

## Chapter 2: Alternatives

### INTRODUCTION

The National Environmental Policy Act requires federal agencies to conduct a careful, complete, and analytic study of the impacts of proposals that have the potential to affect the environment and consider alternatives to that proposal, well before any decisions are made. Federal agencies are also required to involve interested or affected members of the public in the National Environmental Policy Act process. The environmental assessment assists the National Park Service in decision-making and in the determination that the potential for significant effect does not exist and the preparation of an environmental impact statement is not required. All alternatives are consistent with the legal requirements, established standards, and guidelines for the management of natural and historic resources in accordance with the mission of the National Park Service.

The wilderness legislation for Rocky Mountain National Park (Public Law 111-11) was passed by Congress on March 30, 2009. The legislation identified the East Shore Trail area for consideration of non-motorized bicycle use and directed the National Park Service to establish an alignment line for a trail within one year. Working with a number of stakeholders and trail designers, the National Park Service submitted the alignment line for the trail before March 30, 2010. The submitted alignment line follows the present East Shore Trail in many locations. In other locations, the alignment line deviates from the existing trail for the purpose of improving public safety, to minimize impacts to park resources, or improve the sustainability of the trail.

Congress did not require the construction of a trail along the alignment line, and the legislation basically states that the National Park Service will follow its normal decision making process with respect to allowing non-motorized bicycle use on the trail. For this reason, the National Park Service has prepared this Environmental Assessment to evaluate the potential impacts of allowing bicycle use on the East Shore Trail within the national park, and the potential impacts of the improvements that are likely to be needed to accommodate bicycle use on the trail.

In developing the alternatives to be considered in this Environmental Assessment, the National Park Service only considered alternatives within its administrative authority (i.e., within the authorized boundary of Rocky Mountain National Park and located within the East Shore Trail Area as defined in Public Law 111-11). Congress further directed the National Park Service to “maximize the opportunity for sustained use of the trail without causing (1) harm to affected resources, or (2) conflicts among users.” These directives played a significant role in the development of the alternatives considered in this Environmental Assessment. Specifically, in order to avoid causing harm to affected resources, the trail would not be widened to any significant degree and would essentially remain a single-track trail.

This chapter describes two alternatives for allowable uses and management of the East Shore Trail within Rocky Mountain National Park. Alternative A is no action / continue current management, where the National Park Service would continue to allow travel by foot or on horseback. Bicycles would not be permitted.

The National Park Service also developed an action alternative that would allow bicycle use on the northern two miles of the East Shore Trail within Rocky Mountain National Park.

## DESCRIPTION OF ALTERNATIVES

### ALTERNATIVE A: NO-ACTION / CONTINUE CURRENT MANAGEMENT

The no action alternative describes the continuation of the present management operation and condition; it does not imply or direct discontinuing the present action or removing existing uses, developments, or facilities. The no-action alternative provides a basis for comparing the management direction and environmental consequences of the other alternatives and must always be considered in every environmental assessment. Under the no action alternative, the two-mile section of the East Shore Trail within the park would be managed as it is currently. Pedestrian use would continue to be allowed along the entire two-mile section of trail and livestock use would continue to be allowed on the East Shore Trail north of its intersection with the Ranger Meadows Trail. The use of bicycles would not be permitted anywhere on the trail within the park. The trail would continue to be a Class 3 single track trail with a natural trail tread and a nominal width of 2 feet. Trail crossings through wetland sections would continue (figure 3), including one short segment of bog bridge.

No changes to the trail alignment (figure 3) would be made, and trail maintenance would occur as it has in the past. Trail clean-up crews would continue to assess the East Shore Trail every spring and remove fallen trees or other obstacles blocking the trail. Crews would continue to clean all drainage control structures such as waterbars, ditches, and culverts; remove loose rocks and debris; and trim/prune vegetation as necessary. As called for in the Trail System Maintenance and Reconstruction Plan (NPS 2000), scattered erosion problems along the trail would be corrected at some point in the future, including filling and stabilizing eroded areas and constructing appropriate drainage structures.

