

Reinecker Creek Trail 2010

Environmental Screening Report

Date: September 28, 2010

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Summary of Recommendations

Issues, hotspots, and values

The primary environmental issues to consider on the Reinecker Creek trail network are related to those trail sections that are in close proximity to Reinecker Creek and Harold Provincial Park. The trail has been routed away from the creek but does cross it twice. There are still three main issues:

1. Destruction or degradation of streambanks and wetlands.
2. Enabling access into the creek and Provincial Park by motorized traffic.
3. The introduction of invasive species into the riparian zone and trail system.

These issues are especially sensitive around the two creek crossings. Given that the area is also well-used as a cattle range a preliminary inventory for invasive plant species will also be useful as baseline information for future monitoring.

Recommendation #1: Trail design and construction

Avoid trail layout through riparian areas where possible. If unavoidable, engage a biologist to ensure that the intent of protective legislation (Riparian Areas Regulation, and Section 9 of the Water Act) is followed. Construct all trails using current best practices to avoid erosion and control sediment flow into water bodies. Certified wildlife/danger tree assessors must sign off on any danger trees that require removal during trail construction, especially in riparian areas. This will minimize destruction of important nesting habitat for birds and small mammals.

Recommendation #2: Plant species at risk

Conduct a simple reconnaissance inventory for plant species at risk and. The environmental screening process has coordinated species lists that are separated based on vulnerability to impact (e.g., red or blue listing) and habitat type (e.g., riparian or forested habitats). These lists are provided in this report along with a field guide to the most vulnerable and likely plants to occur in the Reinecker Creek area (Appendix A).

Recommendation #3: Invasive plant management

A baseline inventory on the presence of invasive plants will also be useful to monitor trends in distribution and abundance. A preliminary list was started on a 7 October 2010 visit and included Canada thistle, clasping bedstraw, field chickweed, dandelion, meadow buttercup, and mullein. Invasive plant species lists and guidelines on inventory methods can be coordinated through the Invasive Plant Council of BC (<http://www.invasiveplantcouncilbc.ca/>).

Recommendation #4: Wildlife species at risk

Avoid all habitat features used by wildlife species at risk during trail layout and design. A table of wildlife species at risk and habitat features is provided in this report.

Part 1: Application

Action Description

This environmental screening report encompasses the sections of trail built in 2009 as well as the historical roads accessing the Stern Valley on the west side of Reinecker Creek. Trail activities and use include hiking, biking, horseback , snowshoeing and skiing.

Purpose

The Reinecker Creek Trail system is a project of the Columbia Shuswap Regional District (CSRD) Area C Parks. The Shuswap Trail Alliance (STA) provided the technical expertise and crews to do the actual construction. They (STA) have also contracted to do the trail maintenance, inspections, inventory and monitoring in the first year. This will include establishment of monitoring sites.

Use of the Reinecker Creek Trail since trail construction began has been primarily biking, with hiking and horse riding as secondary uses. Residents of Salmon Arm and campers at Harold Provincial Park have been the primary users.

There are 5 sections to the Reinecker Creek Trail System:

Lower East Reinecker Creek

This is a 4.5km section through mixed deciduous and conifer forest. There is a registration box at the trail head on the Harold Park trail. This is designated no-bikes from Harold Park to the South Crossing as bikes are not allowed in Harold Park at this time. There is a pinch gate 400 metres south of the junction of lower and upper east trails to prevent cattle following the trail south of their range. This should be monitored when the trail inspections are done.

South Reinecker Creek Crossing

This is a 1.3km section from the junction of the lower and upper east sections to the old road up the west side. The main feature on this section is the clear-span foot bridge across Reinecker Creek. This is an environmental monitoring site because of the location on the creek. The main reasons for monitoring this location is to track streambank erosion and invasive plant proliferation. There has been a lot of cattle sign around this site. They cross the creek both below and above the bridge. As well it is an ideal stopping place for trail users and should be monitored for social trails and site trampling.

A site that was considered for possible environmental monitoring on this trail is a 275 metre section of decking over some wet seep areas and seasonal creeks. Monitoring this area for intrusions off the decks may be worthwhile and should certainly be done during regular trail inspections.

Upper East Reinecker Creek

This section of trail is 4.2km and was constructed in 2009 and 2010 through mixed deciduous and coniferous forests. There is a prominent animal lick site near the 2.5km point. The trail was deliberately re-aligned west of that site and a deck built across the seasonal stream flowing from that site. This was a possible environmental monitoring site to monitor intrusions into the lick. This may not be an issue as there is no indication that such a feature exists when on the trail. Another possible environmental monitoring site may be just north of here where the trail skirts a large wetland 50 metres to the east. While it is visually appealing it may not be as appealing as a place to walk. The trail crosses Reinecker Creek on a clear span bridge constructed in 2009. This is a possible environmental monitoring site because of its location on Reinecker Creek and the need to monitor the effect of trail use on the streambanks and the meadow on the east side. As there is a monitor site on the south crossing a second site here may not be needed. For now these sites can be monitored at the time of the bi-annual inspections and action taken if needed.

