Chapter 2: Alternatives

Introduction

This chapter describes five management strategies (alternatives) that the National Park Service (NPS) is considering to achieve resource protection and visitor experience goals in the Lake Crescent area of Olympic National Park (ONP) as identified in the 2008 General Management Plan (GMP) and 1998 Lake Crescent Management Plan (LCMP) related to the development of a non-motorized, multiple use trail along the general route of the historic Spruce Railroad grade. These alternatives were developed through an interdisciplinary planning process that included discussions among subject matter experts, agency officials, partner agencies, American Indian tribes, and comments received from members of the public during initial project scoping and during the public review and comment period for the 2011 Spruce Railroad Trail Expansion and Improvement Environmental Assessment (2011 SRRT EA).

Changes in response to public comment are described for all action alternatives. The primary changes considered in the 2012 Spruce Railroad Trail Environmental Assessment (2012 SRRT EA) as compared to the 2011 SRRT EA are:

- Alternatives 2, 4, and 5 are universally accessible. The NPS has identified a new trail alignment for Segment D (Lyre River Trailhead) that conforms to 2009 Final Draft Accessibility Guidelines for Outdoor Developed Areas published by the Federal Access Board while minimizing impacts to park resources and adjacent private lands. In contrast, Alternative 3 considers the alignment originally proposed by the NPS in the 2011 SRRT EA as the preferred alternative to allow comparison of the 2011 SRRT EA and 2012 SRRT EA preferred alternatives.

- The trail segments proposed for the Sol Duc area in the 2011 SRRT EA are not included in the 2012 SRRT EA. The reasons for this are described later in this chapter under "Actions Considered but Dismissed."

- Alternative 4 (NPS Preferred) considers a firm and stable trail surface that would meet accessibility standards and provide one continuous trail surface rather than the asphalt and gravel combinations considered in the other action alternatives. This was in response to public comments that requested a firm and stable surface be considered, and comments that firm and stable surfaces have been used successfully for accessible, multiple use trails in many locations, including other sections of the Olympic Discovery Trail located outside ONP. This alternative also responds to public comments related to providing adequate trail width to allow passing.

Alternative 1 is the no-action alternative, which describes current management of the existing Spruce Railroad Trail (SRRT) and associated parking lots and trail access. The no-action alternative provides a baseline against which other alternatives may be compared.

Alternatives 2, 3, 4, and 5 (Action Alternatives) describe a range of reasonable approaches to meet the purpose and need for taking action, and to achieve management goals and objectives described in Chapter 1. The goals of this plan are to protect natural and cultural resources and improve visitor experience. The Action Alternatives described in this chapter vary in how the park proposes to meet the management objectives defined for each goal, but differ primarily in the extent to which the objectives of Goal 2 are met. The objectives of Goal 2 are:

Resource Education and Interpretation Objectives:

- Improve interpretation of historic Spruce Railroad Grade.
- Interpret lake ecology and unique resources: plants, fish, water quality, geologic history.
- Improve visitor orientation, interpretation, and visitor services to better serve visitors traveling along the US 101 corridor.

Visitor Access Objectives:

- Provide safe pedestrian and bicycle access through the Lake Crescent area for visitors and the traveling public and reduce conflicts between non-motorized and motorized uses.
- Provide adequate parking and vehicle turnaround space at the Lyre River trailhead for safe pedestrian use.
- Provide all visitors, including those with disabilities, the opportunity to visit, learn about, and enjoy the unique natural and cultural resources of the area.

Visitor Experience Objectives:

- Provide opportunities for a variety of outdoor experiences and recreation uses that minimize conflicts between recreational users, and are compatible with the protection of park resources and values.
- Protect views from Lake Crescent and Highway 101.
- Provide appropriate facilities to support visitor use. This may include, but is not limited to: benches, picnic tables, comfort stations, trash receptacles, and a means for proper pet waste disposal.

Park Operational Objectives:

- Design the improvements to the historic Spruce Railroad grade and the existing SRRT to facilitate effective and sustainable ongoing management, maintenance, and visitor use.
- Protect the trail from future damage by including sustainable trail design measures at stream crossings and slide areas.
- Design trail to preclude unauthorized vehicular access.

- Provide for the continued use of private property within the Lake Crescent watershed while minimizing the impacts and effects of private development on the visitor experience, lake ecology, scenic and visual quality, and the historic setting.

All Action Alternatives considered were developed in accordance with the 2009 Final Draft Accessibility Guidelines for Outdoor Developed Areas published by the Federal Access Board. These guidelines apply to the construction or alteration of new facilities on federal lands or on behalf of the federal government. Only Alternative 3 contains a section of trail (Segment D) that would not meet these guidelines.

This chapter is organized as follows:

- Alternative 1 (No-Action, Continue Current Management Approach)
- Activities Common to All Action Alternatives
- Alternative 2 (Accessible Trail – 3 ft. wide asphalt with 4 ft. wide gravel)
- Alternative 3 (2011 Preferred Alternative – 6 ft. wide asphalt with 4 ft. wide gravel)
- Alternative 4 (2012 NPS Preferred Alternative – Accessible Trail: 10.5 ft. wide, firm and stable)
- Alternative 5 (Accessible Trail – 8 ft. wide asphalt with 3 ft. wide gravel)
- Alternatives Considered but Dismissed
- Environmentally Preferred Alternative
- Summary Table of Alternatives
- Summary Table of Environmental Consequences

Alternative 1 - No Action (Continue Current Management, Routine Maintenance Only)

Under the No Action Alternative, the (NPS) would not implement additional trail improvement actions identified in the 2008 GMP and 1998 LCMP. Only routine maintenance of the existing trail system would occur. No new infrastructure would be built. The current situation, as described below would continue. See Chapter 3 (Affected Environment) for a more detailed profile of the project area.

Spruce Railroad Trail – existing conditions

ONP manages a trail system that includes over 600 miles of trail. Trails are maintained in accordance with park-specific trail standards adopted by ONP during the development of the 2008 GMP.

The SRRT addressed in this document is approximately 4 miles long and contains several distinct segments, described below. This trail was developed primarily along a portion of the historic Spruce Railroad grade adjacent to Lake Crescent. The trail is unpaved and varies in

width from approximately 36 inches of clear trail tread up to approximately 6 feet of clear tread in highly compacted areas on the rail grade. Several small drainages cross the existing trail. One of the drainages flows year-round, others flow seasonally. The trail is located along a steep hill slope that descends to Lake Crescent below. Rock slides occur in several locations and have partially buried several sections of the rail grade and associated ditches.

Current maintenance is routine. Seasonal repairs consist of removing downed trees from the trail and limited cleaning of drainage structures. The SRRT was not originally developed to meet accessibility guidelines or to meet a specific park trail standard. The SRRT is best defined as a Multipurpose Bicycle Trail. Maintenance and use is most consistent with the "nature" and "all-purpose" trail standards described for ONP in the GMP. Volunteers complete most routine trail maintenance. NPS staff maintains the trailheads and parking areas

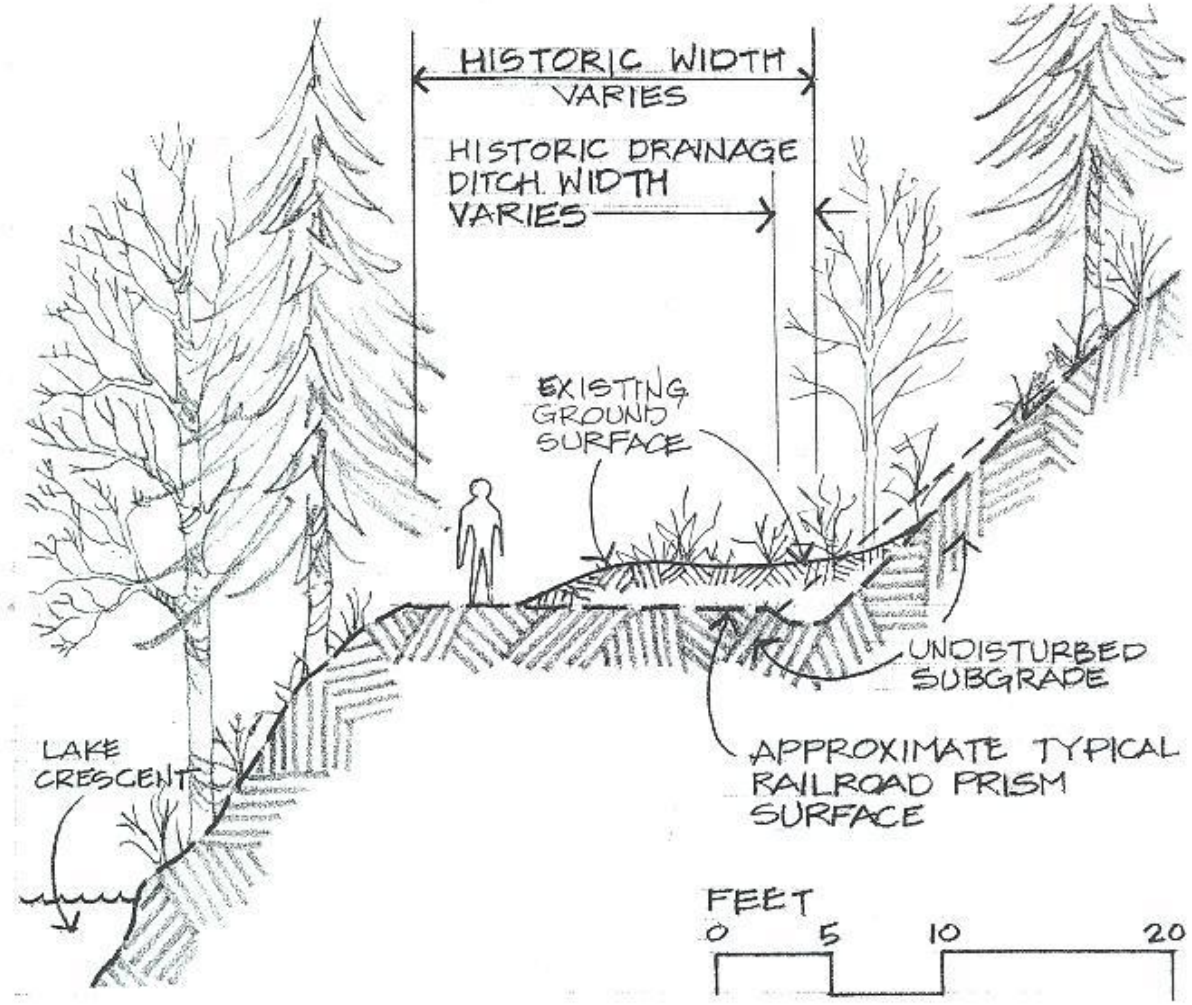

Figure 7. Trail profile (historic railroad segments) existing conditions

Table 2. Olympic National Park Trail Standards

Olympic National Park Trail Standards (2008 General Management Plan)				
STANDARD	**NATURE**	**ALL-PURPOSE & MULTIPURPOSE BICYCLE**	**SECONDARY & FOOT**	**PRIMITIVE**
Tread width	60" maximum	24" standard 30" maximum	18" standard 24" maximum	18" standard 18" maximum
Clearing and Brushing	8' lateral 10' vertical	8' lateral 10' vertical	6' lateral 8' vertical	4' lateral 8' vertical
Maintenance frequency	Annual +	Annual	Usually semi-annual	Occasional (for route definition & resource protection)
Bridge width	8' decking maximum	6' decking maximum	6' decking maximum	None
Puncheon width	60" maximum	48" maximum	48" maximum	None
Turnpike width	60" maximum	48" maximum	36" maximum	Not generally allowed, 24" maximum

Nature Trails — These trails are generally paved or gravel surfaced, and are designed for large numbers of relatively inexperienced users. Stock is prohibited except for occasional administrative use, or when a nature trail is the only trail available for stock to access all-purpose or secondary trails. Nature trails are maintained to a standard for higher use volumes.

All-Purpose Trails — These trails are main routes; they are open to hikers and stock, and are maintained to a standard for stock travel.

Multipurpose Bicycle Trails — Located outside of wilderness, these trails are open to hikers, stock, and bicycles, and are maintained to all-purpose standards.

Secondary Trails — These trails are open to hikers and stock, and will be maintained to a standard for foot travel. These trails are designed for experienced horses and riders.

Foot Trails — These trails are open to hikers, and are maintained to a standard for foot travel. They are closed to stock, except for occasional administrative use.

Primitive Trails — These trails are open to hikers only, for high elevation or low-use area access. Primitive trails include both constructed trails and trails established by continual use. These trails have minimal improvements — enough to protect the resources. Occasional maintenance is performed, as time and budget allow keeping routes open and protecting park resources.

Universally Accessible Trails — These trails are accessible to and usable by people with disabilities.

The SRRT is immediately bordered by trees and herbaceous plants that have established since the railroad was abandoned and later closed to vehicular access. In several areas the cut slope above the trail has slumped onto the railroad grade, burying the trail and abandoned railroad ditches, reducing the width of exposed railroad corridor and providing a medium for the growth of both native and non-native vegetation.

The SRRT is located on a south-facing terrace with scenic views of Lake Crescent and the surrounding mountains and is a popular, year-round destination.

For the purpose of this EA, the existing SRRT is broken into four separate planning segments:

- **Segment A** (from the western end of the SRRT at Camp David Junior Road (CDJR) to the west side of the short railroad tunnel,
- **Segment B** (the trail segment between the two historic railroad tunnels),
- **Segment C** (the trail east of the long railroad tunnel near Lake Crescent on the historic railroad grade),
- **Segment D** (the trail between Lake Crescent and the current Spruce Railroad Trail parking lot near the Lyre River – not on the historic railroad grade).

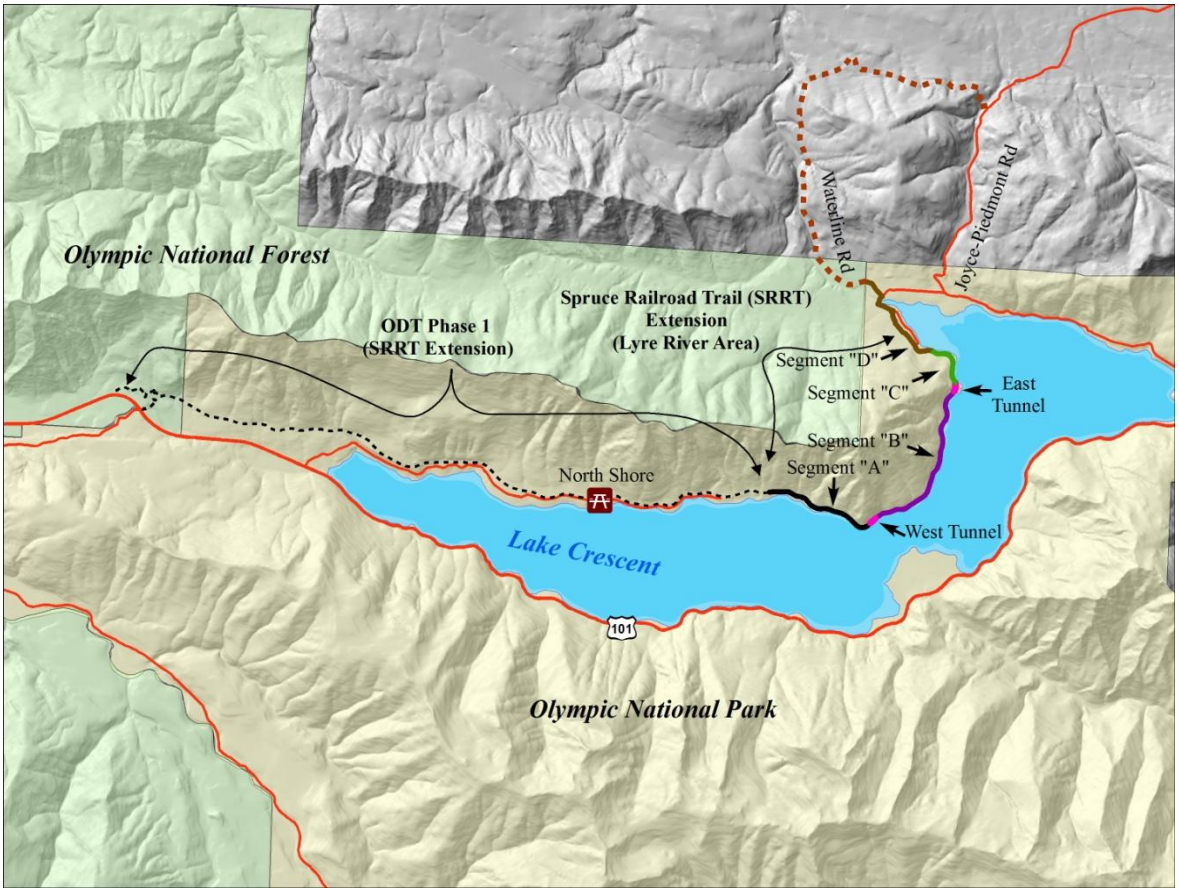

Figure 8. Project Area Map (only lands within the boundary of Olympic National Park are addressed in this EA)

Segment A: The trail begins in the west at a trailhead located at the end of Camp David Junior Road (milepost (MP) 0.0 to MP 1.07). The trailhead is identified by a small sign and bulletin board at the end of the road. A spur trail climbs a short distance to reach the historic Spruce Railroad grade. The trail continues east along the railroad grade for approximately one mile to the partially collapsed, west railroad tunnel (short tunnel) and bypass trail. There are five downslope bank failures located in Segment A, including four with exposed, historic wood cribbing.

West Railroad Tunnel (short tunnel) & Bypass: A geotechnical evaluation of the western railroad tunnel (short tunnel) was conducted in late 2010 (PanGEO, 2011). This evaluation found that the short tunnel is approximately 140 feet long, and is oriented northeast-southwest. The tunnel ranges between 19 to 22 feet in width and between 25 to 30 feet in height. In the past, attempts to close the tunnel through the use of blasting resulted in a large debris pile at the east tunnel portal. An approximately 425 foot long bypass trail provides access around the tunnel to the south between MP 1.07 and MP 1.13. The bypass trail averages three feet in width and is immediately adjacent to Lake Crescent.