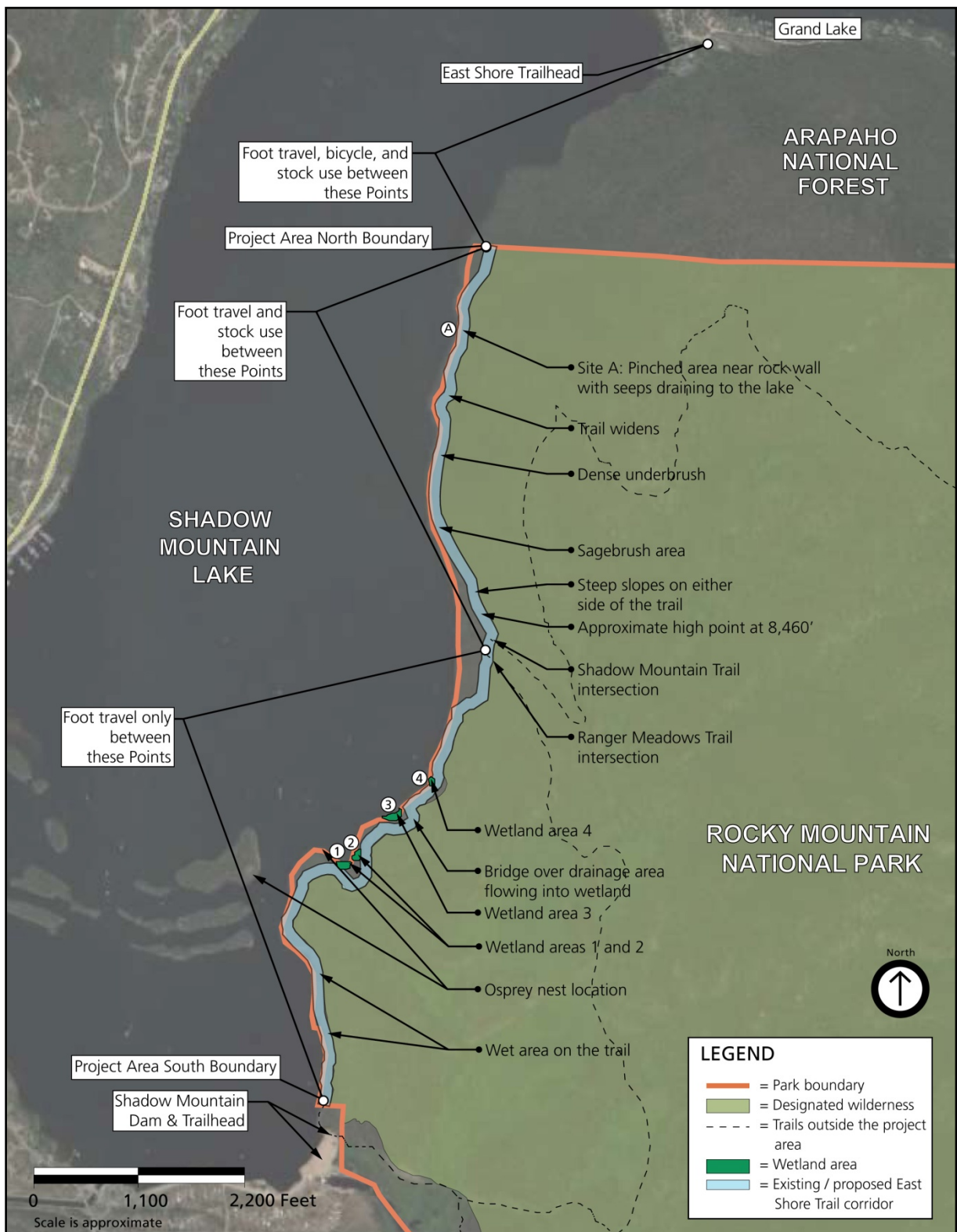


Figure 3: Alternative A, No-Action Alternative, Existing Conditions

## ALTERNATIVE B: ALLOW BICYCLE USE WITH MINOR TRAIL MODIFICATIONS

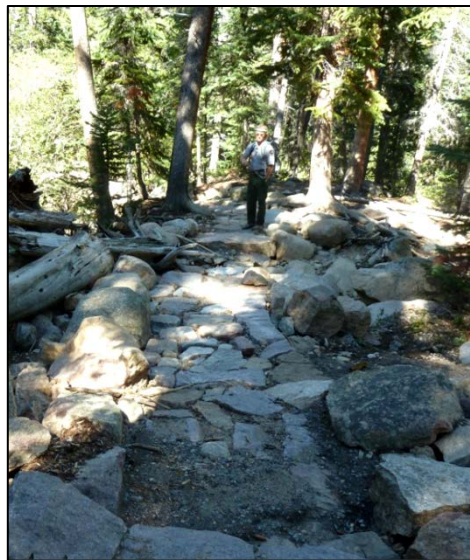
This alternative proposes minor improvements to a two-mile portion of the East Shore Trail within the national park to accommodate bicycle use and other existing trail uses. The proposed improvements are for the purpose of improving public safety, trail sustainability, and to avoid impacts to natural and cultural resources. The proposed trail would have the following features:

- Class 3 single track trail with a nominal width of 3 feet.
- Natural trail tread except where causeways may be necessary.
- A bog bridge or stone paver causeway would be placed in a short wetland section located at the north end of the trail (figures 4 and 8). Materials used for the construction of the bog bridge (stone) would be imported from off-site locations and delivered along the shore of Shadow Mountain Lake via flat-bottom boat. No materials would be obtained from local sources to avoid the potential for inadvertent disturbance to stone features in archeological sites..
- An existing causeway that crosses a wetland and the drainage through it would be improved so the wetland is not compromised. Materials used for the construction of the causeway (road base and other materials) would be imported from off-site locations and delivered along the shore of Shadow Mountain Lake via flat-bottom boat. No materials would be obtained from local sources to avoid the potential for inadvertent disturbance to stone features in archeological sites.
- Tree limbs and other vegetation obstructions would be cleared to a width of 4 feet on both sides of the trail, and a height of 10 feet above the ground for the 0.9-mile section north of the Ranger Meadows Trail intersection, where equestrian use is permitted (see figure 5). Tree limbs and other vegetation obstructions would be cleared to a width of 3 feet on both sides of the trail, and a height of 8 feet above the ground for the 1.1 mile section of trail south of the Ranger Meadows Trail intersection, where equestrian use is not permitted (see figure 6).
- In locations with limited sight distance, passing / refuge zones would be developed so users can pass each other, as suggested during public scoping. These zones would be no wider than 6 feet, including the width of the trail, and would extend approximately 25 feet in length (see figure 7).
- Construction of a reroute of the trail (between approximately 1,200-1,500 feet) would be completed to reduce safety hazards and avoid sensitive natural resources (see figure 8).
- Minor improvements would be made to the trail tread in some locations to address safety issues. This would primarily involve covering or removing exposed tree roots and building up or stabilizing the trail tread in these areas.
- On sections where there is minimal cross slope, swales would be constructed to move water off the trail
- As suggested during public scoping, signs and educational materials would be posted at the East Shore Trailhead and at the Shadow Mountain Dam trailhead kiosk prior to allowing mountain biking on the trail. The signs and educational materials would provide guidance on proper trail etiquette (e.g., bikers yield to hikers, slow down when passing, etc.). The intent of this action would be to proactively address the potential for user conflict and establish user norms.

