

Environmental Trail Screening - Environmental Category: Water

Environmental Category	Environmental Feature	Potential Environmental Effects of Project	Mitigation Measures	Links to Legislation and Guidelines	Monitoring	Indicators of Negative Effects	Limits of Indicators	Corrective Actions
Water	Riparian Areas (within 30 m of water body)	Loss of vegetation reduces quality of fish habitat (shade, nutrient inputs: leaf fall and insect drop). Trampling of stream/lake banks causes erosion, decreases water quality, and harms fish. Soil disturbance (including compaction) and vegetation removal will encourage introduction of invasive plants.	Avoid riparian areas. Minimize vegetation removal within riparian areas. Use existing trails where possible within riparian areas. Avoid trail layout parallel to streams. Conduct invasive plant inventory for baseline information. Use seasonal trail closure signs if wet conditions increase impact.	<p>Working Near Water: www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm.</p> <p>RAR Implementation Guidebook: www.env.gov.bc.ca/habitat/fish_protection_act/riparian/documents/ImplementationGuidebook.pdf.</p> <p>DFO Operational Statement on Riparian Vegetation Maintenance: www.pac.dfo-mpo.gc.ca/habitat/os-eo/riparian-riveraine-eng.htm.</p>	Annual maintenance inspections. Trail user forms. Record of public complaints. Report invasive species to Report A Weed and/ or Notify regional invasive species committee.	Loss of riparian vegetation. Increase of invasive plants. Increased soil exposure. Evidence of bank erosion and downstream siltation (cloudy sediment-laden water).	No unnecessary increase of trail surface within riparian areas. No loss of native riparian vegetation (understory shrubs) from trampling. No increase abundance and distribution of invasive plants.	Increase user education efforts (e.g. Stay on Trail!). Seasonal trail closures. Remove or relocate trail surface outside riparian area. Invasive plant removal. Report invasive species to Report A Weed and/ or Notify regional invasive species committee. Create rehabilitation plan that presets criteria that are required re-open trail.
	Stream Crossing	Stream bank instability can cause sedimentation and reduce water quality downstream. Poorly designed bridge crossings can cause debris jams and floods. Bridge abutments can fill in channel and remove fish habitat. Bridge abutments can change hydraulics and cause scouring and erosion downstream	Use existing stream crossings. Construct clear-span bridges (follow DFO Operational Statement). Avoid any instream works. Schedule instream work within regional fisheries least-impact timing window. Complete Notification forms to Provincial Environment Ministry and Fisheries and Oceans Canada.	<p>DFO Operational Statement on Clear Span Bridges: www.pac.dfo-mpo.gc.ca/habitat/os-eo/cs-bridge-ponts-pl-eng.htm.</p> <p>Provincial Notification: www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/.</p> <p>Federal Notification: www.pac.dfo-mpo.gc.ca/habitat/steps/praf/form-formulaire-eng.pdf</p>	Annual maintenance inspections. Trail user forms. Record of public complaints.	Woody debris collected at bridge crossing. Increased scouring of banks downstream of bridge. Bank erosion at crossing and downstream siltation (cloudy sediment-laden water). Loss of riparian vegetation. Increase spread and abundance of invasive plants.	No evidence that bridge deck is restricting stream flow and creating debris jam. No evidence of bank erosion at crossing. No loss of native riparian vegetation (understory shrubs) from trampling. No increase in abundance and distribution of invasive plants.	Increase user education efforts (e.g. Stay on Trail!). Seasonal trail closures. Remove or relocate stream crossing. Invasive plant removal and and invasive species reporting. Create rehabilitation plan that presets criteria that are required re-open trail.
	Sensitive wetlands	Wetland soils are sensitive to compaction and erosion. Many red and blue listed plants are wetland plants. Damage to native wetland plants machinery spread of seed/soil, and soil disturbance creates opportunities for introduction of invasive species.	Redirect trail to avoid wetlands. Conduct sensitive plant inventory (Red/Blue list) and avoid areas where these plants are present. Conduct invasive plant inventory to use as baseline information.	<p>EFlora BC: www.geog.ubc.ca/biodiversity/eflora/.</p> <p>Invasive Species Council of BC: www.bcinvasives.ca/</p>	Annual maintenance inspections. Trail user forms. Record of public complaints.	Loss of wetland vegetation. Increased soil exposure. Increase spread and abundance of invasive plants.	No evidence of soil compaction or loss of wetland vegetation outside of trail bed.	Increase user education efforts (e.g. Stay on Trail!). Seasonal trail closures. Remove or relocate trail outside of riparian area surrounding wetland. Invasive plant removal and invasive species reporting. Create rehabilitation plan that presets criteria that are required re-open trail.