Upper West Reinecker Creek

This is a 2.5km shared motorized trail from Stern Valley (Post RC 06) to Forest Service Road 26 Branch 30 (Post RC 07). FSR 26-30 was newly constructed by Federated Co-op in 2009 and 2010. It cuts through the west and the north sides of the large open meadow in Stern Valley. The old road has become part of the trail system. As none of this section was built by the CSR/D/Shuswap Trail Alliance to meet trail standards there are no locations needed for environmental monitoring sites. However scheduled trail inspections will monitor this trail.

Lower West Reinecker Creek

This is a 5km shared motorized trail from FSR 26-30 at the Upper Trailhead to the Harold Provincial Park on Sunnybrae Road. This is a series of old roads to Stern Valley. Like the Upper West section this trail will be monitored on regularly scheduled trail inspections.

Location

The Reinecker Creek trail system starts from Harold Provincial Park approximately 22km from Salmon Arm. There is a mid-trail trail head as well. This is on the Bastion Mountain Forest Service Road and is approximately 24km from Salmon Arm.

Schedule

Trail construction was completed over 2009 and 2010. The trail is open year-round.

Activities

Trail construction activities will consist of clearing blowdown and brush on the trail corridor, installation of signposts and registration boxes for data collection.

Trail use on the east trails will be non-motorized hiking, biking and horse riding in the spring, fall and summer with cross country skiing and snowshoeing in the winter and spring. The trails on the west side of Reinecker Creek are shared motorized and non-motorized use.

Part 2: Environmental and land-use

Summary (issues, hotspots, and values)

Reinecker Creek Trail System is primarily in the Shuswap moist warm Interior Cedar Hemlock (ICHmw2) biogeoclimatic subzone variant. The sections of the trail covered by this report are entirely in this ICH zone (Fig. 1). Access to the trail through Harold Park is largely through the Interior Douglas-fir zone.

There are two creek crossings on the trail. Both crossings are clear-span bridges and built following Fisheries and Oceans Canada (DFO) Operational Statement on clear span bridges (Appendix B). Trail layout through riparian areas was avoided in most cases. Where this was unavoidable boardwalks were constructed. All trails were constructed using current best practices to avoid erosion and sediment control into water bodies. Prior assessments for ecological communities and plant species at risk as well as a cursory inventory on the presence of invasive plants will be useful as baseline information for long term adaptive management planning.

Standing dead and danger trees on the trail were assessed by a certified wildlife/danger tree assessor and will continue to be assessed on scheduled trail inspections.

Ecological Communities

There are 9 ecological communities listed on the BC status list. Eight are yellow listed (not at risk). One is blue listed (special concern): western red cedar-western hemlock/common horsetail. The Conservation Framework Summary rates the threat to this community as low. There are no red listed (extirpated/endangered/threatened) communities (Table 1).

Plants

The Reinecker Creek trail that this report is concerned with has 3 types of plant habitat: palustrine (wetland), riverine and terrestrial. There are 54 red listed and 146 blue listed species in the ICHmw2 biogeoclimatic zone over those plant habitats. Nearly all of the listed species occur in riparian areas such as wet meadows. (See Table 2.) A plant identification guide is included in this report in order to help in identification of the red and blue species most likely to be encountered on this trail system (Appendix A). These are plants that have been reported on Efora BC [eflora.bc.ca] as occurring in these habitats and in the southern interior of B.C. Special attention will be paid regarding these plants, especially near wetlands and at the two creek crossings.

Wildlife

There are 91 species at risk in the Interior Cedar Hemlock biogeoclimatic zone (all subzones and variants included) (Table 3). Many of those species are found around the lakes and rivers of the Shuswap and likely use the Reinecker Creek valley. Red listed species which may occur in the Shuswap ICH subzone include badger, Lewis's woodpecker, northern leopard frog, Rocky Mountain tailed frog, sage thrasher, Swainson's hawk, tiger salamander, western screech-owl, Williamson's sapsucker, yellow-breasted chat. Special attention should be paid to these species and their habitat (standing dead trees, coarse woody debris on the forest floor, and rock boulders and talus slopes). A blue listed species that also needs special observations for possible habitat is the fisher (dens in hollow logs).

A search on the GeoBC data base for Mapped Wildlife Species Point Locations and Species Inventory Telemetry and Species Inventory Wildlife Observations showed a few observations of rare butterfly species along the south side of White lake but this area will not be affected by the Reinecker Creek Trail.

Reinecker Creek Trail travels through mapped Ungulate Winter Ranges for both moose and mule deer (Fig. 2). Ungulate winter ranges are managed as high-value habitat by the Ministry of Environment. They provide important wintering areas with intact forest canopies for snow interception that also provide foraging habitat nearby. The upper area of the Reinecker Creek Trail has lower gradient slopes and likely more moist habitat suitable for moose, whereas the lower section of the trail with steeper south-facing slopes is likely more suitable for mule deer.

Fish and fish habitat

While there are several streams along this portion of Reinecker Creek there are no lakes. The two foot bridges across Reinecker Creek have been constructed as clear-span bridges at a height to allow woody debris to pass beneath during high water in the spring (following DFO's operational statement on construction of clear-span bridges – Appendix B).