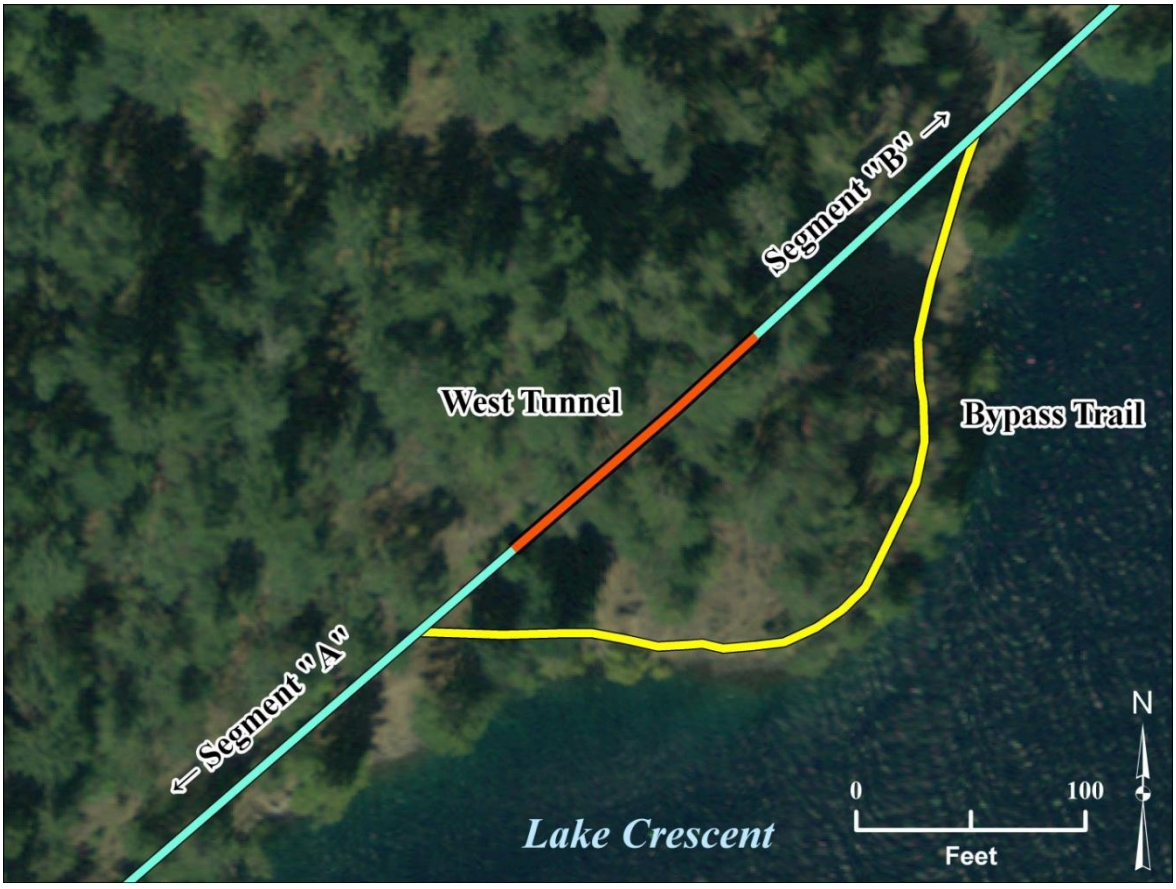

Figure 9. West railroad tunnel and bypass trail

Segment B: The trail continues from the east side of the west (short) railroad tunnel along the historic railroad grade (MP 1.13 to MP 2.72). The grade has eroded in several places, both above and below the trail, leaving a narrowed trail corridor. This trail segment continues east for

approximately 1.59 miles to a second partially collapsed railroad tunnel and bypass trail. There are nine downslope bank failures located in Segment B. This includes two bank failures with exposed, historic wood cribbing and two locations with historic dry laid rock. In one location the dry laid rock is intact, in the second the dry laid rock has failed.

East Railroad Tunnel (long tunnel) & Bypass: A geotechnical evaluation of the eastern railroad tunnel (long tunnel) was conducted in late 2010 (PanGEO, 2011). This evaluation found that the long tunnel is approximately 390 feet long, and is generally oriented north-south with a constant, gentle curve to the west. The tunnel ranges between 21 to 24 feet in width and between 26 to 28 feet in height. In the past, attempts to close the tunnel through the use of blasting resulted in large debris piles at the tunnel portals, leaving as little as three feet of clearance at the north portal where a large volume of rock is accumulated.

A bypass trail between MP 2.72 and MP 2.80 provides access around the long tunnel and to the Devil's Punchbowl, a small, deep bay with steep drop-offs located along the southern edge of the rock outcrop containing the railroad tunnel. The bypass trail is approximately 1,225 feet in length and averages three feet in width. The Devil's Punchbowl is a destination for trail users, including those who are not planning to hike the full length of the Spruce Railroad Trail. It is also a destination for many boaters on Lake Crescent. The Devil's Punchbowl is reached via a rocky trail that departs from the Spruce Railroad grade on both sides of the long tunnel to an existing footbridge. The bridge crosses the small bay and connects trail users to the bypass trail grade.

The footbridge is a steel box truss pedestrian bridge with wood decking. The bridge is approximately 85 feet long and 6 feet wide. A routine inspection of the bridge recently found that it is no longer structurally suitable for use by people traveling with stock. The park has posted safety information to notify trail users of this change in conditions. The bridge remains suitable for use by people traveling on foot or by bicycle.

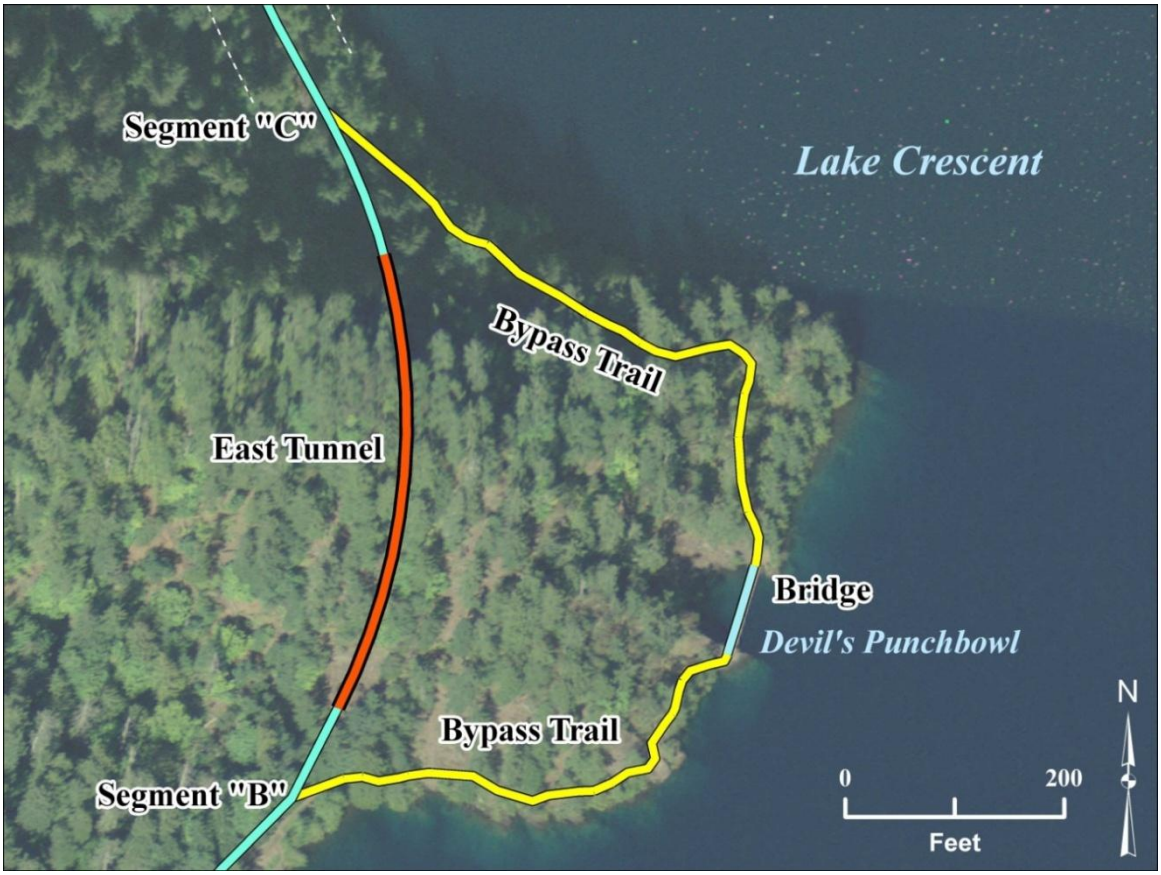

Figure 10. East (long) railroad tunnel, bypass trail and Devil's Punchbowl bridge

Segment C: The trail continues east along the railroad grade for approximately 0.5 miles from the east side of the long railroad tunnel (MP 2.80 to MP 3.27). This trail segment contains multiple seasonal water crossings and is frequently wet or muddy.

Segment D: The easternmost segment of the existing trail leaves the historic railroad grade near the shore of Lake Crescent and climbs approximately 90 feet to bypass private property before descending to the eastern trailhead parking lot at the end of East Beach Road near the Lyre River (MP 3.27 to MP 3.86). There are three small bridges located on the current trail that cross small drainages and wetland areas.

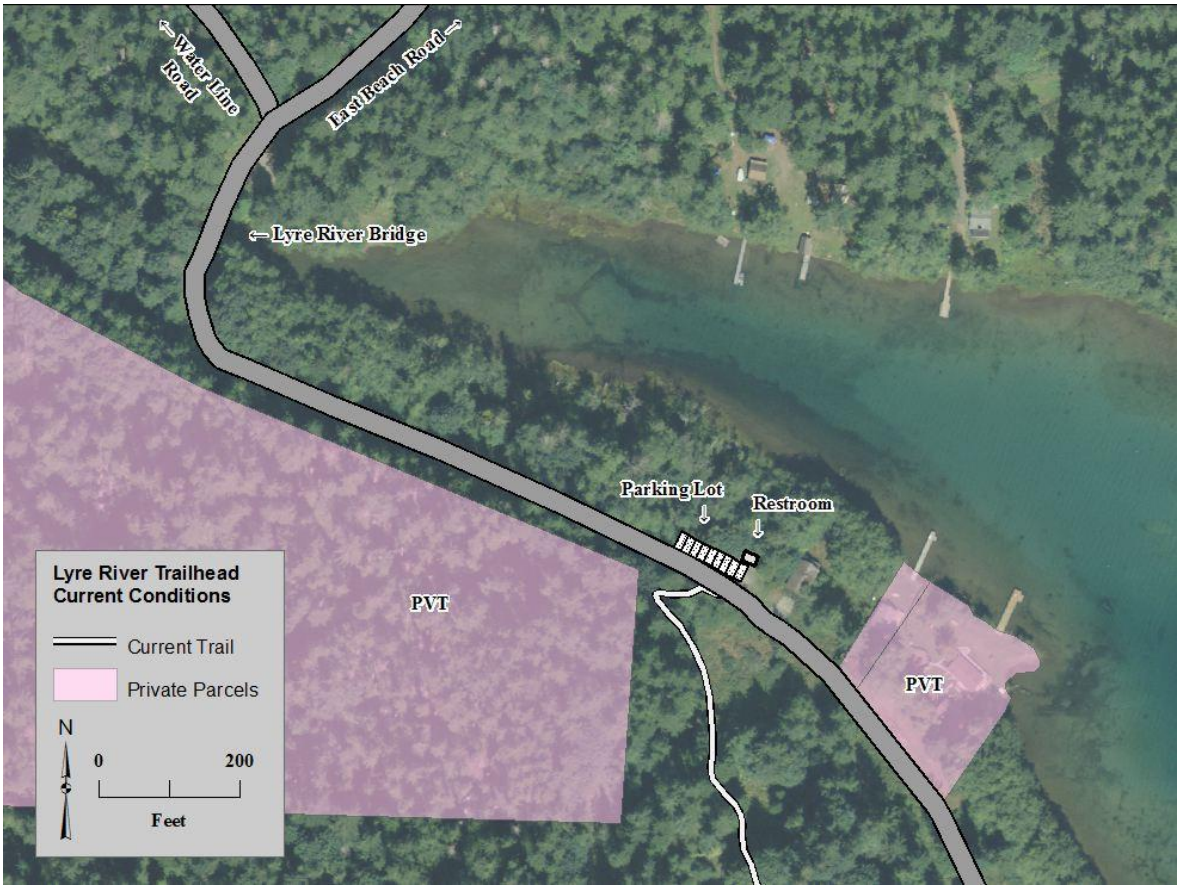

Figure 11. Existing Configuration of Spruce Railroad Trail parking lot area.

Spruce Railroad Trailhead Parking Lot: A small, unpaved parking lot is located at the eastern end of the trail, west of the Lyre River. The parking lot does not provide adequate turnaround space for vehicles with a large turning radius, such as large motorhomes or vehicles towing trailers. The trailhead contains one unisex vault toilet, one picnic table, and a bulletin board with visitor information about the park and trail. The NPS owns a vacant building located immediately adjacent to the current parking area. This structure has been identified for removal. A small, abandoned dock associated with the property remains in Lake Crescent near the outlet to the Lyre River and has also been identified for removal.

Private Lands: Several private landowners access their property on Lake Crescent via a spur road that continues west beyond the existing parking lot. A short segment of the existing Spruce Railroad Trail bisects the corner of a private parcel.

Olympic Discovery Trail – Phase 1 existing conditions

Clallam County received approval from the NPS to construct approximately 6.5 miles of new trail on the historic Spruce Railroad grade above Camp David Junior Road in 2009. This new trail segment was completed in 2011 after improvements to slope stability and drainage were constructed following a slope failure during the winter of 2010.

The Phase 1 trail segment begins outside the boundaries of Olympic National Park, adjacent to Highway 101 west of Fairholme, and opposite the NPS entrance road to the Sol Duc area of the park. The trail extends northeast from Highway 101 into the park. Within the park the trail varies between 12.5 to 14 feet in width. This includes an asphalt paved section that is between 8 and 10 feet in width, and adjacent gravel shoulders that vary between 0.5 to 4 feet in width on each side. The Phase 1 trail segment follows the Spruce Railroad grade to the east, paralleling Camp David Junior Road and ending near the western end of the existing Spruce Railroad Trail.

Clallam County proposes to extend the trail to the west on U.S. Forest Service (USFS) and other lands, eventually connecting with the community of LaPush at the Pacific Ocean as part of a regional trail system known as the Olympic Discovery Trail (ODT). Work on USFS lands was addressed in an environmental assessment completed by Olympic National Forest, Department of Agriculture in 2006. Construction of a new trail section by Clallam County on USFS lands is proposed to begin in 2012. Clallam County proposed to construct trail on the historic Spruce Railroad Grade in the Sol Duc area of Olympic National Park. This action was considered in the 2011 SRRT EA, but was dismissed in the 2012 SRRT EA for reasons described later in this chapter.

Activities Common to All Action Alternatives

The following activities are included in all action alternatives (Alternatives 2, 3, 4, 5). See Chapter 3 (Affected Environment) for a more detailed profile of the current environmental situation in the project area. The conceptual design for trailhead improvements and trail rehabilitation and development presented in this document may be modified during final construction design to best accommodate site-specific conditions and to avoid or minimize resource impacts.

Construction, maintenance, and use of the trail would be managed under all alternatives to comply with laws and policies related to safety and risk management for the visiting public and to provide a safe and healthful workplace for NPS employees, volunteers, and partners.

The Spruce Railroad Trail would be closed to visitor access during construction activities. The length and extent of the closure would depend on the alternative selected and site conditions encountered during construction. Construction under any alternative may be phased to allow any approved actions to occur as funding becomes available and in accordance with best management practices related to visitor use and resource protection.

Traffic control would be required along East Beach Road, Camp David Junior Road, and portions of Highway 101 during construction. The extent and duration of traffic control would depend on the alternative selected. Traffic control would be implemented in coordination with the applicable state or local transportation management agency.

Camp David Junior Road Construction Access

Vehicular access for trucks and other construction equipment would be established from Camp David Junior Road (CDJR) at milepost 4.6 as measured from Highway 101. This construction access point would be located approximately 300 feet from the eastern end of the road. Construction vehicles would enter the project site via Highway 101 onto CDJR. Trailered equipment would be unloaded on CDJR before moving up the access to the work area.

A new construction access is required to avoid damage to the trail constructed above CDJR in 2009 (ODT Phase 1). A graded gravel ramp would be constructed at an approximately 12% grade. Construction would include removal of all vegetation in the access corridor, including trees < 11" dbh. Construction would include grading and placement of fill between CDJR and the ODT Phase 1. The grade would be stabilized through the placement and compaction of 1-1/4-inch minus road base. All materials would come from a park-approved, weed-free source.

Table 3. Installation of a construction access ramp along Camp David Junior Road

Installation of a construction access ramp along Camp David Junior Road	
Construction Requirements	**Quantities**
Length of access ramp	250 linear feet
Width of access ramp	20' wide at bottom, 14' wide at top
Volume of excavation/cut required	N/A
Volume of fill required	1200 cubic yards
Volume of base material placed	125 cubic yards
Volume of asphalt placed	N/A
Volume of rip rap placed	N/A
Number of trees removed (≥ 11" dbh)	N/A
Work type	**Duration (approx.)**
Clearing and grubbing, placing fill and base	4 days

Camp David Junior Road (CDJR) Trailhead Development

Under all action alternatives the North Shore Picnic Area parking lot would be rehabilitated within the existing developed area to meet outdoor accessibility standards. This would include improving parking and access to the existing vault toilet, and may also include modifications or additions to the vault toilet if changes in use levels warrant additional development. All or a portion of the parking lot would be paved to provide a firm and stable surface. Parking spaces would be clearly delineated to maximize the number of vehicles that could park in the lot. Accessible parking would be identified adjacent to the restroom.