Hand tools would be used for trail improvements including tread stabilizing and leveling, moving materials, and constructing a log causeway or installing stone pavers. Chain saws would be used to cut trees and logs, and a small trail dozer would be used to clear new trail alignments and

grade the trail tread. Materials for constructing or improving causeways would be imported using a flat-bottom boat. Construction of the trail improvements would occur daily between 7:00 am and 5:00 pm during the summer months (from June through September).

Once the trail improvements were completed, and for one year following the inception of bicycle use on the trail, the National Park Service in partnership with the Headwaters Trails Alliance would provide opportunities for all trail users to submit comments about user conflicts and to learn about remedies the National Park Service and Headwaters Trails Alliance are considering to “avoid conflicts among users” as directed by Congress. Allowing bike use on this section of the East Shore Trail would not set a precedent for allowing future bike use further south on the East Shore Trail. Any additional considerations for bicycle use on trail sections with the national park or adjacent national forest lands would be subject to a separate evaluation and compliance by the National Park Service / U.S. Forest Service.



**Figure 4: Example of a Stone Causeway Trail Treatment that could be used at the North End of the Trail to Cross the Short Wetland Section.**

If trail users indicate that conflicts exist among users, the National Park Service would implement adaptive management strategies, as described below. For example, bicyclists would only be permitted to use the two-mile section of the East Shore Trail within the National Park on even days of the month. Other trail users (hikers, stock users, etc.) would be permitted to use the East Shore Trail on even days, but must do so with the understanding that bicyclists may be present on the trail.

Bicyclists would be notified via signs and other means that they must remain on the two-mile section of the East Shore Trail while within the national park, and that deviating from the trail may result in loss of the privilege of using bicycles on the trail.

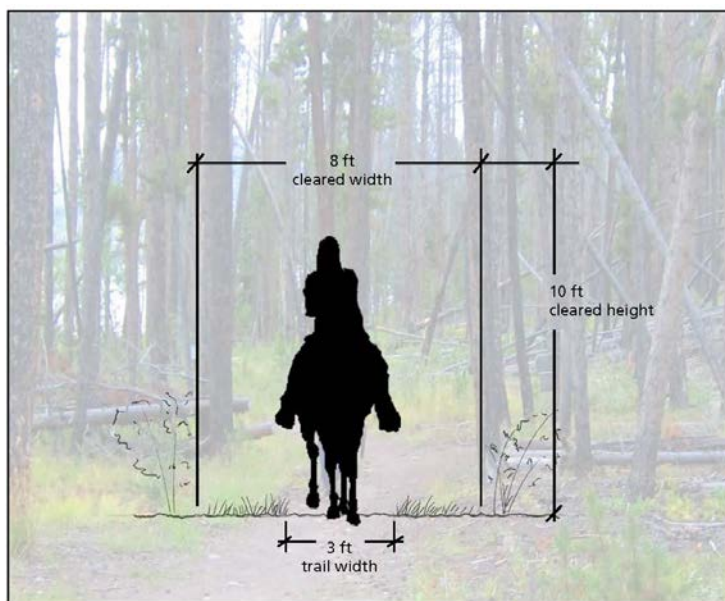
If bicycles straying off the East Shore Trail become a significant problem, as determined by the National Park Service, the Headwaters Trails Alliance would be notified and would be provided with an opportunity to remedy the situation. If the situation is not remedied within a reasonable period of time, as agreed upon between the Headwaters Trails Alliance and the National Park Service, bicycle use on the East Shore Trail would be revoked.

### **Adaptive Management**

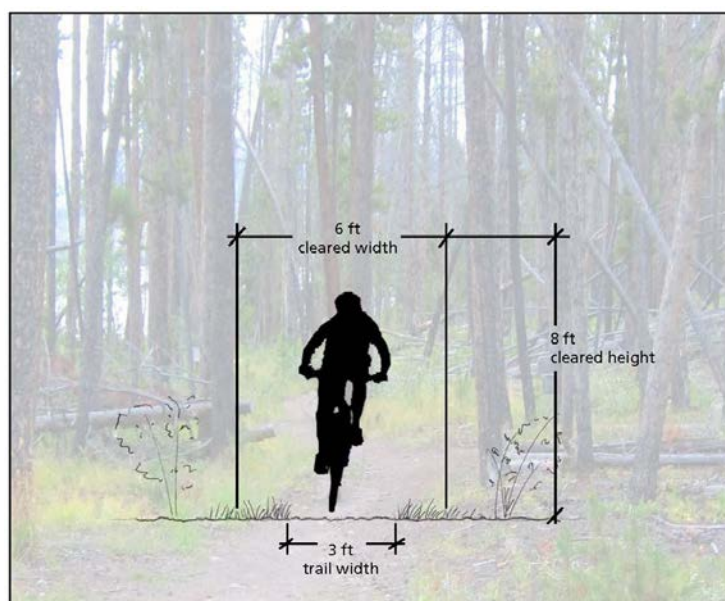
The action alternative would incorporate monitoring and adaptive management strategies to address visitor use conflicts and resource impacts. Monitoring and evaluation are important in determining whether management actions are achieving objectives. For instance, if monitoring