Soil and water degradation

Other than stream crossings most of the trails in this system are predominantly dry (Figure 1). Sections near wetlands have been routed to high ground away from the wetlands or boardwalks have been constructed above the seeps and streams. Current standards and best practices (Whistler Standards, International Mountain Bike Association) for trail construction related to grade and drainage concerns will minimize any negative impacts of the trail on surrounding soil and water quality (e.g., rock French Drains have been constructed as low-maintenance water control points).

Current and historic land use

The Shuswap First Nation utilized this area for hunting and gathering. The area is of historical interest and claim by the Shuswap people.

Logging interests along the trail route on the west side of Reinecker Creek and north of the current trail on the east side are held primarily by Federated Coop. They have been consulted regarding built and planned trail proposals. At the time of trail planning and construction a woodlot near the east trail was up for sale by the B.C. Forest Ministry. Many trail sections are through recently logged areas as well as areas that will be logged in future.

There is no Guide Outfitter operating in this area.

Reinecker Creek trail is within the Trapline TR0326T002, which is a large trapline encompassing the entire peninsula of land west out to Cinnemousin narrows on Shuswap lake.

There is a range license on the north and west sections of the trail route. A pinch gate to prevent cattle following the trail south from their range has been constructed on the north end of the Lower East section of trail.

There are no mining claims found in the area.

Part 3: Mitigation and monitoring

This will form the framework for a long-term adaptive management plan:

- A. **Results:** What we are attempting to achieve?
- B. **Desired Behaviours:** Actions by users that are most likely to achieve results?
- C. **Indicators:** What to measure to determine if results are being achieved?
- D. **Limits:** Acceptable bounds of the measured indicator?
- E. **Monitoring Schedule:** How often the indicators will be measured?
- F. **Corrective Actions:** Actions triggered if limits are surpassed?

A. Results

- 1. Avoid removal of large standing dead trees.
- 2. Avoid soil compaction and trail widening near riparian areas.
- 3. Minimize spread of invasive plant species.
- 4. Minimize physiological or behavioural disruption of wildlife.
- 5. Avoid increased threat to wildfire along the private land interface.

B. Desired Behaviours

- 1. Use certified wildlife/danger tree assessors to evaluate standing snags prior to removal for safety concerns will promote the conservation of wildlife habitat trees. Conduct baseline inventory of large nest trees during trail layout phase. All danger trees that do require removal as a consequence of trail construction should be fallen must be left to decay on the forest floor.
- 2. No trails through wetlands, and minimal travel through riparian areas (30 m from water bodies). Use existing trails, construct boardwalks, avoid widening existing trails, avoid heavy use during muddy conditions, obey all trail closures.
- 3. Learn to identify invasive plants, inspect clothing, equipment, and animals before and after activity, restrict use of areas with invasive plants to times of the year

when spread is unlikely, remove invasive plants using appropriate techniques (contact Invasive Plant Council of BC). Conduct baseline inventory.

4. Do not harass wildlife, record wildlife encounters on standard forms provided at trail heads/campground.
5. No open fires except in designated campsites, no trail use during high fire risk periods when backcountry closures are in effect. No smoking.

C. Indicators

1. Number of nest trees (requires baseline inventory), and
2. Trail widths, trail braiding, evidence of erosion within riparian areas (30 m from water course) (option: use Backcountry Recreation Impact Monitoring – BRIM forms)
3. Extent and frequency of invasive species occurrence within 5 m of trails
4. Proportions of wildlife encounters resulting in an alarm response (movement by animals to safer locations), population abundance and distribution trends (check with Min. of Environment for updates on wildlife inventory data)
5. Fire rings/scars, reports of trail use during closed periods.

D. Limits

1. No trees with large open nests removed as a consequence of trail development activities.
2. No increase in trail width, no erosion near waterways
3. No increase in invasive species stem densities, or spatial extent of current infestations
4. No increase in rate of alarm responses over time, no harassment reported, no abandonment of habitats caused by trail activities
5. No increase in fire scars outside of campsites.

E. Monitoring Schedule

Select monitoring sites at bridge crossings where sprawl is likely. Use photo documentation and/or follow BC Parks method to measure trends in trail widening and vegetation damage. Monitor sites during the 2 scheduled maintenance inspections (spring and fall).

Trail user survey forms should be made available at trail heads.

Incorporate assessments and compilation of trail use forms into a trail maintenance plan (e.g., spring trail clearing and trail monitoring, end of season form collection and summary). Create central repository for this information with CSRD Area C Parks staff (where will this information be stored, who will be responsible for managing it?) Monitoring Schedule

- Assessment frequency and application will be tailored to the rate of change that is expected at specific sites (e.g., high use trails near sensitive sites). Current suggestions are for a 3 year monitoring schedule.

