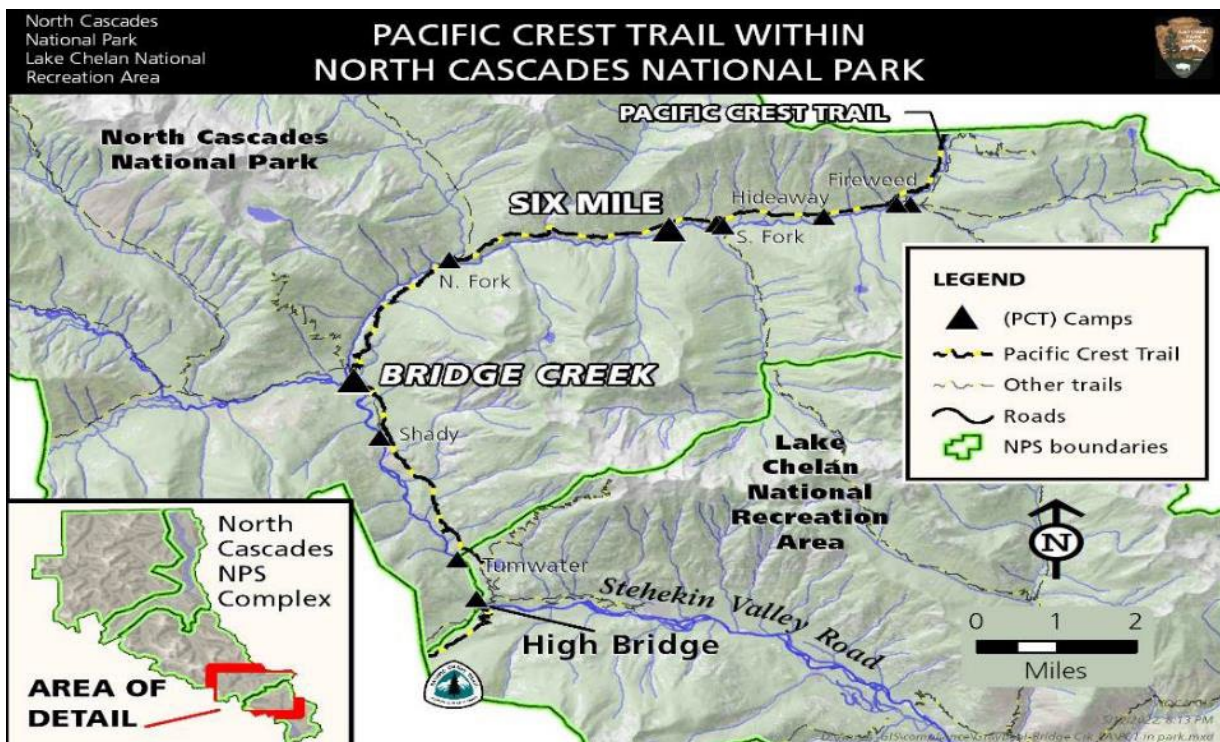
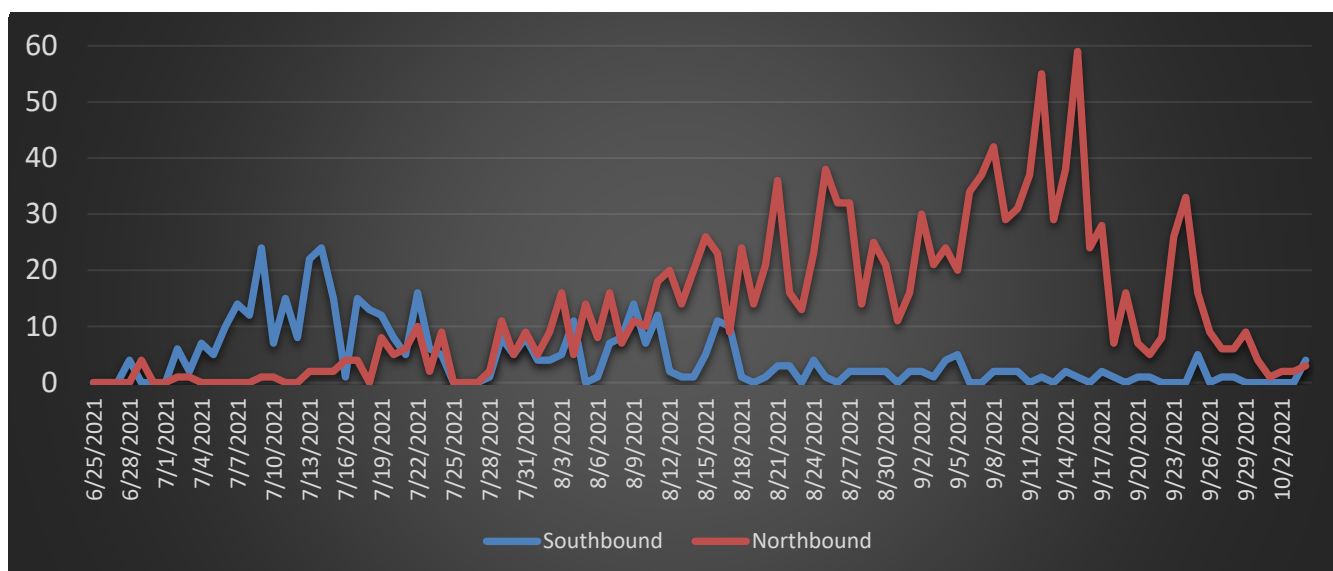


Figure 5. Graph showing hiker and stock use levels from 2017 to 2021 on the Pacific Crest Trail just south of the northern NPS boundary. Most of this use is by overnight users but may reflect a few day hikers. This use is not just PCT long-distance hikers but also backpackers and stock users on shorter trips that are permitted with a NPS backcountry permit. Values for the graph were generated by calculating a 7-day moving average on total daily passes from the trail counter. These passes include both northbound and southbound traffic and represent total traffic rather than the number of people/stock crossing the counter. The counter is an TRAFx infrared trail counter.



Figure 6. Graph showing passes of the trail counter in the Suiattle area in 2021 on the PCT south of the Park Complex in the Darrington Ranger District of the US Forest Service. This location used two counters to determine if users were travelling northbound or southbound. This trail counter location is thought to catch primarily PCT long-distance hikers and provides a ceiling estimate on the number of long-distance hikers passing this portion of the trail. Data courtesy of George Winters and US Forest Service.



Backcountry overnight permit data summarized from 2010 to 2021 show overall camping use at these camps saw a 45% increase in 2016 (Figure 7). After leveling out for a couple years, use in 2019 jumped 13% from the previous year. The onset of the COVID-19 pandemic in early 2020 caused a sharp drop in use with public lands closed part of the summer season and PCT long-distance hiking was discouraged by the US Forest Service. Use levels in 2021 appear lower on Figure 7 because PCT long-distance permit holders no longer need to obtain a NOCA overnight backcountry permit. However, Stehekin Post Office parcel data show that PCT hiker use in 2021 appears to have rebounded to post-2016 levels (Figure 8).

In 2020, the NPS designated Six Mile Camp and a portion of the hiker camp at Bridge Creek as drop-in camps for hikers holding a PCT long-distance permit issued by the Pacific Crest Trail Association. The drop-in camps were implemented to avoid crowding and user conflicts during peak season and provide a solution more aligned with the travel patterns of long-distance hikers (see more details in the Purpose and Need section below). PCT hikers may also obtain a NPS backcountry permit to stay at any of the other designated camps along the trail.

In 2020, the Pacific Crest Trail Association (PCTA) and the US Forest Service (USFS) instituted a limit of 15 southbound hikers per day, which helps to limit hikers exceeding campsite capacity eliminate camping areas from being overwhelmed with too many people starting in one day near the northern terminus of the trail, including the Park Complex. This appears to have reduced crowding impacts seen at camping areas at Stehekin in 2019. The PCTA and USFS also have a limit of 50 northbound hikers per day from the southern terminus of the trail, however, given the distance between the southern terminus and NOCA this has much less effect once hikers spread out along the trail.

Figure 7. Graph showing annual visitor use nights from the NOCA overnight backcountry database. Each data series is the total visitor use nights (VUN) from a number of camps. Stehekin Landing all includes Purple Point Camp, Lakeview camps and Stehekin Landing Overflow. High Bridge Area includes High Bridge Camp, Tumwater Camp, and Shady Camp. All Bridge Creek includes Bridge Creek Hiker, Stock, and Group Camps. Wilderness Corridor Total includes North Fork, Six Mile, South Fork, South Fork Stock, Hideaway, Fireweed, and Fireweed Stock Camps. Stehekin Landing camps are no longer permitted as a backcountry permit and thus has no data starting in 2020.

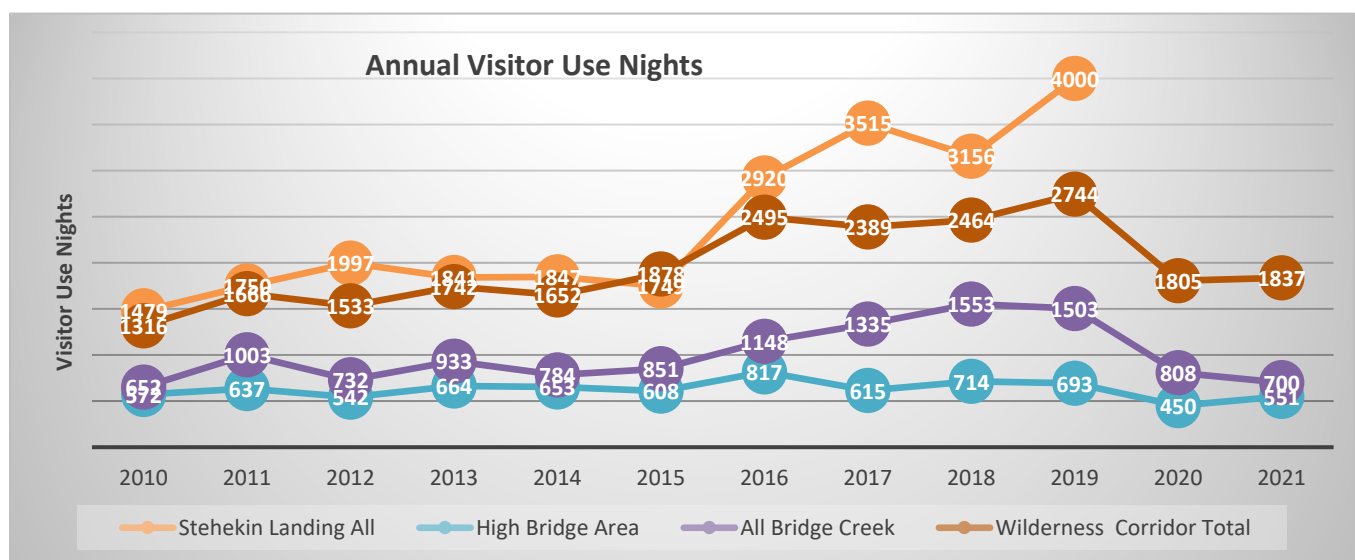
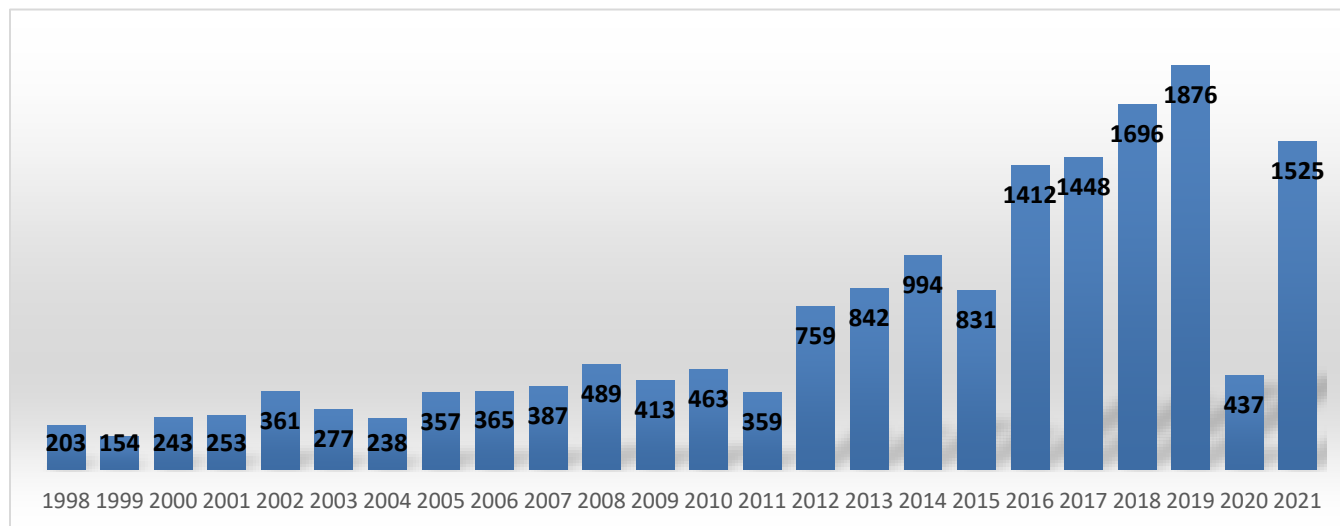


Figure 8. Graph showing packages picked up by PCT hikers at the Stehekin Post Office between 1998 and 2021. While it does not reflect the total number of hikers it represents an index of the relative number each year. Source: US Postal Service.



### 1.3: PURPOSE AND NEED FOR ACTION

Considering recent environmental and visitor use changes (discussed above), the purpose of this action is to maintain existing, and create new, overnight backcountry camping opportunities while preserving wilderness character and conserving the natural and cultural resources in North Cascades National Park Service Complex. Specific attention is given to minimizing and managing the impacts associated with backcountry recreation (hiking, backpacking, and stock packing).

The need for this project arises from both existing conditions and the mandates prescribed by the Organic Act of 1916, the Wilderness Act of 1964, and the National Trails System Act of 1968 (as amended). The North Cascades National Park Wilderness Management Plan (NPS 1989) also addresses maintaining wilderness character, allowing for backcountry recreation, and minimizing impacts to resources. These documents provide the legislative and policy framework for the NPS and its actions, including the proposed action.

#### 1.3.1: *Brush Creek Trail Reroute*

A 2,400-foot reroute of Brush Creek Trail near Graybeal Hiker and Stock Camps is being proposed to maintain this travel corridor for more sustainable use by stock and hikers. A section of the existing trail was washed out by floods in 2003, 2006, and 2017 (Figure 9), rendering the upper three miles of this trail impassable by stock. This is problematic as the NPS has committed to keeping this trail passable for stock users. Stock use is important for trail maintenance as the park’s Stock Packer relies on this trail to bring in equipment and supplies with stock animals. Without stock access, the crew spends additional time hauling equipment to and from worksites (The nearest stock camp is U.S. Cabin; Figure 2). This reduces the amount of maintenance possible in the area, given the short duration of the summer work season. Additionally, rerouting the trail out of the floodplain zone would prevent further damage to the trail, ease maintenance requirements, reduce costs, and allow natural processes in the floodplain to occur unhindered. It is anticipated that this reroute will still be required given the fires that occurred in 2022.



Figure 9. Photo showing damage to a portion of the Brush Creek Trail resulting from multiple flood events.



### **1.3.2: Graybeal Hiker and Stock Camps**

Relocations of Graybeal Hiker Camp is necessary because of the repeated damage due to flooding occurring in Brush Creek in 2003, 2006, 2017, and 2021 and wildfire damage in 2022. The relocation of the Graybeal Stock Camp is due to the future threat of flooding and 2022 wildfire damage. This flooding is believed to have increased aggradation in Brush Creek near the current Graybeal Hiker and Stock Camps. In essence, large volumes of sediment are being moved downstream, which raises the elevation of the stream channel making both camp areas more susceptible to flooding.

The 2006 NPS Management Policies provide clear guidance on minimizing impacts to streams:

#### **4.6.6 Watershed and Stream Processes**

*The Service will manage watersheds as complete hydrologic systems and minimize human-caused disturbance to the natural upland processes that deliver water, sediment, and woody debris to streams. These processes include runoff, erosion, and disturbance to vegetation and soil caused by fire, insects, meteorological events, and mass movements. The Service will manage streams to protect stream processes that create habitat features such as floodplains, riparian systems, woody debris accumulations, terraces, gravel bars, riffles, and pools. Stream processes include flooding, stream migration, and associated erosion and deposition.*

*The Service will protect watershed and stream features primarily by avoiding impacts on watershed and riparian vegetation and by allowing natural fluvial processes to proceed unimpeded. When conflicts between infrastructure (such as bridges and pipeline crossings) and stream processes are unavoidable, NPS managers will first consider relocating or redesigning*



*facilities rather than manipulating streams. Where stream manipulation is unavoidable, managers will use techniques that are visually nonobtrusive and that protect natural processes to the greatest extent practicable.*

Flood damage includes erosion and deposition of sediment in large portions of the hiker camp and a small portion of the stock camp (Figure 10). Patterns of erosion and sand deposition have forced the layout of the hiker camp into a confusing web of trails, tent pads, and cook areas that do not meet the preferred design features of camps in Stephen Mather Wilderness (See Appendix B). Both NPS staff and visitors have commented on the poor condition and layout of this camp. Moving the campsites out of the floodplain zone would prevent further damage, ease maintenance requirements, reduce costs, allow natural processes to occur unhindered, and ensure compliance with NPS policies.

Fire damage includes the hillslopes and valley bottom forest around the current hiker and stock camps burned at low to moderate severity. At least one small debris flow was documented to the east of the current location of these camps, likely triggered by a minor rainstorm that occurred sometime between September 21 and 25, 2022 (Figure 11).

Figure 10. Photos showing washed out camp trails and floodplain aggradation at the Graybeal Hiker Camp



Figure 11. Photo showing the small debris flow that occurred along the Brush Creek Trail just upstream from Graybeal Camps.



### **1.3.3: Bridge Creek Camp and Six Mile Camp Modifications**

Additional backcountry camp accommodations for PCT long-distance permit holders along the Bridge Creek Trail are needed to address crowding associated with increased usage on this trail in the last several years. Sufficient capacity doesn't exist at the existing PCT hiker drop-in camps and an expansion is needed to accommodate current and future use.

Since 2020 the NPS has not had staffing capacity to make sure that PCT hikers obtain a NPS backcountry overnight camping permit for specific designated camps. Given the patterns of travel for PCT hikers, they have limited phone and internet access and obtaining backcountry permits is difficult. When these hikers don't obtain the NPS permit they are prone to camp anywhere that is convenient which can result in "crashing" campsites already occupied by NPS permitted parties. This results in crowding and a loss of solitude for the permitted parties.

Prior to honoring PCTA's long-distance hiking permit and designating drop-in camps for those permit holders, the NPS required all PCT hikers to obtain a NPS overnight camping permit. Between 2016 and 2019 staff made a concerted effort to issue these permits to any PCT hikers wishing to camp overnight in the Park Complex. In addition, NPS staff recorded each person or party that identified as a PCT hiker. This information along with nearby trail counter data captures the travel patterns of most of the PCT hikers passing through the Park Complex and provides the basis for estimating levels of use and capacity needs (see below and Appendix A).

Analysis of the 2016-2019 NPS overnight camping permit dataset shows that approximately 30% of the camping use along the PCT corridor in the Park Complex (including campgrounds in the lower Stehekin valley) was by PCT hikers. PCT hikers who camped stayed an average of one night in the Park Complex. A

comparison of permit data with trail counter data in the Suiattle area of the trail, several miles to the south of the Park Complex, suggests a majority of PCT hikers stay in the Park Complex, with estimates of 69% to 93% obtaining NPS permits from 2017-2019 data. These data indicate a clear need to accommodate PCT hikers for over 2,000 visitor use nights per hiking season.

Analysis of data from trail counters and NOCA's backcountry permit database demonstrates a need to provide more camping capacity for PCT long-distance hikers in the Park Complex. The current PCT drop-in camps at Bridge Creek and Six Mile seem well-spaced and appear to serve the need for available space for accommodating these users (Appendix A). Appropriate sizing of camp capacity is intended help to reduce resource damage.

## CHAPTER 2 – ALTERNATIVES

### 2.1: ALTERNATIVE I: PROPOSED ACTION

#### 2.1.1: *Summary of Proposed Action*

The main components of the proposed action are listed below. See the following sections in this chapter for details of the work that is proposed for each component.

- Reroute Brush Creek Trail
- Relocate Graybeal Hiker and Stock Camps and design and construct to better meet preferred design features
- Reassign existing and construct new camp areas to accommodate hikers including PCT long-distance hikers at Bridge Creek Camp
- Modify Six Mile Camp to better meet preferred design features and accommodate more PCT long-distance hikers.

#### 2.1.2: *Reroute Brush Creek Trail*

A section of Brush Creek Trail would be rerouted by building a new 2,400-foot-long trail out of the valley bottom (Figure 12). The new location would be less prone to future damage caused by flooding and channel migration of Brush Creek. Where necessary, the abandoned portion of Brush Creek Trail would be scarified and covered with debris to obscure it and promote vegetation reclamation. Some segments of the trail are already being reclaimed by floodplain and post-fire processes.