by the National Park Service and/or Headwaters Trail Alliance indicates that conflicts between bicyclists and other trail users are increasing, different management actions may be necessary to better inform visitors or to control use. Adaptive management uses information as it becomes available to alter management actions. It is an iterative process that requires selecting and implementing management actions, careful monitoring, comparing results with objectives, and using feedback to make future management decisions. Adaptive management recognizes the importance of continually improving management techniques through flexibility and adaptation instead of adhering rigidly to a standard set of management actions.



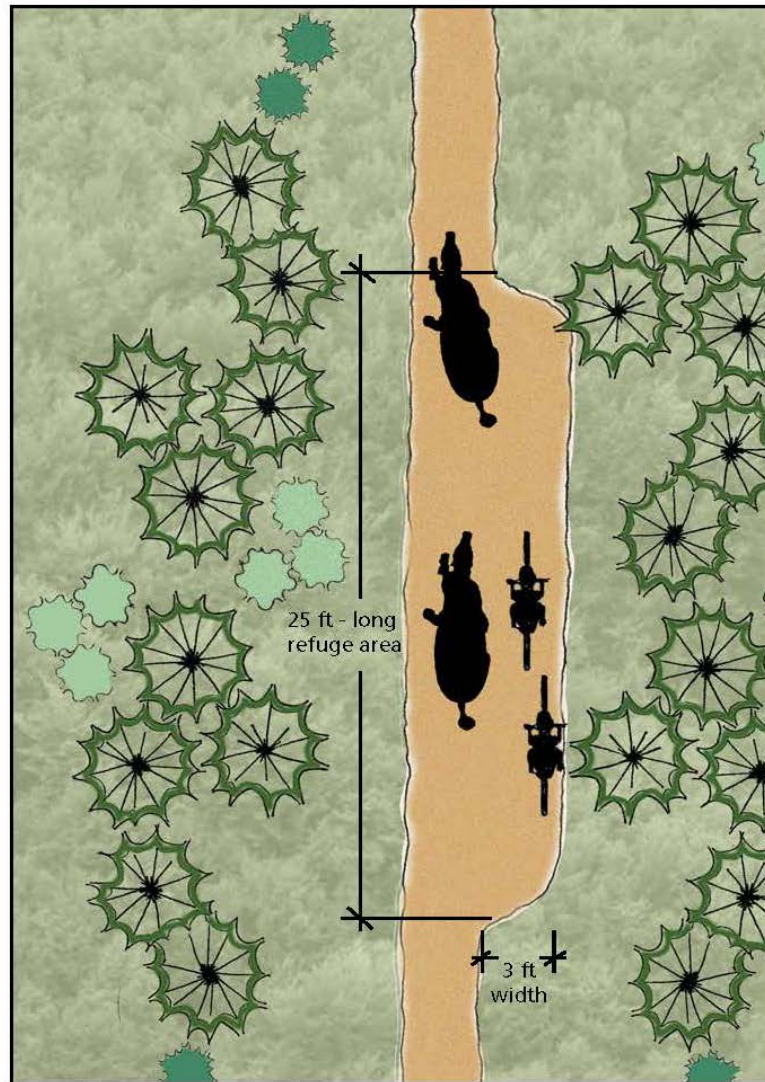
**Figure 5: Average Trail Dimensions for the 0.9 Miles of Trail North of the Ranger Meadows Trail Intersection, Where Equestrian Use is Permitted**



**Figure 6: Average Trail Dimensions for the 1.1 Miles of Trail South of the Ranger Meadows Trail Intersection, Where Equestrian Use is Not Permitted**

The adaptive management framework for the East Shore Trail focuses on identifying and managing use conflicts and resource impacts that may arise from bicycle use. Following implemen-

tation, indicators of use and resource conditions would be monitored to track changes in conditions. Conditions would be assessed and compared to thresholds, as described below. Thresholds that are exceeded would trigger management changes to restore conditions to the desired state.



