

## Appendices

## Appendix A: Mitigation Measures Common to All Action Alternatives

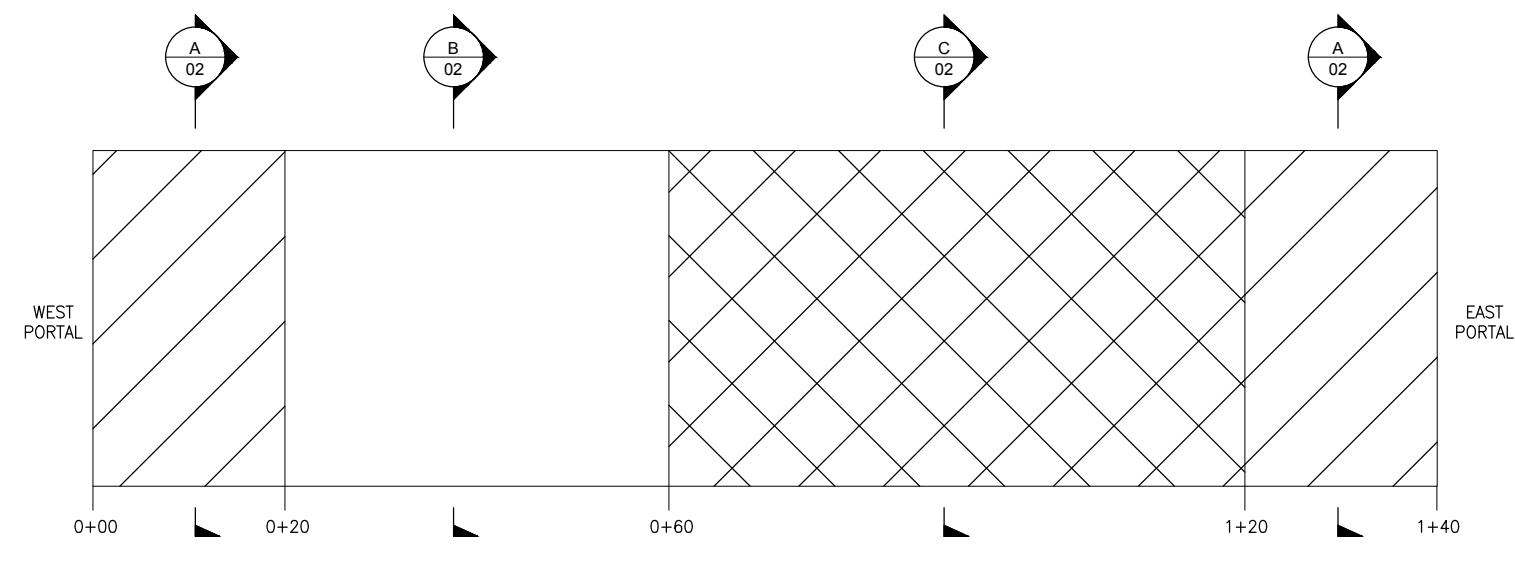
Resource Area	Mitigation
General Considerations	<p>The Spruce Railroad #1 is eligible to the National Register of Historic. Before the beginning of construction, all known contributing features of the historic railroad would be identified and construction methodology will follow the Cultural Resources Treatment Plan.</p> <p>Construction limits would be surveyed and staked and may be marked with construction fencing, tape, flagging, snow fencing, or some similar material, as necessary. The construction limits identify and limit the area of construction activity. The contractor is responsible for ensuring that all work stays inside the construction limits. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone.</p> <p>Area staff would be notified when the project start date is known.</p> <p>Best management practices for drainage and sediment control would be implemented to prevent or reduce nonpoint pollution and minimize soil loss and sedimentation in drainage areas. A stormwater pollution prevention plan would be developed and implemented.</p> <p>Construction vehicle engines would not be allowed to idle for extended periods of time.</p> <p>All construction debris would be hauled from the Park to an appropriate disposal location. All tools, equipment, surplus materials, and rubbish would be removed from the project site upon project completion.</p>
Vegetation	<p>Sediment control measures would be implemented to avoid potential impact to water lobelia from construction activities.</p> <p>A revegetation plan would be developed to restore disturbed areas along the trail, any former trail segments, parking lot parameters, and construction access areas.</p> <p>Native species would be used in all revegetation.</p> <p>To maximize vegetation restoration efforts, the following measures would be implemented:</p> <ul style="list-style-type: none"> <li>• Salvage topsoil and incidental native vegetation (as feasible) from construction areas for reuse during restoration.</li> <li>• Monitor revegetation success and exotic plants for up to 3 years following construction, implementing remedial and control measures as needed.</li> </ul> <p>Temporary barriers would be provided to protect existing trees, plants, and root zones. Trees or other plants would not be removed, injured, or destroyed without prior approval from the park botanist.</p> <p>In an effort to avoid introduction of non-native / noxious plant species, no imported</p>

	<p>hay/straw bales would be used during construction or revegetation. On a case-by case basis, the following materials may be used for erosion control: pole peelings, wood straw, or other certified weed-free mulch products preapproved by Olympic National Park's chief botanist.</p> <p>All construction vehicles will be pressured washed prior to entering the park for the first time; subsequent entries will not require pressure washing unless the vehicle shows signs of mud, plant material, or other substances that could harbor seeds or other parts of exotic plants.</p> <p>All tools and clothing will be free of seeds or other parts of exotic plants before being used at the construction site.</p> <p>All haul trucks bringing fill materials from outside the Park would be covered to prevent seed transport. (This may or may not be necessary depending on the timing of construction.)</p> <p>All fill, rock, and additional topsoil would be obtained from the project area, if possible. If not possible or if weeds are known to exist in the project area, then weed-free fill, rock, or additional topsoil would be obtained from sources outside the park. NPS personnel would certify that the source is weed-free. Areas which are disturbed by project activities will be revegetated using site-adapted native seed and/or plants.</p> <p>The NPS would develop a plan to maintain vegetation in areas surrounding railroad features (bridges, tunnels, and sidings) to prevent vegetation encroachment.</p> <p>To prevent upslope rock failures and downslope bank failures, the NPS would routinely maintain culverts and remove vegetation surrounding railroad features (sidings, bridge and tunnel approaches).</p>
Water Quality and Soils	<p>Use best management erosion-control practices for drainage and sediment control to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in the lake and drainage areas. These practices may include but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. Silt fencing fabric would be inspected daily during project work and weekly after project completion, until removed. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into the lake and any flowing water bodies.</p> <p>If weather conditions during project operations generate and transport sediment to the lake or stream channels, operations would cease until weather conditions improve. The operation of ground-disturbing equipment during large precipitation events would increase the production of sediment that may be transported.</p> <p>In areas where drainages cross the trail, a drainage system will be established that supports the natural drainage pattern and the efficient removal of flowing water from the trail alignment.</p> <p>A storm water pollution prevention plan would be developed and implemented prior to commencing any near-water activities.</p>