The new trail would be constructed to current “All Purpose” trail standards from the NOCA Trails Handbook with a 24” wide trail tread (NPS no date). Additionally, vegetation within the eight-foot wide by ten-foot high trail corridor would be cleared. During construction the trail crew would endeavor to remove as few trees as possible. No living old growth trees (> 30 inches diameter measured at 4 feet above the ground) would be removed during the construction of the trail and to the extent possible trail work would seek to minimize damage to the root zone of old growth trees.

Over the course of two to three years during the months of June to October, construction of the trail reroute would take a six-person trail crew approximately sixty-four days to complete. The crew would camp at the existing Graybeal Stock Camp during this time.

To complete this work, NPS staff require the following tools: picks, shovels, rock bars, Pulaskis, McLeods, sledgehammers, rigging and grip hoists, chainsaws, generators, roto hammers, explosives, and a helicopter.

A helicopter would be utilized to deliver and remove equipment and supplies to these remote sites and if needed move gravel from the river bar to the new trail tread. It is estimated that the helicopter would need to bring up to eight sling loads in during the spring and bring out up to four sling loads in the fall. It is estimated that one to two hours of flight time would be required to move gravel from the river bar up to the new trail. Flight time would vary depending on the substrate underlying the new trail. See the minimum requirements analysis (MRA) in Appendix C for a rationale for the use of prohibited uses of power tools and helicopter delivery in the designated wilderness.



North Cascades National Park

# PROPOSED ACTIONS BRUSH CREEKTRAIL / GRAYBEAL CAMPS

**PROPOSED HIKER CAMP**

**LEGEND**

✚ NPS boundaries (inset)

Brush Creek Trail

**PROPOSED REROUTE**

**PROPOSED STOCK CAMP**

**EXISTING GRAYBEAL STOCK CAMP**

**EXISTING GRAYBEAL HIKER CAMP**

Brush Creek

0 0.125 0.25 Miles

North Cascades NPS Complex

**AREA OF DETAIL**

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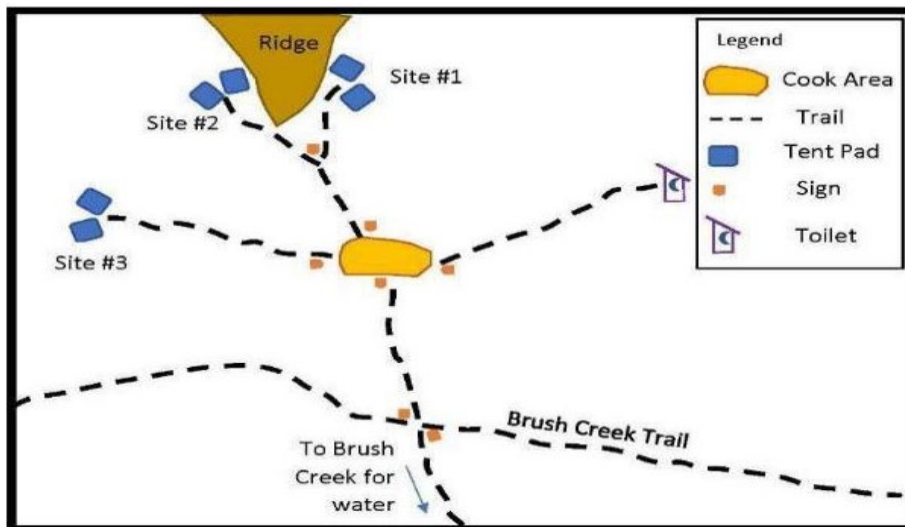
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### 2.1.3: Graybeal Hiker and Stock Camps

Graybeal Hiker and Stock Camps may be relocated to new locations in proximity to the Brush Creek Trail (Figure 12). Prior to the 2022 fire, these locations were selected based on best available locations, soil types, terrain, and forest types for building campsites, and visitor use at the sites. However, damage from the fire may have compromised the viability of these locations as safe or desirable camps in the long-term. While the proposed hiker camp appears to be outside the edge of the burn perimeter from the best available fire mapping information at this time (October 2022), it is on a debris cone and modeling of debris flow risk identifies this area with a moderate to high risk likely making it an unsuitable location (NPS 2022).

Figure 13. Site map showing the proposed new Graybeal Hiker Camp layout. The map is not to scale and for schematic purposes only.



The proposed stock camp is within the burn perimeter and most of the large trees were damaged due to burned roots, which may increase the number of hazard trees that would require removal with a camp in that general area. The NPS will likely close Brush Creek to camping for one or more seasons to monitor post-fire effects on the landscape and forests. This would also provide time to re-evaluate the suitability of the proposed sites and seek alternative sites for Graybeal and Hiker Camps if needed. Though they may be in different locations in the Brush Creek valley than originally planned, the NPS would only develop campsites at locations that do not exceed the scope and scale of impacts identified in this EA. The NPS will conduct a follow up environmental compliance review and likely cover the action with a memo-to-file or a categorical exclusion under NEPA.

Siting and layout of the camps would meet preferred design features of camps in Stephen Mather Wilderness to limit impacts to natural and cultural resources and solitude, including meeting design standards to reduce human-bear conflict (Appendix B). The camps would retain the initial capacity for people and tents. Prior to flood damage in 2017 Graybeal Hiker Camp had three sites to accommodate 4 people each. Graybeal Stock Camp is a single site to accommodate up to 12 people. The hiker camp may be relocated approximately 1.3 miles north of its existing location and the stock camp may be relocated to the corridor along the old trail between the existing stock and hiker camps, once the trail reroute is complete. Where necessary, abandoned campsites would be scarified and covered with debris to hasten revegetation and a return to a more natural state.

The new hiker camp would consist of three new camp sites with two tent pads each, a common cook area, and an open-air pit toilet. Simple single post signs would be installed at each trail junction with symbols and arrows pointing toward each area of the camp (Figure 13). Water would be available nearby at Brush Creek, which would be an approximately 350-foot walk for campers. If suitable trees are available, campers would be required to store food by hanging from the limbs of nearby trees. Otherwise, portable wildlife-resistant food canisters would be required for overnight camping or the NPS would install wildlife resistant food storage lockers.

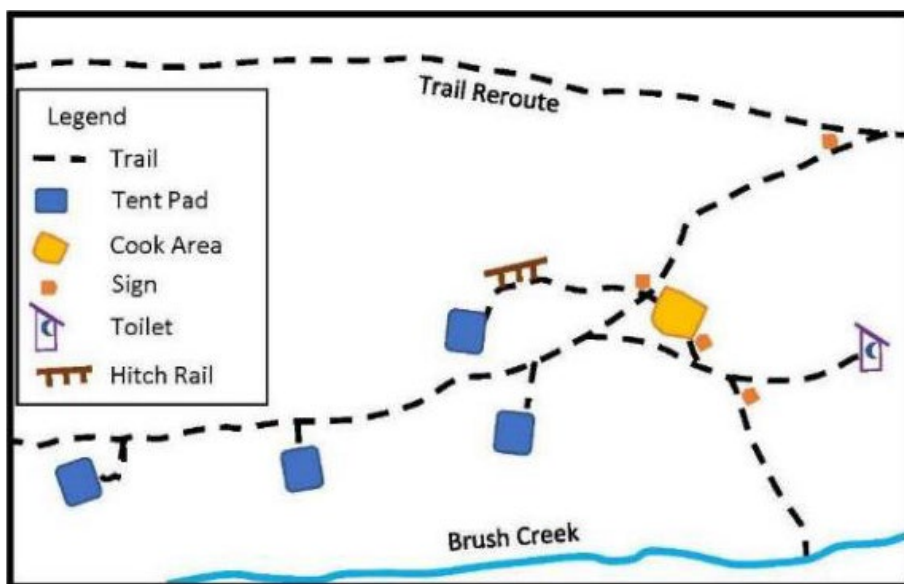
The new stock camp would consist of four tent pads, a common cook area, a hitch rail, and an open-air pit toilet (Figure 14). One of the tent pads would be near the hitch rail so the packer can sleep close to pack animals. The toilet currently used for the hiker camp would be used by the new stock camp (if still viable after post-fire assessment). Otherwise, a new toilet would be installed. Simple single post signs would be installed at each trail junction with symbols and arrows pointing toward each area of the camp. Water would be available nearby at Brush Creek. Capacity at this camp would remain the same.

Construction of both camps would take a trail crew composed of six individuals approximately forty days to complete between June and October over the course of two to three years. To complete this work the crew would need to use picks, shovels, rock bars, Pulaskis, McLeods, sledgehammers, rigging and grip hoists, and chainsaws. The same helicopter flights outlined above would be utilized for the camp and trail reroute construction work.

The new camps will be located in old growth forest. Hazard trees are always a concern in these forests, particularly after the fire, and as mentioned above, the NPS manages to reduce risk of dead or diseased trees falling on people or stock animals using the camp areas. During camp site construction, hazard trees would be assessed by park staff according to best available information and science. Hazard trees would be felled as necessary by the trail crew and left in place.

Figure 14. Map showing the pre-fire proposed new Graybeal Stock Camp layout.

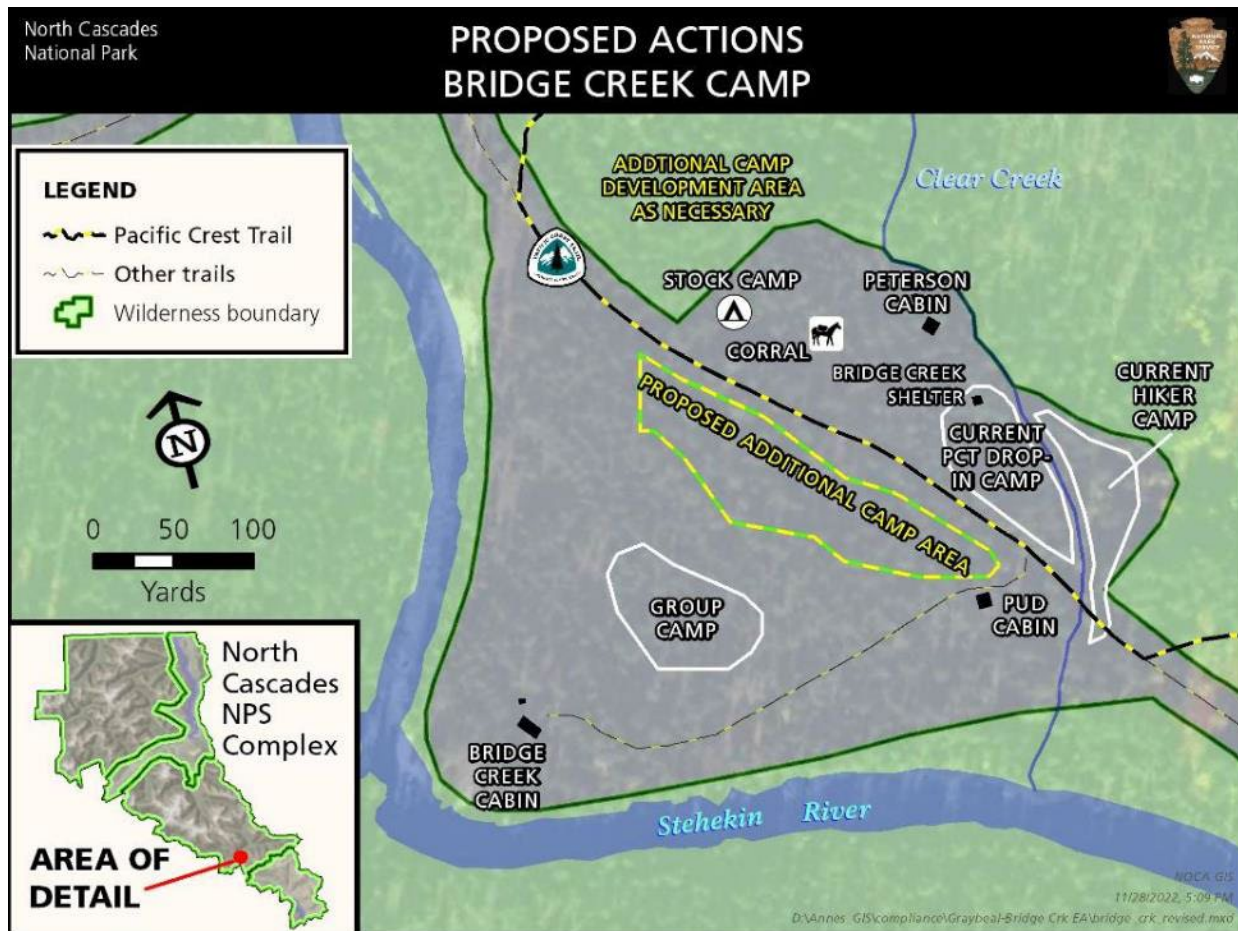
The map is not to scale and for conceptual and schematic purposes only.



#### 2.1.4: Bridge Creek Camp and Six Mile Camp Modifications

As part of the proposed action, modifications would be made to Bridge Creek Camp and Six Mile Camp to accommodate additional long-distance PCT hikers. The Bridge Creek Camps layout and design would be reconfigured as necessary to meet standards to reduce human-bear conflict for different user groups, including long-distance PCT hikers, small backpacking groups, large backpacking groups, overnight stock users including a corral, and Tent to Tent camping area (Figure 15 and 16).

Figure 15. Map showing the proposed additional camping accommodations at Bridge Creek Camp.



Sufficient separation between cooking and sleeping areas does not exist for the current layout and needs to be updated given existing patterns of human-bear conflicts in the area and possible grizzly bear re-introduction (see Appendix B for other preferred design features to reduce human-bear conflict). The adjacent area in designated wilderness to the northwest of the existing stock camp *may* be used only if the existing area outside of wilderness is not enough to accommodate sufficient separation between cooking and sleeping areas for all Bridge Creek user-group camps and would contribute to the long-term preservation of wilderness character. Additional camp space would be constructed adjacent to and south of the PCT to accommodate up to 20 PCT drop-in hikers with individual tents in the area. As needed, outhouses (design to be determined), wildlife-resistant food storage lockers, and signs would be added to the area. All actions outlined here for Bridge Creek Camps area would be dependent on a determination of no significant impacts to cultural resources in the area. If needed the NPS will conduct a follow up environmental compliance review and likely cover the action with a memo-to-file or a categorical exclusion under NEPA.

Figure 16. Photo showing the current conditions at the PCT drop-in camp at Bridge Creek Camp.



Several modifications would be made at Six Mile Camp (Figure 17). First, a new separate cook area would be constructed, and an additional wildlife-resistant food storage locker would be added in the cook area for two total. Second, the old cook area would be converted into one to two tent pads. Third, the tenting area would be expanded to include an existing disturbed area (Figure 18). And lastly, an abandoned site to the east would be rebuilt to accommodate additional tent pads. The capacity of the expanded Six Mile Camp would be between fifteen and twenty people with single person tents.

Construction of these camp modifications in both areas would take a trail crew composed of four people approximately thirty days to complete over the course of one to two seasons (twenty days at Bridge Creek Camp and ten days at Six Mile Camp). Work at Bridge Creek Camp would be completed between May 1st and November 30<sup>th</sup> and the work at Six Mile Camp would be completed between June 1st and October 31st.

To complete this work the crew would need to use picks, shovels, rock bars, Pulaskis, McLeods, sledgehammers, rigging and grip hoists, and chainsaws. Two to four helicopter flights are also a part of this proposed action to bring in wildlife-resistant food storage lockers and toilets too heavy and bulky to be carried in on foot or by stock. See the minimum requirements analysis (MRA) in Appendix C for an explanation of prohibited uses in the designated wilderness and when those uses can be relaxed following the proper analysis. Hazard trees would be managed in the same manner as the Brush Creek Camps.



Figure 17. Map showing proposed changes at Six Mile Camp. The map is not to scale and for schematic purposes only.

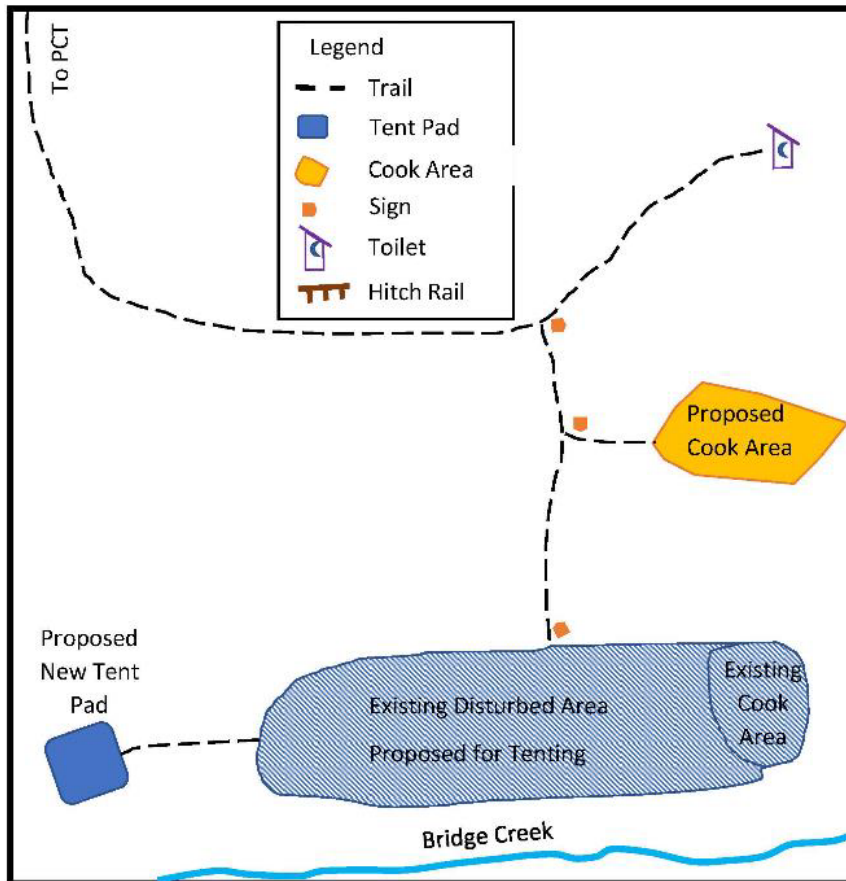


Figure 18. Photo showing part of the existing disturbed area and cook area at Six Mile Camp.





## **2.2: ALTERNATIVE II: NO ACTION ALTERNATIVE**

Under the No Action Alternative, the NPS would continue to manage these areas as it has been under current and developing conditions.

### **2.2.1: *Brush Creek***

The Brush Creek Trail and Graybeal camps would continue to be maintained and utilized for their intended purposes to meet the preferred design features (PDFs) as much as practicable. However, after the 2022 Brush Creek 2 Fire, Graybeal Camps may remain closed due to the risk of hazard trees and the possibility of lingering risk of landslides or debris flows. Closure decisions would be based on monitoring and evaluation as on-the-ground conditions develop. Outside of the hazard tree and landslide risks, the Graybeal Camps are also likely to see even more flooding and associated damage post-fire with more hillslope sediment transported into Brush Creek contributing to additional aggradation of the stream bed, which could make maintenance of camp facilities difficult and potentially increase the risk to people and stock camping in the area.

### **2.2.2: *Bridge Creek/Pacific Crest Trail***

Current camp footprints would be utilized along the PCT. While there could be reassignments of existing camp areas to different user groups in the future, there would be no increases in campsite footprints. No action would likely lead to an increase in vegetation trampling, human wildlife conflict, and conflict between users seeking a limited number of campsites.

## **2.3: ALTERNATIVES CONSIDERED BUT DISMISSED**

### **2.3.1: *Project Work in Wilderness Solely with Non-motorized Tools***

Use of only non-motorized tools in designated wilderness was considered and dismissed from detailed analysis in this EA but is considered in more detail in the MRA (Appendix C). While many construction tasks outlined in the proposed action could be accomplished without motorized tools, when the project is considered on balance with all the other trail maintenance needs in the wilderness, power tools are deemed to be the minimum tool for use in designated wilderness. Chainsaw and motorized tool use for the project work enables a limited number of trail crew members to keep all trails and designated camps in the Park Complex up to established standards. Not keeping trails to maintenance standards results in numerous short and long-term impacts to wilderness character that the NPS considers unacceptable.

## **2.4: NEARBY PROJECTS THAT MAY CAUSE CUMULATIVE EFFECTS**

There are several other past, present, and reasonably foreseeable (funded and planned) operational activities in the area that likely would add cumulative impacts when combined with the direct and indirect impacts of the project alternatives. The cumulative effects are addressed in the next chapter and the activities are outlined below:

- Past activities include routine maintenance activities in each past summer season. The NPS trail crew has spent several weeks in each area doing routine trail and camp maintenance with the same tools as proposed in Alternative I. Activities include clearing downed trees and brush, felling hazard trees, cleaning drainage structures, and repairing trail tread and trail structures such as small bridges, as needed.