**Figure 7: Average Dimensions for Safe Passing / Refuge Zones**

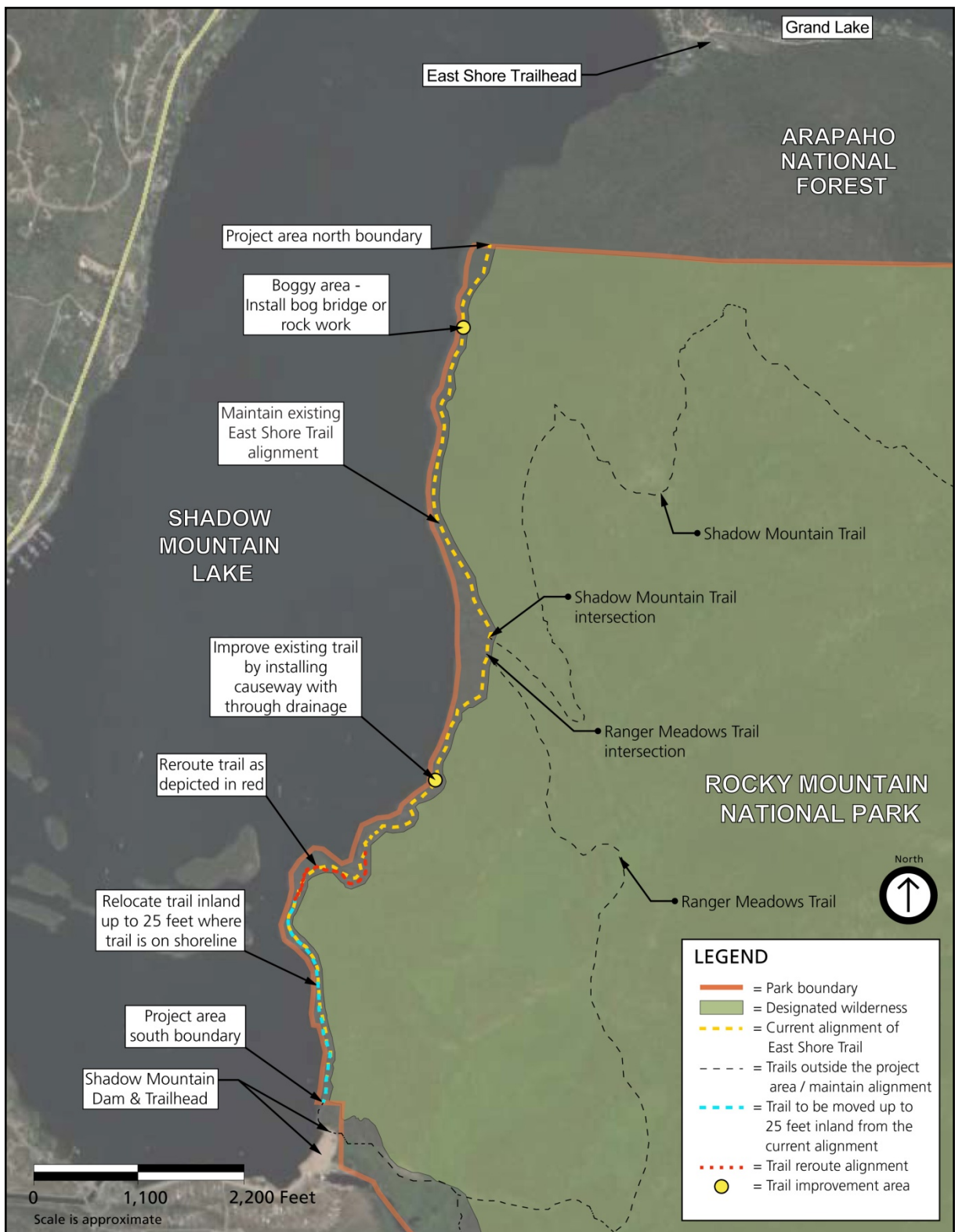
If the park were to allow bicycle use on the East Shore Trail, upon completion of the trail improvements the National Park Service would coordinate with trail proponents to prepare baseline documentation of the trail width and condition prior to allowing bicycle use. In addition, during the first full summer of bicycle use, the National Park Service would coordinate with trail proponents to count the number of trail users on the northern segment of the trail during a one week period. If initial user counts or subsequent user counts exceed a daily average of six or more bicyclists per hour, or if groups of bicyclists exceed ten riders, the National Park Service would coordinate with trail proponents to conduct a visitor survey of East Shore Trail users on the northern segment of the trail to determine if user conflicts or safety concerns reach the thresholds identified in table 1. If the threshold is met, the identified adaptive management strategy would be implemented. In addition, the National Park Service would coordinate with trail proponents to document the trail width and condition. If the resource damage thresholds identified in table 1 are met, the identified adaptive management strategies would be implemented.

**Table 1: Adaptive Management Indicators, Thresholds, and Management Actions**

Indicator	Threshold	Management Action
<b>Visitor Conflicts with Bicyclists</b>		
Accident involving bicyclist and another trail user (any mode of travel)	First accident	Park rangers determine the cause of the accident Trail configuration: Modify the trail where possible to improve safety Bicycle speed: post speed warning signs for affected section
	Second accident on same section of trail following initial management action	Implement alternate bike days
Verbal or written complaints from trail users about trail use conflicts with bicyclists	5 or more unique verifiable complaints May through September	Increase law enforcement patrols to 2 per week
	5 or more unique verifiable complaints May through September for a second season	Place trail advocates to increase presence on trail and increase monitoring
	5 or more unique verifiable complaints May through September for a third season	Implement alternate bike days
<b>Bicyclists in Restricted Areas</b>		
Bicyclists in areas restricted from biking, including bicyclists on the trail on non-bike days if alternate bike days are in effect	5 or more occurrences during the first complete calendar year*  5 or more occurrences during the second calendar year following initial management action*	Install additional signs
		Issue citations for off-trail use
		Eliminate bicycle use
<b>Resource Damage</b>		
Loss of trail tread	Facility condition index exceeds 5 – 10% change	Armor trail with logs or rock
		Trail advocates assist with increased trail maintenance
Expansion of off trail resource damage	Expansion exceeds 1,000 sq. ft. from initial bike trail configuration	Reevaluate trail design, and trail advocates assist with establishing a defined trail edge
	Expansion exceeds 1,000 sq. ft. following initial management action	Eliminate bicycle use