	<p>Regular site inspections would be conducted to endure that erosion-control measures are properly installed and functioning effectively.</p> <p>Prior to starting work each day, all machinery would be inspected for leaks (e.g., fuel, oil, and hydraulic fluid) and all necessary repairs would be made before the commencement of work. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery used in project implementation.</p> <p>Delineate wetlands and apply protection measures during projects. Perform project activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.</p> <p>Any machinery maintenance involving potential contaminants (e.g., fuel, oil and hydraulic fluid) would occur outside the riparian area, defined as the entire channel migration zone or a distance greater than 150 feet from the stream edge. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery used in project implementation.</p> <p>Hazardous spill clean-up materials would be on-site at all times. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery used in project implementation.</p>
Wildlife and Fisheries	<p>NPS Wildlife and Fisheries Management staff would provide input during the development of final construction drawings and contract specifications to ensure that potential impacts to native wildlife species (including fish, bats, bald eagles, fisher, migratory birds, amphibians, etc.) are avoided or minimized to the greatest extent possible.</p>
Special Status Species	<p>No clearing of vegetation or major construction activity would occur within suitable habitat for northern spotted owl or marbled murrelet during the breeding season. Work in areas adjacent to suitable habitat would occur outside of the early breeding season to ensure that noise related disturbance is avoided or minimized.</p> <p>Conduct work between two hours after sunrise and two hours before sunset when such work includes the use of equipment which produces noise above 92 decibels (such as chainsaws, heavy equipment, and helicopters) and would occur between April 1 and September 15.</p> <p>No trees that provide nesting habitat for marbled murrelet would be removed.</p> <p>To avoid adverse impacts to breeding murrelets, any noise-producing construction activities above ambient noise levels within 35 yards of murrelet habitat would not begin until after August 6, during murrelet late breeding season (August 6 to September 15), and would be initiated as late as possible. This would ensure that heavy equipment operation would occur outside of the prime breeding season, yet provide a window for construction to be completed before winter weather.</p> <p>During the project work period between August 6 and September 15 within 35 yards</p>

	<p>of marbled murrelet habitat, no work that generates above ambient noise levels would take place at night or within 2 hours of sunrise and sunset, when murrelets are known to be most active.</p> <p>The park would maintain strict garbage control to prevent scavengers (e.g. corvids), which are predators on murrelet nests, from being attracted to the project area. No food scraps would be discarded or fed to wildlife.</p>
Visitor Experience and Recreational Resources	<p>Visitors would be informed in advance of construction activities.</p> <p>The project area would be closed to visitor use during construction activities.</p> <p>A traffic management plan would be developed and implemented to avoid or reduce impacts to local residents and park visitors using park roads during construction. Short-term closures may be required.</p> <p>The ONP Public Information Officer would be provided with the project schedule (as soon as it is known) and periodic update of project work to inform visitors of project status and access.</p>
Cultural Resources	<p>A Cultural Resource Treatment Plan would be developed to address how contributing features of the eligible National Register railroad will be restored or rehabilitated. Construction of the trail will be coordinated with the park Chief of Cultural Resources to insure that all work is done in compliance with this treatment plan.</p> <p>Should any significant archeological resources be uncovered during construction, work would be halted in the area and the park archeologist, Office of Archeology and Historic Preservation (OAHP), and appropriate Native American Tribes would be contacted for further consultation. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.</p> <p>The NPS would ensure that all contacts and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case archeological resources are uncovered during construction.</p> <p>Equipment and material staging areas would avoid known archeological resources.</p> <p>NPS archeologists would be on-site during all initial ground disturbing activities and when deemed necessary to protect specific historic features.</p> <p>Historic culverts constructed of log, timber, stone or concrete would be made serviceable and routinely maintained, as practicable.</p> <p>Historic culverts that are deemed 'not serviceable' would be inventoried and recorded as areas that may present future archeological and trail maintenance issues.</p>


Appendix B: Long and Short Tunnel Profiles




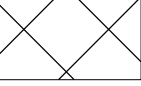
NOTES:

1. ALL DIMENSIONS ARE APPROXIMATE AND SHALL BE DETERMINED IN THE FIELD.

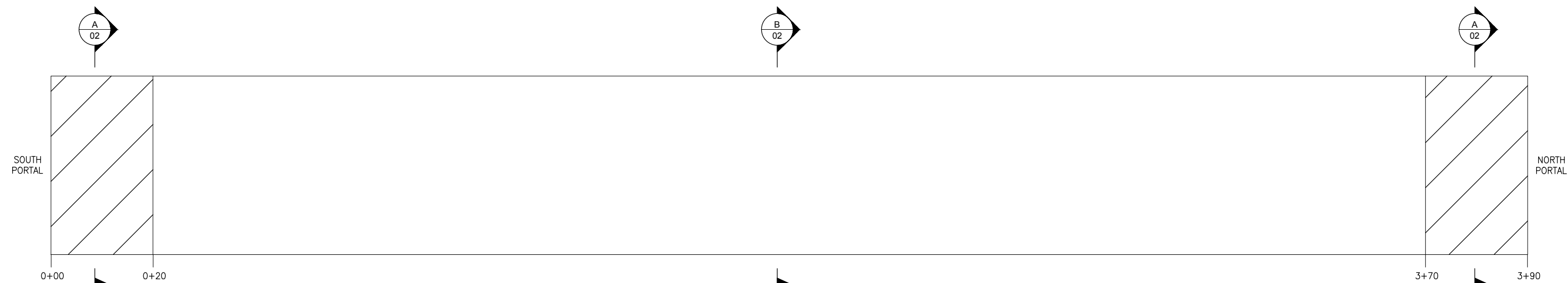
LEGEND:

 FULL FRMS AND ROCK BOLTS SECTION

 UNLINED SECTION

 PARTIAL FRMS AND ROCK BOLTS SECTION

1 SHORT TUNNEL PROFILE  
SCALE: NTS



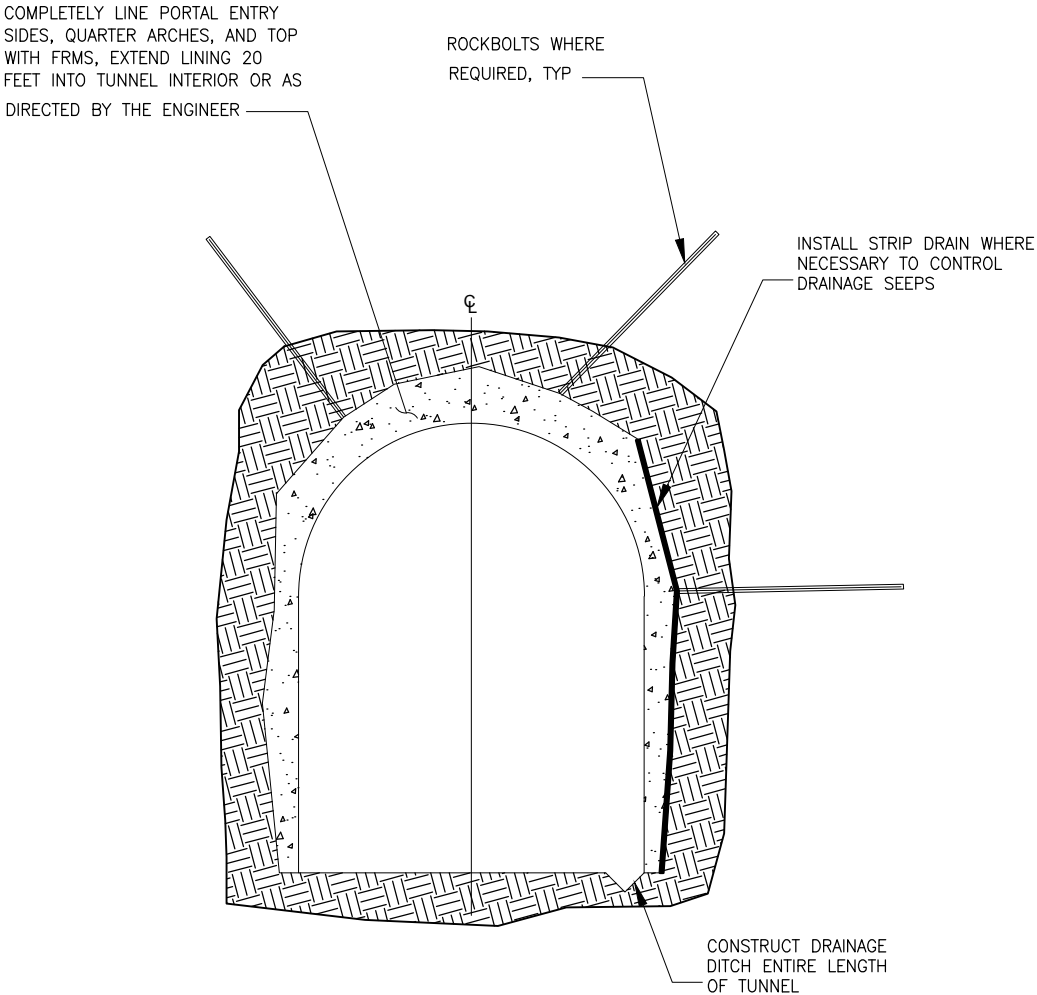
2 LONG TUNNEL PROFILE  
SCALE: NTS

						 	DESIGNED: CR	CHECKED:	<div>CLALLAM COUNTY</div> <div>SPRUCE TUNNEL</div> <div>REHABILITATION PROJECT</div> <div>LONG AND SHORT TUNNEL PROFILES</div>	DATE: APRIL 29, 2011
							DRAWN: PDC	APPROVED: GM		JOB NO: 4352.0
							HORZ SCALE: AS NOTED	VERT SCALE: NA		DRAWING NO: 01
										SHEET NO: 01 OF 03
No.	REVISION	BY	APP'D							

TUNNEL REPAIR CROSS SECTIONS

GENERAL NOTES:

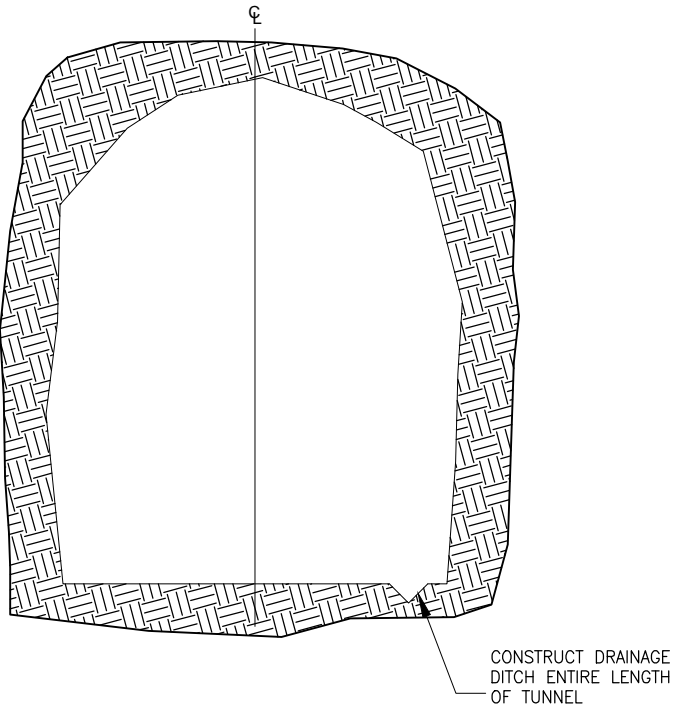
- 1. SCALE ANY LOOSE ROCK THROUGH THE ENTIRE LENGTH OF THE TUNNEL AND AT PORTAL LOCATIONS.
- 2. REMOVE ALL ROCK ACCUMULATIONS AND TIMBER DEBRIS FROM WITHIN TUNNEL.
- 3. INSTALL ROCKBOLTS WHERE DIRECTED.
- 4. APPLY FRMS AT LOCATIONS SHOWN ON PROFILE (SHEET 01).



**A** FULL FRMS AND ROCK BOLTS SECTION  
SCALE: NTS

SHORT TUNNEL: STA 0+00 TO 0+20  
STA 1+20 TO 1+40

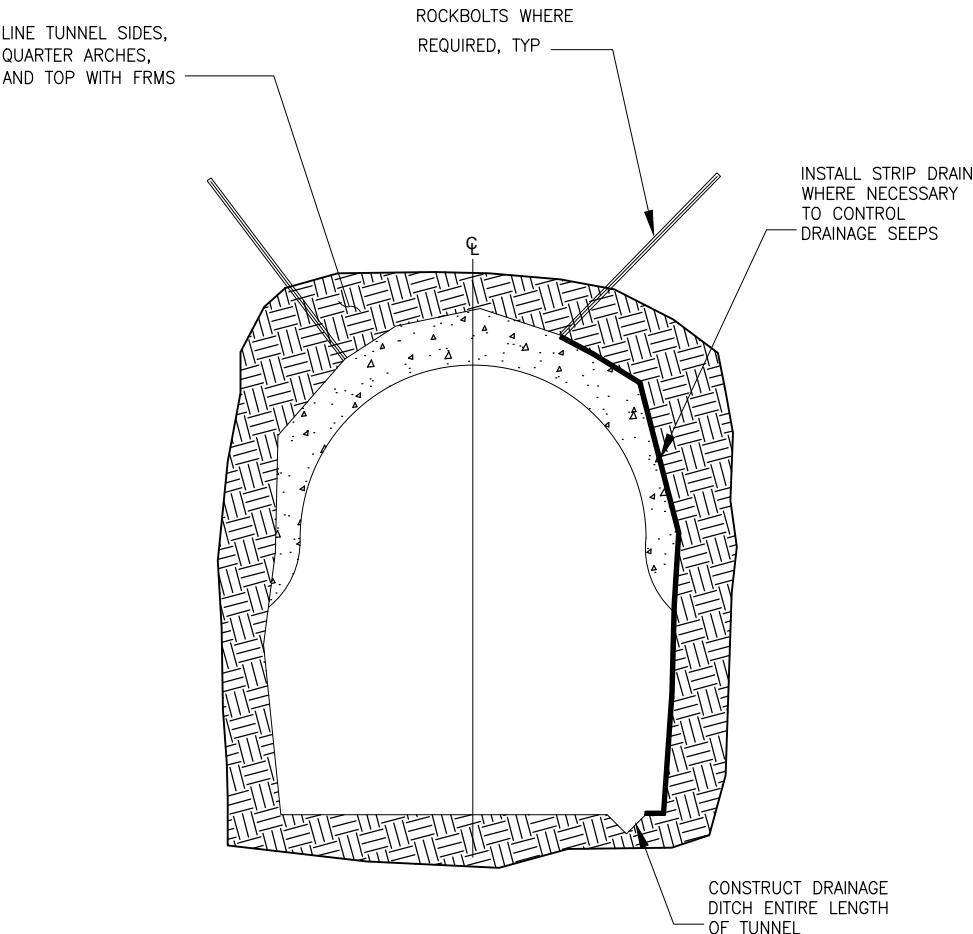
LONG TUNNEL: STA 0+00 TO 0+20  
STA 3+70 TO 3+90