- In summer and fall 2022 there were 128 helicopter landings and 33 longline deliveries in the Chilliwack River drainage including Brush Creek, primarily related to wildfire management and damage assessment. This is extremely high use because of the fire, normally there would be none to a few helicopter landings/longline delivery in the area for tasks related to trail maintenance and radio repeater repair (at Copper Lookout).
- The NPS will likely be constructing a new stock bridge over Bridge Creek near the North Fork Camp in summer 2023 or 2024. This is between Bridge Creek Camp and Six Mile Camp along the PCT. The previous bridge collapsed under snow load in winter 2020/21 and the NPS installed a suspended foot bridge in summer 2021. This project will entail the presence of Trails staff and similar tools outlined in the proposed action, including helicopter flights.
- Some improvements to the PCT between Bridge Creek Camp and North Fork Camp are planned in summer 2024. Buggy trail segments will be repaired by relocating two short segments totaling 800 linear feet from low lying ground to the adjacent hillside, and by adding and repairing turnpike. One of the relocations passes through a rocky area and will require some blasting. Approximately 60 feet of existing turnpike will be repaired, and if time allows extended by approximately 30 feet. Finally, a short slickrock section will be blasted to improve grade and footing for stock. This will include 20 feet of shallow bench blasting. If time permits, there may be some blasting on the downstream approach to North Fork bridge to improve grade and footing. This will involve a crew of four up to 12 days of work, using chainsaws, rock drills, rigging, explosives, and assorted hand tools.
- Depending on the timing of this work in either or both 2023 and 2024 summer seasons, the NPS trail crew will spend several weeks in each area doing routine trail and camp maintenance with the same tools as proposed in Alternative I. Activities include clearing downed trees and brush, felling hazard trees, cleaning drainage structures, and repairing trail tread and trail structures such as small bridges, as needed.
- Additional post-fire trail and camp rehabilitation work is likely to occur simultaneously to the work in Brush Creek. This includes upper Brush Creek trail, part of Copper Ridge Trail, part of the Chilliwack River Trail and Whatcom Camp. This includes trail and camp building and construction activities analogous to the proposed action and (re)construction of trail structures such as turnpikes and small bridges. It may include additional helicopter landings/deliveries for which the need would be determined with a minimum requirements analysis.
- Yet to be determined Whitebark pine conservation actions may occur in the Chilliwack watershed in summers of 2023, 2024, and/or 2025. Timing and scope of such work is unknown at this time. Additional helicopter flights may be needed for which the need would be determined with a minimum requirements analysis.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.0: ISSUES DISMISSED FROM DETAILED ANALYSIS

### 3.0.1: *Environmental Justice and Indian Trust Resources*

No potential impacts related to tribal trust resources or communities identified as low-income or minority populations as identified in Executive Order 12898 were identified during internal or external scoping for this project. Therefore, these topics were dismissed from detailed analysis.

### 3.0.2: *Invasive Non-native Plants*

Introduction of invasive non-native plant species is always a concern when there is ground-breaking work in the Park Complex. The trail crew will implement standard operating procedures to limit the spread of invasive (NPS 2021). These measures include that all equipment including boots will be cleaned prior to hiking or working on the trail to reduce weed infestations. No fill in the form of gravel should be added to the site from sources outside of the Park Complex. With these measures there are no potential for significant impacts, and the issue was dismissed from further analysis.

### 3.0.3: *Visitor Use and Experience*

Visitor use and experience is addressed in the context of wilderness character (Section 3.5). Opportunities for solitude and primitive and unconfined recreation are qualities of wilderness character addressing visitor experience and are directly relevant to all areas except for the Bridge Creek camps, which are not in designated Wilderness. There would be additional impacts to visitor experience at the Bridge Creek camps with the addition of more people at times. However, it is expected that users would either avoid or adapt to these conditions. Increasing the potential number of people present in the Bridge Creek area by increasing overall camping capacity is not expected to have potential for significant impacts and the issue was dismissed from further analysis.

## 3.1: WILDLIFE AND WILDLIFE HABITAT

### 3.1.1: *Affected Environment*

#### Brush Creek

Habitat in the main Chilliwack River drainage consists of intact stands of mature late-seral coniferous forest with some mixed coniferous-deciduous trees in the riparian zones. Dominant tree species include Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*) and Pacific silver fir (*Abies amabilis*) with mixed priority depending on location. The more specific project area in the tributary of Brush Creek is considered mid-elevation where mature Pacific silver fir is the dominant tree species with sparse scatterings of Douglas-fir, western hemlock, and western red cedar, ranging from 20-50 in. diameter at breast height (dbh) and many at or exceeding 120 feet in height. Canopy closure is approximately 60% or greater depending on exact location. The understory in the project activity area is relatively open, consisting of a dominant huckleberry shrub layer, scattered tree saplings and ground cover consisting of ferns and moss.

The post-fire assessment process for the Chilliwack Complex fire occurred in late September 2022 when portions of the area were still burning. From this assessment soil burn severity was considered predominantly

low to unburned with limited amounts of high and moderate. A preponderance of old-growth conifer forest exists in the Chilliwack and Brush Creek drainages, much of which was burned and poses a direct loss to northern spotted owl and marbled murrelet nesting requirements. These conifer species are not well adapted to fire, thus high tree mortality is also expected within a few years post-fire from low-intensity fire damage to roots, charred bases, and crown scorch. Both existing Graybeal hiker and stock camps along with the proposed Graybeal stock camp and accompanying trail were heavily burned leaving behind numerous standing hazard trees, downed wood and fallen rock debris. The proposed Graybeal hiker camp reportedly did not burn but appears susceptible to debris flows with its position situated below steep slopes of high severity burn.

Other at-risk terrestrial wildlife species that may be directly affected by loss of habitat and connectivity from the fire include Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*: federal Proposed Threatened), northern goshawk (*Accipiter gentilis*: WA Candidate), wolverine (*Gulo gulo*: WA Candidate, federal Proposed Threatened), Pacific fisher (*Pekania pennanti*: WA Endangered), and grizzly bear (*Ursus arctos*: federal Threatened, WA Endangered).

### Bridge Creek

Much of the Bridge Creek valley bottom in the drainage is at mid-elevation, ranging from 4,528 ft at the Bridge Creek Trailhead on State Route 20 to 2,175 ft at Bridge Creek Camp.

The existing Six Mile Camp is in a forested stand adjacent to the fast-flowing and pristine Bridge Creek. Forested habitat throughout the drainage, especially the steep south aspects, is highly fragmented and interspersed with avalanche chutes covered with a diversity of dense shrubs, small-sized trees, and saplings. The dominant overstory consists of Pacific silver fir, with codominants consisting of Douglas-fir, western red cedar, lodgepole pine (*Pinus contorta*), occasional western white pine (*Pinus monticola*), and ponderosa pine (*Pinus ponderosa*) in the lower section of the drainage. Overstory in the vicinity of the project site is predominantly Pacific silver fir with a dominant shrub layer of Northwest huckleberry (*Vaccinium membranaceum*). Elevation at the project site is 3,068 ft.

The proposed project area at Bridge Creek Camp consists of a relatively open forested stand of predominantly Douglas-fir, with the occasional scattering of ponderosa pine and lodgepole pine. The largest Douglas-fir measures approximately 32 inches diameter at breast height (dbh) with the majority ranging from 8-20 inches dbh. The largest ponderosa pine measures approximately 30 inches dbh. The few scattered lodgepole pine are relatively small-sized measuring less than 15 inches dbh. The height of most trees in the stand ranges from approximately 100-150 feet tall. The shrub layer is sparse consisting of occasional Oregon boxwood (*Pachistima myrsinites*) and birch leaf spirea (*Spiraea betulifolia*) as the primary species. Ground cover consists of patchy club moss (*Lycopodium spp.*) and scattered clumps of pine grass (*Calamagrostis rubescens*). Small-diameter dead and down logs are abundant throughout the stand. Elevation at the project site is 2,175 ft.

### **3.1.2: Federally Threatened Species: Northern Spotted Owl**

The northern spotted owl (*Strix occidentalis caurina*) was listed as a federally threatened species under the Endangered Species Act (ESA) in 1990 (USDI 1990). The primary concerns leading to the listing were loss and modification of its preferred old-growth forest habitat and inadequacy of existing regulatory mechanisms

that led to severe population declines. In addition to the ESA, the northern spotted owl is also protected by the Migratory Bird Treaty Act of 1918, as amended (16 USC 703-711).

#### Environmental Consequences Alternative I: Proposed Action

##### *Brush Creek*

Systematic northern spotted owl surveys were conducted in the Chilliwack River drainage and the Brush Ck. tributary by NOCA staff in 1996 with no detections or activity centers identified. No systematic surveys have been conducted since, although some less intensive spot check surveys have been periodically conducted. No spotted owls were detected in these surveys. In the Washington Cascades, an average spotted owl territory encompasses over 6,000 acres and can include a broad range of forest types (Hamer et al. 2007). Despite the lack of verifiable detections, suitable habitat maps and ground-truthing suggest there is adequate nesting/roosting/foraging habitat in the Chilliwack River drainage and its tributaries to support at least one nesting pair of spotted owls. It is currently unclear how the 2022 Chilliwack Complex fire may affect northern spotted owl habitat requirements, largely depending on burn severity and extent within suitable habitat.

Construction activities would result in temporary increases in sound and human activity which may in turn temporarily affect any spotted owls in the vicinity. However, construction would be of a temporary duration and work would occur after the early nesting season date of July 15 and only during daylight hours, when spotted owls are less active. Construction activities would avoid disturbance during the dawn and dusk periods when feeding events may occur. The main trail system adjacent the project area is already subject to significant amounts of human activity from hikers and stock animals. There are no known nesting pairs of spotted owls within 0.7 mi. (core area) of the proposed project and no designated spotted owl critical habitat is adjacent to the project. The camp relocation activity would directly modify a small portion of available spotted owl habitat, mainly ground vegetation disturbance, but is not expected to degrade the forest stand's function for nesting/roosting/foraging and dispersal requirements. Most nest trees of spotted owls in western Washington were found in Douglas-fir, western red cedar, and western hemlock trees in descending order of use, respectively (Wilk et al., 2018). Since the project area consists predominantly of Pacific silver fir trees it is presumed the area would not be optimal nesting habitat for spotted owls, but the forested stands could be categorized as spotted owl dispersal habitat. Habitat was further degraded by the 2022 Chilliwack Complex fire. Due to the low likelihood of nesting spotted owls present in the immediate project vicinity and the minor removal of vegetation associated with the camp relocation and trail reroute, no measurable adverse effects to spotted owl behaviors are expected. NPS biologists have assessed that the proposed project activity would have a no effect determination to northern spotted owls or critical habitat under Section 7 of the Endangered Species Act.

##### *Bridge Creek*

Spotted owl surveys were initially conducted in the Upper Stehekin River drainage above High Bridge by NOCA staff in 1993 (Kuntz and Christophersen 1996). These surveys identified three spotted owl pair territories and two separate single adult territories. A new pair was discovered in 2007 ancillary to other project work. The Institute for Bird Populations (IBP) resurveyed the area in 2007 and 2008 (Siegel et al. 2009) using the same survey transects used in 1993. These surveys resulted in one confirmed pair with two fledged juveniles at one site and a single adult spotted owl at another site. These detections were in the same general vicinity as the 1993 detections, suggesting the locations represent core activity centers containing high quality habitat.



Systematic spotted owl surveys were initially conducted in the Bridge Creek drainage in 1993 by NOCA (Kuntz and Christophersen 1996) and repeated in 2007 and 2008 by IBP staff (Siegel et al. 2009). No spotted owls were identified in the drainage during any of the survey years. No systematic spotted owl surveys have been conducted in the area since 2008, so the status of spotted owls in the project vicinity is unknown.

All historic spotted owl detections in the upper Stehekin River watershed are located outside of a 0.7-mile radius (core area) from Bridge Creek Camp and Six Mile project areas. Neither project is within or adjacent to spotted owl designated critical habitat.

Because the forest stands encompassing the Bridge Creek Camp project area consists of relatively open habitat, minimal forest structure, and a predominance of smaller diameter trees that are unsuitable for nesting, it is presumed the project area would not be optimal nesting habitat for Spotted Owls. Similarly, because of high forest fragmentation within the Bridge Creek drainage, limited connectivity of suitable habitat, and mid-elevation forest stands of predominantly Pacific silver fir, the Six Mile Camp project area is considered suboptimal nesting habitat for spotted owls. Both project areas are already degraded by developed campsites that experience a high volume of hikers and associated human disturbance during the busy summer hiking season. Each is near or adjacent to fast-flowing streams where ambient noise is high. Although not optimal nesting habitat, we expect spotted owls to use the forest stands within the proposed project areas only for occasional foraging or for dispersing between the patches of suitable habitat in the surrounding landscape. Dispersal, roosting, and foraging habitats are generally abundant and well-distributed in the Stehekin River watershed. The loss or degradation of approximately 0.50 acre of understory vegetation within dispersal and foraging habitat is not expected to measurably affect spotted owl dispersal behavior or success within the watershed. Therefore, the effect to dispersal habitat is negligible.

Project construction for both Bridge Creek and Six Mile Campgrounds includes the use of chainsaws and hand tools for clearing and grubbing tent pads, cooking area, toilet, and small foot paths to access these areas. Construction activity would occur over a period of approximately four weeks at the Bridge Creek Camp site and likely less time at the Six Mile Camp site. The project activity would directly modify a small portion of ground vegetation but is not expected to degrade the forest stand's function for potential spotted owl roosting/foraging and dispersal requirements. In addition, a helicopter would be used to transport supplies needed for the Bridge Creek project. This potential noise disturbance would be mitigated by following a recommended flight path and by using established best practices, which includes scheduling flights during the latter half of the spotted owl breeding season (July 16 to September 30), when the biological effect of noise disturbance is considered negligible to fledged spotted owls.

In summary, no measurable adverse effects to spotted owl behaviors are expected, due to suboptimal spotted owl nesting habitat, no known spotted owl activity centers within a 0.7-mile radius of the project sites, only minor removal of understory vegetation associated with the construction of both proposed project areas, existing high ambient noise from adjacent streams, and the presence of already substantial camping activity and human use in each of the project areas. Adherence to best management practices (BMPs) as outlined in the park's programmatic trails maintenance guidance (NPS 2021) would also help mitigate potential noise disturbance during the construction period. NPS biologists have assessed the proposed project activity would have a no effect determination to the northern spotted owl or critical habitat under Section 7 of the Endangered Species Act.

### *Cumulative Effects*

Eventually as trees age in the immediate vicinity of the new campsites and other campsites in the area, there would be a need for hazard tree removal which would result in a medium-term minor effect because of the loss of snag habitat, also an important component of owl habitat. However, other planned projects in the project areas would increase the time that trail crews would be working in the area and occupying campsites that may otherwise be used by visitors. Several other proposed projects in the area may also contribute to an increase in noise disturbance from power tools and possibly helicopter flights. In consideration of these cumulative effects, NPS biologists have assessed that the proposed project activity would have a no effect determination to the northern spotted owl or critical habitat under Section 7 of the Endangered Species Act.

### Environmental Consequences Alternative II: No Action Alternative

The no action alternative would not cause a change in types or amounts of human activity in the project areas and would likely have no discernable impacts or benefits to northern spotted owl.

### *Cumulative Effects*

In consideration of the projects that could produce cumulative effects, NPS biologists have assessed that the activities listed above would have a no effect determination to the northern spotted owl or critical habitat under Section 7 of the Endangered Species Act.

#### **3.1.3: Federally Threatened Species: Marbled Murrelet**

Marbled murrelets (*Brachyramphus marmoratus*) are seabirds in the family Alcidae that nest in coastal late-successional and old-growth forests in the Pacific Northwest. Due to loss or modification of these forest types, they were listed under the Endangered Species Act (ESA) in 1992 as a federally threatened species in WA, OR and CA (USDI 1992; 57 FR 45328). Other contributing factors for the listing included high predation rates, mortality in gillnets, and oil-spill mortality. In addition to the ESA, the marbled murrelet is also protected by the Migratory Bird Treaty Act of 1918, as amended (16 USC 703-711).

The farthest known inland occupied marbled murrelet site in Washington is 84 km (52 mi) in the northern Cascades mountains (Hamer, 1995). Wilk et al. (2016) reported the average distance of 14 nest sites from the Washington coast was 14 miles and average elevation was 2,392 ft. Wilk et al. (2016) also reported that of the 14 nest trees identified in Washington, Douglas-fir (n=8), western hemlock (n=5) and Sitka spruce (n=1) were the preferred trees species selected for nesting. Hamer and Nelson (1995) found Douglas-fir (n=3), western hemlock (n=2) and western red cedar (n=1) were the preferred tree species selected for marbled murrelet nesting.

Marbled murrelet surveys are typically conducted by using specialized radar equipment from a mobile boat or vehicle (Hamer and Meekins 1998). A marbled murrelet radar survey was conducted near the mouth of the Chilliwack River in the Chilliwack Lake area of British Columbia, resulting in nine marbled murrelet-type targets (Hamer Environmental L.P. 2008). However, to date no intensive or systematic surveys of marbled murrelets have been conducted farther upstream in the Chilliwack River watershed, due to the remoteness and inaccessibility for radar- equipped vessels or vehicles.

The best available mapping of marbled murrelet suitable habitat in NOCA includes forested stands within the project area. However, the Brush Creek project area is located at the extreme edge of mapped suitable habitat. On-the-ground surveys confirmed that suitable murrelet habitat is very limited and fragmented within the Brush Creek drainage and is considered very marginal within the project area. In addition, the

2022 Chilliwack Complex wildland fire further degraded potential marbled murrelet habitat in the Chilliwack River and Brush Creek drainages.

The Bridge Creek project areas are too far inland and therefore have no suitable habitat and are not analyzed below.

#### Environmental Consequences Alternative I: Proposed Action

##### *Brush Creek*

Construction of the relocated camp and trail reroute would require power tools, such as chainsaws, and various hand tools. This increase in unfamiliar sound and human activity could cause a significant disturbance event by causing a murrelet to delay or avoid nest establishment, flush away from an active nest site, or abort a feeding attempt during incubation or brooding of nestlings. However, the value of the habitat in the project area is considered low for marbled murrelet nesting. Pacific silver fir is the dominant tree species within the project area and no known marbled murrelet nests have been located to date in this tree species within Washington. The sparsely scattered western red cedar and Douglas-fir trees that are present in the immediate vicinity of the project area did not appear to have large diameter limbs suitable for murrelet nesting platforms. The vegetation, such as the few scattered conifers present that could be potential marbled murrelet nesting trees, would not be altered through removal or degraded by project activities. The proposed work would result in no reduction of canopy closure or the creation of canopy gaps. The elevation of the project is approximately 3,000 ft, slightly higher than the average elevation of 2,392 ft. for murrelet nests located in Washington (Wilk et al 2016). The trail reroute does not occur in marbled murrelet habitat, except for a short distance on either end where it ties into the main trail. These segments fall within marginal habitat given the limited suitable features and structure of the forest stands, therefore disturbance to murrelets is not anticipated. The marbled murrelet nesting season is from April 1 – September 23. Following BMPs established for trail work to include a marbled murrelet timing restriction (no work until two hours after sunrise and stop work two hours before sunset) can minimize any potential disturbance during the nesting season. NPS biologists have assessed that the proposed project activity would have a no effect determination to marbled murrelets or critical habitat under Section 7 of the Endangered Species Act.

##### *Cumulative Effects*

In consideration of the projects that could produce cumulative effects, NPS biologists have assessed the proposed project activity would have a no effect determination to the marbled murrelet or critical habitat under Section 7 of the Endangered Species Act.

The proposed action and other nearby projects would have minor or no cumulative effects to marbled murrelets habitat, since it is already marginal murrelet habitat and no large trees with adequate branch size for nesting platforms would be altered. Relocating the camps would not result in an increase in human use of the project area; therefore, this action would have little or no increase in cumulative effects from human use.

#### Environmental Consequences Alternative II: No Action Alternative

The no action alternative would not cause a change in types or amounts of human activity in the project areas and would likely have no discernable adverse or beneficial effects to marbled murrelet.

#### *Cumulative Effects*

In consideration of the projects that could produce cumulative effects, NPS biologists have assessed that the activities listed above would have a no effect determination to the marbled murrelet or critical habitat under Section 7 of the Endangered Species Act.

#### **3.1.4: Other Wildlife**

##### Environmental Consequences Alternative I: Proposed Action

###### *Brush Creek*

Remote cameras have detected the presence of several forest carnivores in the Chilliwack River drainage including wolverine, black bear, pine marten, cougar, and bobcat. To date, no den sites have been documented for these species within the project area. These carnivores typically have large home ranges and are often transitory in their movement patterns. Construction activity involving chainsaws and other power tools could potentially cause some temporary noise disturbance or displacement if any of these carnivores were passing through the project area at the time of construction but would be expected to be short-lived in duration and have no long-term affect. Helicopter use may be needed to transport construction supplies but would occur only after carnivore spring denning season.

Constructing the new camps to the preferred design features (Appendix B) would reduce the risk of human-bear conflict and have a long-term beneficial effect.

###### *Bridge Creek*

Remote cameras, track surveys and scat collections have detected many of NOCA's native forest carnivores in the Stehekin River watershed to include gray wolf, black bear, cougar, Canada lynx, bobcat, wolverine, pine marten, striped and spotted skunk, and Pacific fisher. It's feasible that any one of these animals could either be transitory or have an established territory near the proposed project areas, however no den sites have been confirmed within the project areas or in the immediate vicinity to date. Construction activity involving chainsaws could potentially cause some temporary noise disturbance or displacement if any of these forest carnivores were in the vicinity at the time of construction, but this is not expected to be significant or have a long-term affect because following BMPs would minimize the impact. Use of a helicopter to transport equipment and supplies may be needed, but would occur only between July 16 and February 28, after the early spotted owl nesting season and carnivore denning season.

Constructing the new camps to the preferred design features (Appendix B) would reduce the risk of human-bear conflict and have a long-term beneficial effect.