\* This threshold was based on statistics that indicate that since October of 2009, on average the park has received 1 complaint annually for every 50,000 visitors (Gamble pers. comm. 2013a). Typically, the nature of these complaints has included reports of horse manure on trails, poor trail signage, and noisy groups of hikers. While 5 complaints does not sound like a lot, compared to the average number of complaints received annually in the park and given the low number of users in the East Shore Trail Area, it would indicate an area of concern for park staff.





**Figure 8: Alternative B: Allow Bicycle Use with Minor Trail Modifications Map**

## Mitigation Measures

The following mitigation measures to protect natural resources, cultural resources, and other values, would apply to Alternative B.

- Construction would take place during the summer season (between June and September) and would be limited to the hours between 7:00 am and 5:00 pm in order to minimize impacts to wildlife. Trail construction in proximity to osprey nests would not occur until the young have fledged.
- Construction zones would be identified and marked on the ground prior to any construction activity. The marked areas would define the construction zone and confine activity to the minimum area required for construction. All trail workers would be instructed to avoid conducting activities beyond the construction zone as defined on the ground.
- In an effort to avoid introduction of exotic plant species, no hay bales would be used. Hay often contains seed of undesirable or harmful invasive exotic plant species. Therefore, on a case-by-case basis the following materials may be used for any erosion control that may be necessary: rice straw, straws determined by the National Park Service to be weed-free (e.g., Coors barley straw or Arizona winter wheat straw), cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales. Standard erosion control measures such as silt fences and/or sand bags would also be used to avoid potential soil erosion.
- If silt fencing fabric is used, it would be inspected weekly or after every major storm. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into any wetlands, lakes, or flowing water bodies.
- Any excavated soil may be used in the trail project; excess soil would be stored in approved areas.
- Revegetation plantings, if necessary, would use native species from genetic stocks originating in the park. Revegetation efforts would focus on recreating the natural spacing, abundance, and diversity of native plant species. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. The principal goal is to avoid interfering with natural processes.
- In many areas soils and vegetation are already impacted to a degree by various human activities and natural events. Trail improvements would take advantage of these previously disturbed areas wherever possible. Soils within the project construction limits would be compacted and trampled by the presence of construction equipment and workers. Soils would be susceptible to erosion until revegetation takes place. Vegetation impacts and potential compaction and erosion of bare soils would be minimized by conserving topsoil. The use of conserved topsoil would help preserve micro-organisms and seeds of native plants. The topsoil would be replaced as close to the original location as possible, and supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area. This would reduce construction impacts.
- Some petrochemicals from construction equipment could seep into the soil. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.
- Although no blasting is expected for this project, any blasting would conform to NPS-65, Explosives Use and Blasting Program (1991), specifications. All blasting charges would use the minimum amount necessary to accomplish the task. All blasting would be used to shatter, not distribute, any material.

- Should construction unearth previously undiscovered archeological resources, work would be stopped in the area of any discovery and the park would consult with the state historic preservation officer/tribal historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The National Park Service would ensure that all personnel who work on the trail are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Personnel would also be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment traffic would be minimized in the area of the site. Equipment and materials staging areas would also avoid known archeological resources.
- Visitors would be kept informed of construction activities.
- Construction work would be planned to reduce disruption to normal park activities.
- Personnel working on the trail would be informed about the special sensitivity of park values, regulations, an appropriate housekeeping.
- Materials used for the construction of the bog bridge (stone) and causeway (road base and other material) through wetlands would be imported from off-site locations and delivered along the shore of Shadow Mountain Lake via flat-bottom boat. No materials would be obtained from local sources to avoid the potential for inadvertent disturbance to stone features in archeological sites.
- Adaptive management strategies would be implemented to avoid conflicts among users. Please refer to table 1 for adaptive management indicators, thresholds, and actions.

## **ALTERNATIVES AND ACTIONS DISMISSED FROM FURTHER CONSIDERATION**

The following options were considered during the early stages of the planning process but were rejected based on their inability to meet the purpose and need and/or the objectives of the project. Not all of these options encompass an entire alternative, but rather various components of the alternatives.

### **WIDENING OF LARGE SECTIONS OF THE EAST SHORE TRAIL**

Widening of large sections of the East Shore Trail would not meet the objectives of the proposed action and was therefore not carried forward as a component of an action alternative. Widening of large sections of trail would not allow for multiple uses “without causing harm to affected resources” due to the close proximity of the trail to wetlands, and other natural and cultural resources.

### **HARDENED TRAIL TREAD**

During initial discussions, use of a hardened trail tread was discussed for portions of the East Shore Trail. This idea was rejected due to the fact that it would not meet the purpose and objectives of the action due to the fact that use and installation of a hardened, non-pervious surface would affect natural resources. Use of a hardened surface could also conflict with the proposed action’s goal to avoid conflict among users by changing the character of the trail from what is currently experienced by hikers and stock users.

## THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In accordance with Director's Order #12, the National Park Service is required to identify the "environmentally preferable alternative" in all environmental documents. The environmentally preferable alternative is determined by applying the criteria suggested in the National Environmental Policy Act, which is guided by the Council on Environmental Quality. The Council on Environmental Quality provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act, which considers:

- Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations.
- Assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserving important historic, cultural, and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, section 101)."

Generally, these criteria mean the environmentally preferable alternative is the alternative that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources (Federal Register 1981). Based on the above evaluation, it has been determined that alternative A would be considered the environmentally preferable alternative.

Under alternative B, short-term adverse impacts to wildlife, soils, and wetlands would result from construction of trail realignments and bog bridges or causeways. Long-term adverse impacts to these resources from visitor activity would be similar to alternative A, although there would be a small increase in disturbance of wildlife from mountain bikes. Alternative B would somewhat reduce the long-term adverse impacts on wetlands where the trail would be routed out of wetlands.

Alt A would perpetuate the long-term negligible to minor adverse impacts caused by the initial construction and ongoing presence of the trail resulting in loss of vegetation, soils, and wetland functions, and wildlife disturbance caused by visitors. These impacts would also continue at similar intensities under alternative B. Alternative A would avoid short-term adverse impacts from construction and would result in less wildlife disturbance without the presence of mountain bikes.



## SUMMARY COMPARISON OF THE ALTERNATIVES

Table 2 provides a summary of the important features of the alternatives described earlier in this chapter. Table 3 summarizes the environmental consequences that would result from each alternative. More detailed summaries of the impacts are presented in the Conclusion sections at the end of the analyses for each alternative under each impact topic. The full analyses of the impacts are presented in Chapter 3: Affected Environment and Environmental Consequences.

The purpose of this project was identified at the beginning of chapter 1, with a goal to evaluate whether to allow bicycle use on the northern two miles of the East Shore Trail within the park and whether such use can be accommodated without causing harm to affected resources or conflicts among users. Objectives were established for the proposed action that could be used to determine if the action alternative would be successful in meeting the purpose.

**Table 2: Comparison of the Alternatives**

Feature	Alternative A	Alternative B
Trail alignment and routing	Maintain the current trail alignment within the two-mile project area. 0.018 acre of wetlands would be affected.	Realign the trail in two locations. 0.008 acre of wetlands would be affected.
Trail uses	Retain pedestrian use along the entire two-mile section. Retain livestock use on the trail section north of the intersection with the Ranger Meadows Trail.	Retain pedestrian use along the entire two-mile section. Retain live-stock use on the trail section north of the intersection with the Ranger Meadows Trail. Allow bicycle use along the entire two-mile section.
Trail design and structures	Trail standard - Class 3 Single track trail with nominal width of 2 feet and natural trail tread. Maintain the existing trail tread. Retain one existing bog bridge.	Trail standard - Class 3 Single track trail with nominal width of 3 feet and natural trail tread. Improve the trail tread in selected locations to improve safe passage by bicycles. Abandon the existing bog bridge due to trail relocation. Construct a new bog bridge or stone paver causeway in the wetland section at the north end of the trail using imported materials. Construct swales or maintain cross slopes to facilitate appropriate trail drainage. In areas of limited sight distance, increase trail width to no wider than 6 feet to create safe passing zones.
Trail maintenance	Clear tree limbs and vegetation as needed to maintain trail passage.	Clear tree limbs and vegetation obstructions to a width of 1.5 feet on both sides of the trail and a height of 8 feet above the ground.
Construction methods	No new construction	Hand tools would be used for most activities such as excavating and hauling materials and constructing causeways or installing stone pavers. Chain saws would be used to cut trees and logs. A small trial dozer would be used to clear new alignments and grade trail tread.