Provide a process for people to record and report observations non-conforming use of the new trail (e.g., motorized use in riparian area, open fires outside of campsites)

F. Corrective Actions

- Increase user education efforts
- Seasonal trail closures (e.g., high water in spring, invasive plant seed dispersal periods)
- Trail relocation (specific thresholds that would trigger this level of corrective action still require more discussion)

Part 4: Pre-screen checklist

Compliance (legislation, land-use plans, guidelines)

Riparian Areas Regulation (BC Water Act, Federal Fisheries Act)

- ✓ Maintain no-disturbance zone in streamside protection and enhancement areas (SPEAs)
- ✓ Notify Ministry of Environment and Fisheries and Oceans Canada (DFO) if work is unavoidable in and about a stream or water body
- ✓ Follow intent and criteria for no harmful alteration or disruption of fish habitat in DFO's Operational Statements for clear span bridges (Appendix X) when constructing foot bridges over streams

Species at Risk Act

- protection to listed species (extirpated, endangered, or threatened)
- federal government has responsibility for federal lands, aquatic species, and migratory birds

Wildlife Act

- protection of nests and nesting birds

Identified wildlife management strategy

- protection of species at risk and regionally important wildlife that the provincial government has designated as requiring special management under the Forest and Range Protection Act (FRPA)

Notification/Consultation

Sexqéltkemoc Lakes Division and Neskonlith Indian Band

Private land holders

Federated Co-op

Woodlot license holders

Range tenure holders

Local motorized recreation groups

BC Parks

Checklist of potential impacts:

Avoid disturbance within riparian areas

Plant species at risk inventory prior to final trail location (see Appendix A)

Invasive plant inventory as baseline information

Avoid direct disturbance to wildlife (harassment by people and dogs)

Avoid soil compaction, sedimentation and erosion near water bodies (see Appendix B for design criteria when constructing clear span bridges)

Minimize wildlife tree removal

Web-based Information Sources

BC government Land and Resource Data Warehouse. December 2009 extractions through GeoBC Data Distribution Service.

BC Conservation Data Centre 2010, BC Species and Ecosystem Explorer, BC Ministry of Environment, Victoria BC, Available: <http://a100.gov.bc.ca/pub/eswp/> (accessed Jan 8, 2010).

Habitat Wizard. BC Ministry of Environment FDIS Fisheries Database.

E-Flora. Electronic atlas of the plants of BC. In: Klinkenberg, Brian. (Editor) 2009.

E-Flora BC: Electronic Atlas of the Plants of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. January, 2009.

Mineral Titles on Line BC. www.mton.gov.bc.ca/mtov (checked on September 21, 2010)

Table 1. Ecological communities at risk in the Shuswap moist warm biogeoclimatic zone (ICHmw2) .These vegetation communities have been avoided where possible during trail design and construction on the Reinecker Creek trails

English Name	BC List	Ecosystem Group
bluejoint reedgrass / glow moss	Yellow	Herbaceous, Wetland
bluejoint reedgrass - sedges	Yellow	Herbaceous, Wetland
Douglas-fir - western redcedar / falsebox	Yellow	Forest
western redcedar / Utah honeysuckle / oak fern	Yellow	Forest
western redcedar / devil's club / lady fern	Yellow	Forest, Riparian
western redcedar - hybrid white spruce / skunk cabbage	Yellow	Wetland, Forest
western redcedar - western hemlock / common horsetail	Blue	Forest, Riparian
western hemlock / falsebox	Yellow	Forest
western hemlock - western redcedar / falsebox / red-stemmed feathermoss	Yellow	Forest

Table 2. Plant species at risk in the interior cedar hemlock biogeoclimatic zone (ICH) within the Kamloops Forest District and Columbia Shuswap Regional District .These plant species have been avoided where possible during trail design and construction on the Reinecker Creek trails.

Scientific Name	English Name	BC List	Habitat Type
<i>Azolla mexicana</i>	Mexican mosquito fern	Red	lakeshore;wetland;river bank
<i>Chenopodium atrovirens</i>	dark lamb's-quarters	Red	forest/upland
<i>Isoetes howellii</i>	Howell's quillwort	Red	lakeshore;wetland
<i>Olsynium douglasii</i> var. <i>inflatum</i>	satinflower	Red	wetland;river bank;forest/upland
<i>Rhizomnium punctatum</i>		Red	
<i>Sphagnum platyphyllum</i>		Red	
<i>Agoseris lackschewitzii</i>	pink agoseris	Blue	wetland;forest/upland
<i>Drepanocladus sendtneri</i>		Blue	
<i>Dryopteris cristata</i>	crested wood fern	Blue	wetland;forest/upland
<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>	purple-leaved willowherb	Blue	estuaries;wetland;forest/upland
<i>Epipactis gigantea</i>	giant helleborine	Blue	
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	Blue	lakeshore;wetland;forest/upland
<i>Hypnum pratense</i>		Blue	
<i>Myriophyllum ussuriense</i>	Ussurian water-milfoil	Blue	estuaries;lakeshore;wetland;river bank
<i>Orthotrichum alpestre</i>		Blue	
<i>Pinus albicaulis</i>	whitebark pine	Blue	
<i>Pohlia atropurpurea</i>		Blue	
<i>Pyrola elliptica</i>	white wintergreen	Blue	wetland;forest/upland
<i>Salix tweedyi</i>	Tweedy's willow	Blue	lakeshore;wetland;river bank

Table 3. Bird species at risk in the interior cedar hemlock biogeoclimatic zone (ICH) within the Kamloops Forest District and Columbia Shuswap Regional District .Habitat features used by these bird species have been avoided where possible during trail design and construction.