#### *Cumulative Effects*

Building new and improved trails and camps in both project areas is likely to contribute to increased use in these areas in the long-term. In addition, current trends show an overall increase in backcountry visitation and with time there may be an increase in the number of nights that the camps are at full capacity. This increased human activity in the existing camp area may contribute to an increase in cumulative effects to wildlife and their habitat, which at a most basic level may include short-term behavioral shifts, temporary physiological changes and alterations in overall fitness when disturbed by recreationists. This could potentially occur after a lull in Brush Creek after visitor use has been re-established following post-fire landscape stabilization.

Other at-risk terrestrial wildlife species that may be directly affected by loss of habitat and connectivity from the 2022 wildfires include Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*: federal Proposed Threatened), northern goshawk (*Accipiter gentilis*: WA Candidate), wolverine (*Gulo gulo*: WA Candidate, federal Proposed Threatened), Pacific fisher (*Pekania pennanti*: WA Endangered), and grizzly bear (*Ursus arctos*: federal Threatened, WA Endangered).

#### Environmental Consequences Alternative II: No Action Alternative

The no action alternative would not cause a change in the types or amounts of human activity in the project areas, given the number of tent pads would remain the same, and would likely have no discernable impacts, benefits, or cumulative effects to other wildlife or habitat. However, current trends show an overall increase in backcountry visitation and with time there may be an increase in the number of nights that the existing camp site is at full capacity. This in turn would increase human activity in the project area and may contribute to an increase in consequential cumulative effects to wildlife and their habitat.

Other at-risk terrestrial wildlife species that may be directly affected by loss of habitat and connectivity from the 2022 wildfires include Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*: federal Proposed Threatened), northern goshawk (*Accipiter gentilis*: WA Candidate), wolverine (*Gulo gulo*: WA Candidate, federal Proposed Threatened), Pacific fisher (*Pekania pennanti*: WA Endangered), and grizzly bear (*Ursus arctos*: federal Threatened, WA Endangered).

### **3.2: CULTURAL RESOURCES**

#### **3.2.1: Affected Environment**

##### Brush Creek

Brush creek is a tributary of the Chilliwack River which enters the head of Chilliwack Lake just north of the international border. Both Chilliwack Lake and River are the location of a major Sockeye salmon fishery and likewise places of focused indigenous activity. The Nlaka'pamux and Stó:lō First Nations, as well as the Upper Skagit, Nooksack, and other American Indian tribes, all consider the project area to be within their traditional homelands. The first Euro-American exploration occurred along the 49<sup>th</sup> parallel for surveying the international boundary, and later from the administration and recreational use of the public lands.

##### Bridge Creek

The Bridge Creek Campground is at the confluence of two major valleys that both provide relatively easy passage through the mountain range to the upper Stehekin Valley. Due to this nexus of travel ways and relative abundance of flat ground, it has been a waypoint for indigenous peoples, miners and recreationalists dating back at least 9,000 years. This project area is within the traditional lands of the Colville Confederated Tribes, Yakama Nation, Sauk-Suiattle Indian Tribe, and others.

#### **3.2.2: Environmental Consequences Alternative I: Proposed Action**

Maintaining the park's trails and campgrounds in good condition and ensuring campsites are sized for the appropriate number of people keeps most visitors within previously disturbed areas. This helps reduce the risk of damage to sensitive cultural resources whether they are known or unknown. In addition, the trails and



campgrounds allow visitors to access and enjoy historic structures and other less culturally sensitive sites that are preserved for visitor enjoyment and education.

#### Brush Creek

Due to logistical limitations, the Brush Creek Area of Potential Effect (APE) was not surveyed for cultural resources prior to the initiation of the project. NOCA conducted National Historic Preservation Act (NHPA) Section 106 consultation with two Canadian First Nations (Stó:lō and Nlaka'pamux Nations), two American Indian Tribes (Nooksack and Upper Skagit Tribes) and the State Historic Preservation Officer (SHPO). The NPS recommended a NHPA 106 finding of No Adverse Effect, informed these consulting parties of the lack of inventory within the APE, provided them with an inadvertent discovery and monitoring plan to be implemented during construction, and asked for comments on this methodology. The Stó:lō Nation and the SHPO responded that they were satisfied with the proposal to identify and protect cultural resources should they be encountered. While it is unknown whether historic properties are within the Area of Potential Effect, trails workers would avoid sensitive areas which could result in minor adverse impacts by having archeologists monitor the construction work.

#### Bridge Creek

In the summer of 2021, an inventory of cultural resources was performed within the designated APEs at both the existing Bridge Creek and Six Mile camps by NPS cultural resources staff (Sholin et. al 2022; Newberry-Cushman et. al 2022). The inventory at Bridge Creek involved subsurface investigations within the footprint of the proposed new campsites and pedestrian surface survey within the adjacent designated wilderness northwest of the stock camp. The inventory at Six Mile included both pedestrian and subsurface survey to identify any unknown cultural resources in the area. Results from these surveys helped form the basis for the proposed action presented in this EA.

The NPS conducted NHPA Section 106 consultation with the Colville Confederated Tribes, the Yakama Nation, the Sauk-Suiattle Indian Tribe and the SHPO and recommended a NHPA Section 106 finding of No Adverse Effect. The results of the survey, and proposed mitigations, were presented to these consulting parties for comment. The Colville Confederated Tribes and SHPO responded that they were satisfied with both the completed inventory and with the proposed mitigations to avoid impacts to historic properties. Based on the findings from the survey, any potential construction impacts to historic properties within the footprint of the proposed new campsites and the adjacent area in designated wilderness would be avoided with an inadvertent discovery and monitoring plan.

#### Cumulative Effects

Building new and improved camps is likely to contribute to increased use in these areas in the long-term. In addition, current trends show an overall increase in backcountry visitation, and with time, there may be an increase in the number of nights that the camps are at full capacity. An increase in human activity at any of these camps may contribute to an increase in consequential cumulative effects on both known and unidentified cultural resources. Furthermore, the areas for the proposed camps within the Brush Creek drainage were burned or near the burn perimeter of the Chilliwack fires in 2022. The decrease in vegetation from the fires could expose previously unidentified cultural resources, making them more vulnerable to human activity in the area until the forest has recovered.

In consideration of the nearby projects that could cause cumulative effects (Section 2.4), NPS cultural resources staff have either completed inventories within the footprints of these projects or have prepared plans to mitigate any impacts to historic properties that may occur.

### **3.2.3: Environmental Consequences Alternative II: No Action Alternative**

#### Common to all locations

If the no action alternative is selected, visitors would continue to use the existing camps and trails in their presently unacceptable condition. This could result in user-created trails and campsites that may damage unrecorded cultural resources. The proposed action could also uncover unrecorded sites; however, new construction is preferred to occur under the deliberate action of park staff so that potential impacts can be mitigated with an inadvertent discovery and monitoring plan, as mentioned above. Additionally, under this alternative, these trails, and campgrounds would guide park visitors away from accessing vulnerable cultural resources while maintaining access to historic structures and other cultural sites which are preserved for visitor enjoyment and education.

#### Cumulative Effects

In consideration of the nearby projects that could cause cumulative effects (Section 2.4), NPS cultural resources staff have either completed inventories within the footprints of these projects or have prepared plans to mitigate any impacts to historic properties that may occur.

## **3.3: FLOODPLAIN PROCESSES AND WATER QUALITY**

### **3.3.1: Affected Environment**

#### Brush Creek

As indicated in Section 1.3 part of the existing Brush Creek Trail, Graybeal Hiker Camp, and part of Graybeal Stock Camp area within the active floodplain, necessitating the proposed action. The areas proposed for trail reroute and camp relocations are out of the floodplain and along the debris apron or valley wall of the drainage (Figure 17). Debris aprons are landforms where rock, soil, and vegetative debris (colluvium) accumulates as it is shed from the steeper slopes above. They are relatively stable landforms in the North Cascades with slopes typically between 0 to 20%. Valley walls are the steep sides of mountain valleys with slopes typically over 40%, too steep for significant colluvial accumulation. The trail relocation passes through debris cones, which are landforms that form near the outlets of small streams where material is deposited in a conical shape with a surface slope greater than 15%. These landforms can be episodically unstable when streams jump channels during large rainfall events, and they can also be paths for snow and debris avalanches. They are typically referred to as 'brush chutes' on the trail since they tend to host dense vegetation such as slide alder and vine maple. As a result, maintenance of tread, and the trail corridor, is higher on these landforms.

#### Bridge Creek

The Bridge Creek camps are located on a high terrace above the confluence of Bridge Creek and the Stehekin River, well above the floodplain. However, the current PCT drop-in camp and hiker camp are directly adjacent the banks of Clear Creek (Figures 12 and 13). Clear Creek is not known to flood and has a small drainage basin. Most of the existing Six Mile Camp is located on the floodplain or low terraces that could be subject to bank erosion during flood events of Bridge Creek. The proposed cook area and toilet are both on a high terrace above the floodplain.

### 3.3.2: Environmental Consequences Alternative I: Proposed Action

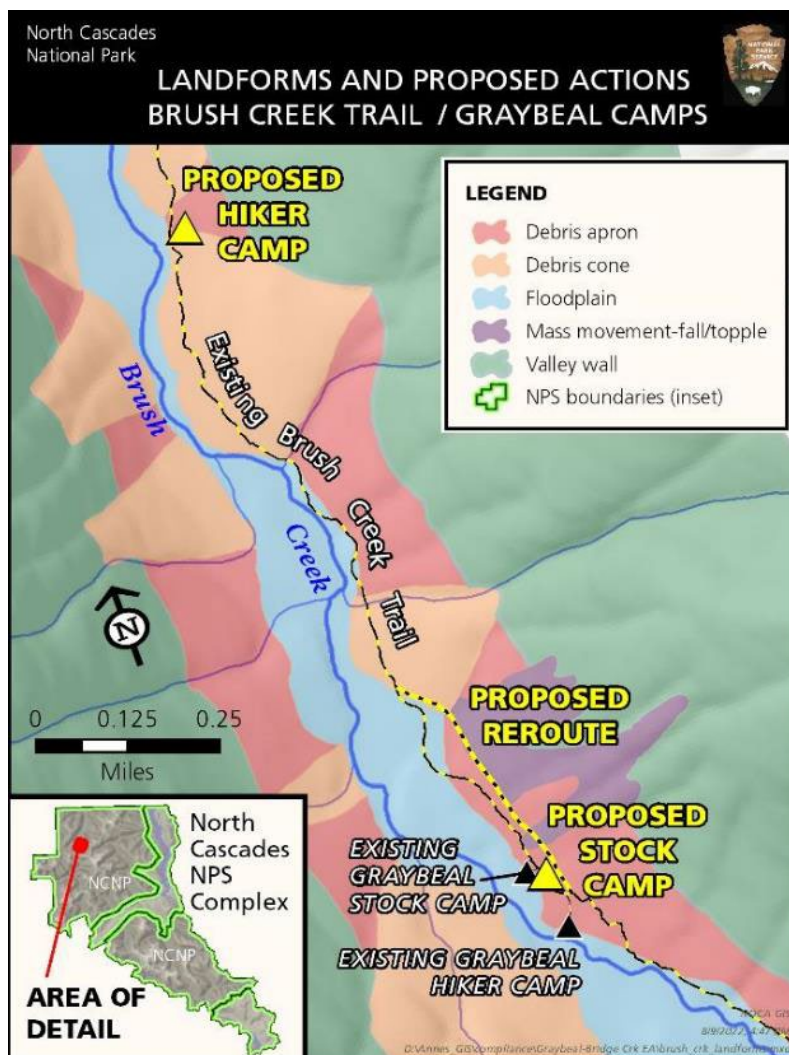
#### Common to All Locations

Construction of the new trails and campsites could generate potential adverse effects to water quality. During rain events bare soil would be susceptible to erosion and sediment transport to nearby streams, increasing the turbidity of the streams. Such turbidity can be detrimental to aquatic life. However, given the local topography, distance to sensitive aquatic habitat, and preventative camp/trail construction and maintenance practices (NPS 2021) the adverse effects are anticipated to be minimal.

#### Brush Creek

Removing the trail and camps from the Brush Creek floodplain would have beneficial effects on water quality since a pit toilet and stock hitchrail would no longer be maintained within the floodplain. It would reduce human and stock foot traffic and camping in the Brush Creek floodplain which would have beneficial effects on aquatic organisms by reducing turbidity generated from foot travel and altering habitat to fit camp uses (i.e., social trails, firewood collection), and trail and camp maintenance activities. Moving the trail and camps out of the floodplain has beneficial effects to Brush Creek since natural processes of channel migration can occur without alteration.

Figure 20. Map showing landforms relative to the position of existing and proposed camps.



### Bridge Creek

Adding the additional bare ground of the tent pads to Six Mile Camp could have adverse effects on water quality by contributing a source of fine sediment that could be transported into Bridge Creek causing additional turbidity during rainstorms and snow melt.

### Cumulative Effects

All the nearby projects that could cause cumulative effects (Section 2.4) may have local short-term adverse effects during the work. However, the goal of all of these is to maintain or improve the trail system to contain foot traffic to the trail and protect against the water quality impacts mentioned above. Cumulatively and in the long-term, all these actions would have neutral to beneficial effects to water quality.

### **3.3.3: Environmental Consequences Alternative II: No Action Alternative**

#### Brush Creek

Trail and camps would continue to be located within the Brush Creek floodplain, including retaining the stock camp toilet within the active floodplain which has long-term minor impacts on water quality, as well as ongoing disturbance from users within the floodplain ecosystem as mentioned above. Summer storms and late fall rain on snow events can raise the level of water quickly in the upper Brush Creek basin, therefore it is also a safety concern for visitors, particularly those with stock, to continue maintaining the camp and trail within the Brush Creek floodplain.

#### Bridge Creek

The no action alternative would likely cause increased crowding of people camping at the Bridge Creek camps and Six Mile Camp. This may have localized adverse effects on water quality if the areas along Clear Creek and Bridge Creek see an expansion in vegetation trampling, and soil compaction and loss.

### Cumulative Effects

All the nearby projects that could cause cumulative effects (Section 2.4) may have local short-term adverse effects due to new soil and sediment being exposed and dug up during the construction work. However, the goal of these projects is to maintain or improve the trail system to contain foot traffic to the trail and protect against the water quality impacts mentioned above.

## **3.4: OLD GROWTH FOREST AND VEGETATION**

National Parks and designated wilderness in the U.S. are some of the last refuges for old growth forest and old growth trees. The areas around the project areas either qualify as old growth forest or may contain large trees which provide significant benefit to the forest ecosystem. The definition old growth or mature forest is still evolving and the process of creating a working definition which allows for optimal planning and adaptive management is currently underway across the U.S. after the recent signing of [Executive Order 14072: Strengthening the Nation's Forests, Communities and Local Economies](#) (Biden 2022). While the concept of old growth forest can be challenging to define quantitatively, we know that old individual trees and older forest ecosystems, provide unique benefits to the vegetation and wildlife communities in the park. The benefits include higher seedling survival rates, more plant and wildlife diversity, and increased genetic adaptation to extreme climatic events. Loss or modification of forest structure, processes and extent decrease the sustainability of individual trees and forest ecosystems. Prematurely removing trees can lead to lower overall species richness throughout the forest, loss of critical habitat, decreased overall forest health, reduced tree seedling growth rates, and decreased levels of carbon sequestration.

Areas of old growth forest burned in the Chilliwack fire complex of 2022. The severity of the fire caused substantial tree mortality, the extent of which has not yet been fully assessed. Additionally, latent mortality up to two years after the fire is expected.

See also Section 3.1.1 for a description of the forest/vegetation communities in the affected area.

### **3.4.1: Environmental Consequences Alternative I: Proposed Action**

#### Common to All Locations

The deliberate design of the proposed action would mitigate impacts to vegetation so that plants are less likely to be damaged or removed by recreational use outside of trails and camps because visitors are more likely to concentrate their use on well-maintained trails and camps.

Constructing and relocating camps would require clearing of understory plants and felling of trees in an area that needs to be cleared for development (trails, tent pads, etc.).

Trees rated as hazardous based upon the potential for failure and the presence of a target which include cooking areas, tent pads, and toilets would be felled during construction and on an ongoing basis as part of reducing risk for trees falling on the camps in the future. This includes all trees that are tall enough to be within falling distance of a target. A commonly used mitigation, though not the only possible mitigation, is the removal of hazard trees. Other possible mitigations include closing the target or relocating it. Assuming current practices extending into the future, the proposed action would result in additional felling of hazard trees or snags. From parkwide data, an average of seven hazard trees per backcountry camp are removed each year. Recurring hazard tree surveys and hazard tree risk mitigation for the life of the camps would be necessary. Hazard tree surveys will consider all management options when addressing hazard trees which include, removal of the target, trimming or topping hazard tree, or removal/felling of the hazard tree. Effects specific to each area are summarized in the sections below.

#### Brush Creek

The proposed action would remove approximately a 10-ft X 2400 ft (0.55 acre) swath of native vegetation along the new trail corridor. Out of the total length of this proposed segment approximately 800 feet cross talus and 150 feet cross a brushy avalanche path. The direct effects in the swath would include removal of all vegetation including an unknown number of trees, and disturbance of talus habitat which mostly harbors lichens and mosses. The overall number of trees to be removed, particularly large trees, would be minimized as much as is practicable. In forested areas this would result in the cutting and removal of some tree roots.

A roughly equivalent length of the old trail segment would be allowed to naturally revegetate. The segment that would be abandoned is primarily in old growth forest on the floodplain. The new trail alignment would result in less ongoing disturbance to root zones and understory plants from trail maintenance which includes activities such as brushing, short reroutes, and clearing fallen trees from the trail.

Construction of the new Graybeal camps would remove approximately 0.2 acre of vegetation resources, including an unknown number of trees, from clearing new access trails, cook areas, toilets, stock hitching area, and tent pads. The overall number of trees to be removed, particularly large trees, would be minimized as much as is practicable and limited to the number necessary to implement the proposed project. In forested areas this would result in the cutting and removal of some tree roots.



Considering the large acreages of surrounding vegetation, these changes would have no or minor effects to forest structure, forest processes, the sustainability of individual trees, and forest ecosystems. While some trees are expected to be removed, the proposed action will have minor effects on overall species richness throughout the forest, critical habitat, overall forest health, tree seedling growth rates, and levels of carbon sequestration due to the acreage of unaffected vegetation adjacent to the site and across the ecosystem.

Moving the Graybeal Hiker and Stock camps new locations would require hazard tree surveys over approximately 11 acres for each camp (total of 22 acres). This estimate is based on a 200-foot radius around each unit of the camp which would allow for mitigation of any tree up to 200 feet in height, which if failed, could fall in the camp. This would be slight increase in camp area compared to the old sites which would be abandoned. The new sites would likely have higher rates of removal due to mortality from the 2022 Chilliwack complex fire and latent mortality of trees affected by the fire. Removal of trees and snags could result in decreased ecological value of the local forest.

#### Bridge Creek

The proposed action would remove up to 0.15 acres of vegetation resources from construction of the new PCT hiker drop-in camp at Bridge Creek and expansion of Six Mile Camp, including an unknown number of trees.

Increasing the size of Six Mile Camp and Bridge Creek Camp as proposed would increase the area requiring annual hazard tree survey and mitigation. The addition of a new campsite at Bridge Creek would require hazard tree surveys over approximately 32 acres based on a 200-foot radius around each unit of the camp which would allow for mitigation of any hazard tree up to 200 feet in height. The Six Mile expansion would require hazard tree surveys over approximately 6.3 acres. The impacts from premature removal of trees and snags, including large individuals, include decreased ecological value of the local forest, reduction in carbon sequestration ability of the existing forest, loss of genetic potential, decreased plant species diversity and decreased forest health and tree seedling development.

Ongoing removal of hazard trees would result in minor effects to the old growth forest ecosystem. The additional number of hazard trees affecting the modified area should be minimal.

#### Cumulative Effects

Several of the nearby projects that could cause cumulative effects (Section 2.4) have the goal to maintain or improve the trail system to contain foot traffic to the trail and maintain existing camps to continue to address overnight visitor use. These maintenance and improvement projects result in a beneficial effect to vegetation because plants are less likely to be damaged or removed by recreational use outside of trails and designated camps because visitors are more likely to concentrate their use on well-maintained trails and camps.

Given the increased camp area of the proposed action a cumulative effect would be the removal of additional hazard trees. This additional project work would have minimal cumulative effect on the vegetation resources. Cumulative effects which include decreased ecological value of the local forest, reduction in carbon sequestration ability of the existing forest, loss of genetic potential, decreased plant species diversity and decreased forest health and tree seedling development are minor due to the large acreage of unaffected vegetation adjacent to the site and across the ecosystem.

### **3.4.2: Environmental Consequences Alternative II: No Action Alternative**

#### Brush Creek

If the no action alternative is selected visitors would continue to use the existing trail and camps in their unsatisfactory condition. Continued use of the trails would result in minor damage to vegetation resources through creation of social trails, widening of trail segments, and development of prohibited user-created tent pads at the existing sites. Illegal tent pads create approximately 50-100 square feet of bare ground or trampled vegetation per tent pad.

Hazard tree surveys and mitigation would continue for the existing camps.