**B** UNLINED SECTION  
SCALE: NTS

SHORT TUNNEL: STA 0+20 TO 0+60

LONG TUNNEL: STA 0+20 TO 3+70



**C** PARTIAL FRMS AND ROCK BOLTS SECTION  
SCALE: NTS

SHORT TUNNEL: STA 0+60 TO 1+20

No.	REVISION	BY	APP'D	



JACOBS ASSOCIATES  
Engineers/Consultants

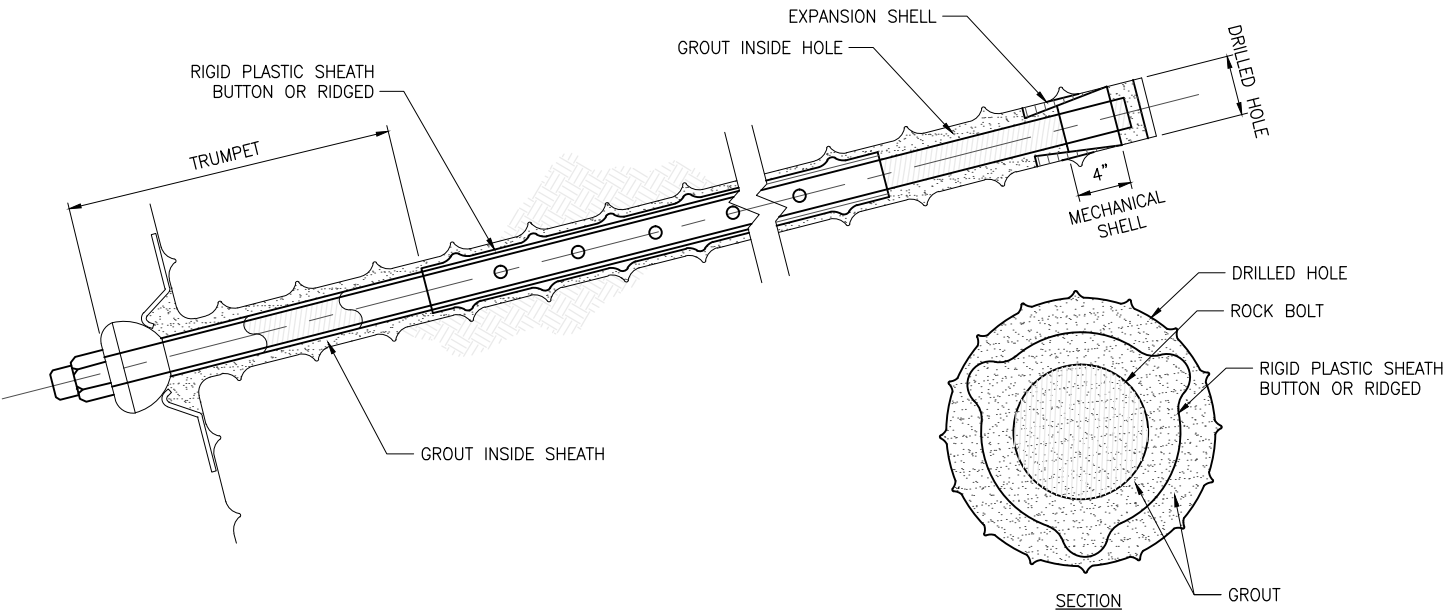


DESIGNED:	CHECKED:
CR	
DRAWN:	APPROVED:
PDC	GM
HORZ SCALE:	VERT SCALE:
AS NOTED	NA

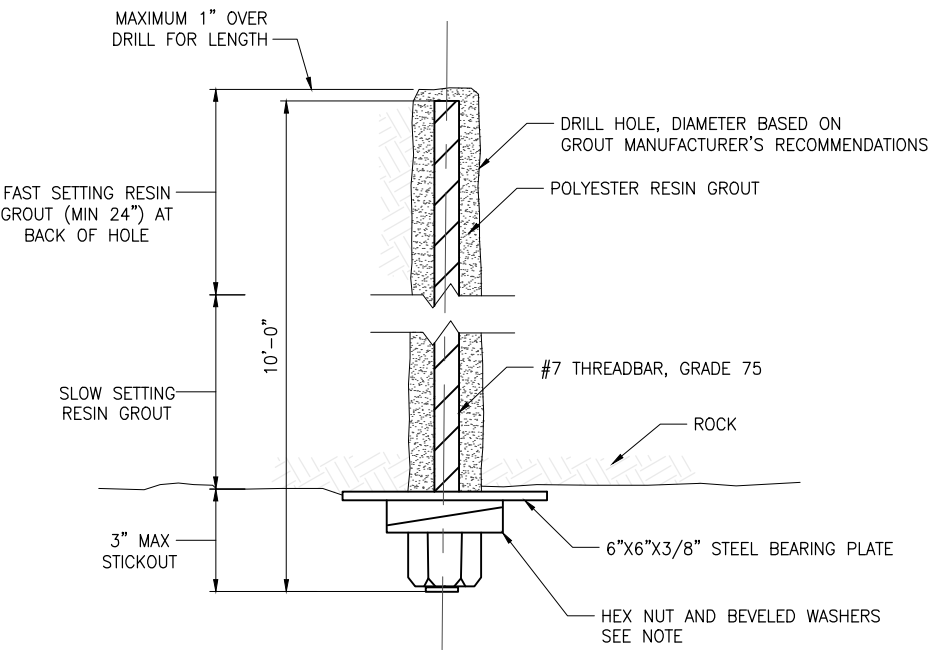
CLALLAM COUNTY  
SPRUCE TUNNEL  
REHABILITATION PROJECT

LONG AND SHORT TUNNEL SECTIONS

DATE:	APRIL 29, 2011
JOB NO:	4352.0
DRAWING NO:	02
SHEET NO:	OF
02	03



1 DETAIL - DOUBLE CORROSION PROTECTION ROCK BOLT (DCP)  
SCALE: NTS



2 DETAIL - RESIN GROUTED ROCK BOLT (RGRB)  
SCALE: NTS

NOTE: CONTRACTOR MAY USE DOME ANCHOR NUTS AS A SUBSTITUTE TO HEX NUT AND BEVELED WASHERS. IF DOME NUTS ARE USED REPLACE 3/8" STEEL PLATE WITH 1/2" STEEL PLATE DISHED TO ACCEPT DOME NUT.