Additionally, two accessible parking spaces would be constructed along Camp David Junior Road (CDJR) in an existing widened turnout area adjacent to the existing North Shore Picnic

Area parking lot. The accessible parking spaces would be designated and signed for use by people with disabilities only. The widened area of CDJR would be graded. Gravel (1-1/4-minus) would be placed over an area 35-feet long and 12-feet wide. Asphalt would be placed on the gravel with an additional six inches of asphalt in a turndown edge along the road. The entire area would be graded so that the asphalt elevation matches the adjacent gravel road elevation.

Compacted gravel and asphalt six feet in width would be extended from the accessible parking spaces across CDJR to connect with a newly developed accessible spur trail. The spur trail would provide access to the ODT Phase 1 trail segment and the extended Spruce Railroad Trail.

The centerline of the spur trail would be marked using tape and stakes at intervals to clearly identify both straight and curved sections. Once the alignment is marked, a tracked loader would be used to clear duff and vegetative overburden to a width of ten feet. This material would be loaded onto trucks, removed from the park, and disposed of at an approved site.

The trail grade would be constructed along the hillside through the removal of trees and other vegetation and the excavation of the trail grade. The spur trail would include switchbacks on the hill above CDJR at a grade of five percent. In areas where an upslope cut bank is exposed, class 2 and 3 rip rap would be placed to support the exposed bank while leaving the full width of trail.

After the base of the trail is in place and the cut banks supported, 1-1/4-inch minus gravel would be placed and compacted to a depth of six inches and a width of seven feet for the entire length of the spur trail. The gravel would be compacted in place; asphalt three-inches thick and six-feet wide would be placed on the compacted gravel base and centered so that six inches of compacted gravel remains on each side of the trail outside the edges of the asphalt. Additional gravel would be placed and compacted outside of the edges of asphalt to raise the gravel elevation to level with the completed asphalt grade.

Table 4. Construction requirements of a new universally accessible parking and trail access along Camp David Junior Road near the North Shore Picnic Area parking lot

Construction of new universally accessible parking and trail access along Camp David Junior Road near the North Shore Picnic Area parking lot.	
Construction Requirements	**Quantities**
Length of trail segment	495 linear feet
Area of accessible parking development	420 square feet
Volume of excavation/cut required	155 cubic yards
Volume of fill required	325 cubic yards
Volume of base material placed	64 cubic yards
Volume of asphalt placed	35 cubic yards
Volume of rip rap placed	30 cubic yards
Number of trees removed (≥ 11" dbh)	3
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	13 days

Animal-resistant trash receptacles and recycling containers would be placed at the CDJR trailhead to accommodate increased visitor use. Trail information and interpretation signs would also be installed.

Establishing Primary Trail Centerline

The trail centerline would be surveyed and staked for horizontal alignment and vertical grade as established in the construction drawings. Olympic National Park (ONP) archeology staff would inspect and adjust the surveyed alignment as necessary to conform to the historic railroad alignment (where present) to establish a final centerline.

The final centerline would be used to establish the construction limits. The width of the construction limits varies and is described for each alternative considered. The construction limits would be marked using flagging or other accepted means to allow for identification of the area to the contractor. The construction limits identify the external boundary where construction-related disturbance may occur. The approved construction limits would be of sufficient size to accommodate trail development, construction access, passing zones, turnaround, resting, and staging areas. Construction limits would be minimized and kept within previously disturbed areas to the greatest extent possible.

Site Preparation – Vegetation Removal and Grading

After the construction limits are marked and identified to the contractor, the area would be cleared of vegetation, duff, and overburden. Trees within the construction limits would be cut as close to ground level as possible using a chain saw. Overhanging limbs in the construction limits

would be pruned using approved horticultural standards to create a clear zone up to 12-feet high. Once cut, trees would be dispersed into the surrounding forest using an excavator. Some trees may be utilized during trail development. This may include using logs to rehabilitate historic wood cribbing, to help delineate portions of the trail, or to develop benches or other appropriate trail features. Small woody material up to six inches in diameter would be disposed of outside the Park or mechanically shredded and placed in the surrounding forest to avoid the creation of large piles of material. Removed vegetation would be loaded onto a dump truck using either a loader or excavator and disposed of at a permitted location outside the Park. Areas containing invasive plant species would be cleared of those plants and the area protected from reintroduction of non-native plants until the entire project is revegetated through the application of weed-free mulch.

After vegetation removal is complete, removal of duff and other overburden from the trail corridor would be completed using a small bulldozer and/or grader. Where feasible, the duff layer would be salvaged from areas free of non-native plants as identified by the park's vegetation specialist and applied to newly finished slopes following trail construction. Where the historic Spruce Railroad grade is within the construction limits, the overburden would be removed to an elevation identified by a park archeologist as the top of the railroad ballast or higher. The intent would be to minimize disturbance to remaining historic materials to the greatest extent possible while allowing for the development of a firm and stable surface for trail construction. The overburden would be loaded into trucks using construction equipment (excavator, loader) and disposed of at a permitted location outside the Park.

If excessively muddy or wetted areas are encountered within the construction limits the contractor would place and compact 1-1/4-inch minus gravel from a park-approved source as necessary to stabilize the surface and allow passage of trucks and construction equipment along the route.

Upslope Bank Failures

Within Segments A, B, and C upslope bank failures have resulted in slide materials within the proposed construction limits at approximately eight locations. Slide materials within the construction limits would be removed, as appropriate to maintain slope stability and trail integrity, by loading materials onto a dump truck using either a loader or excavator. Slide materials would be removed down to the grade of the railroad ballast or higher, creating a vertical cut against the slope. Where necessary, the slope would be stabilized through the placement of Class 2, 3 and 4 rip rap against the vertical cut, raised to a height sufficient to support the entire exposed face and prevent continued migration of slide materials onto the trail. Work would be accomplished using a tracked excavator and dump truck.

If park staff determine that the removed slide material is acceptable for use in other areas of proposed trail construction it would be transported and stockpiled for later use. Suitability for

reuse would be based on whether or not the materials are suitable from an engineering standpoint. Best management practices would be utilized to ensure that such use would not introduce or spread non-native plants within the park. If materials are not acceptable for such use they would be removed from the park to a permitted disposal site.

Downslope Bank Failures

Where bank failures have occurred along proposed trail segments, the desired width would be established either through modifying the alignment to move the trail away from the bank failure or through the placement of downslope bank stabilization. All areas of the existing trail that propose the use of large construction equipment would be rehabilitated and stabilized to provide a stable corridor for construction and maintenance access and trail use.

Within Segments A and B, fourteen areas between the proposed trail bed and lake edge have failed. Six of these sections contain historic log cribbing from the original construction of the rail grade. Historic dry laid masonry from the construction of the rail grade is also present. The combined length of failed bank measured along the water's edge is 1,409 linear feet.

In the six areas where historic log cribbing is present, the trail bed would be reconstructed. The trail bed would be excavated using a tracked excavator to an elevation slightly above the water level. Log cribbing would be removed to allow for new bank stabilization to be installed. This would be done in accordance with cultural resource guidelines to rehabilitate the historic appearance of the log cribbing. No work would occur below the ordinary high water mark.

In the area of historic dry laid masonry, all failed areas would be reconstructed in accordance with a treatment plan developed in consultation with cultural resource specialists. Bank stabilization would be designed to protect the remaining section of intact masonry wall. The lowest 12 inches to 18 inches of wall would be at or below the ordinary high water mark. Where the masonry wall is intact, it would remain. Concrete abutments would be placed into the bank and structural steel bridging with wood decking would be placed on top of the trail section to provide a driving platform for construction equipment, and a permanent trail surface.

Where masonry wall is not intact, initial work would entail the removal of the identified masonry elements along the bank down to the lake level. Material identified by cultural specialists as historic dry laid masonry wall would be treated in a manner consistent with NPS cultural resource guidelines. The excavated rock material would remain at the site and be used for reconstruction. A steel bridging structure would be placed on the trail grade as described above. New material matching the intact wall material would be transferred to the site using dump trucks. The material would be hand placed, beginning with the larger material at the bottom and extending up the wall. Rock would be placed to create a lock between adjoining pieces. As the wall is raised, previously excavated material would be replaced behind the wall and compacted into place.

The six areas that contain no log cribbing or dry laid masonry would be reconstructed through the placement of Class 3, 4, and 5 rip rap, placed beginning at the lakeshore and extending upslope to the level of the trail. The lower 12 to 18 inches of the rip rap fill would be below the ordinary high water level of the lake. As the rip rap is constructed, voids would be filled with graduated rock sized between three inches down to 1-1/4 minus road base. Where appropriate, alternatives to rip rap would be used to stabilize areas. All downslope bank stabilization would be designed and constructed to avoid or minimize impacts to water quality, shoreline habitat and native vegetation to the greatest extent possible. Any rip rap used would be placed using the minimum design necessary to establish a structurally sound bank. Bank reconstruction would utilize a tracked excavator to place the rip rap and a dump truck to transport rip rap and backfill.

Trail Drainage

Areas where water flows across the trail would be contained through the placement of a buried plastic culvert, a trail bridge, boardwalk, or a low water crossing. Where culverts are placed, the trench would be excavated using a tracked excavator and the culvert placed in the trench at the design slope. The trench would be backfilled using native material and compacted. The inlet and outlet ends would be protected through the placement of class 2 and 3 rip rap. Where low water crossings are installed, the trail grade would be slightly depressed at the location of the crossing, rising for 25 feet on each side to match the trail grade.

In Segments A & B, approximately 3 culverts and 8 low water crossings would be installed. Water flow across the trail within Segments C and D would be contained through the placement of low water crossings, boardwalk or trail bridges. Low water crossings would be placed at approximately 12 locations. Concrete, rather than asphalt, would be used to create a swale, providing a flow path for water. Where identified as necessary, the inlet and outlet sides of the low water crossing would be channelized through the placement of 3-inch minus rock to direct the water and maintain the channel alignment.

Cross Drainage by Culvert, Low Water Crossings, and Concrete Panel Bridge

Water flow across the trail would be contained through the placement of buried plastic culverts, low water crossings or elevated crossings. Five cross drains have been identified and additional minor drains may be identified in the future and these cross drains would be contained through the placement of an appropriately sized plastic culvert at each location. Inlet and outlet ends of culverts would be protected from erosion through the placement of rip rap around the inlets and outlets. At approximately 2-3 cross drain locations water would be contained through the placement of concrete low water crossings. The trail grade would be slightly depressed for 50 feet on each side of the crossing to match the trail grade. The trail surfacing would utilize concrete in the depressed grade, providing a flow path for water and a cleanable surface for maintenance. Where identified as necessary, the inlet and outlet sides of the low water crossing would be channelized through the placement of 3-inch minus rock to direct the water and maintain the channel alignment while minimizing erosion. Three locations in Segment D-ADA

would require large culverts. One location within Segment C would require the placement of an elevated water crossing consisting of a bridge structure approximately 16 feet in length and 12 feet in width. This bridge would span a year-round stream channel. The bridge would be placed on concrete abutments excavated into the ground. The trail would be raised over a 100-foot length to match the elevation of the bridge. Culverts, elevated water crossings, and low water crossing placement would utilize a tracked excavator, dump trucks, and compaction equipment.

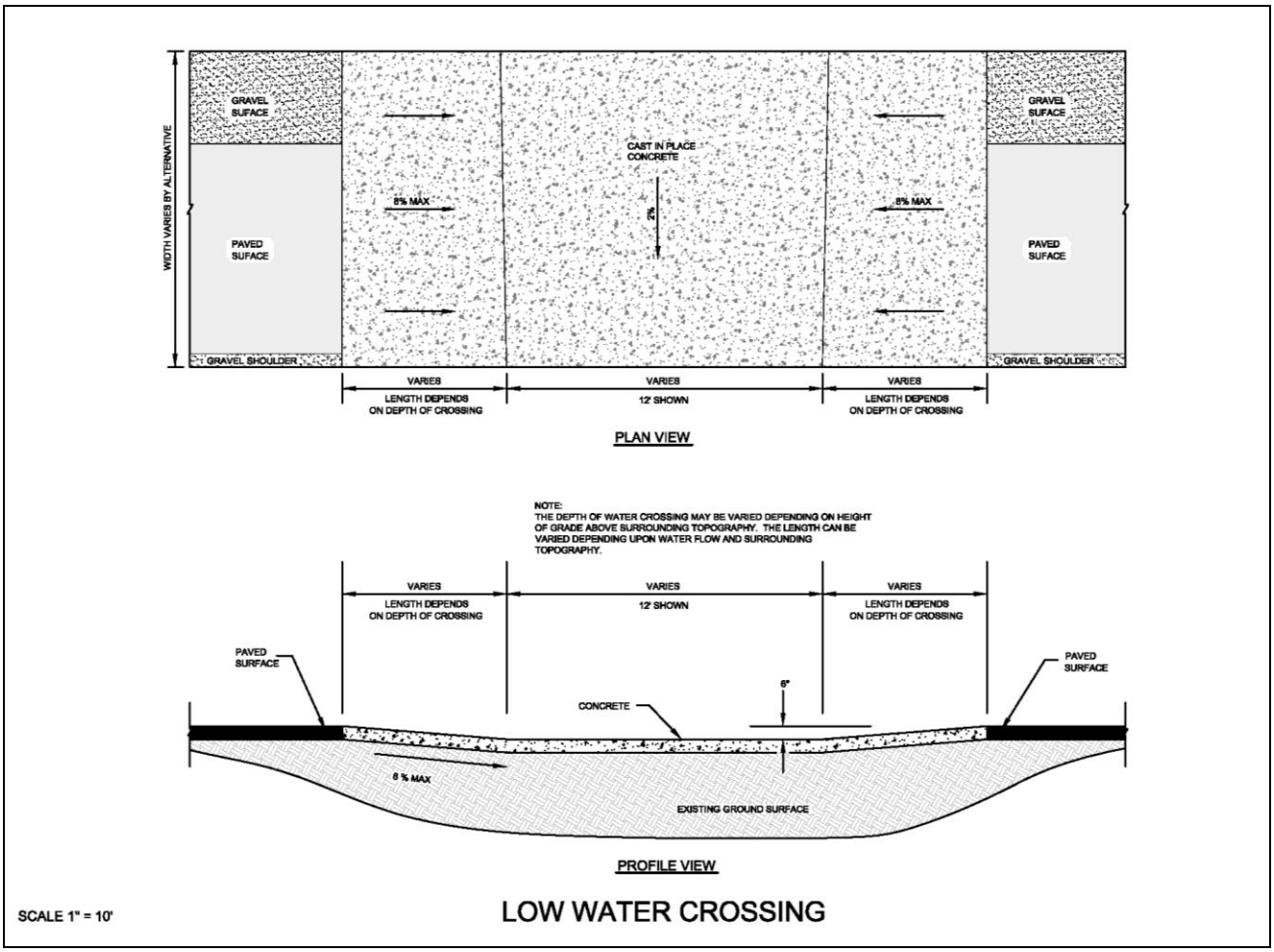

Figure 12. Plan and profile views showing low water crossing

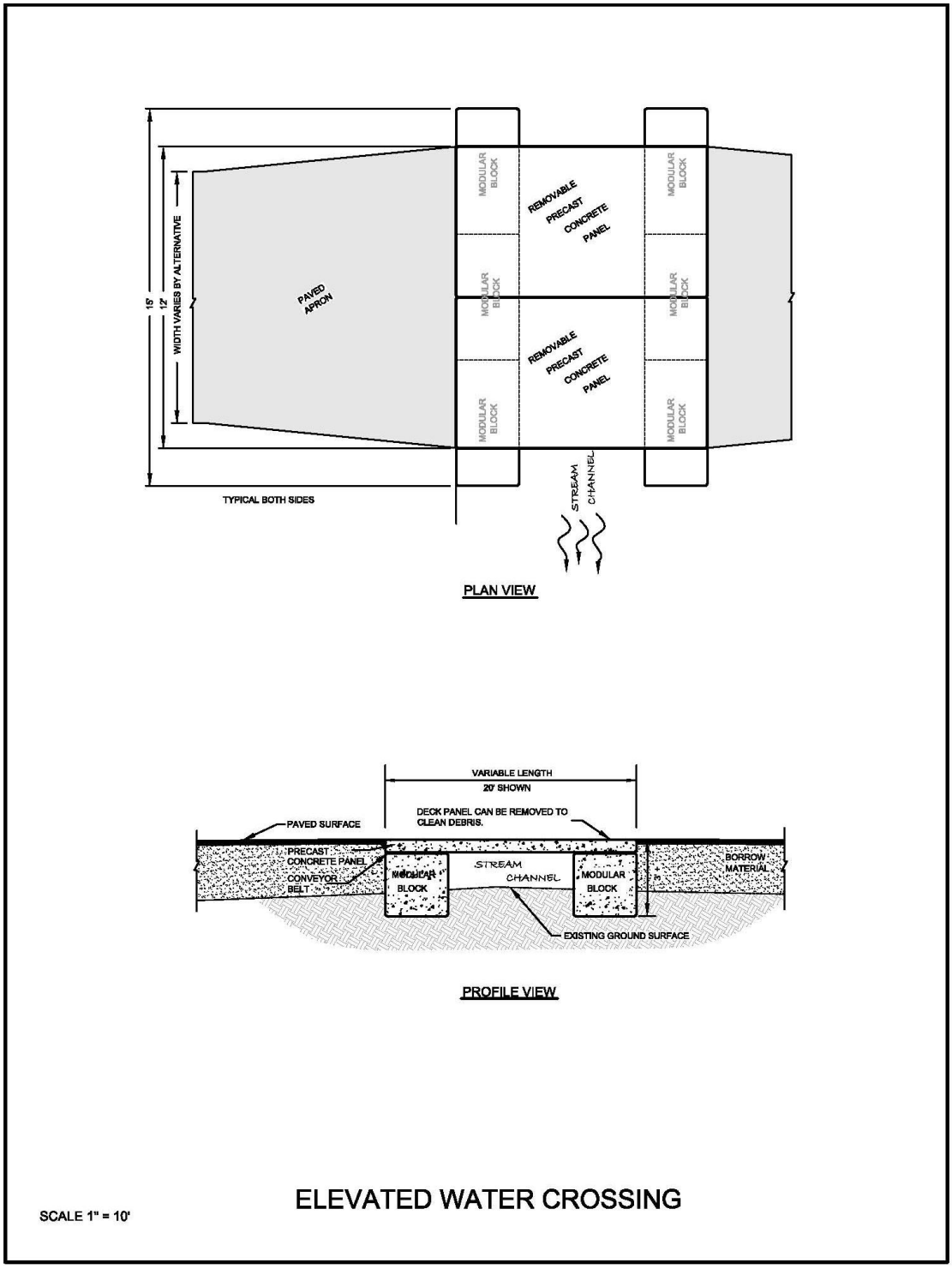

Figure 13. Plan and profile views showing elevated water crossing

Four locations would require the placement of bridges in accordance with the NPS SRRT trail standards. Bridge lengths would vary from 16 to 26 feet. These bridges would span year-round stream channels. The bridges would be placed on concrete abutments excavated into the ground.