Environmental Trail Screening - Environmental Category: Plants

Environmental Category	Environmental Feature	Potential Environmental Effects of Project	Mitigation Measures	Links to Legislation and Guidelines	Monitoring	Indicators of Negative Effects	Limits of Indicators	Corrective Actions
Plants	Red/Blue listed Plants	Soil disturbance (including compaction) can damage native plants and create conditions for introduction of invasive plants.	Conduct inventory within trail area for rare and endangered plants, avoid rare plant habitats, conduct baseline inventory of invasive plants.	E-Flora BC: www.geog.ubc.ca/biodiversity/eflora/ . Invasive Species Council of BC: www.bcinvasives.ca/	Annual maintenance inspections. Trail user forms. Record of public complaints.	Decrease in abundance or distribution of red/blue listed plants. Increased soil exposure. Increase presence and spread of invasive plants.	No decrease in abundance or distribution of red/blue listed plants. No increase spread of invasives plants in sensitive areas.	Increase user education efforts (e.g. Identify red/blue listed plants). Seasonal trail closures. Remove or relocate trail away from red/blue listed plant location. Invasive plant removal and invasive species reporting. Create rehabilitation plan that presets criteria that are required re-open trail.
	Native plants on sensitive sites (grasslands, meadows)	Soil compaction and erosion can damage native plants and create prime conditions for the introduction of invasive plants. Removing standing dead trees along trails for safety concerns removes valuable wildlife habitat (e.g., cavity nesting birds).	Use existing trails where possible. Learn to identify invasive plants. Inspect clothing, equipment, pack animals and pets for plant parts before and after activity. Incinerate or bag and dispose of collected plant parts. Obey all signs and trail closures. Leave gates as you found them. Restrict use of areas with invasive plants to times of the year when spread is unlikely (e.g., the period from flowering to seed dispersal). Invasive plants should generally be cut at the ground rather than pulled if pulling is likely to result in dispersal of seed. Pack-in invasive plant-free seed for pack animals. Avoid grazing pack animals in infested areas.	E-Flora BC: www.geog.ubc.ca/biodiversity/eflora/ . Invasive Species Council of BC: www.bcinvasives.ca/	Annual maintenance inspections. Trail user forms. Record of public complaints.	Evidence of unnecessary trail widening/braiding. Increased areas of exposed soil and native plant damage outside of trail bed (especially at view points). Increased soil exposure. Increase presence and spread of invasive plants.	No unnecessary trail widening or increased soil exposure outside of the trail bed. No increase abundance and distribution of invasive plants.	Increase user education efforts (e.g. Stay on trail!). Seasonal trail closures. Create structures at viewpoints to limit trampling/expansion (e.g., benches, railings). Invasive plant removal and invasive species reporting. Create rehabilitation plan that presets criteria that are required re-open trail.
	Steep hillsides, difficult or technical terrain	Poorly designed trails on steep ground can change drainage patterns and cause erosion. Erosion will cause trail widening and rutting. Erosion will remove organic material from soil and expose roots damaging native vegetation. Erosion causing sedimentation of streams will decrease water quality and harm fish.	Follow appropriate trail design and construction standards for slopes (e.g., 8-10% grade average). Design trail to avoid stormwater runoff down trail: Half rule (trail slope does not exceed half the grade of the hill), regular grade reversals (prevents water flow down trail tread).	International Mountain Bike Association: www.imbacanada.com/resources/trailbuilding . Whistler trail standards: www.orc.bc.ca/research_pub.htm	Annual maintenance inspections. Trail user forms. Record of public complaints.	Erosion of trail bed. Scoured ruts. Deposition of soil and debris at switchbacks or change in slope. Sediment-laden water below erosion sites.	No sediment-laden water as a result of trail erosion. Minimal increase in trail width and depth from erosion.	Construct rock armouring, stormwater control structures. Seasonal trail closures. Realign or relocate trail to avoid steep slopes where erosion is occurring. Create rehabilitation plan that presets criteria that are required re-open trail.