No.	REVISION	BY	APP'D	



JACOBS ASSOCIATES  
Engineers/Consultants

PanGEO  
INCORPORATED

DESIGNED:	CHECKED:
CR	
DRAWN:	APPROVED:
PDC	GM
HORZ SCALE:	VERT SCALE:
AS NOTED	NA

CLALLAM COUNTY  
SPRUCE TUNNEL  
REHABILITATION PROJECT

DETAILS

DATE:	APRIL 29, 2011
JOB NO:	4352.0
DRAWING NO:	03
SHEET NO:	OF
03	03



# SRRT EA Cumulative Impact Summary

Past Actions		Current Actions (Alt 1)	Reasonably Foreseeable Future Actions	Action Alternatives
<b>PHYSICAL ENVIRONMENT</b>				
<b>Geologic Features and Soils</b>	Construction of the Spruce Railroad and tunnels resulted in impacts to the geologic features and soils on the north shore of Lake Crescent, in the Sol Duc area, and outside of the park.	Railroad features are deteriorating, no new geological impacts other than background levels of erosion.	Railroad features are deteriorating, no new geological impacts other than background levels of erosion would continue.	There would be additional disturbance to geologic features and soils associated opening both historic railroad tunnels, widening of the SRRT and expanding of the Lyre River parking lot, and construction of an access trail on CDJR.
	Construction of Highway 101 on the south shore of Lake Crescent, East Beach Road, and Camp David Junior Road resulted in impacts to the geologic features and soils near Lake Crescent, and outside of the park.	Routine maintenance and repairs to adjacent roads results in minor impacts to geologic features and soils.	Routine maintenance and repairs to adjacent roads would continue to result in minor impacts to geologic features and soils.	Routine maintenance and repairs to adjacent roads, in addition to the new trail development proposed on the SRRT would continue to result in minor cumulative impacts to geologic features and soils.
	Construction of the park's existing 600 miles of hiking trails and additional system of roads resulted in impacts to the geologic features and soils throughout the park, including the project area.	Routine maintenance and repairs to the park's existing trail and road system results in impacts to geologic features and soils.	Routine maintenance and repairs to the park's existing trail and road system would result in continuing impacts to geologic features and soils.	In addition to the existing level of maintenance and repairs to the park's trail system, the widening of the SRRT would add slightly to the overall disturbance to geologic features and soils in the context of the broader system.
	Construction of other sections of regional trail networks outside the park have impacted geologic features and soils.	Routine maintenance and repairs to the existing trail systems results in impacts to geologic features and soils.	In addition to routine maintenance and repairs, new sections of regional trail are currently under construction or planned for construction in the near future, particularly areas of the proposed Olympic Discovery Trail. This includes new trail on USFS lands adjacent to the park, among others.	-

## Appendix C: Cumulative Impact Summary

<b>Hydrology and Water Quality</b>	Visitor and Administrative use has resulted in increased sediment, nutrient, and contaminant loads in areas of development adjacent to surface waters. Construction along the shoreline and within riparian areas have also affected hydrology and water quality to varying extents.	Routine use, maintenance and repairs to existing infrastructure results in continuing impacts to water resources associated with altered hydrologic patterns and introduction of contaminants from developed areas, including Highway 101, other roads, and shoreline development. Despite the current use levels, water quality at Lake Crescent has remained exceptionally high.	Routine use, maintenance and repairs to existing infrastructure would continue to alter and affect water resources, both within and outside of the project area. New development on private lands adjacent to Lake Crescent would likely occur as property owners develop or maintain their lots.	In addition to the existing level of use, maintenance and repairs to existing infrastructure, the park would expand development as described by installing new bank armoring in several sections of the SRRT and widening the trail. This would add to the existing level of impact to water resources during construction, and also by adding to the extent of infrastructure with the potential to impact water resources. Impacts would be somewhat lessened due to the paving of access road and parking areas to minimize sediment transport that is occurring in these areas.
<b>Air Quality</b>	Vehicle emissions from visitor, administrative, residential, and industrial uses have affected regional air quality.	Routine use, maintenance, and repairs to road and trail infrastructure both within and outside of the park results in ongoing effects to air quality from vehicle emissions and use of motorized tools and equipment.	Air quality impacts are expected to be consistent with current use levels. No new developments with the potentially to measurably affect air quality are currently planned in the area.	In addition to background levels of air quality impacts, there would be some additional use of motorized vehicles and equipment to construct and maintain new trail as described above. This increase would be noticeable during construction, but negligible in the context of local and regional air quality in the long term.
<b>Vegetation</b>	Extensive logging and vegetation removal has reduced the extent of old growth forests on the Olympic Peninsula. Construction and maintenance of roads and trails within and outside of the park required the removal of mature trees and other vegetation. Existing residential, recreational and industrial uses required removal of native vegetation throughout the region, including within the park.	Vegetation impacts are ongoing as a result of routine maintenance, repairs and use. This includes removal of hazard trees in developed areas and routine brushing to clear existing trail and road corridors and around buildings and utilities. Existing development in the Lake Crescent area threatens water lobelia when sediments from upslope use areas is deposited in shallow water habitats occupied by water lobelia.	Vegetation impacts would continue to occur from routine use and maintenance activities. Additional impacts would occur from new developments outside of the park associated with regional trail development, including construction of new trail on USFS lands adjacent to OLYM.	In addition to ongoing impacts, the proposed improvements to the SRRT would result in construction related disturbance to between 5.6 and 6.5 acres due to widening the SRRT and parking areas. This would result in the removal of up to 165 large trees (11" - 30" dbh). This would result in additional shoreline disturbance with the potential to affect water lobelia, but most development would occur away from known lobelia habitat and paving of parking areas and roads would minimize future sediment transport near the Lyre River.