#### Bridge Creek

If the no action alternative is selected, hazard tree surveys and mitigation would continue for the existing camps. Additionally, visitors would continue to use the existing camps and in their unsatisfactory condition. Continued use of the camps would result in damage to vegetation resources through creation of social trails, widening of trail segments and development of prohibited, user-defined tent pads around the existing camps and possibly along the trail corridor. Illegal tent pads create approximately 50-100 square feet of bare ground or trampled vegetation per tent pad.

#### Cumulative Effects

Several of the nearby projects that could cause cumulative effects (Section 2.4) have the goal to maintain or improve the trail system to contain foot traffic to the trail and maintain existing camps to continue to address overnight visitor use. These maintenance and improvement projects result in a beneficial effect to vegetation because plants are less likely to be damaged or removed by recreational use outside of trails and designated camps because visitors are more likely to concentrate their use on well-maintained trails and camps. This would be mixed with the adverse effects noted in the sections above.

## **3.5: WILDERNESS CHARACTER**

### **3.5.1: Affected Environment**

The Stephen Mather Wilderness was designated in 1988 and includes the proposed project areas, except for the existing Bridge Creek Camps. The Brush Creek Trail, Pacific Crest Trail, Graybeal Hiker Camp, Graybeal Stock Camp, and Six Mile Camp all existed prior to wilderness designation and are identified as designated camps in the Park Complex's 1989 Wilderness Management Plan. The system of maintained trails and designated camping by permit are designed to preserve wilderness character by containing and concentrating recreational use to specific areas and prevent overcrowding. Further, overnight visitors are encouraged to practice [Leave No Trace](#) principles to assume personal responsibility for preserving wilderness character in these settings.

The analysis below is organized by [qualities of wilderness character](#). Preserving wilderness character is identified as the central mandate of the Wilderness Act of 1964 (Public Law 88-577). Based on language from the law, five qualities are identified that include untrammeled, undeveloped, natural, outstanding opportunities for solitude and primitive and unconfined recreation, and other features of value. Outstanding opportunities is broken down into three groups 1) opportunities for solitude, 2) opportunities for primitive recreation, and 3) opportunities for unconfined recreation. In the Stephen Mather Wilderness historic and prehistoric resources are considered to contribute to the other features of value quality.

Section 4(c) of the Wilderness Act states that certain uses are prohibited “except as necessary to meet the minimum requirements for the administration of the area for the purpose of this Act...”. Prohibited uses include motor vehicles, motorized equipment, landing of aircraft, mechanical transport, structures, installations, and others. A minimum requirements analysis (MRA) was prepared to consider and account for tangible effects to wilderness character from various alternatives (Appendix C). Two of those alternatives are analyzed in this EA. The results of that analysis are synthesized in the sections below. For more information on Interagency standards for MRAs see the [Minimum Requirements Decision Guide](#) maintained by the [Arthur Carhart National Wilderness Training Center](#).

### **3.5.2: Environmental Consequences Alternative I: Proposed Action**

#### Untrammeled

No components of the action are considered to intentionally manipulate biophysical processes and result in trammeling actions. If trails and campsites are kept to standards, then this promotes effective drainage and use of the facilities that minimizes trammeling effects due to damming of water and erosion. While the other components may cause some trammeling effects, they are likely negligible when mitigations and best practices for work are followed.

#### Undeveloped

For the proposed Brush Creek Trail reroute and Graybeal camps relocations there is no net change in facilities and no additional effect on the Undeveloped quality. The expansion of Bridge Creek Camp, Six Mile Camp, and addition of a food storage locker at Six Mile Camp results in a negative long-term effect on a small area. Helicopter and power tool use would result in short-term effects to the undeveloped quality at Bridge Creek Camp and Six Mile Camp.

#### Natural

Relocating the Brush Creek Trail and Graybeal camps out of the floodplain would remove human activity from within the floodplain. All camps with proposed changes would have layouts and facilities to help reduce human-wildlife conflicts, a long-term positive effect on this quality. For example, the expanded Six Mile Camp is designed to increase the separation between cooking and sleeping areas which should reduce human-wildlife conflicts improving the natural quality. Use of the helicopter and chainsaws result in short-term effects to the natural quality primarily due to noise disturbance to wildlife that would be in the area. Presence of Trail Crews and other NPS staff has a minimal effect on this quality.

Maintaining the trail and camp system to standard has a positive impact on the Natural Quality in that it minimizes negative impacts (trail braiding, bare ground near water or in fragile meadows, impacts to stream banks or lake shores, unmanaged human waste) that would occur by unmanaged visitor use. Maintaining trail tread and structures protect the natural quality in high use areas because they prevent visitors from departing the trail and trampling vegetation to find the easiest way around an obstruction or across a stream. With a sufficient crew capacity to keep up with annual clearing, brushing, repair, and replacement this prevents these impacts and by keeping up with maintenance reduces future workloads.

#### Outstanding Opportunities for Solitude and Primitive and Unconfined Type of Recreation

Relocating and constructing new Graybeal camps would increase opportunities for solitude for visitors staying in these camps as they'll be configured so that different camping parties would have better separation for solitude and privacy. The change of location of the Brush Creek Trail and Graybeal camps would likely

Figure 19. A hiker on the PCT traveling through the meadows just east of North Fork Camp. NPS/Rosemary Seifried



reduce repair and maintenance needs in this area, restore the loss of stock access for the public and administrative use. Given this area's remoteness and short work season, not having NPS stock access for trail maintenance lengthens repair times. These factors would provide long-term beneficial effects to opportunities for primitive recreation.

Building a new PCT drop-in camp at Bridge Creek and Six Mile would provide additional camping opportunities for PCT hikers and they would be less prone to stay at other camps in wilderness along the PCT without a NOCA backcountry permit. Observed past behavior shows that PCT hikers in this situation are more likely to use other camps with permitted visitors staying in them. Unpermitted hikers "crashing" permitted hikers camps has a negative impact on opportunities for solitude.

The sight and sound of the helicopter, chainsaws, and any other motorized tools would have short-term negative effects on opportunities for solitude for any visitors in the area at the time of use.

Opportunities for solitude would be maintained by rerouting Brush Creek Trail and with the trail and camp system maintained because users are able to travel in predictable timeframes from camp to camp thus preventing overcrowding in campsites and often on the trails. In short, this condition allows for the efficacy

of the backcountry permit system. For that subset of more self-reliant users seeking a primitive and unconfined type of recreation maintenance of the trails adversely affects their experience. However, these users have ample opportunities if they get off the maintained trail system and travel cross-country in the wildlands of the North Cascades.

#### Other Features of Value

Effects to cultural resources that contribute to this quality are outlined in section 3.2 above.

#### Summary of Effects to Wilderness Character

The five qualities of wilderness character may interact in direct and subtle ways that may complement or conflict with the others as do the effects discussed above. The overall effects by quality for both Alternatives I and II are considered together in Table 1. Overall, there would be increased short-term negative effects during construction of trails and camps. The new/expanded camps would be expected to preserve or improve wilderness character in the long-term, particularly the natural quality, opportunities for solitude, and opportunities for primitive and unconfined recreation.

#### Cumulative Effects

The only potential additional impacts from the nearby projects from Section 2.4 would be to opportunities for solitude. As long as there are no wildfires or aerial searches/rescues in the area the flyover of additional helicopters from projects would add a few minutes of some distant motorized noise to the project area. However, as is evident from the helicopter activity primarily associated with the Chilliwack Complex Fire this can necessitate well over a hundred landings/longline deliveries and tens of hours of helicopter traffic over head. Additional traffic on the trail and presence of the trail crew doing maintenance on the trails and at camps would likely not be noticeable to most users of the trail. However, the maintenance work would prolong the period in which chainsaws are used and visitors would be subject to the sight and sound of them. There would be a similar cumulative impact on the undeveloped quality.



Table 1. Table showing summary of short-term, long-term, positive, and negative effects from minimum requirements analysis for both alternatives I and II. Note that the numbers are only used to tally effects and do not represent magnitude or value.

Wilderness Character	Alternative I: Proposed		Alternative II: No Action	
	short-term	long-term	short-term	long-term
Untrammeled	0	0	0	0
Undeveloped	Power tool use (-2) Helicopter use (-1)	Expanded camp area at Six Mile (-1) New camp area in wilderness at Bridge Creek (-1)	Additional motorized tool use for maintenance (-1) Possible helicopter deliveries for maintenance (-1)	0
Natural	Power tool noise (-2), Helicopter noise (-1)	Trail improvement (+1) Camp improvements (+2)	Additional motorized tool use for maintenance (-1) Possible helicopter deliveries for maintenance (-1)	Trail and camps remain in floodplain (-2) No camp improvements (-1)
Solitude or Primitive and Unconfined Recreation	Power tool sight & sound (-2) Helicopter sight & sound (-1)	Improved camps for solitude (+4), New camp area in wilderness at Bridge Creek (-1)	Additional motorized tool use for maintenance (-1) Possible helicopter deliveries for maintenance (-1)	Poor solitude at camps (-3)
Unique / Other Features	0	Improved camps to contain recreational impacts (+4)	0	No trail or camp improvements (-4)
<b>Tally</b>	<b>-9</b>	<b>8</b>	<b>-6</b>	<b>-10</b>

### 3.3.2: Environmental Consequences Alternative II: No Action Alternative

#### Untrammeled

No components of the action are considered to notably manipulate biophysical processes and result in trammeling actions.

#### Undeveloped

Trail crew uses chainsaws for routine maintenance for Brush Creek Trail, Graybeal camps, and Six Mile Camp which has a short-term adverse effect on the undeveloped quality.

In managing the trail and camps on the Brush Creek floodplain there would be no net increase in the footprint of developed area and no functional effect on the undeveloped quality from these activities.

This would result in NPS staff maintaining and/or re-building the camp after flood events without stock support, which is time consuming and may result in additional helicopter landings or deliveries to the location.

#### Natural

This alternative would have a long-term negative effect on the natural quality because ongoing efforts to maintain the trail and camps would alter the floodplain of Brush Creek causing short-term but periodic impacts to water quality. The toilet for Graybeal stock camp would continue to create a risk of water contamination during flood events. More frequent trail maintenance would increase motorized tool use and occasional additional helicopter flights would have ongoing short-term impacts to the natural soundscape and any wildlife nearby.

Keeping camps with poor separation between cooking and tenting areas increases the likelihood of wildlife-human conflict and therefore possible impact to the natural quality.

#### Outstanding Opportunities for Solitude and Primitive and Unconfined Type of Recreation

Maintaining Graybeal camps in the current condition would continue to provide compromised opportunities for solitude for visitors staying in these camps as they'll be configured so that different groups have poor separation for solitude and privacy.

Currently the upper Brush Creek Trail is blocked to stock access for the public and administrative use. Given this area's remoteness and short work season, not having NPS stock access for trail maintenance lengthens repair times for damaged camp areas. These factors create adverse effects to opportunities for primitive recreation.

Maintaining the current PCT drop-in camp at Bridge Creek and Six Mile at current capacities would provide fewer camping opportunities for PCT hikers outside of wilderness and they may be prone to stay at other camps in wilderness along the PCT without a NOCA backcountry permit. Hikers in this situation are more likely to use other camps with permitted visitors staying in them thereby having a negative impact on opportunities for solitude.

#### Other Features of Value

Effects to cultural resources that contribute to this quality are outlined in section 3.2 above.

#### Summary of Effects to Wilderness Character

The five qualities of wilderness character may interact in direct and subtle ways that may complement or conflict with the others as do the effects discussed above. The overall effects by quality for both Alternatives I and II are considered together in Table 1. Overall, there would be continued short-term negative effects during maintenance of trails and camps which would be expected to worsen and degrade wilderness character in the long-term in Brush Creek, particularly the natural quality and opportunities for solitude or primitive and unconfined recreation quality. Not addressing the camp capacity issue for PCT hikers would likely impact opportunities for those hikers as well as NPS permitted parties.

#### Cumulative Effects

The cumulative effects as noted above for the proposed action would also apply to the No Action alternative.

# CHAPTER 4 – CONSULTATION AND COORDINATION

## 4.1 LIST OF PERSONS AND AGENCIES CONSULTED

### **4.1.1: History of Public Involvement**

The formal public scoping period for this EA was from March 9, 2022, through April 6, 2022. Ten comments were received from various individuals and organizations.

A virtual public meeting for scoping was held on March 18, 2022, in which three members of the public attended.

### **4.1.2: Agencies Consulted**

#### Section 106 of the National Historic Preservation Act Consultation

Several formal consultation letters describing the project components, and the potential effects that they may have on cultural resources, were sent to the State Historic Preservation Office (SHPO) and the associated tribal partners for each project. Consultation letters for the Brush Creek Trail and Graybeal Camps relocation were dated July 30, 2021, February 14, and April 13, 2022, and January 6, 2023. These letters were sent to the SHPO, Upper Skagit Indian Tribe, Nooksack Indian Tribe, Stó:lō First Nation, and the Nlaka'pamux First Nation. Responses were received by the SHPO in concurrence with the project's potential effects and proposed cultural resources monitoring on August 3, 2021, February 25, 2022, and January 9, 2023. The Upper Skagit Indian Tribe and Stó:lō First Nation also responded with their interests and concerns on August 2, and September 15, 2021, and February 28, and March 9, 2022. Kim DiCenzo, the Cultural Resources Manager at NOCA, also met virtually with a cultural resources program representative from the Stó:lō First Nation to discuss concerns and mitigations on February 2, 2022.

Consultation letters were also sent for both the Six Mile Camp and the Bridge Creek Camp expansion projects. These letters were addressed to the SHPO, Sauk-Suiattle Indian Tribe, Colville Confederated Tribes, and the Confederated Tribes and Bands of the Yakama Nation on May 12, and July 8, 2021, and February 10, and April 14, 2022. The SHPO concurred with our project components and survey findings for the Six Mile Camp expansion project on July 12, 2021, and February 16, 2022. NOCA received concurrence for Six Mile from the Colville Confederated Tribes on February 23, 2022. Additional concurrence was received for the Bridge Creek Camp expansion from the SHPO on May 12, 2021, and April 27, 2022, and the Colville Confederated Tribes on May 4, 2022.

#### Section 7 of the Endangered Species Act

Roger Christophersen, Wildlife Biologist at NOCA discussed the rationale for No Effect determinations for listed species with Vince Harke with the US Fish and Wildlife Service on April 6, 2021, with follow up emails on April 7, 2021. Mr. Harke agreed the proposed action would have No Effect on listed species.

### **4.1.3: List of Preparers**

Alberts, Collin, Environmental Protection Specialist, NOCA

Anthony, Hugh, Aquatic Ecologist, NOCA

Braaten, Anne, GIS Specialist and Bear Biologist, NOCA

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 Sarrantonio, Sharon, Geologist, NOCA  
 Sholin, Carl, Archeologist, NOCA  
 Zimmer, Bill, Trails Supervisor, NOCA

## 4.2 REFERENCES

- Biden, J.R. 2022. Executive Order 14072: Strengthening the Nation's Forests, Communities, and Local Economies. Presidential Documents. Federal Register, vol. 87 no. 81, April 27, 2022.  
<https://www.govinfo.gov/content/pkg/FR-2022-04-27/pdf/2022-09138.pdf>
- Hamer, Thomas E.; Nelson, S. Kim. 1995. Chapter 6: Characteristics of Marbled Murrelet Nest Trees and Nesting Stands. In: Ralph, C. John; Hunt, George L., Jr.; Raphael, Martin G.; Piatt, John F., Technical Editors. 1995. Ecology and conservation of the Marbled Murrelet. Gen. Tech. Rep. PSW-GTR-152. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; p. 69-82.
- Kuntz II. RC and RG Christophersen. 1996. A survey of the northern spotted owl in North Cascades National Park Service Complex. NPS Technical Report NPS/CCSONOCA/NRTR-96/05. US Department of the Interior, National Park Service, North Cascades National Park, Sedro Woolley, WA.
- Hamer, T.E., E.D. Forsman, and E.M. Glenn. 2007. Home range attributes and habitat selection of barred owls and spotted owls in an area of sympatry. *The Condor* 109:750-768.
- Hamer Environmental L.P. 2008. Use of Radar to Determine the Presence/Absence of Marbled Murrelets in North Cascades National Park, Washington. Final Report submitted to North Cascades National Park Complex, November 4, 2008.
- NPS. no date. Trails Handbook. North Cascades National Park, Skagit District.
- NPS. 1989. Wilderness Management Plan, North Cascades National Park Service Complex. Signed by Superintendent March 20, 1989.
- NPS. 2012. Final General Management Plan/Environmental Impact Statement for Ross Lake National Recreation Area. US Department of the Interior, National Park Service, Pacific West Region – Seattle Office, Seattle, Washington. Online at: <http://www.nps.gov/noca/parkmgmt/rlna-gmp.htm>
- NPS. 2015. Revision of PW-062 "Hazard Tree Management" Directive. Regional Director, Pacific West Region.
- NPS. 2017. Foundation Document, North Cascades National Park Service Complex, Washington, August 2017. US Department of the Interior, National Park Service, Pacific West Region – Seattle Office, Seattle, Washington. Online at: <https://parkplanning.nps.gov/document.cfm?parkID=327&projectID=16940&documentID=47867>

- NPS. 2018. Thunder Creek and Park Creek Trails. North Cascades National Park Service Complex Website. US Department of the Interior, National Park Service. Online at: <https://www.nps.gov/noca/planyourvisit/thunder-creek-trail.htm>
- NPS. 2021. Programmatic: Routine and Cyclic Trail Maintenance Categorical Exclusion, Detailed Project Description and Best Management Practices, North Cascades National Park Complex. PEPC number 46436.
- NPS. 2022. Wilderness Trip Planner. North Cascades National Park Service Complex Website. US Department of the Interior, National Park Service. Online at: <https://www.nps.gov/noca/planyourvisit/wilderness-trip-planner.htm>
- Newberry-Cushman, T.; E. LaFave, C. Sholin, and K. DiCenzo. 2022. Historic Property Inventory for the Six Mile Camp Reconfiguration Project, Chelan County, Washington. NPS Technical Report, DAHP Project 2021-07-04134, PEPC Project 104616. US Department of the Interior, National Park Service, North Cascades National Park, Sedro Woolley, WA.
- Sholin, C.; E. LaFave, M. Hawk, and K. DiCenzo. 2022. Historic Properties Inventory for the Pacific Crest Trail Drop-In Camp at Bridge Creek in Chelan County, Washington. NPS Technical Report, DAHP Project 2021-05-02711, PEPC Project 90835. US Department of the Interior, National Park Service, North Cascades National Park, Sedro Woolley, WA.
- Siegel, R. B., K. E. Jablonski, M. N. Scholer, R. C. Kuntz II, and R. L. Wilkerson. 2009. Surveying for Spotted Owls on the east slope of North Cascades National Park Service Complex, 2007-2008. Natural Resource Technical Report NPS/NCCN/NRTR—2009/184. National Park Service, Fort Collins, Colorado.
- USDI. 1990. Endangered and threatened wildlife and plants; determination of threatened status for the Northern Spotted Owl; Final Rule. Federal Register Vol. 55:26114-26194. June 26, 1990.
- Hamer, Thomas E.; Nelson, S. Kim. 1995. Chapter 6: Characteristics of Marbled Murrelet Nest Trees and Nesting Stands. In: Ralph, C. John; Hunt, George L., Jr.; Raphael, Martin G.; Piatt, John F., Technical Editors. 1995. Ecology and conservation of the Marbled Murrelet. Gen. Tech. Rep. PSW-GTR-152. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; p. 69-82.
- Hamer, T.E., E.D. Forsman, and E.M. Glenn. 2007. Home range attributes and habitat selection of barred owls and spotted owls in an area of sympatry. The Condor 109:750-768.
- Hamer Environmental L.P. 2008. Use of Radar to Determine the Presence/Absence of Marbled Murrelets in North Cascades National Park, Washington. Final Report submitted to North Cascades National Park Complex, November 4, 2008.
- USDI. 1992. Endangered and threatened wildlife and plants; determination of threatened status for the Washington, Oregon, and California population of marbled murrelet. Federal Register Vol. 57:45328-45337. October 1, 1992.
- Wilk, R.J., Raphael, M.G. and Bloxton, T.D., Jr. 2016. Nesting habitat characteristics of Marbled Murrelets occurring in near-shore waters of the Olympic Peninsula, Washington. J. Field Ornithol., 87: 162-175. <https://doi.org/10.1111/jofo.12150>
- Wilk R.J., Lesmeister D.B, Forsman E.D. 2018. Nest trees of northern spotted owls (*Strix occidentalis caurina*) in Washington and Oregon, USA. PLoS ONE 13(5): e0197887. <https://doi.org/10.1371/journal.pone.0197887>



## APPENDIX A: VISITOR USE DATA AND ANALYSIS

### Overnight Use Data for Camps in the Affected Environment

This data provides a summary of the percentage of nights that the camps were full in the affected environment considered in the EA during the peak season of July through September. This provides a sense of how popular and in demand respective designated campsites are.

Table A-1. Table showing percentage of nights that camps were full on the Chilliwack River, Copper Ridge, and Brush Creek Trails. Note a fire in the area in 2021 significantly curtailed typical levels of use. The average only uses 2014-2020 data.