Environmental Trail Screening - Environmental Category: Wildlife

Environmental Category	Environmental Feature	Potential Environmental Effects of Project	Mitigation Measures	Links to Legislation and Guidelines	Monitoring	Indicators of Negative Effects	Limits of Indicators	Corrective Actions
Wildlife	Wildlife Red/Blue listed Wildlife	Physiological and behavioural disruption to wildlife from increased human (and dog) presence.	Record wildlife encounters, actions taken, and responses of animals. Remain on established trails. Obey all signs and area closures. Do not harass wildlife. Do not handle wildlife. Do not allow dogs to be at large and harass wildlife. Pack out all garbage. Yield to wildlife on trails and roads. Focus activities in areas and at times of the year when wildlife are least likely to be disturbed. Remain still or retreat when animals are encountered and react to human presence. Stay at distances sufficient to prevent changes to the behaviour of animals (at least 100 m in open areas is the default for large mammals). For alpine trails in highquality wildlife habitat, develop these guidelines specifically for large mammal species such as caribou, grizzly bear and mountain goat. Review list of potential wildlife using area and their critical/high-value habitats. Conduct cursory wildlife habitat assessment. Avoid disturbing wildlife habitat features and trail layout in high quality wildlife habitat.	Wildlife guidelines for backcountry tourism/commercial recreation: www.env.gov.bc.ca/wld/twg/index.html . Identified wildlife management strategy: www.env.gov.bc.ca/wld/frpa/iwms/index.html	Record wildlife encounters, actions taken, and responses of animals. Consider use of remote trail cameras to monitor changes in wildlife behaviour. Annual maintenance inspections. Trail user forms. Record of public complaints.	Increased proportion of encounters resulting in an alarm response (movement by animals to safer locations). Declining wildlife inventory trends in trail area.	No increase in rate of alarm responses of wildlife over time. No abandonment of habitats by wildlife. Consult with regional biologists through Ministry of Environment offices to determine acceptable limits of change, especially for species such as Grizzly bear.	Trail closures. Trail relocation outside of prime habitat. Consult with species specialists to determine specific thresholds for trail closures ahead of time.

Environmental Trail Screening - Environmental Category: Interfaces

Environmental Category	Environmental Feature	Potential Environmental Effects of Project	Mitigation Measures	Links to Legislation and Guidelines	Monitoring	Indicators of Negative Effects	Limits of Indicators	Corrective Actions
Interfaces	Forestry Harvest areas, interface with motorized roads and tracks	Unanticipated consequences of use of nonmotorized trails by motorized users can cause trail tread displacement, erosion, trail width and depth impacts and increased spread of invasive species.	Sign non-motorized trails; utilize stiles and trailhead design (pinches, grade, doglegged starts) to filter for intended use; collaborative planning, monitoring, and education with motorized trail stewardship orgs.		Annual maintenance inspection plus ongoing user "trail watch". Monitor trail intersections and motorized vehicle entry points for invasive species.	Observations of motorized use of non-motorized trails. Evidence of erosion and soil compaction, tread displacement from unintended motorized use of non-motorized trails	No sediment-laden water as a result of trail erosion. Minimal increase in trail width and depth from erosion. Minimal tread displacement.	Warning signage. Construct fencing, stiles, of barriers if appropriate. Increase user education through media/ print/web, increased patrol and monitoring by stewardship organizations, and trail closure if compliance is not maintained.
	Dry south-facing hillsides near urban interface	Increased recreational use of an urban interface area can increase threat of wildfire to nearby residents	Educate users to obey all backcountry closures during high risk fire seasons.		Annual maintenance inspection plus ongoing user "trail watch".	Observations of trail use during high fire risk backcountry closures. Signs of fires in undesignated areas. Fires during fire bans.	No increase in fire scars in undesignated areas. No reports of fires during fire bans.	Increased vigilance and reporting by local trail stewards. May require posting a contact person and number. Increase user education efforts. Increase local trail stewardship efforts. Close trails during high fire risk seasons. Permanent trail closure or relocation.