The trail would be raised over a 100-foot length to match the elevation of the bridge. Bridge and low water crossing placement would utilize a tracked excavator and dump truck.

Spruce Railroad Trailhead Parking Lot, Lyre River Road and Water Line Road

The existing parking lot would be expanded after the NPS-owned vacant property is removed (house and dock). Parking lot expansion would be limited to the footprint of the demolished building extended laterally to the adjoining property line, leaving an undeveloped buffer adjacent to the adjoining property. An accessible sidewalk would be constructed along the perimeter of the parking lot to provide a path to the accessible restroom, relocated bulletin board and trailhead signs, and also to guide people to a new trailhead access point that would be moved slightly to the east as shown in the drawing below.

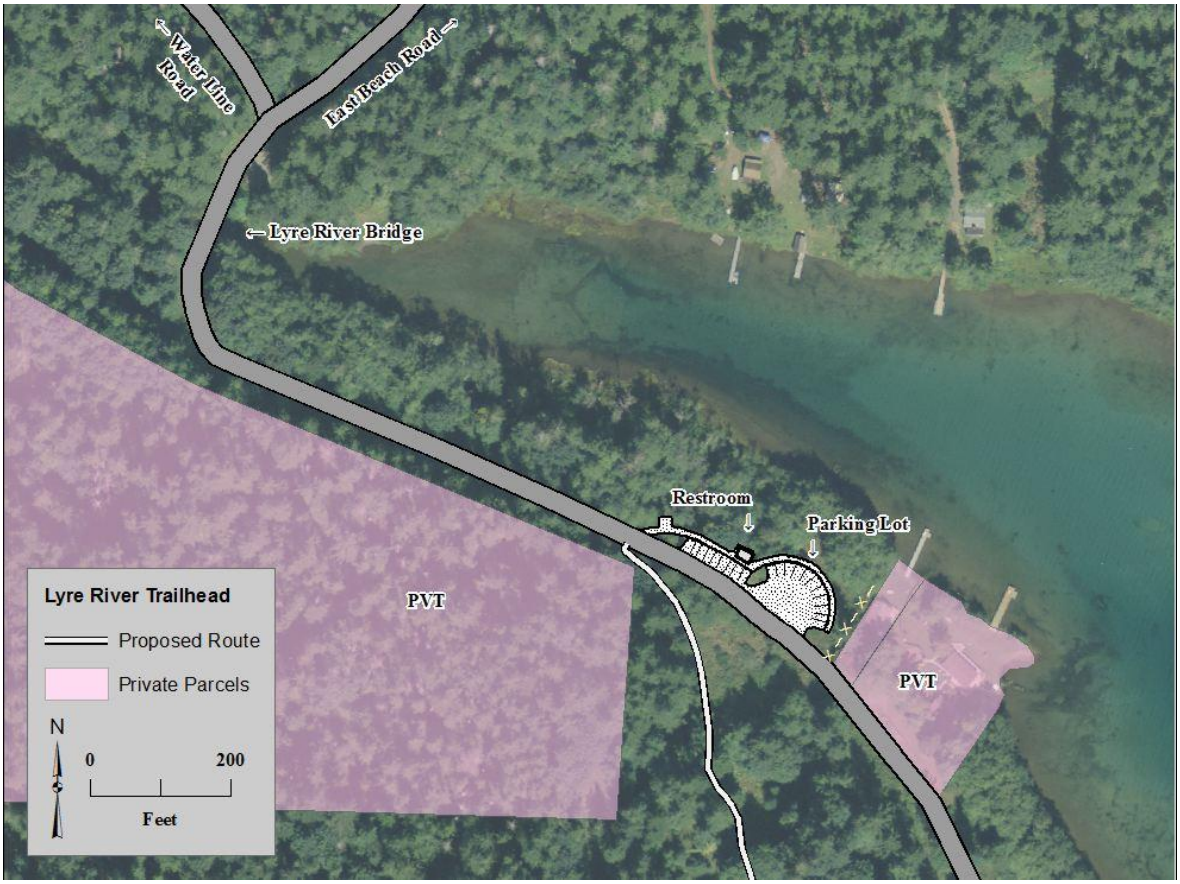

Figure 14. Improved Lyre River trailhead parking lot

The area has been surveyed for wetlands. No wetland areas would be developed. The lands between the expanded parking lot and Lake Crescent would be rehabilitated to natural conditions. The parking lot would be paved with 3" thick asphalt in the existing and expanded parking area. The paved lot would be striped to delineate 19 parking spaces and a large vehicle turnaround area. Two disabled-access parking spaces would be designed and marked in accordance with ABA accessibility standards.

The NPS would pave the road from the Lyre River Bridge to the expanded Spruce Railroad Trail parking lot, and would also pave the 0.2 mile long section of the existing Water Line Road within the park. A bike lane would be striped along the road.

Table 5. Parking lot at Lyre River (Spruce Railroad Trailhead)

Parking lot at Lyre River (Spruce Railroad Trailhead)	
Construction Requirements	**Quantities**
Surface area of parking lot	17,800 square feet
Volume of excavation/cut required	165 cubic yards
Volume of fill required	1750 cubic yards
Volume of base material placed	220 cubic yards
Volume of asphalt placed	165 cubic yards
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	6 days

Table 6. Road from parking lot to the Lyre River Bridge

Road from parking lot to the Lyre River Bridge	
Construction Requirements	**Quantities**
Length/width	950 feet long/ 22 feet wide
Volume of base material placed	258 cubic yards
Volume of asphalt placed	158 cubic yards
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	6 days

Table 7. Water Line Road

Water Line Road	
Construction Requirements	**Quantities**
Length/width	1050 feet long, 11 feet wide
Excavation	194 cubic yards
Volume of base material placed	143 cubic yards
Volume of asphalt placed	97 cubic yards
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	6 days

Railroad Tunnels & Bypass

Both historic railroad tunnels would be opened and developed for trail access. Re-opening of the short tunnel would commence after construction access is provided through Segment A through clearing and bank stabilization. The area near the west tunnel portal would be sufficiently cleared to allow for trucks and equipment to turn around. The tunnel would be scaled and any loose rock would be removed from the entire length of the tunnel and at portal locations.

All removed materials would be loaded onto a dump truck utilizing an excavator. Once access through the tunnel is established, work would continue on Segment B to clear the grade and stabilize the downslope bank. The tunnel floor would be filled with 1-1/4-inch minus road base and sloped with a high spot at its center to provide flow of water from any point to the outside ends of the tunnel and out into the lake. Once access to the East (long tunnel) is secure, work would proceed with clearing and opening the long tunnel. Once open, trail development would continue through the long tunnel to complete development of Segment C.

Table 8. West Railroad Tunnel Segment and bypass: Construction Requirements

West Railroad Tunnel Segment and bypass: Construction Requirements	
Construction Requirements	**Quantities**
Length of trail segment	200 linear feet
Volume of excavation/cut required	2000 cubic yards
Volume of fill required	N/A
Volume of base material placed	68 cubic yards
Volume of asphalt placed	7 cubic yards
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	5 days

Short Tunnel Rehabilitation Details

The stability of the tunnel portals and the large rock block failure that has occurred throughout the middle and northeast ends of the west tunnel in the tunnel crown and quarter arches would be addressed as recommended in the *Final Geotechnical Report Spruce Railroad Tunnel Evaluation* (PanGEO. 2011). A tunnel profile and cross-sections showing the details of these recommendations are included in Appendix B.

- Loose rock would be scaled throughout the entire length of the tunnel and at the portal locations. In particular, the large rock block in the tunnel crown above the northeast portal would be removed so that it does not pose a risk of falling and endangering pedestrians. All rock and timber debris would be removed from within the tunnel and the

large pile of rock accumulation at the east portal that resulted from the attempt to close the tunnel via blasting.

- A minimum of four inches of fiber reinforced microsilica shotcrete (FRMS - steel or synthetic fiber) would be installed to the exposed bedrock in the crown and quarter arches from the middle of the tunnel to the east portal. FRMS creates a self-supporting lining in the tunnel. The fibers in the shotcrete act as reinforcement, instead of using traditional reinforcing bars. Adding FRMS to the interior of the tunnel would enhance the tunnel performance during seismic events and would inhibit further weathering and deterioration of the exposed rock surface, thereby preventing further rock fall.
- A minimum of four inches of FRMS would be applied to the exposed bedrock portals in the vicinity of the tunnel opening for the same reasons listed above. This would include the sidewalls, crown, and quarter arches.
- Rock bolts would also be installed to anchor potentially loose rock blocks within the tunnel and at portals. These rock bolts would be placed into the rock blocks as needed, and not in a pattern. An example plan sheet showing shotcrete lining and rock bolt details is included as Appendix B.
- Seepage along major joint sets that are producing water within the tunnel and at the portals would be controlled by installing strip drains on the rock prior to placing shotcrete. The drain strips would be extended down to the tunnel invert or bike path drainage so that any captured water flows to an acceptable location. Strip drains usually consist of a Geosynthetic drainage board, or dimple board, that can be cut into varying widths.
- At least one drainage ditch would be installed along one of the tunnel walls. The tunnel invert and drainage grade would be established so water within the tunnel naturally drains out of the tunnel and prevents any water from collecting within the tunnel. Drain pipes would not be placed in the ditches.
- When removing the large rock pile at the tunnel portal, care would be taken to grade the bike path away from the tunnel to facilitate drainage.

East Railroad Tunnel & Bypass: The east railroad tunnel would be cleared of debris and developed for trail use. The bypass trail would be retained, routine maintenance would continue. Under alternatives 3, 4, and 5 the bridge at the Devil's Punchbowl would be replaced with a new structure of the same length, width and general design, constructed to support stock and pedestrians. The new bridge would be constructed off-site, staged on the lawn adjacent to the Storm King Ranger Station and flown into the site using a heavy lift helicopter. The flight would occur after September 15 and before April 1 to avoid potential noise disturbance to marbled murrelet during the breeding season.

Long Tunnel Rehabilitation Details

The long tunnel would be rehabilitated and maintained as recommended in the *Final Geotechnical Report Spruce Railroad Tunnel Evaluation* (PanGEO. 2011). A tunnel profile and cross-sections showing the details of these recommendations are included in Appendix B. Although the ground within the long tunnel is self-supporting on a large scale with only localized spalling and raveling, rehabilitation actions are needed to support opening the tunnel for use as a trail. The main areas requiring work are the tunnel portals. At a minimum, the following actions would be taken to allow for safe access.

- Loose rock would be scaled throughout the entire length of the tunnel and at the portal locations.
- All rock and timber debris would be removed from within the tunnel and the large piles of rock accumulation at the north and south portals that resulted from the attempt to close the tunnel via blasting.
- The two remaining timber sets that are standing in the tunnel would be removed to prevent them from becoming a hazard when they fall.
- A minimum of four inches of fiber reinforced microsilica shotcrete (FRMS - steel or synthetic fiber) would be installed to the exposed bedrock. Adding FRMS to the portal locations would enhance the tunnel performance during seismic events and would inhibit further weathering and deterioration of the exposed rock surface, thereby preventing further rock fall.
- Where seeps are encountered at the tunnel portals, water would be controlled by installing strip drains on the rock prior to placing shotcrete. The strip drains may be extended down to the tunnel invert or the bike path drainage so that any captured water flows to an appropriate location. Strip drains usually consist of a geosynthetic drainage board, or dimple board, that may be cut into varying widths.
- At least one drainage ditch would be installed along one of the tunnel walls. The tunnel invert and drainage grade would be established so water within the tunnel naturally drains out of the tunnel and prevents any water from collecting within the tunnel. Drain pipes would not be placed in the ditches.
- When removing the large rock pile at the tunnel portal, care would be taken to grade the bike path away from the tunnel.

Table 9. East Railroad Tunnel Segment and bypass: Construction Requirements

East Railroad Tunnel Segment and bypass: Construction Requirements	
Construction Requirements	**Quantities**
Length of trail segment	500 linear feet
Volume of excavation/cut required	7,500 cubic yards
Volume of fill required	N/A
Volume of base material placed	170 cubic yards
Volume of asphalt placed	19 cubic yards
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	20 days

East Approach to West (short) Tunnel – Missing Trestle Area

A short bridging structure is proposed to be installed on the east approach to the short tunnel where a short trestle formerly existed. A steel or concrete bridge structure with either concrete or heavy wooden decking would be installed at this location to bridge a small cove-like indentation in the shoreline. This location would be made passable for construction equipment and regular trail maintenance vehicle passage. It is likely that the bridge would be brought down the trail from the west side (Camp David Junior side) and placed by cranes located on both sides of the trail gap.

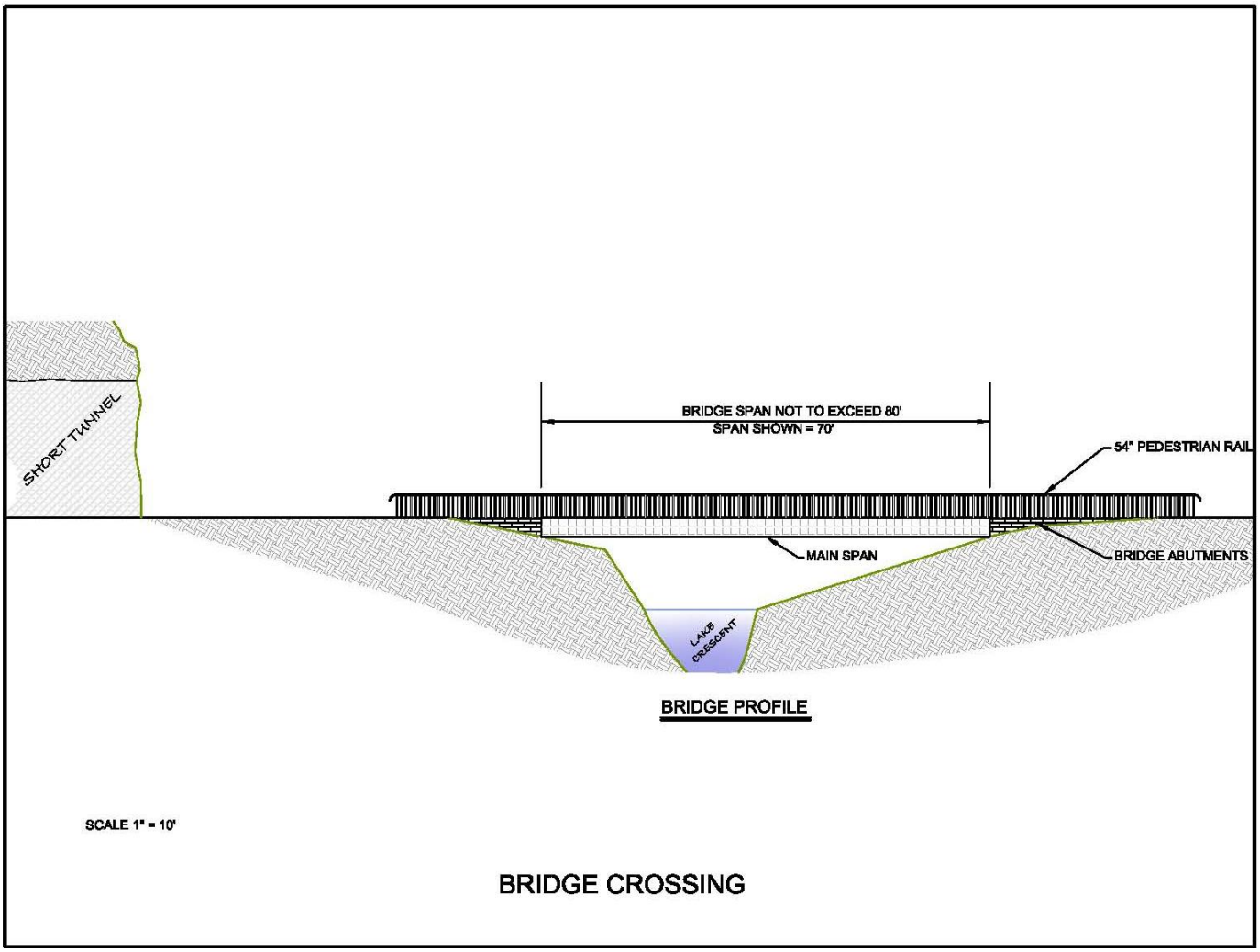

Figure 15. Profile view of bridge crossing

Asphalt Paving Sequence (Alternatives 2, 3, 5)

In areas where a paved trail surface is proposed, following establishment of the approved construction limits and site preparation described above, the contractor would compact the sub-base of the entire route using a mechanical compactor. Once compacted, 1-1/4-inch minus gravel road base would be centered in the construction limits and placed to the width and depth identified in the approved alternative. This would be completed using dump trucks to supply the road base and bulldozers and graders to spread the material. The road base would be compacted to 90 percent of a standard proctor using a mechanical compactor. The compacted base would be tested for compaction utilizing industry standard tools and methods.