Camp Name	Capacity	2014	2015	2016	2017	2018	2019	2020	2021	Average
Boundary	4,4,4	34%	35%	41%	32%	27%	33%	48%	13%	36%
Silesia	4,4	38%	47%	47%	41%	29%	42%	54%	15%	43%
Egg Lake	4,4,4	29%	46%	33%	38%	37%	42%	42%	25%	38%
Copper Lake	4,4,4	46%	48%	42%	30%	38%	38%	46%	14%	41%
Copper Creek	4,4,4,4,4	5%	4%	1%	10%	4%	3%	24%	4%	7%
U.S. Cabin Stock	12	18%	41%	38%	23%	41%	61%	54%	38%	40%
U.S. Cabin Hiker	4,4,4,4	7%	11%	13%	12%	10%	7%	23%	3%	12%
Indian Creek	4,4,4	23%	37%	32%	26%	26%	27%	38%	10%	30%
Bear Creek	4	26%	28%	30%	22%	21%	36%	49%	14%	30%
Graybeal Stock	12	38%	13%	18%	16%	16%	20%	15%	26%	20%
Graybeal	4,4	15%	24%	21%	18%	18%	20%	24%	15%	20%
Whatcom	4,4,4	12%	13%	16%	13%	11%	12%	22%	4%	14%

Table A-2. Table showing percentage of nights in July, August, and September that camps were full along the PCT in the Park Complex.

Camp Name	Capacity	2014	2015	2016	2017	2018	2019	2020	2021	Average
Fireweed	6,6	20%	21%	47%	41%	29%	26%	54%	40%	35%
Fireweed Stock	8,12	5%	7%	29%	20%	18%	22%	39%	7%	18%
Hideaway	12	50%	50%	67%	68%	64%	68%	73%	64%	63%
South Fork	4,4	23%	14%	38%	47%	37%	37%	67%	41%	38%
South Fork Stock	12	29%	26%	43%	48%	41%	53%	53%	50%	43%
Six Mile	12	46%	47%	84%	90%	82%	92%	NA	NA	55%
North Fork		38%	30%	58%	61%	45%	46%	55%	29%	45%
Bridge Creek Stock	8	0%	1%	8%	12%	16%	12%	17%	9%	9%
Bridge Creek Group	12, 12	5%	7%	13%	22%	24%	35%	12%	8%	16%
Bridge Creek Hiker	4,4,4,4,4,4	2%	0%	3%	3%	3%	2%	0%	0%	2%
Shady	8	15%	18%	28%	29%	27%	34%	22%	27%	25%
Tumwater	4,4	21%	9%	23%	11%	32%	17%	9%	20%	18%
High Bridge	6,6	15%	10%	28%	26%	26%	30%	26%	30%	24%

## **Analysis to Determine Camp Capacity for Bridge Creek and Six Mile PCT Drop-In Camps**

### ***Introduction***

Prior to honoring PCTA's long-distance hiking permit and designating drop-in camps for those permit holders, the NPS required all PCT long-distance hikers to obtain a North Cascades overnight backcountry camping permit (backcountry permit). Between 2016 and 2019 NPS staff made a concerted effort to issue these permits to any PCT hikers wishing to camp overnight in the Park Complex. In addition, NPS staff recorded each person or party that identified as a PCT hiker in the permit database. Along with nearby trail counter data this created a dataset that captures the travel patterns of most of the PCT hikers that pass through the Park Complex and provides the basis for estimating levels of use and capacity needs. Sources of error in this data include that not all PCT hikers camping in the park obtained a backcountry permit, some likely did not stay at the camp assigned to them, and other hikers commonly do shorter section hikes and may or may not have obtained the required NPS backcountry permit. These other hikers may have identified as PCT long-distance hikers but covered a section less than 500 miles. Non-compliance rates with permits are unknown, however a comparison of the backcountry permit data with a trail counter data on the PCT from the Suiattle area several miles to the south, shows that annually 69% to 93% of those who passed the counter obtained a backcountry permit (from 2017-2019 data). The location of this counter is thought by the Forest Service and PCTA to catch primarily PCT through-hikers, and thus a good approximation of the number passing through the North Cascades. Thus, it appears that there were high rates of compliance with obtaining NPS backcountry permits during this period. The Park Complex section of the PCT is also short enough that it is reasonable some remaining percentage of long-distance hikers passed through in a day without camping.

Analysis of the backcountry permit dataset from 2017 to 2019 shows that approximately 30% of the camping use was by PCT hikers along the PCT corridor in the Park Complex (including campgrounds in the lower Stehekin valley). PCT hikers that camped stayed an average of one night in the Park Complex. This data shows a clear need to accommodate PCT through hikers for over 2000 visitor use nights per hiking season.

Data from the backcountry permit database and from trail counters at several locations allows for the analysis of the effect of camp capacity on the frequency of instances the capacity of the camp is exceeded. This is the basis for determining the necessary capacity for each camp. While the preferred design features of backcountry camps identify camp design to maximize solitude and privacy between groups, this standard is not adhered to for PCT drop-in camps as long-distance hikers when camping often tend to congregate together in closer proximity than other backpacking groups. Thus, the PCT drop-in camps have less separation between tent pads and by design provide less camping privacy between users of the camp.

### ***Methods and Analysis***

The year 2019 has the highest level of use on record and thus the data from this year was chosen to provide the basis for capacity analysis. Three areas/trail segments were chosen to collate the use of all PCT hikers that obtained backcountry permits. These areas were chosen based on where PCT hikers are likely to camp and where there was space available to designate a PCT drop-in camp. These camps are listed, and the 2019 data is summarized in Tables A-3. This data generally shows that overnight use in the Stehekin Landing area was favored by PCT hikers with 64% of PCT hiker use there.

Approximately 24% of PCT hikers used the High Bridge to Bridge Creek area, and 17% used camps along the trail that are in designated wilderness. Note

the data does not necessarily reflect PCT hiker preference for individual camps, as that data primarily reflects park policy since NPS staff were directed to permit PCT hikers first at High Bridge, Bridge Creek Group, and Six Mile and then as a second-tier option at Bridge Creek Hiker, South Fork Stock, and Fireweed Stock. It was also NPS policy at the time to direct PCT hikers to Lakeview Group & Stock Camp and Stehekin Landing Overflow.

Table A-3. Data from camps showing camp capacity and a comparison of PCT hiker versus all camping users. Visitor Use Nights (VUN) are the number of people multiplied by the number of nights each stayed at a given camp. Table A summarizes data from camps the lower Stehekin Valley. Table B for the High Bridge to Bridge Creek area, and Table C for camps along the PCT in North Cascades National Park that are also in designated wilderness.

A	Camp	PCT VUN	All VUN	% PCT use
12	Lakeview Group + Stock Camp	803	874	92%
32	Lakeview Camp	89	988	9%
40	Stehekin Landing Overflow	369	541	68%
24	Purple Point	24	1123	2%
	<b>Stehekin Total</b>	<b>1285</b>	<b>3526</b>	<b>36%</b>

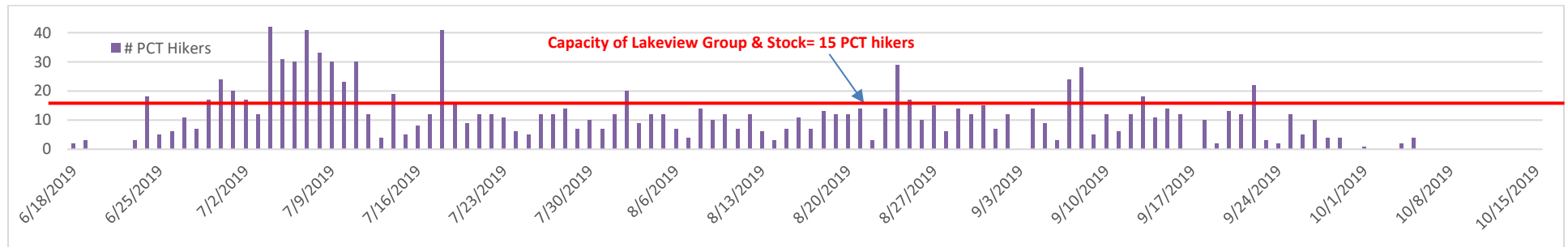
B	Camp	PCT VUN	All VUN	% PCT use
12	High Bridge	36	299	12%
12	Tumwater	3	185	2%
	<b>High Bridge Area Total</b>	<b>39</b>	<b>484</b>	<b>8%</b>
8	Shady	2	93	2%
24	Bridge Cr Hiker	44	631	7%
24	Bridge Cr Group	289	359	81%
8	Bridge Cr Stock	12	18	67%
	<b>Bridge Cr Area Total</b>	<b>347</b>	<b>1101</b>	<b>32%</b>
	<b>High Bridge to Bridge Creek Total</b>	<b>386</b>	<b>1585</b>	<b>24%</b>

C	Camp	PCT VUN	All VUN	% PCT use
18	North Fork	68	326	8%
12	Six Mile	107	381	77%
8	South Fork	26	247	12%
12	South Fork Stock	26	135	54%
12	Hideaway	13	155	9%
12	Fireweed	27	210	7%
20	Fireweed Stock	70	135	35%
	<b>Wilderness Total</b>	<b>337</b>	<b>1589</b>	<b>31%</b>

While the above data is useful in identifying relative amounts of overall use it does not address the ebb and flow in the number of hikers using camps on any given night. However, a comparison of nightly data against camp capacity numbers indicates the number of nights that the capacity was exceeded in any given night. Figure A-1 compares the capacity of Lakeview Group and Stock (15 people/night) against actual use in 2019. Between July 12 and October 15, the capacity of this camp was exceeded 10 out of 96 nights. The 2019 data before July 12 was filtered out because there was an unusual pulse

of southbound hikers in early July. This condition is unlikely to occur again because in 2020 PCTA imposed a limit of 15 hiking starts/day for south bound long-distance permit holders. It is likely this limit would reduce pulses of large numbers of hikers in the future and thus pre-July 12 data is not used for capacity determinations.

Figure A-1. Graph showing the capacity of Lakeview Group & Stock Camp (12 people/night) against permitted use in 2019.



Likewise, the same type of comparison was done for Bridge Creek and Six Mile Camps to consider the effects of capacity changes on capacity exceedance frequency. The early July pulse from these camps did not register because the southbound hikers pass almost all the Park Complex PCT segment before getting to Stehekin where they can easily obtain a backcountry permit. Thus, data from north bound hikers later in the season is more useful for this analysis. At a capacity of 8 people, the Bridge Creek drop-in camp exceeded this 10 out of 96 nights (10%) and Six Mile (capacity of 12 people) saw that limit exceeded 5 out of 96 nights (5%).

Figure A-2. Graph showing the capacity of the Bridge Creek Drop-in camp (red line = 8 people/night) against permitted use in 2019. The blue line indicates a minimum capacity of 13 people identified for the new PCT drop-in camp from this analysis

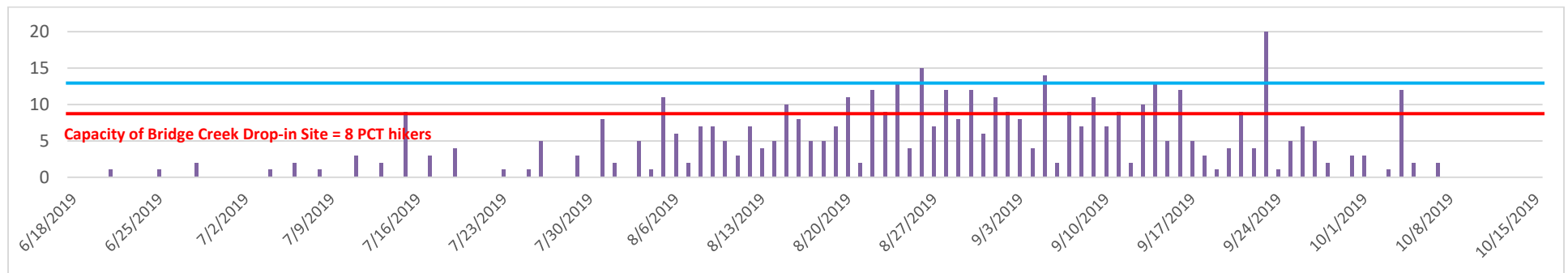
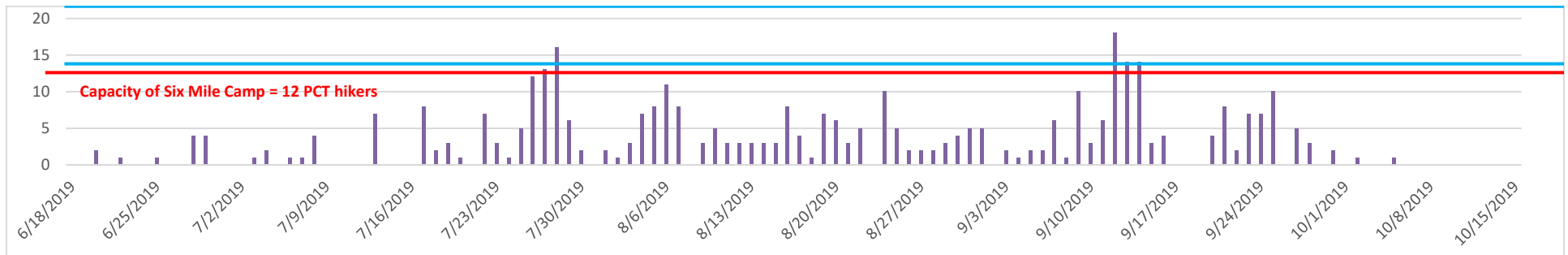


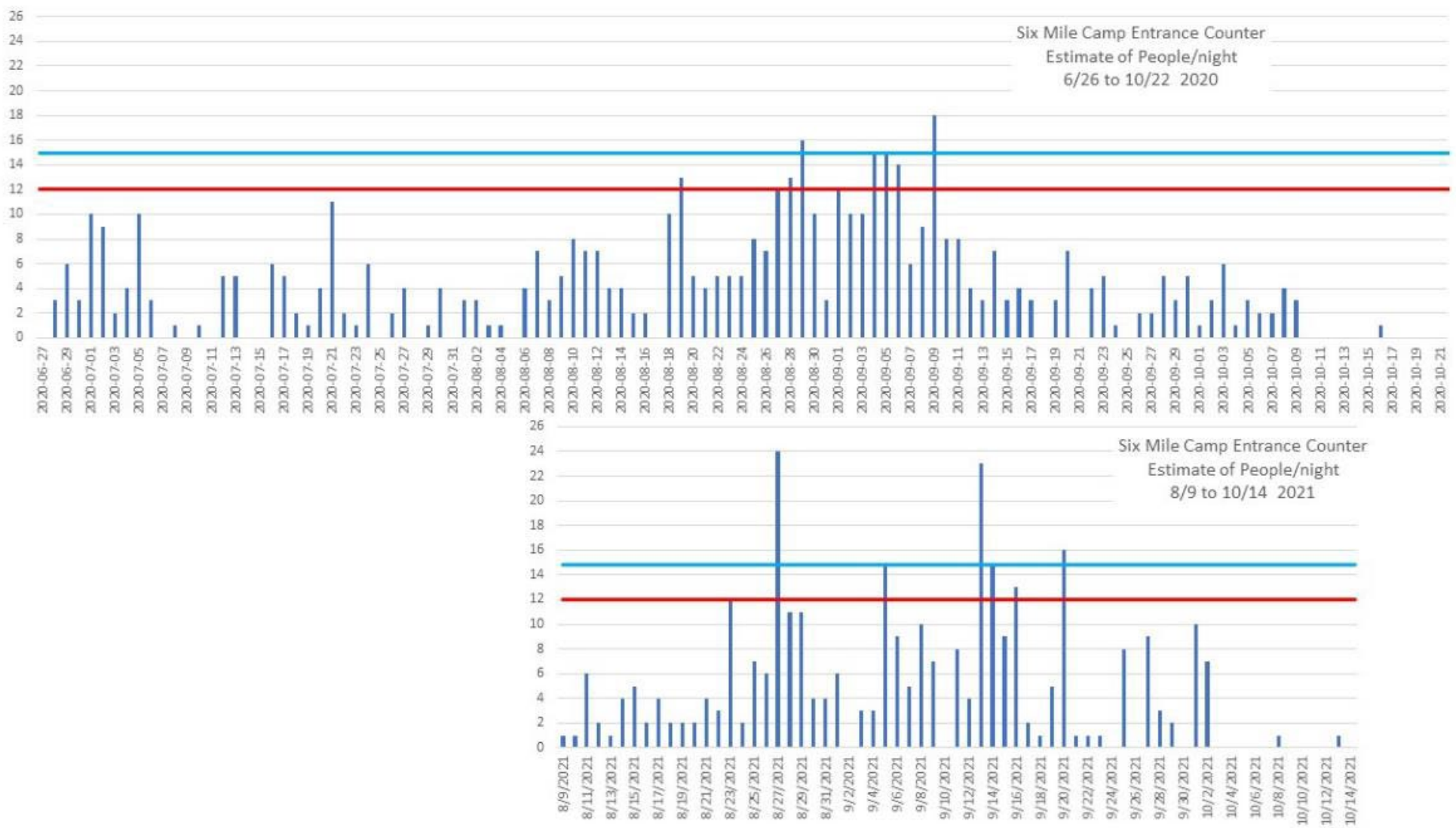
Figure A-3. Graph showing the capacity of the Six Mile Drop-in camp (red line = 12 people/night) against permitted use in 2019. The blue line indicates the minimum capacity of 13 people identified for the new PCT drop-in camp from this analysis



To partly address the uncertainties with NPS backcountry permit compliance discussed above, NPS staff were also able to install an infrared trail counter at the entrance trail to Six Mile Camp in 2020 and 2021 in an effort to directly measure people accessing the camp (Figure A-4). This data suggests similar patterns and amounts of use at Six Mile camp corroborating the 2019 data. However, this data also contains inaccuracies due to a bird nest directly across from the counter with the bird likely triggering it instead of humans. These triggers were filtered out as much as they could be discerned by trying to balance the number of counter passes in the late afternoon and evening (that were presumably hikers arriving) with those passes in the morning (presumably hikers departing).



Figure A-4. Graph showing the capacity of the Six Mile Drop-in camp (red line = 12 people/night) against trail counter data in 2020 and 2021. The blue line indicates the minimum capacity of 15 people identified for the new PCT drop-in camp from this analysis.



### ***Summary and Selection of Camp Capacities for Proposed Action***

No standards exist for this area for camp capacity exceedance to guide setting the proposed camp capacities. However, applying the basic principle of minimizing exceedance to just a few times a season is employed. Exceeding the capacity of a camp may cause campers to crowd together and/or to camp on flat ground outside of the developed boundaries of the camp thereby trampling vegetation and compacting soils. It takes only a few nights of camping to damage vegetation beyond recovery and considering this a limiting attribute, exceeding capacity of the camp no more than 3 times a season is chosen. This results in a minimum capacity of 13 for the Bridge Creek PCT drop-in camp (Figure A-2) and a minimum capacity of 15 for Six Mile Camp (Figures A-3 and A-4).

Given the uncertainties in the data discussed above, adding a buffer to the estimated capacity limits is prudent. In addition, while 2019 was the biggest year yet in people obtaining PCTA long-distance permits (7880 issued), the maximum number of permits available (8000) was not reached thus there is some potential for increased use beyond 2019. To provide some buffer for this increased use the design for the drop-in camps at Bridge Creek and Six Mile is chosen for a maximum capacity of 15-20 people. A camp at this capacity should contain all camping impact use but may feel crowded to some users when occasionally full.

## APPENDIX B: PREFERRED DESIGN FEATURES (PDFs) FOR STEPHEN MATHER WILDERNESS CAMPS

- Sited away from dynamic geologic processes and landforms that may disrupt the camp or endanger visitors (floodplains, debris cones, and rockfall areas)
- Does not occupy suitable or sensitive wildlife habitat (northern spotted owl and/or marbled murrelet suitable nesting habitat, grizzly or black bear, other species as applicable).
- Does not occupy rare plant habitat.
- Does not occupy sensitive archeological sites.
- If in forest, sited so that hazard tree risks are minimized and will be for the foreseeable future
- Camp at least 100 feet away from a water body
  - Personal experiences and social science show that visitors want to camp as close as possible to waterbodies. Depending on the local conditions (soils, vegetation, wildlife, and visitor use patterns), campsites could be located closer to water but would require a site-specific evaluation and containment strategy (see Marion, Wimpey, and Lawhorn 2018).
- Camp is not so far away from a water source as to be inconvenient to the user (15 min walk max?)
- Toilet is at least 200 feet away from a water body
- The cooking and food storage area are combined and is at least 100 feet away from tent pads/sleeping area to reduce risks of human bear conflict. Other national parks with grizzly bears use a 100-yard standard distance for this separation and this will be achieved when possible.
  - Cooking and food storage areas may be communal for multiple campsites, or each individual site may have its own area. A rule of thumb could be 1 cook site for a large group camp and 1 cook site for every 2 small group campsites within the same camp area.
  - A concerted effort is needed to provide guidance to public to show where the proper cook/food storage area is.
  - A cooking area should not be so screened by topography or vegetation so that when approaching on trail you can see it if a bear was hanging around or if in the cook area one can see an approaching bear.
- Meets privacy standards: out of sight of both the main trail and other campsites.
- Camp areas are contained on terrain or in a vegetation type that resists growth of barren ground (e.g., sidehill campsites)
- As appropriate and applicable may have the following installations for visitor use mitigation:
  - Fire rings – Rock fire rings where fires are allowed.
  - Food storage – Depending on the site the NPS will provide either a wire suspended between trees in forested areas or a metal wildlife resistant storage box or will require use of a bear resistant food container.
  - Toilet (Wallowa or Composter):
    - Large group camps should have separate toilets from small group camps in the same area.
- Stock Users have some different needs and Stock Camps need to have some different PDFs:
  - Need <20% slopes as stock don't navigate steep slopes as well as people.
  - Needs generally larger area to accommodate animals

- Not too far from water so watering is not overly time consuming (for example if animals need to be led singly to water).
  - Needs well-constructed trail to water access
  - Need a tent pad next to the hitchrails for the packer(s).
- Administrative camps have a few different standards:
  - Admin camps can have Knaack boxes
  - Some ranger camps have wood platforms (Pelton Basin and Boston Basin)
  - New camps ideally extension of existing camps to concentrate all human camping impacts in a locale.