English Name	BC List	Identified Wildlife	Class	Habitat Type
Lark Sparrow	Red		birds	forest/upland
Western Screech-Owl, <i>macfarlanei</i> subspecies	Red	Y (May 2004)	birds	wetland; forest/upland
Lewis's Woodpecker	Red	Y (May 2004)	birds	wetland; forest/upland
Swainson's Hawk	Red		birds	wetland; forest/upland
Great Blue heron, <i>herodias</i> subspecies	Blue	Y (Jun 2006)	birds	estuaries; lake shore; wetland ;river bank; forest/upland
Short-eared Owl	Blue	Y (May 2004)	birds	forest/upland
Canyon Wren	Blue		birds	forest/upland
Olive-sided Flycatcher	Blue		birds	wetland; forest/upland
Bobolink	Blue		birds	wetland; forest/upland
Horned Lark, <i>merrilli</i> subspecies	Blue		birds	forest/upland
Barn Swallow	Blue		birds	estuaries; lake shore; wetland; river bank; forest/upland
Long-billed Curlew	Blue	Y (May 2004)	birds	estuaries; wetland; forest/upland
Boreal Owl	Yellow		birds	
Black Tern	Yellow		birds	
Common Nighthawk	Yellow		birds	
Northern Harrier	Yellow		birds	
Bald Eagle	Yellow		birds	
Sandhill Crane	Yellow	Y (Jun 2006)	birds	lake shore; wetland; river bank; forest/upland
Western Screech-Owl	No Status		birds	

Table 4. Other wildlife species (mammals, insects, amphibians, reptiles, gastropods) at risk in the interior cedar hemlock biogeoclimatic zone (ICH) within the Kamloops Forest District and Columbia Shuswap Regional District .Habitat features used by these species have been avoided where possible during trail design and construction.

English Name	BC List	Identified Wildlife	Class	Habitat Type
American Badger	Red	Y (May 2004)	mammals	forest/upland
Western Painted Turtle - Intermountain - Rocky Mountain Population	Blue		turtles	wetland; river bank
Townsend's Big-eared Bat	Blue		mammals	wetland; forest/upland
Monarch	Blue		insects	wetland; forest/upland
Wolverine, <i>Iuscus</i> subspecies	Blue	Y (May 2004)	mammals	forest/upland
Pale Jumping-slug	Blue		gastropods	forest/upland
Magnum Mantleslug	Blue		gastropods	forest/upland
Fisher	Blue	Y (Jun 2006)	mammals	wetland; forest/upland
Fringed Myotis	Blue	Y (May 2004)	mammals	wetland; forest/upland
Bighorn Sheep	Blue	Y (Jun 2006)	mammals	wetland; forest/upland
Common Sootywing	Blue		insects	wetland; forest/upland wetland; river bank;
Grizzly Bear	Blue	Y (May 2004)	mammals	forest/upland
Columbia Spotted Frog	Yellow		amphibians	
Western Toad	Yellow		amphibians	
Grey Wolf	Yellow		mammals	
Rubber Boa	Yellow		reptiles	
Wolverine	No			
	Status		mammals	
	No			
Western Painted Turtle	Status		turtles	