## Appendix C: Cumulative Impact Summary

	Non-native plants have been introduced to the region, and the project site.	Ongoing use also provides opportunities for the introduction or spread of non-native plants, although best management practices are implemented to avoid or minimize this risk to the greatest extent possible.	Ongoing use also provides opportunities for the introduction or spread of non-native plants, although best management practices are implemented to avoid or minimize this risk to the greatest extent possible.	Ongoing use and development would continue to provide opportunities for the introduction or spread of non-native plants, although best management practices are implemented to avoid or minimize this risk to the greatest extent possible.
<b>Wetlands</b>	Development both within and outside of the park has resulted in the reduction of the extent and quality of wetland habitat in the region and across the country. The existing Lyre River trailhead parking lot is adjacent to a potential wetland area, and portions of the existing SRRT cross seasonal drainages with nearby wet areas.	Ongoing use and maintenance of infrastructure both within and outside the project area is resulting in ongoing effects to wetlands.	A formal wetland delineation is being completed for the project area. The park plans to remove a vacant building near the current SRRT parking lot at the Lyre River. Any areas identified as wetland would be rehabilitated to natural conditions.	A formal wetland delineation is being completed for the project area. Any wetlands within the proposed project area would be avoided. Areas of wetland that are currently affected by development would be rehabilitated to the greatest extent possible. Some areas would be crossed by bridges or boardwalks to prevent impacts to the movement of water.
<b>Wildlife and Wildlife Habitat</b>	Human use and development both within and outside of the park has reduced the quantity and quality of wildlife habitat due to changes in species composition, habitat structure and ecosystem function.	Ongoing use and development continues to impact the quality and quantity of wildlife habitat both within and outside the park. Impacts in the park are primarily associated with front-country developed areas and with the use of aircraft and motorized tools in backcountry locations to maintain remote sections of the existing trail system.	In addition to ongoing levels of impact to wildlife and wildlife habitat, ongoing use and development would continue to occur both within and outside the park. Olympic National Park would continue to provide extensive intact habitat that provides alternate feeding, sheltering and breeding locations for many animals in the park and surrounding areas.	In addition to the ongoing and reasonably foreseeable impacts to wildlife and wildlife habitat, there would be additional loss of habitat due to new trail construction and some disturbance to surrounding habitat during construction and maintenance of the SRRT improvements. The park would continue to provide extensive habitat outside of the project area. Best management practices would be implemented to avoid or minimize disturbance due to construction and maintenance to the greatest extent possible.

## Appendix C: Cumulative Impact Summary

<b>Unique or Important Fish or Fish Habitat</b>	Changes in human use patterns, including consumption of fish and alteration of fish habitat has reduced the distribution and abundance of native fish species. This includes the two endemic fish species present in Lake Crescent, although park management actions to reduce impacts to both species have been taken to protect both fish populations.	Ongoing use and development would continue to affect the quality and quantity of fish populations and fish habitat. Effects would be both positive and negative, since new development in some areas may be off-set by large restoration projects (such as the Elwha dam removal project) in others. NPS has an active monitoring and protection program in place at Lake Crescent to support the preservation of the two endemic fish species.	Current impacts, both positive and negative, would continue.	In addition to ongoing impacts, disturbance to approximately 5.6 to 6.5 acres to widen and improve the SRRT and parking areas and the installation of new bank armoring in Segments A and B of the SRRT would result in additional new construction and maintenance related impacts to the Lake Crescent aquatic habitat, although best management practices would be implemented to avoid or minimize impacts to the greatest extent possible.
<b>Threatened and Endangered Species</b>	Development for human use both within and outside of the park has reduced the extent of suitable habitat for threatened and endangered species, such as the northern spotted owl and marbled murrelet. These changes affected the composition, structure, and function of species populations and habitat. Northern spotted owls are also being affected by increasing populations of barred owls, which displace spotted owls and have reduced available breeding habitat due to competition. A programmatic Biological Opinion was prepared during the preparation of the Olympic National Park General Management Plan.	Ongoing use and development both within and outside the park would continue to affect marbled murrelets and northern spotted owls. Barred owls are continuing to expand their range both within and outside the park. Conservation measures are implemented as part of ongoing park operations to avoid or minimize disturbance to T & E species to the greatest extent possible. Research and monitoring is ongoing.	The current level of disturbance to T & E species would continue, as would efforts to support recovery of listed species and efforts to avoid or minimize impacts to the greatest extent possible. There would be additional disturbance associated with new trail development outside the park, as well as from other land management practices outside the park, but within the local region.	The current level of disturbance would likely continue, as would conservation measures, but there would be some additional disturbance due to the construction of new trail and increased use and maintenance activities within or adjacent to suitable habitat for marbled murrelet and northern spotted owl. Best management practices would be implemented to avoid or minimize disturbance to the greatest extent possible. No loss of individual animals or nest trees would occur.

## Appendix C: Cumulative Impact Summary

<b>Cultural Resources</b>	Cultural resources, including: archeological resources, pre-historic and historic structures, cultural landscapes, and ethnographic resources have been adversely affected by past actions taken to restore natural conditions, to upgrade or replace old materials with new, and through unintentional impacts related to neglect or unplanned disturbance.	The existing level of adverse effect would continue under current conditions. However, new impacts would be avoided to the greatest extent possible through preservation maintenance of remaining historic properties, archeological monitoring and implementation of inadvertent discovery plans, and rehabilitation of some historic properties in areas where this would not unreasonably conflict with the preservation of natural resources.	Other effects to cultural resources that may occur in the reasonably foreseeable future include additional preservation maintenance and rehabilitation of historic properties in areas where this would not unreasonably conflict with the preservation of natural resources.	The historic Spruce Railroad would be affected as described below. Additionally, archeological monitoring and implementation of an inadvertent discovery plan would be implemented to avoid or minimize potential impacts to archeological resources associated with historic resort properties, historic logging camps, or prehistoric sites.
<b>Historic Spruce Railroad</b>	The Historic Spruce Railroad has been affected by the removal of track hardware, conversion of some sections to road, and other sections to trail. The two historic railroad tunnels have been closed through blasting that resulted in adverse effects. Benign neglect has allowed several features to deteriorate or be lost, including historic log cribbing, tunnel supports, dry laid rock wall, trestle bridges, and wooden culverts. Some sections of rail grade have been unmanaged for several years. Some sections of the historic Spruce Railroad retain integrity and were found to be eligible for the National Register of Historic Places. This historic property was determined to have national significance due to its association with World War I and the Spruce Division that supplied materials for airplanes.	Sections of the historic Spruce Railroad are being used as road, trail, or are unmanaged. Elements of the historic property are being lost due to benign neglects as historic fabric deteriorates. This includes the historic log cribbing, wood culverts, and wood tunnel supports. Areas of dry laid stone retaining wall are also failing.		The SRRT would be widened in Segments A, B and C. This would result in the rehabilitation of the railroad grade. The remaining log cribbing and dry-laid stone retaining wall would be rehabilitated as well. Interpretation of the historic railroad would be improved. Deterioration of wood culverts would continue and tunnel supports would be removed when the two historic railroad tunnels are reopened and stabilized to allow for visitor use.