Once the road base is placed and compacted, the contractor would pave each approved trail segment with hot mix asphalt using an asphalt mix design submitted in advance of the work by the contractor and approved by the park. Asphalt would be placed between 2 and 3 inches thick to the width identified in the approved alternative. The thickness of asphalt would be increased to

the 3 inch section in areas where the base material is less stable. This would be completed using dump trucks to supply hot mix asphalt which would be placed using an approved laydown machine and then mechanically compacted. Material would be compacted per Washington State Department of Transportation guidelines (WSDOT 5.04), including testing for compaction.

Rehabilitation of Construction-related Disturbed Areas

At the completion of construction, areas intended for use as permanent passing or resting areas for trail users would be developed as such. Temporary construction, truck staging and turning areas would be rehabilitated to natural conditions through removal of any gravel surfacing, tilling of the surface using construction equipment, and seeding with a park-approved seed stock to avoid the introduction or spread of non-native plant species, or placement of weed-free duff salvaged from the project area.

Precluding Unauthorized Vehicles

Administrative vehicle use would occur on sections of the new trail to support trail maintenance and emergency response by park staff. Steel bollards, approximately four to six inches in diameter, would be placed on all trail access points where the width of the trail would otherwise allow automobile access. Bollards would be bolted into concrete foundations and would be designed with a hinged base to fold down to accommodate authorized vehicle access. Bollards would be spaced to allow access for pedestrians, bicyclists, and equestrians. Adequate clearance would be maintained to provide wheelchair access.

Installation of Minor Trail Features to Improve Visitor Experience

Once the entire route is paved, interpretive media, pet sanitation facilities, and trash receptacles would be placed at trailheads and at select points along the trail as indicated on the construction drawings. The work would entail the use of a small utility truck, tracked loader fitted with an auger, and a portable concrete mixer.

Private Lands

NPS would coordinate with adjacent property owners to avoid or minimize impacts related to trail improvements. This includes ensuring continued access during and after construction, minimizing noise during construction, and protecting water supplies that are within the project area. NPS would confirm ownership of land prior to new development and would seek permission from private land owners regarding any proposed access on private lands associated with trail construction. Additionally, a fence or vegetative screen would be installed between the Spruce Railroad Trail parking area and adjacent private property to discourage trespassing and to improve privacy for residents.

Construction Equipment Used

A variety of equipment would be used to construct the trail. The table below provides an estimate of the noise level that would be generated for each type of construction equipment.

Table 10. Construction noise equipment

Equipment Used	Noise Level (dBA) [1] Avg. L_{max} at 50'
Tracked Excavator	81 (170)
Wheeled Front End Loader	79 (96)
Dump Truck	76 (31)
Dozer	82 (55)
Grader	85 --
Paver	77 (9)
Compactor	80 (57)
One Man Lift	84 (46)
Pickup Truck	55 (1)
Shotcrete Applicator (Concrete Pump)	81 (30)
Rock Scaler - Manual	n/a
Rock Screen (Excavator)	81 (170)
Rock Drill	81 (3)

From FHWA Construction Noise Handbook (2009) and WSDOT Environmental Assessment Preparation, Advance Training Manual (2010) as submitted by Clallam County

Mitigation Measures to Avoid or Reduce Impacts to Natural and Cultural Resources

The National Park Service has identified mitigation measures that would be implemented under all Action Alternatives in order to avoid or minimize adverse effects to natural and cultural resources and visitor experience. Detailed descriptions of these actions are included in Appendix A.

Alternative 2 – Accessible (3 ft. asphalt) with 4 ft. unpaved shoulder

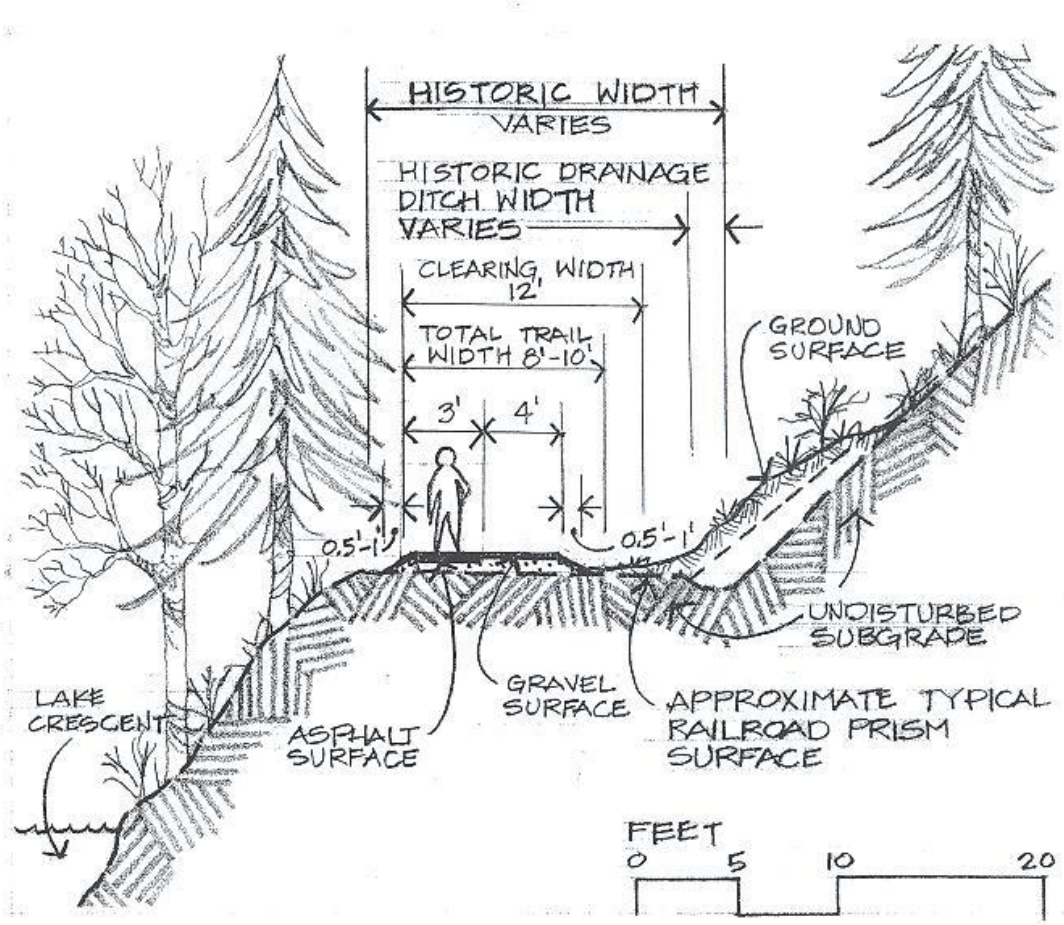

Figure 16. Alternative 2 trail profile

Spruce Railroad Trail

Under Alternative 2, the NPS would make improvements to the Spruce Railroad Trail (SRRT) to meet the minimum guidelines for providing an accessible trail as described in the Draft Final Accessibility Guidelines for Outdoor Developed Areas published on October 19, 2009 (Access Board, 2009). These guidelines are proposed by the Architectural and Transportation Barriers Compliance Board (Access Board) pursuant to the Architectural Barriers Act (ABA) for camping facilities, picnic facilities, viewing areas, outdoor recreation access routes, trails, and beach access routes that are constructed or altered by or on behalf of the Federal government. This

would amend the range of existing park trail standards as described in the 2008 General Management Plan (GMP).

All segments of the SRRT would be accessible. This would require that a new alignment be developed in Segment D to address the steep grades between the historic railroad grade near Lake Crescent and the current SRRT parking lot near the Lyre River. The trail would be paved with asphalt to a width of three feet with passing areas paved to a width of five feet as described in the outdoor accessibility guidelines. A four foot wide, unpaved shoulder would be developed immediately adjacent to the accessible trail surface to accommodate equestrians and other trail users who prefer to travel on an unpaved surface.

Table 11. Alternative 2, trail standards accessible (alt 2)

TRAIL STANDARD	ACCESSIBLE RECREATION TRAIL (Alt 2)
Firm & Stable Tread width	36” minimum 5’ maximum
Gravel or Natural Tread width	48" maximum
Clearing and Brushing	12' lateral 12' vertical
Maintenance frequency	Annual +
Bridge width	8' decking maximum
Accessible Recreation Trails — these trails are open to hikers, stock, and bicycles and are designed to meet federal outdoor accessibility guidelines for recreational trails. These trails are a combination of firm & stable (hardened) surface and gravel or natural tread surface (in areas where stock use is permitted), and are designed for relatively inexperienced users. Accessible recreation trails are maintained to a standard for higher use volumes.	

The specific accessibility design guidelines that would apply to Alternative 2 are included below.

1017 Trails (Access Board, 2009)

1017.1 General. Trails shall comply with 1017.

EXCEPTIONS: 1. where an entity determines that a condition in 1019 does not permit full compliance with a specific requirement in 1017 on a portion of a trail, that portion of the trail shall comply with the specific requirement to the maximum extent feasible. The entity shall document the basis for the determination, and shall maintain the

documentation with the records for the construction or alteration project.
2. Where an entity determines that it is impracticable for an entire trail to comply with 1017, the trail shall not be required to comply with 1017. The entity shall document the basis for the determination, and shall maintain the documentation with the records for the construction or alteration project.

Advisory 1017.1 General Exception 1. Exception 1 can be applied to specific requirements in 1017 on a portion of a trail where full compliance with the requirement cannot be achieved due to any of the conditions in 1019.

Advisory 1017.1 General Exception 2. An entity should first apply Exception 1 to determine the portions of a trail where full compliance with the specific requirements in 1017 cannot be achieved. An entity should then evaluate the entire trail, taking into account the portions of the trail that can and cannot fully comply with the requirements in 1017 and the extent of compliance where full compliance cannot be achieved to determine whether it would be impracticable for the entire trail to comply with 1017. The determination is made on a case-by-case basis.

1017.2 Surface. The surface of trails and their related passing spaces and resting intervals shall be firm and stable.

Advisory 1017.2 Surface. A stable surface remains unchanged by applied force so that when the force is removed, the surface returns to its original condition. A firm surface resists deformation by indentations.

1017.3 Clear Tread Width. The clear tread width of trails shall be 36 inches (915 mm) minimum.

EXCEPTION: The clear tread width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum.

1017.4 Passing Spaces. Trails with a clear tread width less than 60 inches (1525 mm) shall provide passing spaces complying with 1017.4 at intervals of 1000 feet (300 m) maximum. Where the full length of the trail does not comply with 1017, the last passing space shall be located at the end of the trail segment complying with 1017. Passing spaces and resting intervals shall be permitted to overlap.

Advisory 1017.4 Passing Spaces. Entities should consider providing either a 60 inches (1525 mm) minimum clear tread width, or passing spaces at shorter intervals if the clear tread width is less than 60 inches (1525 mm), where a trail is:

- Heavily used;
- A boardwalk; or
- Not at the same level as the ground surface adjoining the trail.

Where the full length of the trail does not comply with 1017, placing the last passing space at the end of the trail segment complying with 1017 enables a person using a wheelchair to turn around and exit the trail.

1017.4.1 Size. The passing space shall be either:

1. A space 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum; or
2. The intersection of two trails providing a T-shaped space complying with 304.3.2 where the base and the arms of the T-shaped space extend 48 inches (1220 mm) minimum beyond the intersection. Vertical alignment at the intersection of the trails that form the T-shaped space shall be nominally planar.

1017.5 Obstacles. Tread obstacles on trails and their related passing spaces and resting intervals shall comply with 1017.5.

1017.5.1 Concrete, Asphalt, or Boards. Where the surface is concrete, asphalt, or boards, tread obstacles shall not exceed ½ inch (13 mm) in height measured vertically to the highest point.

1017.5.2 Other Surfaces. Where the surface is other than specified in 1017.4.1, tread obstacles shall not exceed 2 inches (50 mm) in height measured vertically to the highest point.

Advisory 1017.5 Tread Obstacles. The vertical alignment of joints in concrete, asphalt, or board surfaces can be tread obstacles. Natural features, such as tree roots and rocks, within the trail tread can also be tread obstacles. Where possible, tread obstacles should be separated by a distance of 48 inches (1220 mm) minimum so persons who use wheelchairs can maneuver around the obstacles.

1017.6 Openings. Openings in the surface of trails and their related passing spaces and resting intervals shall comply with 302.3.

EXCEPTION: Openings shall be permitted to be to be a size that does not permit passage of a ¾ inch (19 mm) sphere where openings that do not permit the passage of a ½ inch (6.4 mm) sphere cannot be provided due to the conditions in 1019.

1017.7 Slopes. The slopes of trails shall comply with 1017.7.

1017.7.1 Running Slope. No more than 30 percent of the total length of a trail shall have a running slope steeper than 1:12. The running slope of any segment of a trail shall not be steeper than 1:8. Where the running slope of a segment of a trail is steeper than 1:20, the maximum length of the segment shall be in accordance with Table 1017.7.1, and a resting interval complying with 1017.8 shall be provided at each end of the segment.

Table 1017.7.1 Running Slope and Resting Intervals

Running Slope of Trail Segment		Maximum Length of Segment
Steeper than	**But not Steeper than**	
1:20	1:12	200 feet (61 m)
1:12	1:10	30 feet (9 m)
1:10	1:8	10 feet (3050 mm)

Advisory 1017.7.1 Running Slope. Running slope can also be expressed as a percentage (grade).

1017.7.2 Cross Slope. The cross slope shall comply with 1017.6.2.

1017.7.2.1 Concrete, Asphalt, or Boards. Where the surface is concrete, asphalt, or boards, the cross slope shall not be steeper than 1:48.

1017.7.2.2 Other Surfaces. Where the surface is other than specified in 1017.7.2.1, the cross slope on other surfaces shall not be steeper than 1:20.

1017.8 Resting Intervals. Resting intervals shall comply with 1017.8.

1017.8.1 Length. The resting interval length shall be 60 inches (1525 mm) long minimum.

1017.8.2 Width. Where resting intervals are provided within the trail tread, resting intervals shall be at least as wide as the widest segment of the trail tread leading to the resting interval. Where resting intervals are provided adjacent to the trail tread, the resting interval clear width shall be 36 inches (915 mm) minimum.

1017.8.3 Slope. Resting intervals shall have a slope complying with 1017.8.3.

1017.8.3.1 Concrete, Asphalt, or Boards. Where the surface is concrete, asphalt, or boards, the slope shall not be steeper than 1:48 in any direction.

1017.8.3.2 Other Surfaces. Where the surface is other than specified in 1017.8.3.1, the slope on other surfaces shall not be steeper than 1:20 in any direction.

1017.8.4 Turning Space. Where resting intervals are provided adjacent to the trail tread, a turning space complying with 304.3.2 shall be provided. Vertical alignment between the trail tread, turning space, and resting interval shall be nominally planar.

1017.9 Protruding Objects. Constructed elements on trails and their related resting intervals and passing spaces shall comply with 307.

Advisory 1017.9 Protruding Objects. Protruding objects on trails and their related resting intervals and passing spaces can be hazardous for persons who are blind or have low vision. Signs and other post mounted objects are examples of constructed elements that can be protruding objects.

1017.10 Gates and Barriers. Where gates or barriers are constructed to control access to trails, gates and barriers shall comply with 1017.10.

1017.10.1 Clear Width. Gate openings and openings in barriers for hiker passage shall provide a clear width complying with 404.2.3.

1017.10.2 Gate Hardware. Gate hardware shall comply with 404.2.7.

1017.11 Trail Signs. Trail signs shall include the following information:

1. Length of the trail or trail segment;
2. Surface type;
3. Typical and minimum tread width;
4. Typical and maximum running slope; and
5. Typical and maximum cross slope.

Construction Details

The trail corridor would be cleared to a maximum width of 12 feet. Road base would be placed to a width of 8 feet, with future passing areas receiving a road base 10 feet wide to allow for wider pavement while retaining the width of gravel shoulder in these locations. A 36 inch wide, asphalt paved trail with 5 foot wide asphalt paved passing spaces placed at regular intervals of approximately 1,000 feet at locations designed to minimize resource impact, as described above. An approximately 4-foot wide gravel shoulder would be retained upslope and immediately adjacent to the paved trail to provide access for stock users. An 8”- 12” gravel shoulder would be retained on the downslope side of the paved trail to protect the edge of the asphalt.

Lake Crescent Trail Segment D Construction Details

A new alignment would be developed to create a trail grade that meets outdoor accessibility guidelines previously described. The alignment would utilize the existing trail corridor where

practicable, and would develop new trail in areas where the current alignment is too steep to provide accessible grades. The trail alignment would be cleared to a width of no more than 12 feet. Road base would be placed to a width of up to 8 to 10 feet. Trail surface would match what is described above. The trail alignment would be slightly modified to avoid new construction on the corner of private property. A gravel shoulder up to 4 feet wide would be retained upslope and immediately adjacent to the paved trail to provide access for stock users. This shoulder may be narrowed in some areas to avoid impacts to large trees or avoid other resource impacts. An 8"-12" gravel shoulder would be retained on the downslope side of the paved trail to protect the edge of the asphalt. Where necessary, a retaining structure would be placed to support the uphill bank.