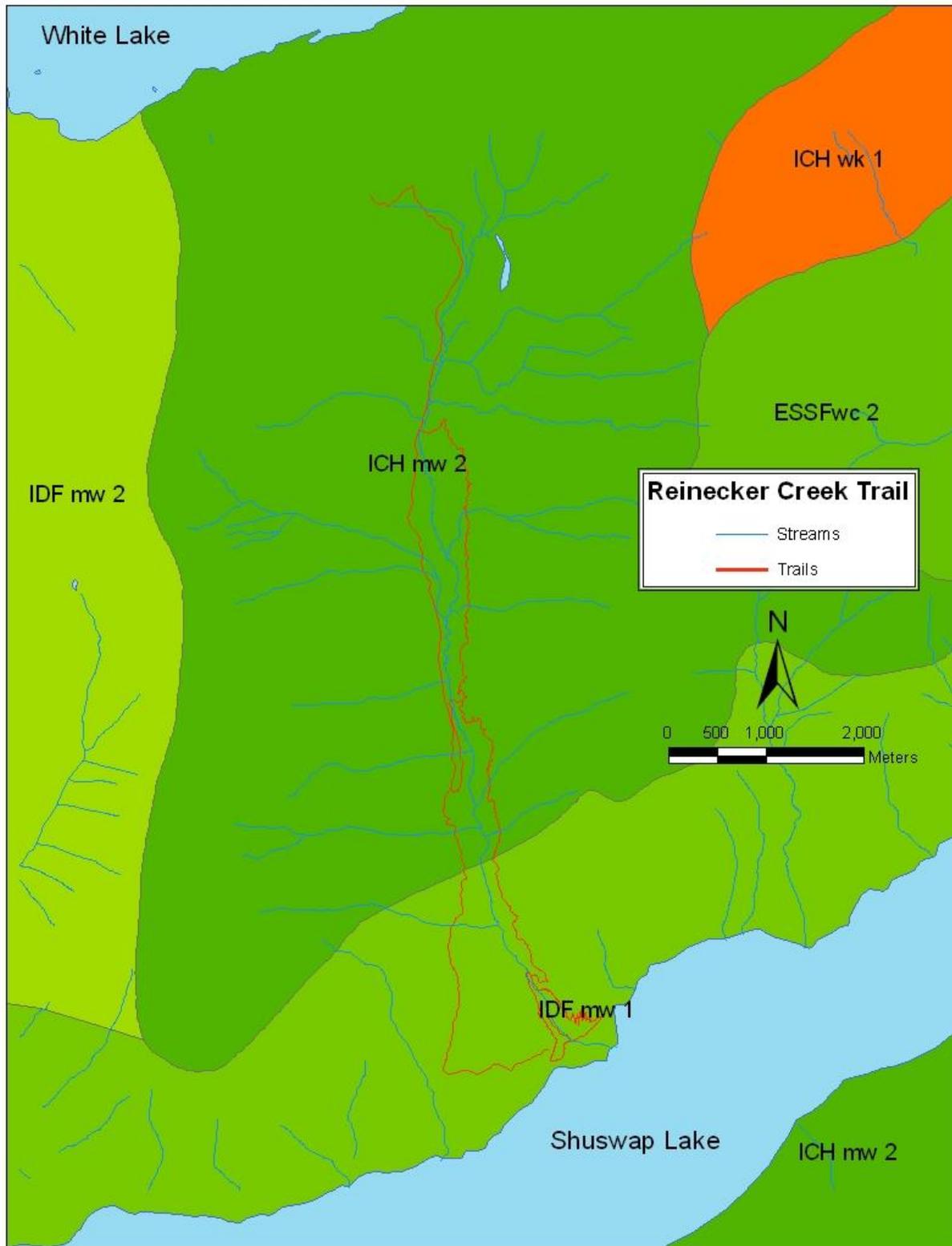


Figure 1. The biogeoclimatic zones near the Reinecker Creek Trail. The majority of the new trail is within the Interior Cedar Hemlock zone (moist-warm subzone).