## Appendix C: Cumulative Impact Summary

<b>Visitor Use and Experience</b>	Olympic National Park provides world-class opportunities for visitors to experience the outstanding natural and cultural resources within the park. The Lake Crescent and Sol Duc areas are among the most visited areas within the park, providing a wide range of overnight and day use. Past development has resulted in the creation of a trail system containing over 600 miles of trail within the park. Very few miles of trail are universally accessible. Extensive trail opportunities also exist outside the park, including many areas that are universally accessible.	The existing level of visitor use would continue and existing infrastructure to support visitor use would remain. The SRRT would continue to support use by hikers, bicyclists and equestrians. Phase 1 of the ODT would provide 6 miles of universally accessible trail in the Lake Crescent area. Trails outside the park would continue to provide additional opportunities for people to experience and enjoy the Olympic Peninsula.	In addition to existing visitor use opportunities, new trail would be built outside the park, including new sections of trail on USFS lands adjacent to the project area. This would expand the current regional trail network and provide increased opportunities for visitors to experience and enjoy the Olympic Peninsula.	The existing SRRT would be widened and made universally accessible in all areas except Segment D under Alt 3. The two historic railroad tunnels would be opened. Trail access and parking would be improved, and there would be increased opportunities for people to experience and enjoy the Olympic Peninsula.
<b>Soundscapes</b>	Use and development both within and outside the park has resulted in numerous activities that affect natural soundscapes. This includes roads, trail, housing, business and recreational developments. The construction of Highway 101 on the south shore of Lake Crescent has added traffic noise to the area.	Ongoing use and maintenance results in noise related impacts that affect biological as well as experiential conditions. Roads and trails require the use of motorized vehicles and tools to maintain surfaces and provide adequate clearance. Vehicle traffic on road and motorized boats on Lake crescent also add noise to the environment. Aircraft use also affects the region. Noise levels vary depending on the season and time of day, and despite the level of development, natural sounds are still present throughout the project area.	Ongoing noise related impacts would continue to occur. New development and use within the project area would also add some degree of additional noise on adjacent lands.	There would be short term noise increase due to widening of the existing SRRT, and also during the expansion of the SRRT parking lot near the Lyre River and the development of accessible parking and an access trail on CDJR and the paving of the Water Line Road and road between the Lyre River bridge and parking lot. There would be some additional noise associated with the ongoing use and maintenance of the expanded trail system. Including the delivery of new trail bridges by heavy life helicopter.
<b>Scenery and Visual Resources</b>	The Olympic Peninsula is renowned for its natural beauty and high quality visual resources. Some impacts have occurred due to development and land use practices, particularly in areas used for commercial activities and commodity production. Lake Crescent is a premier destination for those seeking scenic beauty. Shoreline development has occurred in the past on park and private lands, but a high overall visual quality remains.	The existing high level of scenic beauty and visual resources would continue to exist. There would be some ongoing impacts from adjacent land uses that adversely affect visual resources. There would be some short-term visual impacts associated with routine maintenance and repairs to existing infrastructure on park and private lands.	Future use and development may result in adverse visual impacts, particularly if forested lands that are visible from the Lake Crescent area are cleared or developed. Existing short-term impacts associated with routine use, maintenance and repairs would continue.	There would be greater short-term impacts associated with construction of new trail and the expansion of existing trail and parking lots. There would be no long-term adverse effects other than those associated with routine use, maintenance and repairs.

## Appendix C: Cumulative Impact Summary

<b>Park Operations and Safety</b>	Olympic National Park is managed to provide for employee and visitor safety in accordance with all applicable laws and policies. The park operation has grown over time as new infrastructure has been developed to support increased visitor use.	The existing park operations would continue, as would the NPS commitment to visitor and employee safety.	Park budgets are not expected to increase in the foreseeable future, and may decrease for some operations. The commitment to safety would remain. The general extent of park infrastructure would remain the same.	The existing SRRT and associated parking lots would be improved. The Water Line Road, SRRT parking lot and North Shore Picnic Area parking lot would also be paved. The two historic railroad tunnels would be opened and developed for trail use. This would result in increased operational demands to maintain the expanded infrastructure and provide for visitor and employee safety in a way that protects park resources and values. Support for new trail development on the SRRT may reduce the availability of park staff to maintain other areas. Additional work would be required to provide a firm and stable surface to meet outdoor accessibility guidelines.
<b>Land Use</b>	Olympic National Park was established in 1938, resulting in a change in land use within most of the park boundary. Some private lands have been acquired by the NPS within the park boundary. Some private lands remain within the park boundary. The existing SRRT was constructed on park lands, but resulted in a small amount of trail on the corner of one privately held parcel. A General Management Plan was developed for Olympic National Park that guides land use and expansion of the park boundary.	No changes in land use would occur under the No Action Alternative other than what is approved in the OLYM GMP.	Designation of wilderness may occur on the north shore of Lake Crescent, but outside of the SRRT project area. Other current land uses would continue.	Existing land uses would continue in accordance with the GMP, but the SRRT would be re-aligned to avoid the corner of private property.
<b>Socioeconomics</b>	The local economy includes numerous elements, including tourism, commodity production, provision of services, and retail operations. Government at the federal, state, and local levels also contribute to the local economy.	Under the No Action Alternative, the existing socioeconomic conditions would continue in relation to activities taken by the NPS. Tourism and the ongoing maintenance and operations of the park would continue to support socioeconomic values.	Improvements to park concession operations and the expansion of the visitor opportunities at Hurricane Ridge may result in benefits to local socioeconomic values. Implementation of the Elwha Dam removal project would also support the local and regional economy.	The existing socioeconomic values would be enhanced by the improved trail opportunities, including better connection to regional trail systems. There would be some short-term adverse effects due to closures and delays during trail construction. The estimated cost to implement the alternatives ranges between \$3.5 to \$4.6 million to construct, and between \$920,000 to \$1,600,000 to maintain over a 50 year period.