Table 12. Alterative 2, Segment A

Alt 2 Segment A	
Construction Requirements	**Quantities**
Length of trail segment	5,650 linear feet
Volume of excavation/cut required	1,645 cubic yards
Volume of fill required	250 cubic yards
Volume of base material placed	1438 cubic yards
Volume of asphalt placed	107 cubic yards
Maximum number of trees removed (11" – 23" dbh)	21
Maximum number of trees removed (≥ 24" dbh)	1 (26" dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	30 days

Table 13. Alternative 2, Segment B

Alternative 2, Segment B	
Construction Requirements	**Quantities**
Length of trail segment	8400 linear feet
Volume of excavation/cut required	5633 cubic yards
Volume of fill required	1354 cubic yards
Volume of base material placed	2138 cubic yards
Volume of asphalt placed	159 cubic yards
Maximum number of trees removed (11" – 23" dbh)	60
Maximum number of trees removed (≥ 24" dbh)	0
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	42 days

Table 14. Alternative 2, Segment C

Alternative 2, Segment C	
Construction Requirements	**Quantities**
Length of trail segment	2475 linear feet
Volume of excavation/cut required	21.5 cubic yards
Volume of fill required	8.6 cubic yards
Volume of base material placed	630 cubic yards
Volume of asphalt placed	47 cubic yards
Maximum number of trees removed (11” – 23” dbh)	-5
Maximum number of trees removed (≥ 24” dbh)	0
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	8 days

Table 15. Alternative 2, Segment D

Alternative 2, Segment D	
Construction Requirements	**Quantities**
Length of trail segment	3,832 linear feet
Volume of excavation/cut required	1,041 cubic yards
Volume of fill required	308 cubic yards
Volume of base material placed	975 cubic yards
Volume of asphalt placed	72 cubic yards
Maximum number of trees removed (11” – 23” dbh)	26
Maximum number of trees removed (≥ 24” dbh)	10
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	85 days

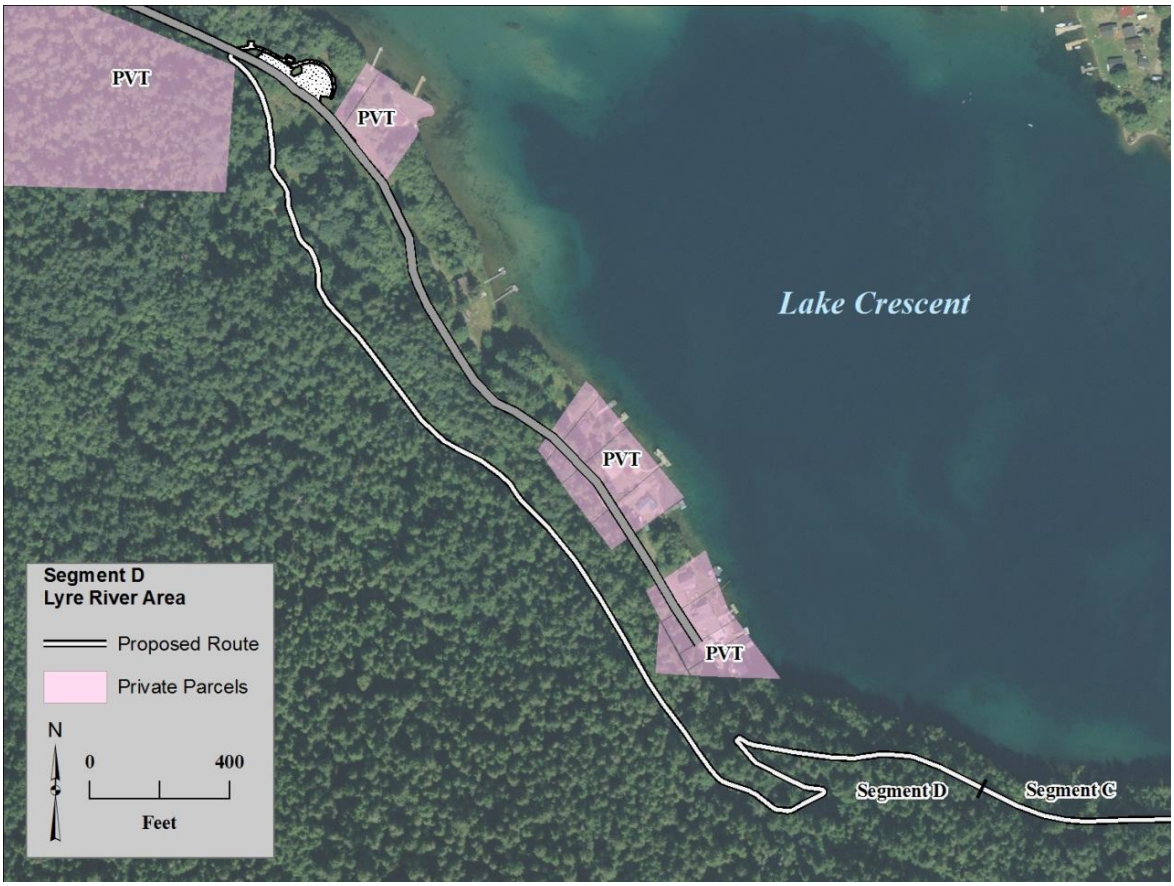

Figure 17, Segment D Trail Alignment for Alts 2, 4, 5.

Railroad Tunnels & Bypass Trails

Under Alternative 2, both historic railroad tunnels would be opened as described under "Activities Common to All Action Alternatives." The accessible trail standard described above would extend through both tunnels, providing a continuous trail experience from the Lyre River Trailhead to the intersection with Phase 1 above Camp David Junior Road.

Both tunnel bypass trails would be maintained in substantially the same condition. The tunnel bypass trails would be signed and managed for pedestrian use only to provide an opportunity for people to have a trail experience at Lake Crescent without bicycles or stock use. The bridge located on the east (long) railroad tunnel bypass trail at the Devil's Punchbowl would be maintained to accommodate use by pedestrians, consistent with park trail guidelines.

Alternative 3 – Accessible from Camp David Jr. Road to beginning of Segment D (not accessible from Lyre River), 6 ft. asphalt and 4 ft. gravel

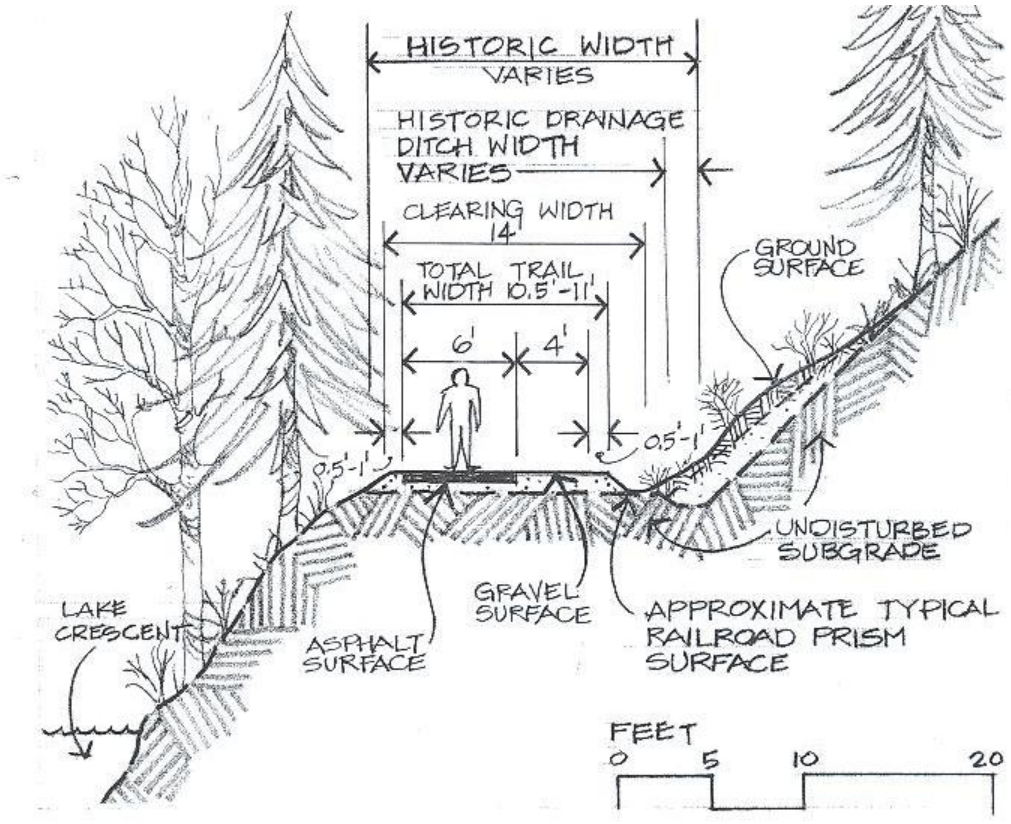

Figure 18. Alternative 3 Trail Profile

Spruce Railroad Trail

Under Alternative 3, the NPS would make improvements to the Spruce Railroad Trail (SRRT) near Lake Crescent as described in the 2011 SRRT EA. The trail alignment would remain in its current location with minor lateral adjustments, up to three feet from the current trail alignment on the railroad grade, to better accommodate site conditions. Both railroad tunnels would be re-opened to allow the existing trail to be widened and developed to meet accessibility standards along the general route of the historic Spruce Railroad grade. Implementation of the proposed trail improvements would occur over time, in phases.

Segments A, B and C: The existing Spruce Railroad Trail would be developed and maintained in accordance with the new ONP trail standard as described in the table below. This would amend the range of existing park trail standards to provide an accessible trail with six feet of asphalt paved surface and an adjacent 4 feet of gravel surface for equestrian use.

Table 16. Alternative 3, trail standards accessible (asphalt)

ONP TRAIL STANDARD	SRRT – ACCESSIBLE (asphalt)
Firm & Stable Tread width	6’ maximum
Gravel or Natural Tread width	4’ maximum
Clearing and Brushing	14' lateral 12' vertical
Maintenance frequency	Annual +
Bridge width	8' decking maximum
SRRT Accessible (asphalt) — these trails are open to hikers, stock, and bicycles and are designed to meet federal outdoor accessibility guidelines for shared use paths to provide access for people with disabilities. These trails are a combination of accessible firm & stable (hardened) surface and gravel or natural tread surface, and are designed for large numbers of relatively inexperienced users. SRRT accessible trails are maintained to a standard for higher use volumes.	

This new ONP trail standard would adopt guidance described in the proposed rulemaking for developing guidelines for federal shared use paths. The guidance described meets and exceeds the minimum outdoor accessibility guidelines described for Alternative 2. These paths are designed for both transportation and recreation purposes and are used by pedestrians, bicyclists, skaters, equestrians, and other users. An advance notice of the proposed rulemaking was published in the Federal Register on March 28, 2011 (Access Board, 2011). These guidelines are proposed by the Architectural and Transportation Barriers Compliance Board (Access Board) to include technical provisions for making newly constructed and altered shared use paths covered by the Americans with Disabilities Act of 1990 (ADA) and the Architectural Barriers Act of 1968 (ABA) accessible to persons with disabilities. Excerpts from the proposed rulemaking are included below.

Draft Technical Provisions for Shared Use Paths (Access Board, 2011)

> The draft technical provisions establish criteria for the following components of a shared use path: surface; changes in level (vertical alignment and surface

discontinuities); horizontal openings; width; grade and cross slope; protruding objects; gates and barriers; and intersections and curb ramps.

1. Surface

Surface. The surface of the shared use path shall be firm, stable, and slip resistant.

A firm, stable, and slip resistant surface is necessary for persons with disabilities using wheeled mobility devices. Bicyclists with narrow-tired bicycles and in-line skaters also need a hard, durable surface. Shared use paths typically are comprised of asphalt or concrete and these surfaces are generally accessible for people with disabilities. These surfaces perform well in inclement weather and require minimal maintenance. Unpaved surfaces that are firm, stable, and slip resistant may be used; however, they may erode over time requiring regular maintenance.

2. Changes in Level

Vertical Alignment. Vertical alignment shall be planar within curb ramp runs, blended transitions, landings, and gutter areas within the shared use path. Grade breaks shall be flush.

Surface Discontinuities. Surface discontinuities shall not exceed 0.50 inch (13 mm) maximum. Vertical discontinuities between 0.25 inch (6.4 mm) and 0.5 inch (13 mm) maximum shall be beveled at 1:2 maximum. The bevel shall be applied across the entire level change.

In addition to firm, stable, and slip resistant surfaces, smooth surfaces are also necessary for the safe use of wheeled mobility devices, as well as bicycles and in-line skaters. The draft technical provisions allow vertical changes in level up to 1/4 inch without treatment and other vertical changes in level from 1/4 to 1/2 inch if they are beveled with a slope no greater than 1:2. Surfaces with individual units laid out of plane and those that are heavily textured, rough, or chamfered, will greatly increase rolling resistance and will subject pedestrians who use wheelchairs, scooters, and rolling walkers to the stressful (and often painful) effects of vibration. Surface discontinuities are also dangerous for bicyclists and in-line skaters. It is highly desirable to minimize surface discontinuities. However, when discontinuities are unavoidable, they should be widely separated.

3. Horizontal Openings

Joints and Gratings. Openings shall not permit passage of a sphere more than 0.5 inch (13 mm) in diameter. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

Surface openings or gaps must be minimized in order to ensure a smooth surface on shared-use paths. Utility covers and drainage grates can be hazards and, for the safety of all users, must be treated.

The draft technical provisions for surface gaps in shared use paths are consistent with the draft provisions in the Pedestrian Access Route - Sidewalk Guidelines. In

most cases, the guidelines will require surface gaps or openings on shared use paths to be no wider than 1/2 inch.

4. Width

Width. The clear width of shared use paths shall be 5 feet (1.5 m) minimum.

The Board is considering requiring accessible shared use paths to provide at least 5 feet minimum width to address those rare circumstances where the AASHTO Bicycle Facilities Guide is not applied so that sufficient space is provided for wheelchair turning and to allow wheelchair users and others to pass one another.

5. Grade and Cross Slope

Grade. The maximum grade of a shared use path shall be 5 percent.
Exception: Where the shared use path is contained within a street or highway border, its grade shall not exceed the general grade established for the adjacent street or highway.

Cross Slope. The maximum cross slope shall be 2 percent.

6. Protruding Objects

Protruding Objects. Protruding objects along or overhanging any portion of the shared use path shall not reduce the clear width of the shared use paths.

Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2 m) above the finish surface or ground shall not protrude more than 4 inches (100 mm) horizontally into shared use paths.

Post-Mounted Objects. Where objects are mounted on free-standing posts or pylons and the objects are 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish surface or ground, the objects shall not overhang shared use paths more than 4 inches (100 mm) beyond the post or pylon base measured 6 inches (150 mm) minimum above the finish surface or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm) the lowest edge of sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2 m) minimum above the finish surface or ground.

The draft technical provisions for protruding objects are derived from the Board's ADA and ABA Accessibility Guidelines and Pedestrian Access Route – Sidewalk Guidelines. The provisions addresses objects that may project into shared use paths in a manner hazardous to people with vision impairments. Any protrusion on a shared use path is considered hazardous for all users, including individuals with disabilities. These technical provisions would apply to the full width of the shared use path. Objects mounted on walls or posts with leading edges above the standard sweep of canes (27 inches) and below the standard head room clearance (80 inches) would be limited to a 4 inch protrusion.

7. Gates and Barriers

Clear Width. Where gates or other barriers are provided, openings in gates and barriers shall provide a clear width of 32 inches (815 mm) minimum.

The draft technical provisions for gates and barriers are based on the Board's ADA and ABA Accessibility Guidelines and Trails Guidelines. Gates or barriers often are wider than 32 inches to allow for the safe passage of bicycles and other authorized users of shared use paths. The Board is proposing to require a 32 inch minimum clearance to address the rare circumstance where gate or barrier openings are deliberately narrow and could restrict access by wheelchair users unless a minimum width applies. A 32 inch wide clear opening provides the minimum clearance necessary to allow passage of an occupied wheelchair or other mobility device. The operation and location provisions for gate hardware are necessary to ensure that individuals with disabilities can operate the hardware.

Lake Crescent Segments A, B, & C Construction Details

The trail corridor would be cleared to a width of 14 feet, with minimal additional cleared areas to accommodate construction access and turnaround areas. Road base would be placed to a width of 11 feet and depth of 10 inches to rehabilitate the feeling and appearance of the historic railroad profile and ditches. Asphalt would be placed to provide a 6-foot wide, universally accessible paved trail surface, consistent with the draft shared use path guidelines published by the Access Board as described above. A 4-foot wide gravel shoulder would be retained upslope and immediately adjacent to the paved trail to provide access for stock users. An 8”- 12” gravel shoulder would be retained on the downslope side of the paved trail to protect the edge of the asphalt.

Historic railroad ditches would be cleared of debris and stabilized where appropriate to rehabilitate historic features. Historic railroad ditches would not be cleared outside of the construction limits or in areas where this would create slope instability that would compromise the integrity of the trail, including surface drainage patterns.

Table 17. Alternative 3, Segment A

Alternative 3, Segment A	
Construction Requirements	**Quantities**
Length of trail segment	5650 linear feet
Volume of excavation/cut required	5050 cubic yards
Volume of fill required	325 cubic yards
Volume of base material placed	1918 cubic yards
Volume of asphalt placed	209 cubic yards
Maximum number of trees removed (11” – 23” dbh)	26
Maximum number of trees removed (≥ 24” dbh)	2 (24” and 26” dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	35 days

Table 18. Alternative 3, Segment B

Alternative 3, Segment B	
Construction Requirements	**Quantities**
Length of trail segment	8400 linear feet
Volume of excavation/cut required	6550 cubic yards
Volume of fill required	1575 cubic yards
Volume of base material placed	2852 cubic yards
Volume of asphalt placed	311 cubic yards
Maximum number of trees removed (11” – 23” dbh)	69
Maximum number of trees removed (≥ 24” dbh)	2 (24” dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	48 days

Table 19. Alternative 3, Segment C

Table 2.14 Alternative 3, Segment C	
Construction Requirements	**Quantities**
Length of trail segment	2475 linear feet
Volume of excavation/cut required	25 cubic yards
Volume of fill required	10 cubic yards
Volume of base material placed	840 cubic yards
Volume of asphalt placed	92 cubic yards
Maximum number of trees removed (≥ 11" dbh)	6
Maximum number of trees removed (≥ 24" dbh)	0
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	9 days

Segment D: The existing Spruce Railroad Trail would be developed and maintained in accordance with the new SRRT trail standard. This would amend the range of existing park trail standards.