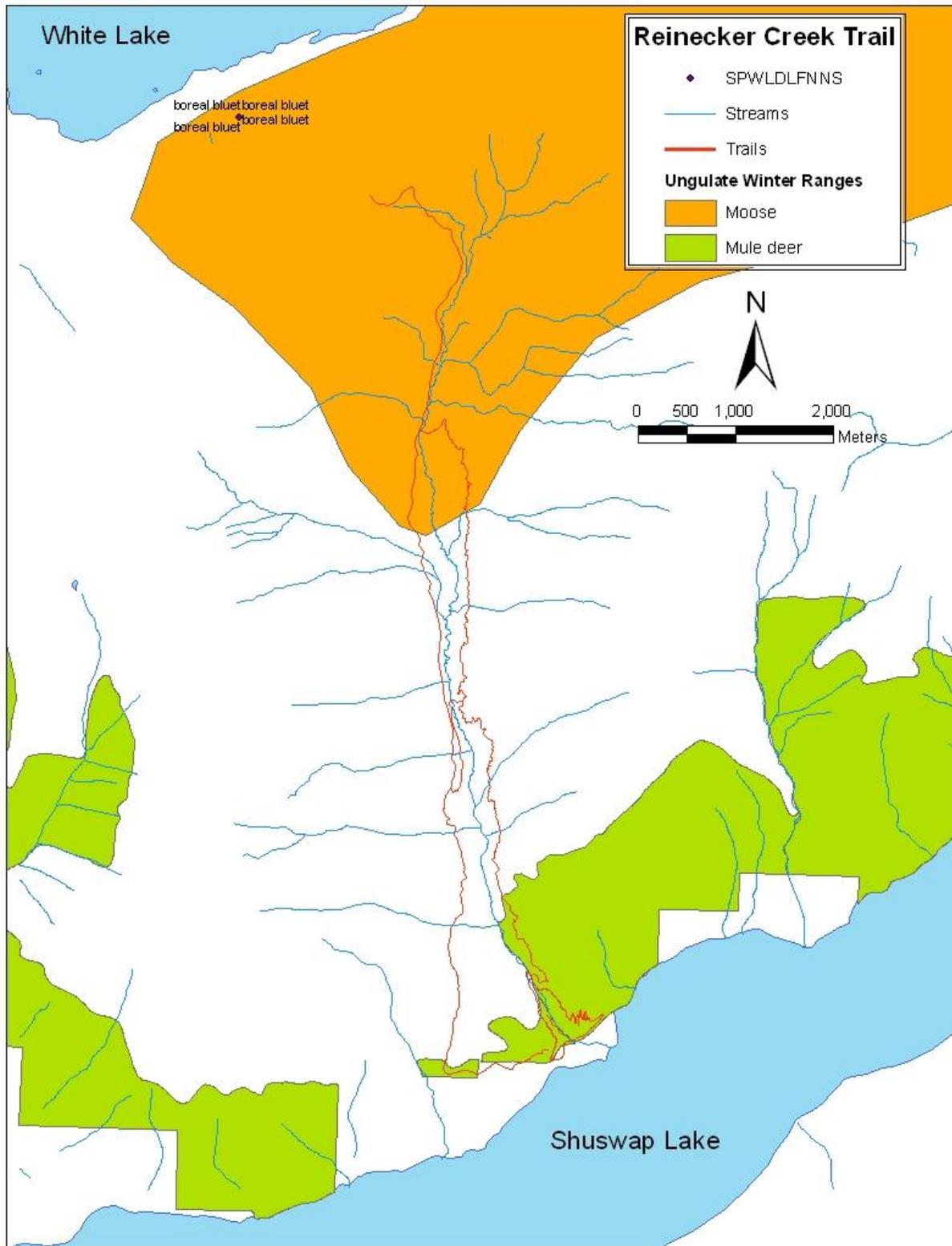


Figure 2. Important wildlife information in the Reinecker Creek Valley includes the location of moose and mule deer winter ranges and rare butterfly sightings near white lake.

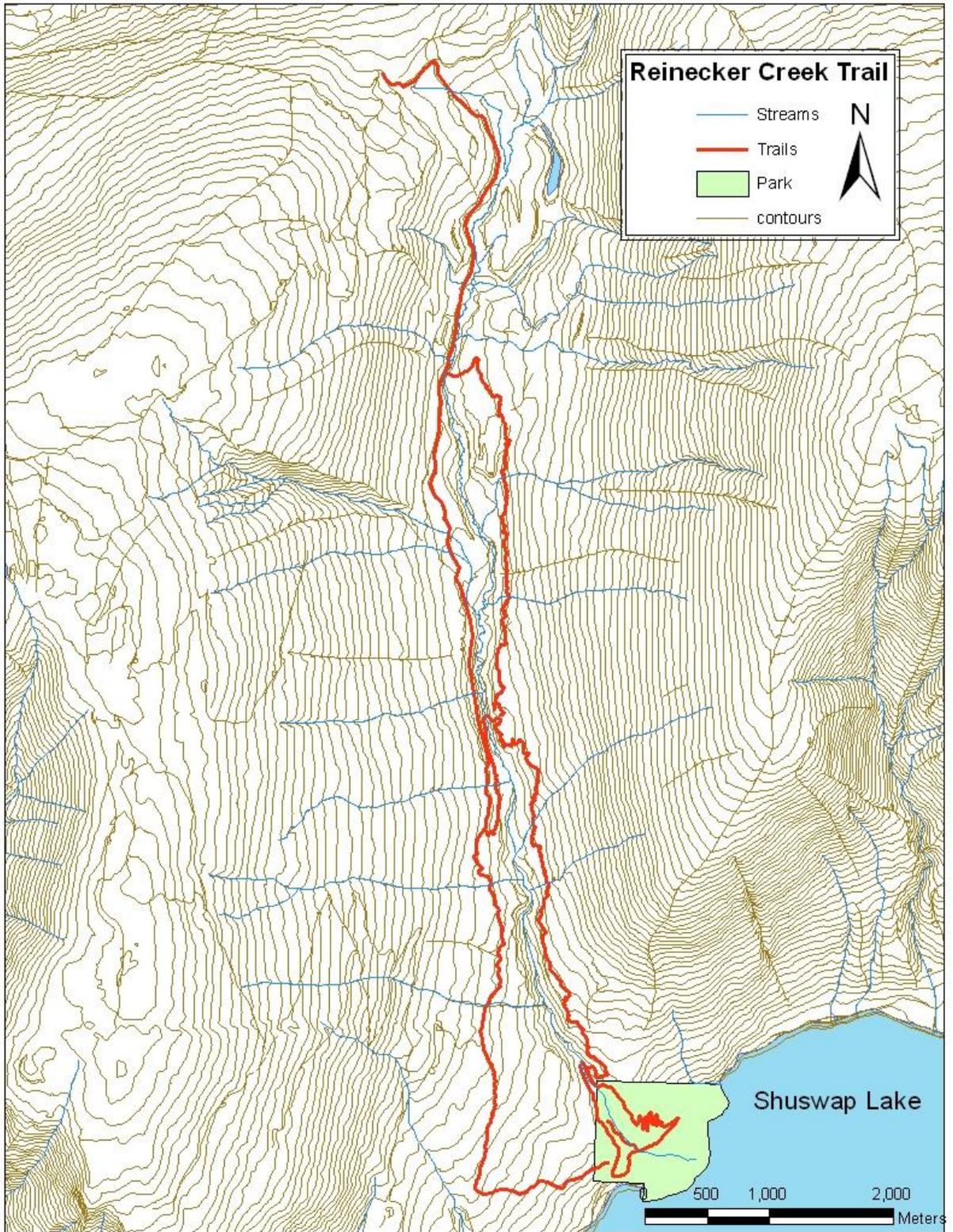


Figure 3. Herald Provincial Park is at the south end of the Reinecker Creek Trail.

APPENDIX A – Field guide to plant species at risk in the Reinecker Creek Trail area.

Reinecker Creek Trail

Provincially red and blue listed plant species - Detailed species descriptions

The following species listings provide detailed descriptions of the red and blue listed plant species in the area of the Reinecker Creek Trail.