## APPENDIX C: MINIMUM REQUIREMENTS ANALYSIS



### North Cascades National Park Service Complex

# MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

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

-- The Wilderness Act of 1964

**Project Title:** **Backcountry Camp Modifications in North Cascades National Park**

### MRDG Step 1: Determination

*Determine if Administrative Action is Necessary*

#### Description of the Situation

*What is the situation that may prompt administrative action?*

Recent changes in environmental and social factors have forced the NPS to consider changes in locations of a trail segment and campsites in Brush Creek and configuration of Six Mile Camp in Bridge Creek:

- The existing Brush Creek Trail was washed out by floods in 2003, 2006, and 2017. The upper three miles of this trail is now inaccessible to stock, which is problematic because the NPS has committed to keeping this trail passable for stock users. This is also important for trail maintenance as NOCA's Packer relies on this trail to bring in equipment and supplies with stock animals.
- Graybeal Hiker and Stock Camps have suffered repeated damage due to flooding events coming from Brush Creek in 2003, 2006, and 2017. Additionally, Brush Creek is aggrading near the current Graybeal Hiker and Stock Camps. This means sediment is being moved down the river's floodplain during high water events and it has the effect of raising the elevation of the floodplain. This makes both campsites more susceptible to flooding in the future, which increases the need for action. Effects of the Chilliwack Complex Fire in 2022 will exacerbate these issues as a large portion of the Brush Creek drainage burned in the Brush Creek 2 Fire.
- Patterns of erosion and sand deposition have forced the layout of the hiker camp into a confusing web of trails, tent pads, and cook areas that do not meet

the preferred design features of camps in Stephen Mather Wilderness. Both NPS staff and visitors have commented on the poor condition and layout of this camp. Moving the campsites out of the floodplain zone will prevent further damage, ease maintenance requirements, reduce costs, and allow natural processes to occur unhindered.

- In recent years there has been high demand and crowding from overnight users and difficulty in issuing NPS permits to long-distance PCT hikers for camps along the Pacific Crest Trail in North Cascades National Park (Bridge Creek Trail).
- Some camp locations are not adequately designed to reduce risks of human-bear conflict.

### Options Outside of Wilderness

*Can action be taken outside of wilderness that adequately addresses the situation?*

☐ YES

**STOP – DO NOT TAKE ACTION IN WILDERNESS**

☒ NO

**EXPLAIN AND COMPLETE STEP 1 OF THE MRDG**

Explain:

These issues cannot be addressed outside of wilderness because they address questions central to managing visitor use in wilderness and are inextricably linked to the public purposes of wilderness.

### Criteria for Determining Necessity

*Is action necessary to meet any of the criteria below?*

#### A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that requires action? Cite law and section.*

☐ YES

☒ NO

Explain:

Not Applicable.



## B. Requirements of Other Legislation

*Is action necessary to meet the requirements of other federal laws? Cite law and section.*

☒ YES    ☐ NO

Explain:

Visitor use management must be addressed in North Cascades National Park Service Complex to prevent impairment as stipulated in the NPS Organic Act.

The Organic Act of the National Park Service: (PL 39-535) “Sec.1. .... The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

Enabling Legislation for North Cascades National Park, Ross Lake National Recreation Area and Lake Chelan National Recreation Area, as amended (PL 90-544)

“In order to preserve for the benefit, use, and inspiration of present and future generations certain majestic mountain scenery, snowfields, glaciers, alpine meadows, and other unique natural features...there is hereby established...the North Cascades National Park” (Title 1, Section 101)

“In order to provide for the public outdoor recreation use and enjoyment of portions of the Skagit River and Ross, Diablo, and Gorge Lakes, together with the surrounding lands, and for the conservation of the scenic, scientific, historic, and other values contributing to public enjoyment of such lands and waters, there is hereby established...the Ross Lake National Recreation Area” (Title 2, Section 201)

“The Secretary shall administer the recreation areas in a manner which in his judgment will best provide for (1) public outdoor recreation benefits; (2) conservation of scenic, scientific, historic, and other values contributing to public enjoyment.” (Title 4, Section 402(a))

### C. Wilderness Character

*Is action necessary to preserve one or more of the qualities of wilderness character, including: Untrammeled, Undeveloped, Natural, Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation, or Other Features of Value?*

#### UNTRAMMELED

☐ YES ☒ NO

Explain:

Action is not necessary to preserve the untrammeled quality.

#### UNDEVELOPED

☐ YES ☒ NO

Explain:

Action is not necessary to preserve the undeveloped quality.

#### NATURAL

☒ YES ☐ NO

Explain:

Some action is necessary to address visitor use impacts on components of the natural quality. Such components may include water quality, fish, wildlife, and/or habitat. Strategies for visitor use management are designed to address and minimize potential impacts to these resources.

Proactively addressing the flood damaged trail is necessary so that an intentional solution to the problem is devised instead of more reactive short-term solutions.

#### SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

☒ YES ☐ NO

Explain:

Some action is necessary to address visitor use impacts on outstanding opportunities for solitude and a primitive and unconfined type of recreation. Strategies for visitor use management are designed to address and minimize potential impacts to these values.

Overnight camping in this area is an established use and under the current system of designated campsites and permits, maintaining these opportunities helps preserve visitor opportunities for primitive and unconfined recreation.

#### OTHER FEATURES OF VALUE

☒ YES ☐ NO

Explain:

Some action is necessary to address visitor use impacts on cultural resources. Strategies for visitor use management are designed to address and minimize potential impacts to these resources.

#### Step 1 Decision

*Is administrative action necessary in wilderness?*

##### Decision Criteria

- |  |   |  |
|--|---|--|
| A. Existing Rights or Special Provisions | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO |
| B. Requirements of Other Legislation     | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            |
| C. Wilderness Character                  |   |  |
| Untrammeled                              | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO |
| Undeveloped                              | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO |
| Natural                                  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            |
| Outstanding Opportunities                | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            |
| Other Features of Value                  | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            |

Is administrative action necessary in wilderness?

☒ YES

**EXPLAIN AND PROCEED TO STEP 2 OF THE MRDG**

☐ NO

**STOP – DO NOT TAKE ACTION IN WILDERNESS**

Explain:

Relevant laws support providing for visitor enjoyment and outdoor recreation use as long as the resources in these areas are maintained unimpaired and wilderness character is preserved. Both the Wilderness Act and NPS Organic Act acknowledge that National Parks and designated Wilderness are for the enjoyment of people and the preservation/conservation of resources.

In summary, action is necessary to manage visitor use while also preserving natural and cultural resources and providing outstanding opportunities for solitude and a primitive and unconfined type of recreation. Proactively addressing the flood damaged trail is necessary so that an intentional solution to the problem is devised instead of more reactive short-term solutions. Overnight camping in these areas is an established use and under the current system of designated campsites and permits, maintaining these opportunities helps preserve visitor opportunities for primitive and unconfined recreation.

## MRDG Step 2

### Other Direction

*Is there “special provisions” language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?*

### **AND/OR**

*Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?*

*Determine the Minimum Activity*

☒ YES

**DESCRIBE OTHER DIRECTION BELOW**

☐ NO

**SKIP AHEAD TO TIME CONSTRAINTS BELOW**

Describe Other Direction:

NOCA’s trail system has a history of recreational use predating both park and wilderness designation. The NPS established standards for the trail system in 1982 that predate wilderness designation, and the Wilderness Act specifically states that “the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system...” (section 4(a)(3)). Thus these standards are key to guiding what the minimum tools and activities are in Step 2.

See also the Stephen Mather Wilderness Camp Preferred Design Features in Appendix B. of the environmental assessment.

NPS Management Policies 2006 and NPS DO-41: 6.3.10.2 Trails in Wilderness. “Trails will be maintained at levels and conditions identified within the approved wilderness management plan or other planning document.”

Management standards in the Wilderness Management Plan for North Cascades National Park Service Complex (1989) state:

- “390 miles of trail are maintained annually in North Cascades National Park Service Complex” (page 15)
- “Non-power tools will be preferred. The Wilderness District Ranger will have final approval for the use of power tools. All contracts will consider the use of non-power tools. Any use of power tools will be limited as far as possible to before the 4<sup>th</sup> of July and after Labor Day. All power tools will use a modified muffler that reduces decibel level...Power tools will be limited

to chain saw, brushers, rock drills, chain saw winches, and explosives. Contractors will be required to meet these standards” (page 16).

- "Aircraft may only be used if stock use is not permitted on trails, trail conditions prevent stock use, or it is impractical to use stock and there is no other practical way to accomplish the work. Aircraft use will be confined to Monday through Thursday and as much as possible to before the 4th of July and after Memorial Day. Emergency operations are exempt. All helicopter operations will comply with NCNPSC’s Helicopter Use Management Plan" (page 16).

- “In Day Use...and Trail/Camp Areas, the use of power tools is permitted when the Trails Supervisor has considered non-power tools and found them to be ineffective, inappropriate, unsafe, or when it would be impossible to complete the work load or maintain the standards outlined in this plan” (page 17).

- “Power tools will be permitted when non-power tools have been considered and found to be ineffective or inappropriate for the job. Consideration will be type of work, safety, weather, distance, amount of work to be accomplished, number of visitors using the area, and the effect on wildlife...Acceptable power tools are chain saws, power winches, and handheld rocks drills, hand-held power brushers and explosives. All power tools will be equipped with a modified muffler that reduces the decibel level” (page 36).

- “Trails are to be maintained to standards as specified in the Wilderness Trails Standards.”

#### Pacific West Region Directive PW-062, Hazard Tree Management (2015):

The park conducts a hazard tree abatement program in accordance with National Park Service Pacific West Region Directive PW-062. The objective of this directive is, “To provide parks with a framework for a hazard tree program that will minimize threats to life and property from the failure of hazard trees within developed areas, consistent with the NPS mission of conserving parks’ natural and cultural resources.” The directive expressly addresses designated campsites in wilderness, “Where wilderness or backcountry campsites or other developments are designated and assigned by the NPS, e.g., permitted campsites, these areas should be identified for inclusion in the hazard tree management program, and such sites should be surveyed and hazards abated/mitigated.”

#### **Time Constraints**

*What, if any, are the time constraints that may affect the action?*

The need to wait a year or two for the landscape to stabilize after the 2022 Brush Creek Fire is an environmental constraint that would dictate the timing of the portion of the action in Brush Creek.



### Components of the Action

*What are the discrete components or phases of the action?*

Component X: *Example: Transportation of personnel to the project site*

Component 1: Brush Creek Trail

Component 2: Graybeal Camps

Component 3: Bridge Creek Camps

Component 4: Six Mile Camp

Component 5: Tools for construction

Component 6: Transport of supplies/equipment

Component 7: Condition of the trail/campsite system as result of this alternative (Is it kept to standards?)

Component 8:

Component 9:

### Proceed to the alternatives.

Refer to the [MRDG Instructions](#) regarding alternatives and the effects to each of the comparison criteria.

MRDG Step 2: Alternatives

Alternative 1: Proposed Action (with prohibited uses)

**Description of the Alternative**  
*What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?*

The Proposed Action would:

- Reroute Brush Creek Trail
- Relocate Graybeal Hiker and Stock Camps
- Reassign existing and construct new camp areas to accommodate hikers including PCT long-distance hikers at Bridge Creek Camp. This may include constructing additional camp facilities such as tent pads in designated wilderness adjacent to the Bridge Creek Camp area.
- Modify Six Mile Camp to better meet preferred design features and accommodate more PCT long-distance hikers.

Construction of the trail reroute would take a six-person trail crew approximately sixty-four days to complete. The crew would camp at the existing Graybeal Stock Camp during this time. Construction of both camps will take a trail crew composed of six individuals approximately forty days. To complete this work, NPS staff require the following tools: picks, shovels, rock bars, pulaskis, mcclouds, sledgehammers, rigging and grip hoists, chainsaws, generators, rotohammers, explosives, and a helicopter.

A helicopter will be utilized to deliver and remove equipment and supplies to these remote sites and move gravel from the river bar to the new Brush Creek trail tread. It is estimated that the helicopter would need to bring up to eight sling loads in during the spring and bring out up to four sling loads in the fall. It is estimated that an hour or two of flight time will be required to move gravel from the river bar up to the new trail. Flight time will vary depending on the substrate underlying the new trail.

Construction of the Bridge Creek and Six Mile camp modifications will take a trail crew composed of four people approximately thirty days to complete over the course of one to two seasons (twenty days at Bridge Creek Camp and ten days at Six Mile Camp). Two to four helicopter flights are also a part of this proposed action, and they will be utilized to bring in food storage boxes and toilets that are too heavy/bulky to be carried in on foot or by stock. An additional bear box would delivered to Six Mile Camp by helicopter.

In this alternative the use of motorized tools matched with the available size of the trail crew and stock program allows trails and campsites to be kept to standard, thus considered a positive impact to the wilderness character qualities as noted below.

For more details on the prposed action see the EA.

**Component Activities***How will each of the components of the action be performed under this alternative?*

Component of the Action		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Brush Creek Trail	Reroute brush creek trail
2	Graybeal Camps	Relocate Graybeal hiker and stock camps
3	Bridge Creek Camps	Reassign existing and construct new camp areas at Bridge Creek
4	Six Mile Camp	Expand and modify Six Mile Camp to better meet PDFs and increase capacity
5	Tools for construction	Hand tools, chainsaws, generators, and rotohammers
6	Transport of supplies/equipment	On foot, by stock, and by helicopter
7	Condition of the trail/campsite system as result of this alternative (Is it kept to standards?)	All wilderness trails and campsites kept closer to standards
8		
9		

## Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

### UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect	Short-term	Long-term
X	Example: Personnel will travel by horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	enter score for each	
1	Reroute brush creek trail	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2	Relocate Graybeal hiker and stock camps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3	Reassign existing and construct new camp areas at Bridge Creek	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
5	Hand tools, chainsaws, generators, and rotohammers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
6	On foot, by stock, and by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
7	All wilderness trails and campsites kept closer to standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Totals		1	0	NE	0	1
Untrammeled Total Rating		1				

Explain:

If trails and campsites are kept to standards then this promotes effective drainage and use of the facilities that minimizes trammeling effects due to damming of water and erosion. While the other components may cause some trammeling effects, they are likely negligible when mitigations and best practices for work are followed.

# UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect	Short-term	Long-term
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	enter score for each	
1	Reroute brush creek trail	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2	Relocate Graybeal hiker and stock camps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3	Reassign existing and construct new camp areas at Bridge Creek	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-1	-1
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		-1
5	Hand tools, chainsaws, generators, and rotohammers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-1	
6	On foot, by stock, and by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-1	
7	All wilderness trails and campsites kept closer to standards	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Totals		0	4	NE	-3	-2
Undeveloped Total Rating		<b>-4</b>				

## Explain:

For the proposed Brush Creek Trail reroute and Graybeal camps relocations there is no net change in facilities and no additional effect on the Undeveloped quality. The expansion of Bridge Creek Camp, Six Mile Camp, and addition of a food storage locker at Six Mile Camp results in a negative long-term effect on a small area. Helicopter and power tool use would result in short-term effects to the undeveloped quality at Bridge Creek Camp and Six Mile Camp. Maintenance level of the trail system and presence of trail crews and other NPS staff is considered to have no effect on this quality.

## NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute brush creek trail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Relocate Graybeal hiker and stock camps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Hand tools, chainsaws, generators, and rotohammers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	On foot, by stock, and by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	All wilderness trails and campsites kept closer to standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		5	3	NE
<b>Natural Total Rating</b>		<b>2</b>		

Short-term	Long-term
enter score for each	
	1
	1
-1	0
	1
-1	
-1	
	1
-3	4

### Explain:

Getting the Brush Creek Trail and Graybeal camps out of the floodplain will remove human activity there including attempts at maintenance which includes activities such as cutting downed trees and soil and vegetation disturbance from shorter reroutes and tent pad and/or cook area relocations within the floodplain. All camps with proposed changes will have layouts and facilities to help reduce human-wildlife conflicts, a long-term positive effect on this quality. For example, the expanded Six Mile Camp is designed to increase the separation between cooking and sleeping areas which should reduce human-wildlife conflicts improving the natural quality. Use of the helicopter and chainsaws result in short-term effects to the natural quality primarily due to noise disturbance to wildlife that will be in the area. Presence of Trail Crews and other NPS staff has a minimal effect on this quality.

Maintaining the trail and camp system to standard has a positive impact on the Natural Quality in that it minimizes negative impacts (trail braiding, bare ground near water or in fragile meadows, impacts to stream banks or lake shores, unmanaged human waste) that would occur by unmanged visitor use. Maintaining trail tread and structures protect the natural quality in high use areas because they prevent visitors from departing the trail and trampling vegetation to find the easiest way around an obstruction or across a stream. With a sufficient crew capacity to keep up with annual clearing, brushing, repair, and replacement this prevents problems from happening and by keeping up with maintenance reduces future workloads.



## SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute brush creek trail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Relocate Graybeal hiker and stock camps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Hand tools, chainsaws, generators, and rotohammers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	On foot, by stock, and by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	All wilderness trails and campsites kept closer to standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Gain in solitude opportunities at Junction Camps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		5	4	NE
<b>Solitude or Primitive &amp; Unconfined Recreation Total Rating</b>		<b>1</b>		

Short-term	Long-term
enter score for each	
	1
	1
-1	0
	1
-1	
-1	
	1
-3	4

### Explain:

Relocating and constructing new Graybeal camps will increase opportunities for solitude for visitors staying in these camps as they'll be configured so that different groups will have better separation for solitude and privacy. The change of location of the Brush Creek Trail and Graybeal camps will likely reduce repair and maintenance needs in this area, restore the loss of stock access for the public and administrative use. Given this area's remoteness and short work season not having NPS stock access for trail maintenance lengthens repair times. These factors will provide long-term beneficial effects to opportunities for primitive recreation.

Building a new PCT drop-in camp at Bridge Creek and Six Mile will provide additional camping opportunities for PCT hikers and they will be less prone to stay at other camps in wilderness along the PCT without a NOCA backcountry permit. Hikers in this situation in the past have "crashed" other camps with permitted visitors staying in them thereby having a negative impact on opportunities for solitude.

The sight and sound of the helicopter, chainsaws, and any other motorized tools would have short-term negative affects on opportunities for solitude for any visitors in the area at the time of use.

Opportunities for solitude will be maintained by rerouting Brush Creek Trail and with the trail and camp system maintained because users are able to travel in predictable timeframes from camp to camp thus preventing overcrowding in campsites and often on the trails. In short this condition allows for the efficacy of the backcountry permit system. For that subset of more self-reliant users seeking a primitive and unconfined type of recreation maintenance of the trails adversely affects their experience. However, these users have ample opportunities if they get off the maintained trail system and travel cross-country in the

## OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute brush creek trail	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Relocate Graybeal hiker and stock camps	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Hand tools, chainsaws, generators, and rotohammers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot, by stock, and by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	All wilderness trails and campsites kept closer to standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		5	2	NE
<b>Other Features of Value Total Rating</b>		<b>3</b>		

Short-term	Long-term
enter score for each	
-1	1
-1	1
	1
	1
	1
-2	5

### Explain:

Maintaining the park's trails and campgrounds in good condition and ensuring campsites are sized for the appropriate number of people keeps most visitors within previously disturbed areas and reduces the risk of damage to sensitive cultural resource whether they are known or unknown to the park. In addition, the trails and campgrounds allow visitors to access and enjoy historic structures and other cultural sites that are preserved for visitor enjoyment and education.

#### *Brush Creek*

Due to logistical limitations, the Brush Creek Area of Potential Effect (APE) was not surveyed for cultural resources prior to the initiation of the project. NOCA conducted National Historic Preservation Act (NHPA) Section 106 consultation with two Canadian First Nations (Stó:lō and Nlaka'pamux Nations), two American Indian Tribes (Nooksack and Upper Skagit Tribes) and the State Historic Preservation Officer (SHPO). NOCA recommended a NHPA 106 finding of No Adverse Effect, informed these consulting parties of the lack of inventory within the APE, provided them with an inadvertent discovery and monitoring plan to be implemented during construction, and asked for comments on this methodology. The Stó:lō Nation and the SHPO responded that they were satisfied with the proposal to identify and protect cultural resources should they be encountered. While it is unknown whether historic properties are within the Area of Potential Effect, by having archeologists monitor the construction work they can advise workers to avoid sensitive areas which at worst would result in minor adverse impacts.