Table 20. Alternative 3, trail standards (SRRT)

ONP TRAIL STANDARD	SRRT
Firm & Stable Tread width	6' maximum
Gravel or Natural Tread width	4' maximum
Clearing and Brushing	14' lateral 10' vertical
Maintenance frequency	Annual +
Bridge width	8' decking maximum

SRRT — these trails are open to hikers, stock, and bicycles. These trails are a combination of firm & stable (hardened) surface and gravel or natural tread surface, and are designed for large numbers of relatively inexperienced users. SRRT trails are maintained to a standard for higher use volumes.

Lake Crescent Trail Segment D Construction Details

Road base would be placed to a width of up to 11 feet. The existing Spruce Railroad Trail would be developed to provide a 6 feet wide paved trail surface. The trail alignment would be slightly modified to avoid new construction on the corner of private property. A gravel shoulder up to 4 feet wide would be retained upslope and immediately adjacent to the paved trail to provide access for stock users. This shoulder may be narrowed in some areas to avoid impacts to large trees or avoid other resource impacts. An 8"- 12" gravel shoulder would be retained on the downslope side of the paved trail to protect the edge of the asphalt. Where necessary, a retaining structure would be placed to support the uphill bank. Segment D would not be developed to achieve a universally accessible trail grade due to the steepness of the slope (18%) to minimize disturbance to park resources that would be required to achieve an accessible grade.

Table 21. Alternative 3, Segment D

Alternative 3, Segment D	
Construction Requirements	**Quantities**
Length of trail segment	3,250 linear feet
Volume of excavation/cut required	250 cubic yards
Volume of fill required	200 cubic yards
Volume of base material placed	389 cubic yards
Volume of asphalt placed	117 cubic yards
Length of retaining structure	200 feet
Maximum number of trees removed (11" – 23" dbh)	11
Maximum number of trees removed (≥ 24" dbh)	7 (24", 26", 30" dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	39 days

Alternative 4 – NPS Preferred Alternative, Accessible 10.5 ft. non-asphalt, firm and stable surface

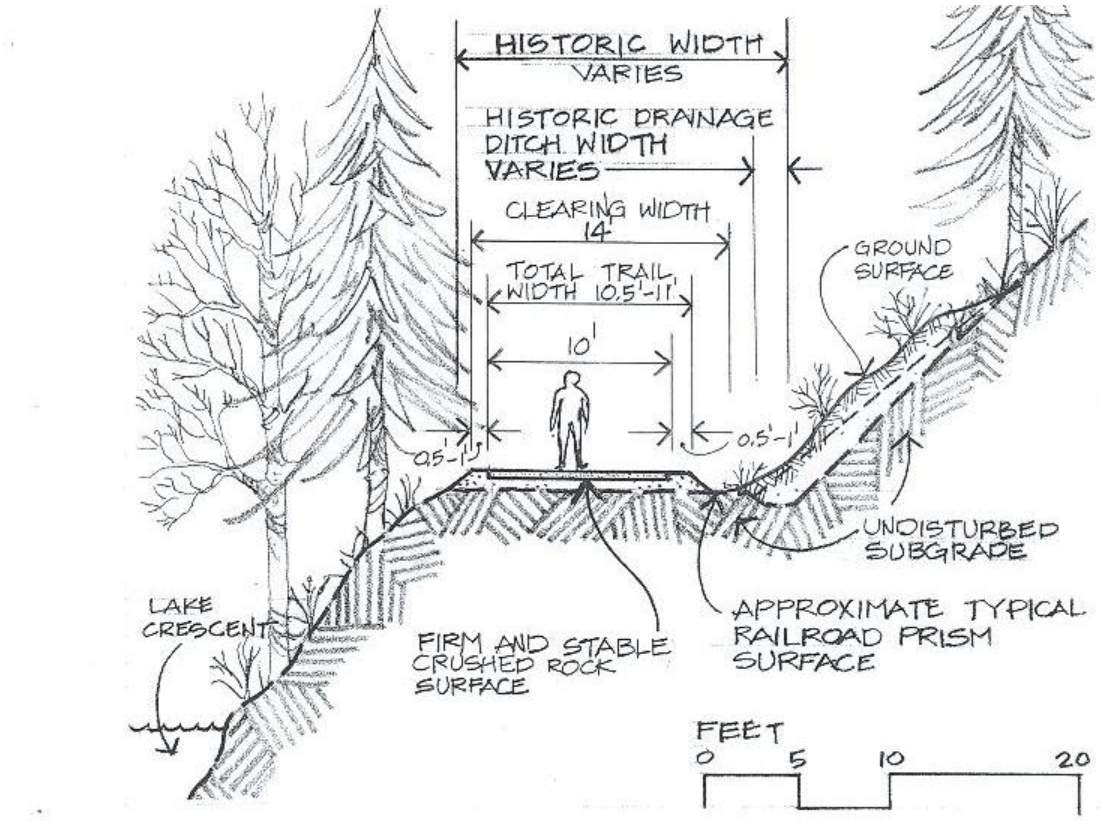

Figure 19. Alternative 4 Trail Profile

Spruce Railroad Trail

Under Alternative 4, the NPS would make improvements to the Spruce Railroad Trail (SRRT) to meet and exceed the guidelines for providing an accessible trail as described in the Draft Final Accessibility Guidelines for Outdoor Developed Areas published on October 19, 2009 (Access Board, 2009) described in Chapter 2. These guidelines are proposed by the Architectural and Transportation Barriers Compliance Board (Access Board) pursuant to the Architectural Barriers Act (ABA) for camping facilities, picnic facilities, viewing areas, outdoor recreation access routes, trails, and beach access routes that are constructed or altered by or on behalf of the Federal government. This would amend the range of existing park trail standards as described in the 2008 General Management Plan (GMP).

Table 22. Alternative 4, trail standards, SRRT (accessible)

ONP TRAIL STANDARD	SRRT – ACCESSIBLE
Firm & Stable Tread width (non-asphalt)	8’ minimum 11’ maximum
Clearing and Brushing	14' lateral 12' vertical
Maintenance frequency	Annual +
Bridge width	8' decking maximum
SRRT Accessible — these trails are open to hikers, stock, and bicycles and are designed to meet federal outdoor accessibility guidelines to provide access for people with disabilities. These trails provide an accessible firm & stable surface (non-asphalt), and are designed for large numbers of relatively inexperienced users. SRRT accessible trails are maintained to a standard for higher use volumes.	

All segments of the SRRT would be accessible. This would require that a new alignment be developed in Segment D as described in Alternative 2 to address the steep grades between the historic railroad grade near Lake Crescent and the current SRRT parking lot near the Lyre River. The trail would be constructed to provide a 10.5 foot wide, firm and stable, non-asphalt surface. The trail would be shared by pedestrians, equestrians, bicyclists, and people traveling in wheelchairs.

The trail corridor would be cleared to a width of 14 feet, with minimal additional cleared areas to accommodate construction access and turnaround areas. Road base would be placed to a width of 11 feet and depth of 10 inches to rehabilitate the feeling and appearance of the historic railroad profile and ditches. Historic railroad ditches would be cleared of debris and stabilized where appropriate to rehabilitate historic features. Historic railroad ditches would not be cleared outside of the construction limits or in areas where this would create slope instability that would compromise the integrity of the trail, including surface drainage patterns.

Table 23. Alternative 4, Segment A

Alternative 4, Segment A	
Construction Requirements	**Quantities**
Length of trail segment	5650 linear feet
Volume of excavation/cut required	5050 cubic yards
Volume of fill required	325 cubic yards
Volume of base material placed	1918 cubic yards
Volume of asphalt placed	N/A
Maximum number of trees removed (11” – 23” dbh)	26
Maximum number of trees removed (≥ 24” dbh)	2 (24” and 26” dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	32 days

Table 24. Alternative 4, Segment B

Alternative 4, Segment B	
Construction Requirements	**Quantities**
Length of trail segment	8400 linear feet
Volume of excavation/cut required	6550 cubic yards
Volume of fill required	1575 cubic yards
Volume of base material placed	2852 cubic yards
Volume of asphalt placed	N/A
Maximum number of trees removed (11” – 23” dbh)	69
Maximum number of trees removed (≥ 24” dbh)	2 (24” dbh)
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	45 days

Table 25. Alternative 4, Segment C

Alternative 4, Segment C	
Construction Requirements	**Quantities**
Length of trail segment	2475 linear feet
Volume of excavation/cut required	25 cubic yards
Volume of fill required	10 cubic yards
Volume of base material placed	840 cubic yards
Volume of asphalt placed	N/A
Maximum number of trees removed (≥ 11” dbh)	6
Maximum number of trees removed (≥ 24” dbh)	0
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	8 days

Table 26. Alternative 4, Segment D

Alternative 4, Segment D	
Construction Requirements	**Quantities**
Length of trail segment	3,832 linear feet
Volume of excavation/cut required	1,210 cubic yards
Volume of fill required	358 cubic yards
Volume of base material placed	1,248 cubic yards
Volume of asphalt placed	N/A
Maximum number of trees removed (11” – 23” dbh)	26
Maximum number of trees removed (≥ 24” dbh)	10
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	75 days

Railroad Tunnels & Bypass Trails

Under Alternative 4, both historic railroad tunnels would be opened as described under “Activities Common to All Action Alternatives.” The accessible trail standard described above would extend through both tunnels, providing a continuous trail experience. Both tunnel bypass trails would be maintained in substantially the same condition. The tunnel bypass trails would be signed and managed for pedestrian and equestrian use only to provide an opportunity for people to have a less developed trail experience at Lake Crescent while allowing a bypass for equestrians who may be uncomfortable bringing their stock through the railroad tunnels. The bridge located on the east (long) railroad tunnel bypass trail at the Devil’s Punchbowl would be repaired or replaced to accommodate use by pedestrians and equestrians, consistent with park trail guidelines.

Alternative 5 – Accessible (8 ft. asphalt) with 3 ft. unpaved shoulder

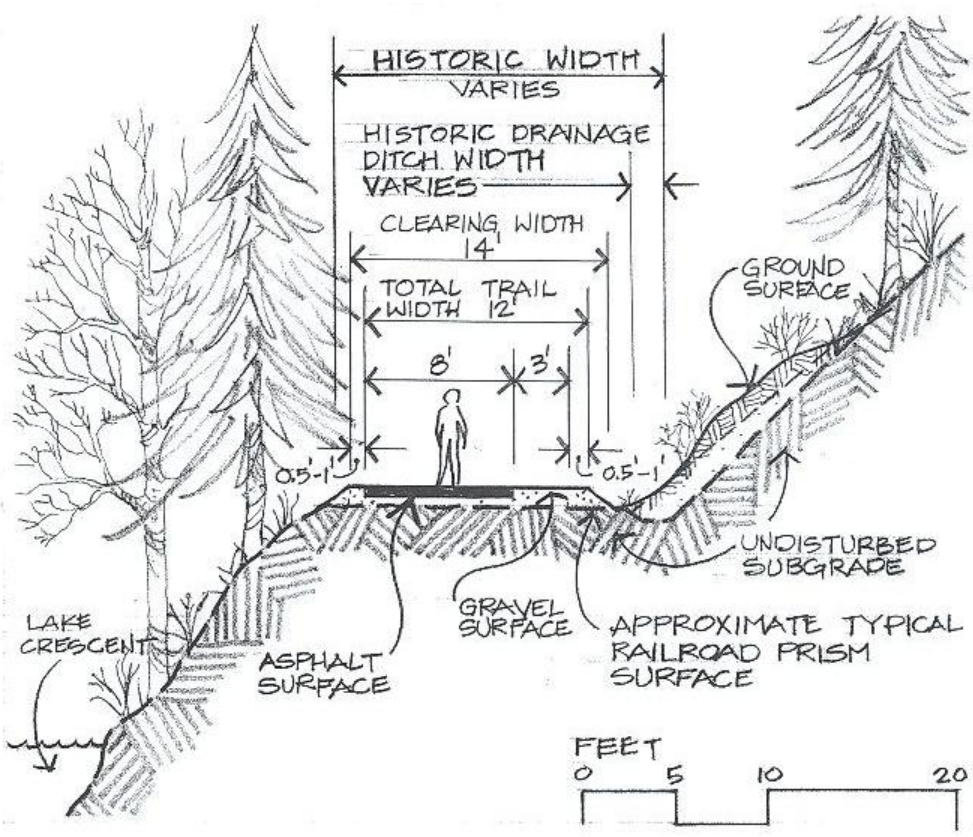

Figure 20. Alternative 5 Trail Profile

Spruce Railroad Trail

Under Alternative 5, the NPS would make improvements to the Spruce Railroad Trail (SRRT) to meet and exceed the guidelines for providing an accessible trail as described in the Draft Final Accessibility Guidelines for Outdoor Developed Areas published on October 19, 2009 (Access Board, 2009). These guidelines are proposed by the Architectural and Transportation Barriers Compliance Board (Access Board) pursuant to the Architectural Barriers Act (ABA) for camping facilities, picnic facilities, viewing areas, outdoor recreation access routes, trails, and beach access routes that are constructed or altered by or on behalf of the Federal government. These guidelines are described in Alternative 2. This would amend the range of existing park trail standards as described in the 2008 General Management Plan (GMP).

All segments of the SRRT would be accessible. This would require that a new alignment be developed in Segment D to address the steep grades between the historic railroad grade near Lake Crescent and the current SRRT parking lot near the Lyre River. The trail would be paved

with asphalt to a width of eight feet. A three foot wide, unpaved shoulder would be developed immediately adjacent to the accessible trail surface to accommodate equestrians and other trail users who prefer to travel on an unpaved surface.

Table 27. Alternative 5, trail standards (accessible)

TRAIL STANDARD	ACCESSIBLE RECREATION TRAIL (Alt 5)
Firm & Stable Tread width	8’ maximum
Gravel or Natural Tread width	36" maximum upslope 12” maximum downslope
Clearing and Brushing	14' lateral 12' vertical
Maintenance frequency	Annual +
Bridge width	8' decking maximum
Accessible Recreation Trails — these trails are open to hikers, stock, and bicycles and are designed to meet and exceed federal outdoor accessibility guidelines for recreational trails. These trails are a combination of firm & stable (hardened) surface and gravel or natural tread surface (in areas where stock use is permitted), and are designed for relatively inexperienced users. Accessible recreation trails are maintained to a standard for higher use volumes.	

Construction Details

The trail corridor would be cleared to a maximum width of 14 feet. Road base would be placed to a width of 12 feet. A maximum 8 foot wide, asphalt paved trail would be placed on the road base to leave an approximately 3-foot wide gravel shoulder upslope and immediately adjacent to the paved trail to provide access for stock users. An 8”-12” gravel shoulder would be retained on the downslope side of the paved trail to protect the edge of the asphalt.

Table 28. Alternative 5, Segment A

Alternative 5, Segment A	
Construction Requirements	**Quantities**
Length of trail segment	5,650 linear feet
Volume of excavation/cut required	5,807 cubic yards
Volume of fill required	374 cubic yards
Volume of base material placed	2,205 cubic yards
Volume of asphalt placed	285 cubic yards
Maximum number of trees removed (11” – 23” dbh)	24
Maximum number of trees removed (≥ 24” dbh)	3
Work type	**Duration (approx.)**
Clearing and grubbing; excavation; placing fill, base and asphalt	35 days

Table 29. Alternative 5, Segment B

Alternative 5, Segment B	
Construction Requirements	**Quantities**
Length of trail segment	8400 linear feet
Volume of excavation/cut required	7,532 cubic yards
Volume of fill required	1,811 cubic yards
Volume of base material placed	3,279 cubic yards
Volume of asphalt placed	423 cubic yards
Maximum number of trees removed (11” – 23” dbh)	69
Maximum number of trees removed (≥ 24” dbh)	2
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	48 days

Table 30. Alternative 5, Segment C

Alternative 5, Segment C	
Construction Requirements	**Quantities**
Length of trail segment	2475 linear feet
Volume of excavation/cut required	25 cubic yards
Volume of fill required	10 cubic yards
Volume of base material placed	3,279 cubic yards
Volume of asphalt placed	125 cubic yards
Maximum number of trees removed (11” – 23” dbh)	6
Maximum number of trees removed (≥ 24” dbh)	0
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	9 days

Table 31. Alternative 5, Segment D

Alternative 5, Segment D	
Construction Requirements	**Quantities**
Length of trail segment	3,832 linear feet
Volume of excavation/cut required	1,424 cubic yards
Volume of fill required	421 cubic yards
Volume of base material placed	1,362 cubic yards
Volume of asphalt placed	193 cubic yards
Maximum number of trees removed (11” – 23” dbh)	32
Maximum number of trees removed (≥ 24” dbh)	10
Work type	**Duration (approx.)**
Clearing and grubbing; excavation and placement of gravel where needed	90 days

Railroad Tunnels & Bypass Trails

Under Alternative 5, both historic railroad tunnels would be opened as described under “Activities Common to All Action Alternatives.” The accessible trail standard described above would extend through both tunnels, providing a continuous trail experience. Both tunnel bypass trails would be maintained in substantially the same condition. The tunnel bypass trails would be open to pedestrians, equestrians, and bicyclists. The bridge located on the east (long) railroad tunnel bypass trail at the Devil’s Punchbowl would be repaired or replaced as described in Alternatives 3 and 4 to accommodate use by equestrians, bicyclists, and pedestrians consistent with park trail guidelines.