**Table 3: Impacts of the Alternatives**

<b>Resource Topic</b>	<b>Alternative A</b>	<b>Alternative B</b>
Wildlife	The impacts of alternative A on wildlife would be long-term, local, negligible to minor, and adverse. The impacts would be associated with disturbance caused by trail users, but would not affect any wildlife at the population level. Cumulative impacts would be minor and adverse and primarily associated with the Bark Beetle Management Plan, although increased trail use could contribute to adverse impacts. Alternative A would contribute in a very small manner to the overall cumulative impacts on wildlife.	The adverse impacts of alternative B on the suite of wildlife species found along the East Shore Trail would be short-term, local, and minor, and result from disturbance by construction crews and equipment, with long-term, local, minor adverse effects from trail use once construction work is complete. There would be no population level effects. Cumulative impacts would be short- and long-term, and minor, with alternative B contributing a small proportion of the overall cumulative impact.
Soils	The impacts to soils associated with alternative A would be long-term, local, minor, and adverse and would primarily result from the loss of productivity, soil compaction, and the potential for erosion. Cumulative impacts of other plans and projects would be a mix of long-term adverse and beneficial effects, with alternative A contributing a small measure of the adverse impacts.	Impacts to soils associated with alternative B, would only be incrementally greater than alternative A, would be long-term, local, minor, and adverse, and would primarily result from the loss of productivity and soil compaction. There would be some minor beneficial effects as a result of erosion control measures. Cumulative impacts of other plans and projects would be a mix of long-term adverse and beneficial effects, with alternative B contributing a small portion of the adverse impacts and beneficial effects.
Vegetation	Alternative A would have long-term, local, negligible to minor adverse effects resulting from original removal of vegetation to construct the trail and continuing use, the potential for introduction of nonnative plant seed, erosion in limited areas where it is currently a problem, and the potential for trail users to venture off trail. Cumulative effects would be mixed, with long-term adverse and beneficial impacts, with the contribution of alternative A relatively small, especially compared to the impact of the mountain pine bark beetle.	Alternative B would have short- and long-term, local, minor adverse effects resulting from construction crews and equipment and removal of vegetation to widen and reroute the trail. There would be other continuing effects, including the potential for introduction of nonnative plant seed, and the potential for trail users to venture off trail. Cumulative effects would be mixed, with long-term adverse and beneficial impacts, with the contribution of alternative B relatively small, although slightly greater than the contribution of alternative A.
Wetlands	The long-term, local, negligible to minor adverse impacts of alternative A would be associated with the original loss of wetland vegetation and the associated wetland functions. Cumulative impacts of other plans and projects would be beneficial because trail plans and natural resource management plans would all include measures to ensure maintenance of wetlands and avoid wetland loss or encroachment. Alternative A would have a negligible adverse contribution to the overall beneficial cumulative effects on wetlands of other plans and projects.	The long-term, local, minor adverse impacts of construction associated with alternative B would be offset by long-term minor benefits as a result of reduced erosion. The cumulative impacts of other plans and projects would be beneficial because trail plans and natural resource management plans would include measures to ensure maintenance of wetlands and avoid wetland loss or encroachment. Alternative B would have both minor adverse and beneficial impacts and the contribution of alternative B to the overall cumulative impacts of other plans and projects would be small.

**Table 3: Impacts of the Alternatives (continued)**

Resource Topic	Alternative A	Alternative B
Visitor Use and Experience	Long-term, minor to moderate beneficial impacts of alternative A would be associated with the recreation opportunities provided by the East Shore Trail. Conflicts between users would be infrequent and would result in long-term, negligible to minor adverse impacts. Regular maintenance activities would result in short-term, minor adverse impacts. Cumulative impacts of other plans and projects would be long-term, minor, and adverse. Alternative A would make a small contribution to these cumulative impacts.	Long-term, minor to moderate beneficial impacts of alternative B would be associated with the recreation opportunities provided by the East Shore Trail, similar to alternative A, including opportunities for mountain biking. Conflicts between users could be greater than alternative A because of the presence of mountain bikes, and could result in minor adverse impacts on visitor experience. Adaptive management measures to reduce adverse impacts would be implemented if impacts reached identified thresholds and long-term impacts would be similar to alternative A. Regular maintenance activities would result in short-term, minor adverse impacts as in alternative A. Trail realignment and causeway construction projects would be short-term minor to moderate adverse impacts from construction activities, and long-term minor benefits to visitor experience from trail improvements. The cumulative impacts of other plans and projects would be long-term, minor, and adverse, as in alternative A. Alternative B would make a small beneficial contribution to these cumulative impacts.
Public Health and Safety	Accident rates would continue at their current low level and the impact of alternative A on public health and safety would be adverse and negligible. Cumulatively, alternative A would combine with past, present, and foreseeable future actions to result in continued long-term, minor to moderate beneficial cumulative impacts. Alternative A would make a small contribution to these cumulative impacts.	Mountain bikes would not be expected to add substantially greater safety risk to the East Shore Trail and with implementation of mitigation measures would result in negligible to minor adverse impacts on public health and safety. Mitigations would include increased trail widths in areas of limited sight distance, as well as increased ranger patrols, signage, visitor information, education programs, adaptive management strategies, and involvement of advocacy groups such as the Headwaters Trails Alliance. Allowing bicycle use would also result in negligible to minor beneficial impacts on public health by providing another means for visitors to participate in an outdoor recreation activity within the park. The effects of alternative B on public health and safety would be slightly detectable when combined with the minor to moderate, cumulative, beneficial impacts from past, present, and future actions, and would result in a continuation of cumulative impacts at that level.

Table 3: Impacts of the Alternatives (continued)

Resource Topic	Alternative A	Alternative B
Park Operations	Current and projected use levels and patterns would result in long-term negligible adverse impacts on maintenance activities. The long-term impacts on park operations to patrol the trail, issue warnings, and citations, and administer the resulting information would be negligible to minor and adverse.	Because the trail would be realigned to avoid erosion-prone and wet areas and would be more sustainable, alternative B, which includes mountain bike use, would result in long-term, negligible adverse impacts on park operations. Increasing ranger patrols by one half-day patrol per week would result in long-term minor adverse impacts. Construction activities would be additional to existing programmed workloads and would result in short-term, minor adverse impacts. Increased visitor complaints because of mountain bike use could result in a long-term, negligible to minor adverse impact on park operations. Adaptive management methods would be implemented; however, those would result in long-term negligible impacts on park operations. The cumulative effects of other plans and actions, combined with the effect from alternative B, would be long term, minor to moderate, and adverse. The contribution of alternative B to the cumulative impacts would be small.