#### *Bridge Creek*

In the summer of 2021, an inventory of cultural resources within and around the APE was performed by NOCA cultural resources staff (Sholin et. al 2022). NOCA conducted NHPA Section 106 consultation with the Colville Confederated Tribes, the Yakama Nation, the Sauk-Suiattle Indian Tribe and the SHPO and recommended a NHPA Section 106 finding of No Adverse Effect. The results of our survey, and proposed mitigations, were presented to these consulting parties for comment. The Colville Confederated Tribes and SHPO responded that they were satisfied with both the completed inventory and with the proposed mitigations to avoid impacts to historic properties. Based on the findings from the survey, construction will have no impacts to historic properties within the footprint of the proposed new campsites.

<b>Summary Ratings for Alternative 1</b>
--

Wilderness Character	
Untrammeled	1
Undeveloped	-4
Natural	2
Solitude or Primitive & Unconfined Recreation	1
Other Features of Value	3
<b>Wilderness Character Summary Rating</b>	<b>3</b>

**MRDG Step 2: Alternatives**

**Alternative 2:** No Action - Continue Management Under Current Circumstances

**Description of the Alternative**  
*What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?*

Under the No Action Alternative, the NPS would continue to manage these areas as it has been under current conditions. The Brush Creek Trail and Graybeal camps would continue to be maintained and utilized for their intended purposes as much as possible. Areas subject to current and future flood damage would be repaired and maintained as much as possible within the current footprint. In addition the current camp footprints would be utilized along the PCT. While there could be reassignments of existing camp areas to different user groups in the future, there would be no increases in campsite footprints.

**Component Activities***How will each of the components of the action be performed under this alternative?*

Component of the Action		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Brush Creek Trail	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.
2	Graybeal Camps	Leave Graybeal camps in existing locations, manage around damage and future floods.
3	Bridge Creek Camps	Leave Bridge Creek Camps in existing configuration.
4	Six Mile Camp	Leave Six Mile Camp in existing configuration.
5	Tools for construction	Motorized tools used for routine trail/campsite maintenance
6	Transport of supplies/equipment	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical transport
7	Condition of the trail/campsite system as result of this alternative (Is it kept to standards?)	No project work more time for maintenance, trails kept closer to standards.
8		
9		

## Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

### UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	Example: Personnel will travel by horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Leave Graybeal camps in existing locations, manage around damage and future floods.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Leave Bridge Creek Camps in existing configuration.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Leave Six Mile Camp in existing configuration.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Motorized tools used for routine trail/campsite maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	No project work more time for maintenance, trails kept closer to standards.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		1	0	NE
Untrammeled Total Rating		1		

Short-term	Long-term
enter score for each	
	1
0	1

Explain:

No components of the action are considered to notably manipulate biophysical processes and result in trammeling actions.

If trails and campsites are kept to standards then this promotes effective drainage and use of the facilities that minimizes trammeling effects. In addition, by maintaining designated campsites this keeps backpackers from camping too close to lakeshores and other sensitive resources.

## UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Leave Graybeal camps in existing locations, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Leave Bridge Creek Camps in existing configuration.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Leave Six Mile Camp in existing configuration.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Motorized tools used for routine trail/campsite maintenance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	No project work more time for maintenance, trails kept closer to standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		0	3	NE
<b>Undeveloped Total Rating</b>		<b>-3</b>		

Short-term	Long-term
enter score for each	
-1	
-1	
-1	
-3	0

### Explain:

Trail crew uses chainsaws for routine maintenance for Brush Creek Trail, Graybeal camps, and Six Mile Camp which has a short-term adverse effect on the undeveloped quality.

In managing the trail and camps on the Brush Creek floodplain there would be no net increase in the footprint of developed area and no functional effect on the undeveloped quality from these activities.

This would result in NPS staff maintaining and/or re-building the camp after flood events without stock support, which is time consuming and may result in additional helicopter landings or deliveries to the location.



# NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Leave Graybeal camps in existing locations, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Leave Bridge Creek Camps in existing configuration.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Leave Six Mile Camp in existing configuration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Motorized tools used for routine trail/campsite maintenance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	No project work more time for maintenance, trails kept closer to standards.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		1	4	NE
<b>Natural Total Rating</b>		<b>-3</b>		

Short-term	Long-term
enter score for each	
	-1
	-1
	-1
-1	
	1
-1	-2

## Explain:

This alternative would have a long-term negative effect on the natural quality because ongoing efforts to maintain the trail and camps would alter the floodplain of Brush Creek causing short-term but periodic impacts to water quality. The toilet for Graybeal stock camp would continue to create a risk of water contamination during flood events. More frequent trail maintenance would increase motorized tool use and occasional additional helicopter flights would have ongoing short-term impacts to the natural soundscape and any wildlife nearby.

Keeping camps with poor separation between cooking and tenting areas increases the likelihood of wildlife-human conflict and therefore possible impact to the natural quality.

Maintaining the trail and camp system to standard has a positive impact on the Natural Quality in that it minimizes negative impacts (trail braiding, bare ground near water or in fragile meadows, impacts to stream banks or lake shores, unmanaged human waste) that would occur by unmanaged visitor use. Maintaining trail tread and structures protect the natural quality in high use areas because they prevent visitors from departing the trail and trampling vegetation to find the easiest way around an obstruction or across a stream. With a sufficient crew capacity to keep up with annual clearing, brushing, repair, and replacement this prevents problems from happening and by keeping up with maintenance reduces future workloads.

## SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Leave Graybeal camps in existing locations, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Leave Bridge Creek Camps in existing configuration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Leave Six Mile Camp in existing configuration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Motorized tools used for routine trail/campsite maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	No project work more time for maintenance, trails kept closer to standards.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		1	3	NE
<b>Solitude or Primitive &amp; Unconfined Recreation Total Rating</b>		<b>-2</b>		

Short-term	Long-term
enter score for each	
	-1
	-1
	-1
	1
0	-2

### Explain:

Maintaining Graybeal camps in a compromised condition will continue to provide compromised opportunities for solitude for visitors staying in these camps as they'll be configured so that different groups have poor separation for solitude and privacy.

Currently the upper Brush Creek Trail is blocked to stock access for the public and administrative use. Given this area's remoteness and short work season, not having NPS stock access for trail maintenance lengthens repair times for damaged camp areas. These factors create adverse effects to opportunities for primitive recreation.

Maintaining the current PCT drop-in camp at Bridge Creek and Six Mile at current capacities will provide fewer camping opportunities for PCT hikers outside of wilderness and they may be prone to stay at other camps in wilderness along the PCT without a NOCA backcountry permit. Hikers in this situation in the past have "crashed" other camps with permitted visitors staying in them thereby having a negative impact on opportunities for solitude.

The sight and sound of chainsaws, helicopters, and any other motorized tools from trail maintenance would have short-term negative affects on opportunities for solitude for any visitors in the area at the time of use.

Opportunities for solitude will be maintained with the trail and camp system maintained because users are able to travel in predictable timeframes from camp to camp thus preventing overcrowding in campsites and often on the trails, in short this condition allows for the efficacy of the backcountry permit system. For that subset of more self-reliant users seeking a primitive and unconfined type of recreation maintenance of the trails adversely affects their experience. However, these users have ample opportunities if they get off the maintained trail system and travel

## OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Leave Brush Creek Trail in existing alignment, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Leave Graybeal camps in existing locations, manage around damage and future floods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Leave Bridge Creek Camps in existing configuration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Leave Six Mile Camp in existing configuration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Motorized tools used for routine trail/campsite maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Foot and stock only for routine trail maintenance, no helicopter landings/deliveries or mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	No project work more time for maintenance, trails kept closer to standards.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		1	4	NE
<b>Other Features of Value Total Rating</b>		<b>-3</b>		

Short-term	Long-term
enter score for each	
	-1
	-1
	-1
	-1
	1
0	-3

### Explain:

If the no action alternative is selected, visitors will continue to use the existing camps and trails in their unsatisfactory condition. This could result in user-created trails and campsites that may inadvertently damage unrecorded cultural resources. The proposed action could also uncover unrecorded sites; however, new construction is preferred to occur under the deliberate action of park staff so that potential impacts can be mitigated.

Keeping the trail system maintained to standards keeps most visitors on the trail and reduces the risk of disturbance to sensitive historic or cultural sites. In addition the trail system allows visitors to enjoy historic structures and cabins that are preserved for visitor use, education, *and for their historical value*. Use of power saws would eliminate potential localized cross-cut saw impacts.

<b>Summary Ratings for Alternative 2</b>
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<b>Wilderness Character</b>	
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Untrammeled	1
Undeveloped	-3
Natural	-3
Solitude or Primitive & Unconfined Recreation	-2
Other Features of Value	-3
<b>Wilderness Character Summary Rating</b>	<b>-10</b>

## Project Title: Backcountry Trail and Camp Modifications

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### MRDG Step 2: Alternatives

#### Alternative 3: Relocate and build with no prohibited uses

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##### **Description of the Alternative**

*What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?*

This action mirrors the Proposed Action but would be accomplished with no motorized tools:

- Reroute Brush Creek Trail
- Relocate Graybeal Hiker and Stock Camps
- Reassign existing and construct new camp areas to accommodate hikers including PCT long-distance hikers at Bridge Creek Camp. This may include constructing additional camp facilities such as tent pads in designated wilderness adjacent to the Bridge Creek Camp area.
- Modify Six Mile Camp to better meet preferred design features and accommodate more PCT long-distance hikers.

Construction of the trail reroute would take a six-person trail crew approximately 128 days to complete. The crew would camp at the existing Graybeal Stock Camp during this time. Construction of both camps will take a trail crew composed of six individuals approximately 80 days. To complete this work, NPS staff require the following tools: picks, shovels, rock bars, pulaskis, mcclouds, sledgehammers, rigging and grip hoists, cross-cut saws, hand saws, explosives, and a helicopter.

A trail workers and pack stock may be utilized to deliver and remove equipment and supplies to these remote sites and move gravel from the river bar to the new Brush Creek trail tread.

Construction of the Bridge Creek and Six Mile camp modifications will take a trail crew composed of four people approximately 60 days to complete over the course of one to two seasons (40 days at Bridge Creek Camp and 20 days at Six Mile Camp). If food storage boxes are too heavy/bulky to be carried into Six Mile Camp by stock, hanging food from trees will be required of campers.

In this alternative the use of non-motorized tools matched with the available size of the trail crew and stock program does not allow trails and

## Component Activities

*How will each of the components of the action be performed under this alternative?*

Component of the Action		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Brush Creek Trail	Reroute Brush Creek Trail
2	Graybeal Camps	Relocate Graybeal Hiker and Stock camps
3	Bridge Creek Camps	Reassign existing and construct new camp areas at Bridge Creek
4	Six Mile Camp	Expand and modify Six Mile Camp to better meet PDFs and increase capacity
5	Tools for construction	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)
6	Transport of supplies/equipment	On foot and by stock only (heli landings outside wilderness at Bridge Creek)
7	Condition of the trail/campsite system as result of this alternative (Is it kept to standards?)	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.
8		
9		

## Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

### UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute Brush Creek Trail	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Relocate Graybeal Hiker and Stock camps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot and by stock only (heli landings outside wilderness at Bridge Creek)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		0	1	NE
<b>Untrammeled Total Rating</b>		<b>-1</b>		

Explain:

If trails and campsites are kept to standards then this promotes effective drainage and use of the facilities that minimizes trammeling effects. If the trail prism is not properly maintained it will dam water and cause muddy areas and slope instabilities. In addition, by maintaining designated campsites this keeps backpackers from camping to close to lakeshores and other sensitive resources. Frequent human traffic in these areas are short-term small area manipulations that may cumulatively be significant, to soils, vegetation, and wildlife using the lake and shoreline areas.



## UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute Brush Creek Trail	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Relocate Graybeal Hiker and Stock camps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot and by stock only (heli landings outside wilderness at Bridge Creek)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		0	2	NE
<b>Undeveloped Total Rating</b>		<b>-2</b>		

### Explain:

For the proposed Brush Creek Trail reroute and Graybeal camps relocations there is no net change in facilities and no additional effect on the Undeveloped quality. The expansion of Six Mile Camp and Bridge Creek Camp results in a negative long-term effect covering a relatively small area. Maintenance level of the trail system and presence of trail crews and other NPS staff is considered to have no effect on this quality.

## NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute Brush Creek Trail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Relocate Graybeal Hiker and Stock camps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot and by stock only (heli landings outside wilderness at Bridge Creek)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		4	2	NE
<b>Natural Total Rating</b>		<b>2</b>		

### Explain:

Getting the Brush Creek Trail and Graybeal camps out of the floodplain will remove human activity there including attempts at maintenance which includes activities such as cutting downed trees and soil and vegetation disturbance from shorter reroutes and tent pad and/or cook area relocations within the floodplain. All camps with proposed changes will have layouts and facilities to help reduce human-wildlife conflicts. For example, the expanded Six Mile and Bridge Creek Camps are designed to increase the separation between cooking and sleeping areas which should reduce human-wildlife conflicts improving the natural quality. However, the addition of camp facilities in designated wilderness adjacent to Bridge Creek Camp is a long-term impact on a relatively small area. Presence of Trail Crews and other NPS staff has a minimal effect on this quality.

With the use of cross cut saws, there is the tendency to choose the path of least resistance for construction of a new trail. This would result in a curvier trail. The straighter the alignment of the trail typically the better drainage it has. With less sediment build-up in ditches and drains it would require less maintenance in the long-term and less disturbance to the natural environment for maintenance and repair.

Presence of Trail Crews and other NPS staff has a minimal effect on this quality.

Because it takes longer to clear trails using non-motorized equipment, the trails across the wilderness will remain blocked for longer and each year not all needed maintenance would always be done. This will lead to significant natural impacts in busy areas from social trails, vegetation trampling at informal campsites (if visitors are not able to make the designated site as a result of having to crawl over downed trees), etc. Impacts from erosion of unmaintained trails, (plugged culverts, dip drains, water bars), will increase.

## SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute Brush Creek Trail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Relocate Graybeal Hiker and Stock camps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot and by stock only (heli landings outside wilderness at Bridge Creek)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		4	2	NE
<b>Solitude or Primitive &amp; Unconfined Recreation Total Rating</b>		<b>2</b>		

### Explain:

Relocating and constructing new Graybeal camps will increase opportunities for solitude for visitors staying in these camps as they'll be configured so that different groups will have better separation for solitude and privacy. Building a new PCT drop-in camp at Bridge Creek and Six Mile will provide camping opportunities for PCT hikers outside of wilderness and they will be less prone to stay at other camps in wilderness along the PCT without a NOCA backcountry permit. Hikers in this situation in the past have "crashed" other camps with permitted visitors staying in them thereby having a negative impact on opportunities for solitude. The addition of camp facilities in designated wilderness adjacent to Bridge Creek Camp is a long-term impact to solitude on a relatively small area, since additional human presence will occupy an area of wilderness not previously occupied before.

There would be a short-term negative impact to opportunities for primitive recreation for visitors because the trail crew will be occupying camps for a significant portion of multiple summer seasons.

Less maintained and more primitive trail conditions would increase opportunities for primitive recreation in some areas. This may also increase opportunities for solitude in some areas because fallen trees and washouts will slow travel times and discourage some visitors from continuing further or even choosing the hike over others. However, some overnight visitors could get backed up and be forced to stay at other designated campsite for which they don't have an overnight permit for. This would negatively impact visitors who do have a permit for a respective camp on those nights. Some visitors may also camp next to the stream or on the floodplain outside thereby affecting other hikers opportunity for solitude

## OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Reroute Brush Creek Trail	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Relocate Graybeal Hiker and Stock camps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Reassign existing and construct new camp areas at Bridge Creek	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Expand and modify Six Mile Camp to better meet PDFs and increase capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Hand tools only within wilderness (motorized tool use at Bridge Creek Camps, outside of wilderness)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	On foot and by stock only (heli landings outside wilderness at Bridge Creek)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trail crew capacity is limited; Trails and campsites are NOT kept to standards.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Totals		0	1	NE
<b>Other Features of Value Total Rating</b>		<b>-1</b>		

Explain:

Not keeping the trail system maintained to standards increases the risk of disturbance to sensitive historic or cultural sites. In addition the trail system will not provide as easy of travel that allows visitors to enjoy historic structures and cabins that are preserved for visitor use, education, *and for their historical value.*

### Summary Ratings for Alternative 3

Wilderness Character	
Untrammeled	-1
Undeveloped	-2
Natural	2
Solitude or Primitive & Unconfined Recreation	2
Other Features of Value	-1
<b>Wilderness Character Summary Rating</b>	<b>0</b>

**Project Title:** Backcountry Trail and Camp Modifications

### MRDG Step 2: Alternative Comparison

**Alternative 1:** Proposed Action (with prohibited uses)

**Alternative 2:** No Action - Continue Management Under Current Circumstances

**Alternative 3:** Relocate and build with no prohibited uses

**Alternative 4:** \_\_\_\_\_

Wilderness Character	Alternative 1		Alternative 2		Alternative 3	
	Positive	Negative	Positive	Negative	Positive	Negative
Untrammeled	1	0	1	0	0	1
Undeveloped	0	4	0	3	0	2
Natural	5	3	1	4	4	2
Solitude/Primitive/Unconfined	5	4	1	3	4	2
Other Features of Value	5	2	1	4	0	1
Totals	16	13	4	14	8	8
Wilderness Character Rating	3		-10		0	

**Project Title:** Backcountry Trail and Camp Modifications

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**MRDG Step 2: Alternative Comparison**

**Alternative 1:** Proposed Action (with prohibited uses)

---

**Alternative 2:** No Action - Continue Management Under Current Circumstances

---

**Alternative 3:** Relocate and build with no prohibited uses

---

**Alternative 4:**

---

Wilderness Character	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	short-term	long-term	short-term	long-term	short-term	long-term	short-term	long-term
Untrammelled	0	1	0	1	0	-1	0	0
Undeveloped	-3	-2	-3	0	0	-2	0	0
Natural	-3	4	-1	-2	0	2	0	0
Solitude or Primitive and Unconfined Recreation	-3	4	0	-2	0	2	0	0
Unique / Other Features	-2	5	0	-3	0	-1	0	0
<b>Total</b>	<b>-11</b>	<b>12</b>	<b>-4</b>	<b>-6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



## MRDG Step 2: Determination

Refer to the [MRDG Instructions](#) before identifying the selected alternative and explaining the rationale for the selection.

### Selected Alternative

<input checked="" type="checkbox"/>	Alternative 1: Proposed Action (with prohibited uses)
<input type="checkbox"/>	Alternative 2: No Action - Continue Management Under Current Circumstances
<input type="checkbox"/>	Alternative 3: Relocate and build with no prohibited uses
<input type="checkbox"/>	Alternative 4:

### Explain Rationale for Selection:

Alternative 1 is selected which provides the highest overall score and long-term benefits to wilderness character. The analysis shows that conducting the project work clearly benefits wilderness character over continuing with business as usual (Alternative 2). While doing the project work without prohibited uses (Alternative 3) results in fewer short-term negative effects but also fewer long-term beneficial effects than Alternative 1. This difference is primarily due to trail crew's ability to move faster with power tools and maintain more trails/camps across the wilderness to standard.

NOCA's trail system has a history of recreational use predating both park and wilderness designation. The NPS established standards for the trail system in 1982 that predate wilderness designation, and the Wilderness Act specifically states that "the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system..." (section 4(a)(3)). Thus these standards are key to guiding what the minimum tools and activities are in Step 2.

The time required to complete this project relates to maintaining the entire trail system in the SMW. There is no additional crew for this project so the same crew is expected to contribute to cyclic trail maintenance in other locations. Thus the longer this project takes the fewer trails will be able to be kept up to the Complex's trail standards. Keeping the trail system to standard prevents widespread localized impacts to soils, vegetation, and cultural resources along the trail corridor. This point has been documented in the programmatic MRA for trails maintenance (PEPC #46436).

The additional time spent in the field by a crew with non-motorized tools means that they will be occupying camp space for additional time and displacing the public resulting in a negative impact on opportunities for primitive recreation for a good portion of a hiking season.

Great care is taken to site the proposed camps in locations that would have minimal impacts to sensitive resources.

Closing regularly used trails and campsites is unacceptable because it eliminates the overnight camping opportunities that have existed for many years, which relates to the recreation public purpose of wilderness. Both the Wilderness Act and NPS Organic Act acknowledge that National Parks and designated Wilderness are for the enjoyment of people and the preservation/conservation of resources.

### Describe Monitoring & Reporting Requirements:

-All helicopter landings, long-line deliveries and flight hours within the park complex shall be reported on an annual basis to the Wilderness Coordinator to inform the Wilderness Character Monitoring Plan.

## Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

Prohibited Use	Quantity
<input type="checkbox"/> Mechanical Transport:	
<input checked="" type="checkbox"/> Motorized Equipment:	Chainsaws and small motorized hand tools for trail/camp construction.
<input type="checkbox"/> Motor Vehicles:	
<input type="checkbox"/> Motorboats:	
<input checked="" type="checkbox"/> Landing of Aircraft:	long line delivery of equipment and supplies
<input type="checkbox"/> Temporary Roads:	
<input type="checkbox"/> Structures:	
<input checked="" type="checkbox"/> Installations:	New camp structures such as signs, tent pads, food storage box, etc.

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following review and decision authorities:

Prepared	Name		Position	
			Environmental Protection Specialist	
	Signature		Date	
Recommended	Name		Position	
			Project Leader	
	Signature		Date	
Recommended	Name		Position	
			Wilderness Coordinator	
	Signature		Date	
Approved	Name		Position	
			Superintendent	
	Signature		Date	