Alternatives Considered but Dismissed

The action alternatives described in the 2011 SRRT EA were considered and dismissed in response to public concerns raised regarding accessibility for people with disabilities and the safety of developing trail in the park that would encourage people to utilize planned and unplanned at-grade crossings on Highway 101. The 2012 SRRT EA analyzes revised alternatives that were developed in response to public comments.

As described in the 2011 SRRT EA, the preliminary range of alternatives considered included an option that would be built to the standard AASHTO design guidelines for shared use paths. This would include a 10 feet wide asphalt paved surface with an adjacent 2 feet wide downslope shoulder to retain the edge of the asphalt, and a 4 feet wide upslope shoulder to provide access for people traveling with stock. This alternative would have resulted in a universally accessible route throughout the entire project area to connect with new sections of the Olympic Discovery Trail that are proposed for future construction outside the park.

This alternative was dismissed from the 2011 SRRT EA because the adverse impacts to natural and cultural resources near Lake Crescent that would be required to construct a trail to the standard AASHTO guidelines was determined to be unacceptable. Several people commented on the 2011 SRRT EA requesting that a fully AASHTO compliant alternative be considered. This alternative was considered but dismissed for the 2012 SRRT EA. Development of a fully AASHTO compliant trail would result in unacceptable impacts to park resources. This determination was based on a variety of factors, including the potential to adversely affect the historic Spruce Railroad, the degree of excavation required in areas with steep grades where slopes would be destabilized, and the extent of vegetation removal and associated impacts to wildlife habitat and visitor experience.

Management Actions Considered but Dismissed

The following management actions were identified during internal and public scoping for SRRT EA, but are not included in any of the Action Alternatives being considered for adoption by the park. Actions are dismissed from full consideration when they do not achieve the purpose and need for taking action, when they are infeasible, or when the actions proposed are outside of the scope of the plan. The reasons for not pursuing each action are identified below.

Construct trail along historic railroad grade to the west of the existing Spruce Railroad Trail parking lot and to the immediate south of Highway 101 to avoid impacts to the surrounding areas in the park. Several comments were received during public scoping suggesting that the NPS consider a trail development alternative that was completely on the historic Spruce Railroad grade. Although the alternatives considered in this plan propose most trail development on the historic railroad grade, Segment D is proposed on other park lands because segments of the railroad grade are privately owned or outside the boundary of Olympic

National Park. This environmental assessment only considers actions that may be taken on NPS lands or under NPS jurisdiction. For this reason, no alternative is considered that would be built entirely on the historic Spruce Railroad grade. If in the future the owners of these private lands become willing sellers and the park has the opportunity to purchase these lands, additional opportunities for trail development on the historic railroad grade may exist.

Construct trail to road standards to allow use by emergency vehicles in the event Highway 101 is closed. The park received comments suggesting that the proposed trail be developed to road standards so that it may be used as an alternate vehicular route if Highway 101 was unavailable. This was dismissed as being outside of the scope of this plan. The purpose of this project is to make improvements to the Spruce Railroad Trail to provide for enhanced non-motorized trail use. Trail development would accommodate administrative vehicular use for trail maintenance and emergency response to the trail only.

Construct an underpass beneath Highway 101 to connect the proposed Lake Crescent and Sol Duc Trails while avoiding the at-grade crossing proposed by Clallam County. The park received numerous comments requesting an alternative to the at-grade trail crossing proposed by Clallam County on Highway 101. The at-grade trail crossing is proposed outside the boundary of Olympic National Park, and the NPS does not have jurisdiction related to this decision. The NPS would be willing to coordinate with the Washington State Department of Transportation and other adjacent property owners to evaluate the feasibility of a Highway 101 underpass should the opportunity become available in the future. However, this alternative is not feasible at this time due to the lack of NPS jurisdiction. This safety concern is one of the primary reasons the park has removed the Sol Duc trail sections from the 2012 SRRT EA. Public comments pointed out that even if the park develops a separate trailhead access at the current Sol Duc entrance road parking lot, people would still be likely to cross Highway 101 between Fairholme Hill and the Sol Duc Road in a location where sight lines are poor and could result in serious visitor injury or fatality. If this issue is resolved in the future, the NPS would consider trail development in the Sol Duc area through an updated, site-specific, public planning process.

Relocate the Spruce Railroad Trail parking lot near the Lyre River to minimize impacts to adjacent property owners. The park conducted a survey of an alternate and overflow parking lot location near the eastern trailhead to the Spruce Railroad Trail. Unfortunately, development of a new parking lot would require extensive removal of intact forests and the altering of surface drainage patterns, including in wetlands and areas adjacent to highly sensitive fish spawning areas and rare shoreline vegetation habitat. The NPS determined that this would result in unacceptable impacts to park resources. For this reason, this alternative was considered but dismissed.

Consideration of a revised proposal by Clallam County (as compared to Alternative 4 included in the SRRT EA). The National Park Service has received updated trail proposals from Clallam County, including a revised proposal submitted in January, 2012. The County's updated

proposals were considered as part of the public review and comment on the 2011 SRRT EA. The NPS incorporated several elements of the County's proposal into the alternatives considered in the 2012 SRRT EA. This includes consideration of an eight foot wide asphalt paved trail surface to meet AASHTO minimum width guidelines for bicycle trails in Alternative 5. The NPS also incorporated elements of Clallam County's proposed treatment of low-water crossings and bridges into the 2012 SRRT EA alternatives. The NPS considered, but dismissed the County's proposed trail alignment in Segment D because the County proposal would cross private lands and the NPS was successful in identifying a new alignment that would meet accessibility guidelines while staying entirely on NPS lands. The NPS considered but dismissed Clallam County's proposed construction methods because the NPS construction methods allow for the trail to be completed with fewer impacts to park resources. This includes less excavation and clearing on steep slopes and adjacent to Lake Crescent and the loss of fewer trees and associated wildlife habitat.

Develop SRRT to provide six feet asphalt and six feet of adjacent natural tread trail to provide passing width for horses, runners and mountain bikers the same as proposed for wheelchairs, pedestrians and road bicyclists. This alternative was considered but dismissed because the construction clearing limits would have required additional clearing and excavation beyond what was proposed in the NPS Preferred Alternative. The NPS chose to consider new alternatives that better achieve the goals and objectives of the project while avoiding or minimizing the extent of adverse impacts. This alternative would not avoid or minimize disturbance beyond what was initially considered in the 2011 SRRT EA.

Develop SRRT to provide 8 feet asphalt with only 2 feet gravel for equestrian use, or eliminate equestrian use. This alternative was considered but dismissed because equestrian use is one of the intended recreational uses of the Spruce Railroad Trail. Eliminating equestrian use is outside of the scope of the SRRT EA. Providing only two feet of shoulder adjacent to a paved trail that would attract a wide range of other user groups was determined to be insufficient for a front-country day use area where higher use levels are anticipated. Two feet was considered to be insufficient to allow for adequate passing distances between equestrians and other trail users.

Improve East Beach road to provide a safe bypass for cyclists around Lake Crescent for people arriving on Highway 101 corridor, not just for people arriving via Highway 112 via Water Line Road. East Beach Road is not entirely within the boundaries of Olympic National Park. Any improvements to East Beach Road would be considered through a separate planning process that involves all affected land managers and property owners. This action was determined to be outside of the scope of the SRRT EA.

Develop alternative to rip rap for downslope bank stabilization along Lake Crescent shoreline to mitigate impacts to aquatic habitat, such as those developed in other areas of the park that incorporate large woody debris. The NPS considered the action carefully, but determined that areas where downslope bank stabilization is proposed are associated with naturally steep and rocky drop-offs where large woody debris would not naturally accumulate. For this reason the proposed actions was considered but dismissed as a complete replacement to rip rap. As described in the SRRT EA, downslope bank stabilization in areas with remnants of the historic Spruce Railroad would be rehabilitated to provide structural stability in a manner consistent with cultural resource guidelines while minimizing potential impacts to water quality

and shoreline processes to the greatest extent possible. In areas where remnants of the historic railroad are not present, the NPS would utilize the minimum amount of bank stabilization necessary to provide structural integrity for the trail. In areas where appropriate, use of vegetation for bank stabilization would be incorporated into the project design.

The Environmentally Preferred Alternative

In accordance with DO-12, the NPS is required to identify the "environmentally preferred alternative" in all environmental documents, including EAs. According to Council on Environmental Quality (CEQ) guidelines, the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of NEPA, which considers:

1. Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;

2. Assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;

3. Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

4. 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;

5. Achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and

6. Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, section 101).

Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources. The following paragraphs compare how well each of the alternatives considered meet criteria 1- 5 described above. The alternatives considered in this document do not measurably vary in how well they meet criteria 6.

1) Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations:
   - Alternative 1 reflects implementation of National Park Service legal and policy guidance related to the protection of the environment for future generations. There

would be no new impacts to natural or cultural resources, although there would be some continued deterioration of some elements of the historic Spruce Railroad Grade (wood culverts, wood tunnel support beams, historic timber half-bridges/cribbing, and dry laid rock wall due to a lack of preservation maintenance or rehabilitation).

- Alternatives 2, 3, 4, and 5 all would require construction related impacts to the environment within the project area, but these impacts would be mitigated to ensure that the integrity of the environment is not impaired over the long-term for future generations. Of these alternatives, Alternative 2 would result in the least construction related impacts, to natural resources. Alternatives 3, 4, and 5 would result in greater disturbance to natural resources because the trail corridor would be wider than what is proposed under Alternative 2. Alternative 3 would result in slightly less disturbance in Segment D because a new accessible trail alignment would not be constructed.
- Under Alternative 1 the historic Spruce Railroad would be adversely affected by the deterioration of wood culverts and timber tunnel supports. Alternatives 2, 3, 4, and 5 would rehabilitate the historic railroad grade, wood cribbing, and railroad tunnels. The dry laid retaining wall would be retained. Wood culverts would remain in place, but would continue to deteriorate.

2) Assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings:

- The NPS would manage the trail to provide safe and healthful surroundings under all alternatives.
- Alternative 1 would continue to provide the existing level of esthetically and culturally pleasing surroundings. This alternative would create no new visual disturbance, but the culturally significant features of the historic Spruce Railroad would continue to deteriorate.
- Alternative 2 would maintain esthetically and culturally pleasing surroundings, providing the least visual disturbance of the action alternatives.
- Alternatives 3, 4, and 5 would result in short-term esthetic impacts during construction but would maintain esthetically pleasing surroundings in the long- term. The action alternatives would result in culturally pleasing surroundings related to the rehabilitation of the historic Spruce Railroad.
- Alternative 5 would result in the most extensive short-term esthetic impacts during construction.

3) Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences:

- Alternative 1 would maintain the existing range of beneficial uses of the environment, without any new degradation, risk of health or safety, or other undesirable and unintended consequences.
- Alternatives 2, 3, 4, and 5 would provide increased visitor opportunities, but with additional impacts to the natural environment associated with trail development. (nearly 3.8 miles on the SRRT). There would be some potential for undesirable and unintended consequences related to the widening of the existing SRRT and development of new trail in Segment D under Alternatives 2, 4, and 5 to provide an accessible trail grade and surface. Some current users of the SRRT may be displaced because the trail experience will be modified from a narrow unpaved trail to a wider trail with asphalt sections proposed in Alternatives 2, 3, and 5.

4) 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:

- Alternative 1 reflects the current management of the SRRT by the NPS. Important aspects of our historic, cultural, and natural heritage are protected, but elements of the historic Spruce Railroad are deteriorating and may eventually be lost. This is particularly true of the remaining log cribbing and rock walls along Lake Crescent, and also the areas of the railroad grade in areas where the bank is eroding. Alternative 1 does support diversity and variety of individual choice related to recreation by providing 6 miles of accessible trail constructed in 2009 by Clallam County above Camp David Jr. Road (CDJR). Alternative 1 would result in no new impacts to natural resources or construction related impacts to cultural resources. The existing SRRT is not accessible, but is used year-round by hikers, equestrians, and bicyclists (although the trail surface is not designed to provide a road-like surface).
- Alternatives 2, 4, and 5 would make the entire SRRT accessible (Segments A, B, C, and D). Alternative 3 would provide an additional 2.9 miles of accessible trail (Segments A, B, C).
- Alternatives 2, 3, 4, and 5 would preserve and rehabilitate important historic, cultural, and natural resources.
- Alternative 5 would result in the greatest construction related disturbance to natural resources, although mitigation measures would be implemented to avoid or reduce impact in accordance with Olympic National Park standard mitigation measures. The two historic railroad tunnels would be re-opened under all action alternatives, and accessible trail would be developed along the existing SRRT. This level of development would attract new user groups to the SRRT, but would also displace some current trail users.

5) Achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
   - Alternative 1 would continue to provide the existing balance between population and resource use in a way that permits a high standard of living and a wide sharing of life's amenities. Phase 1 of the ODT would provide six miles of accessible trail in the Lake Crescent area and the existing SRRT would continue to provide recreational opportunities for the current range of visitors. People would be able to access regional trail to the west from Phase 1 of the ODT and to the northeast on the Adventure Trail that is accessed via the Water Line Road.
   - Alternatives 2, 3, 4, and 5 would provide a balance between population and resource use in a way that permits a high standard of living and a wide sharing of life's amenities.

The alternative that causes the least damage to the biological and physical environment is Alternative 1, the No Action Alternative. The alternative that best protects, preserves, and enhances cultural and historic resources is Alternative 2, followed by Alternative 4, 3, and 5. The alternative that best protects, preserves and enhances natural resources is Alternative 1, although Alternatives 2, 3, 4, and 5 would enhance natural resources at the Lyre River by removing an abandoned building and restoring the adjacent shoreline.

All alternatives meet the criteria listed above to varying degrees, but Alternative 1 is the Environmentally Preferred Alternative because the existing conditions are consistent with the national environmental policy as expressed in Section 101 of NEPA as described above, and Alternative 1 would require the least impact to natural and cultural resources, although deterioration of some elements of the historic Spruce Railroad would continue as described above.

Table 32. 2012 SRRT Alternatives Summary

2012 SRRT Alternatives Summary					
Factor	**Alt 1: No Action**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Railroad Tunnels					
open/remain closed	remain closed	open	open	open	open
bypass trails (around tunnels)	Pedestrian, bicycle, equestrian	pedestrian only	Pedestrian, bicycle, equestrian	Pedestrian & equestrian only	Pedestrian, bicycle, equestrian
Downslope Bank Stabilization					
historic wood cribbing and rock walls	deteriorated	rehabilitate with site-specific rehab emphasis for cultural and natural resources	rehabilitate with site-specific rehab emphasis for cultural and natural resources	rehabilitate with site-specific rehab emphasis for cultural and natural resources	rehabilitate with site-specific rehab emphasis for cultural and natural resources
SRRT: Segments A, B, and C (3.2 miles)					
accessible (yes/no)	no	yes	yes	yes	yes
total trail width (top surface w/shoulders)	~36"	8 - 10 feet	10.5 - 11 feet	10.5 - 11 feet	12 feet
Segments A, B, C trail surface	natural tread	3 ft. asphalt, 4 ft. crushed rock upslope, up to 1 ft. downslope to hold asphalt edge	6 ft. asphalt, 4 ft. crushed rock upslope, up to 1 ft. downslope to hold asphalt edge	10 feet firm and stable unpaved surface	8 ft. asphalt, 3 ft. crushed rock upslope, up to 1 ft. downslope to hold asphalt edge
Segments A, B, C widened passing areas along trail	n/a	Yes, 5 ft. wide asphalt passing areas	No	No	No
Segments A, B, C primary trail corridor clearing limits (width)	n/a	12 feet	14 feet	14 feet	14 feet
SRRT: Segment D (0.5 miles - 0.75 miles)					
alignment	current	new alignment	2011 EA alignment	new alignment	new alignment
accessible (yes/no)	NO	YES	NO	YES	YES

Segment D trail width	~36"	8 - 10 feet	9 - 10.5 feet	8 - 10.5 feet	12 feet
Segment D trail surface	natural tread	3 feet asphalt, 4 feet crushed rock upslope, up to 1 foot downslope to hold asphalt edge plus 5 ft. wide asphalt passing areas	6 feet asphalt, 4 feet crushed rock upslope, up to 1 foot downslope to hold asphalt edge	8- 10 feet firm and stable unpaved surface	8 feet asphalt, 3 feet crushed rock upslope, up to 1 foot downslope to hold asphalt edge
Segment D primary trail corridor clearing limits (width)	n/a	up to 12 feet	up to 12 feet	up to 12 feet	up to 14 feet
SRRT: Parking Lot to Lyre River Bridge					
accessible (yes/no)	n/a	yes	yes	yes	yes
Trail corridor	n/a	striped bike lane	striped bike lane	striped bike lane	striped bike lane
surface	gravel road	asphalt paved road	asphalt paved road	asphalt paved road	asphalt paved road
SRRT: Water Line Road (in park, 10 - 11 feet wide)					
surface	gravel road	paved road	paved road	paved road	paved road
Lyre River Trailhead					
vehicle turnaround	no	yes	yes	yes	yes
surface	gravel	asphalt	asphalt	asphalt	asphalt
# parking spaces	8	19	19	19	19
North Shore Picnic Area parking lot					
surface	gravel	asphalt	asphalt	asphalt	asphalt
Accessible	No	Yes	Yes	Yes	Yes
CDJR trail access adjacent to North Shore Picnic Area					
Accessible trail	no	yes	yes	yes	yes
Accessible parking	0	2 spaces	2 spaces	2 spaces	2 spaces
Improve signage (orientation, information, interpretation)					
Provide additional	no	yes	yes	yes	yes
Improve trail-related visitor services (waste disposal, benches, picnic tables)					
Provide additional	no	yes	yes	yes	yes