Provincially red and blue listed species were identified using the BC Ministry of Environment BC Species and Ecosystem Explorer (<http://a100.gov.bc.ca/pub/eswp/>) using the search criteria of ICHmw biogeoclimatic zone, overlapped with the Columbia-Shuswap, North Okanagan and Thompson-Nicola Regional Districts within the Kamloops Forest District. Information was taken from BC Species and Ecosystems Explorer website, EFlora website, NatureServe website, Rare Native Vascular Plants of BC publication, and BC Species Summary reports from the BC Conservation Data Center. Additional line drawings and information area are available in the publication Rare Native Vascular Plants of BC and in the Species Summary BC Conservation Data Centre.

Moss species are not included in this list because the lack of available descriptive information on habitat and appearance results in difficult field identification.

Crested Wood Fern



Scientific Name	<i>Dryopteris cristata</i>
English Name	crested wood fern
Plant type	Fern
Plant family	Fern
BC List	Blue
IDF and ICH zone	ICHmw;IDFmw;IDFxb
Habitat Type	Swamps and wet meadows

Habitat Description

Swamps and wet meadows in the montane zone

Plant Description

Buckler Fern is an herbaceous perennial with clustered fronds arising from a short rhizome. The stalked fronds have narrowly elliptic blades pinnately divided into numerous pairs of pinnately lobed leaflets, or pinnae. The fertile fronds, 3-6 dm long, are erect and deciduous, while the sterile ones are evergreen, smaller, and more lax. Clusters of spores, or sori are borne along either side of the pinnae midveins on the underside of fertile fronds. Sori are covered by a whitish, broadly horseshoe-shaped membrane, or indusium. The broadly horseshoe-shaped indusium identifies this species as a *Dryopteris*. Other members of the genus in our area have more highly divided leaves and sterile and fertile fronds that are similar to each other.

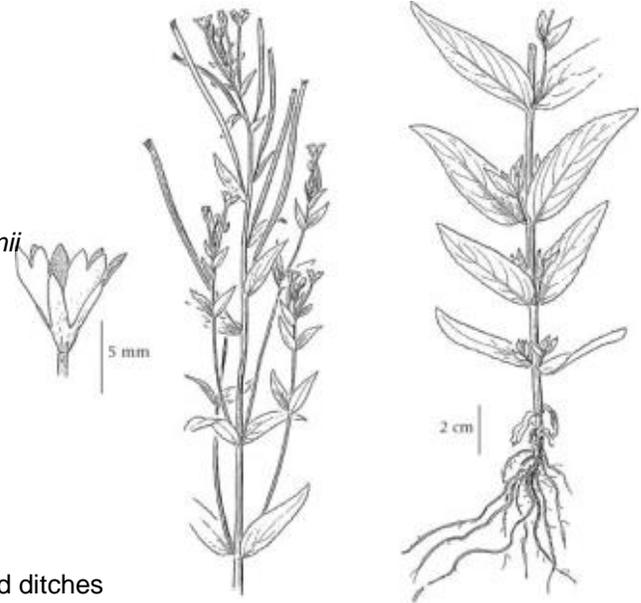
Flower Colour

Flowering period

E Flora <http://innet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Dryopteris+cristata>

Purple-leaved willowherb

Scientific Name	<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>
English Name	purple-leaved willowherb
Plant type	Herbaceous vascular plant
Plant family	Evening primrose
BC List	Blue
IDF and ICH zone	ICHmw
Habitat Type	Wet disturbed areas, fields and ditches



Epilobium ciliatum ssp. *watsonii*

Habitat Description	Wet to mesic disturbed areas, roadsides, fields and ditches from the lowland to montane zones
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Plant Description

Perennial herb, from basal rosettes or fleshy bulblets, lacking rhizomes; stems 15-150 cm tall, simple or branched, generally finely stiff-hairy in lines or spreading-hairy. Leaves opposite, or alternate above, lance- or lance egg-shaped, 1-15 cm long, finely sharp-toothed to almost entire, veins distinct; stalks 0-8 mm long. Flowers a terminal, leafy-bracted panicle or raceme, finely stiff-hairy, with some spreading and glandular hairs; hypanthium 0.5-2.6 mm long; petals 2-14 mm long, rose-purple to white, notched at tip; sepals 2-7.5 mm long, often reddish; stamens less than or equal to length of pistil; stigmas club- or head-shaped. Fruits capsules, 1.5-10 cm long, hairy; stalks 0-30 mm long; seeds 0.8-1.9 mm long, longitudinally grooved, tuft of hairs white, 2-8 mm long, readily detaching. Note: Three subspecies occur in BC 1. Stem leaves relatively narrow and not crowded around inflorescences; plants usually branched above; petals white to pale pink or purple ssp. *ciliatum* 1. Stem leaves broad and often crowded around inflorescences; plants usually unbranched above; petals dark purple. 2. Underground scales or buds present; inflorescences loose, extended ssp. *glandulosum* (Lehm.) Hoch & Raven 2. Underground scales or buds absent; inflorescences more or less flat-topped ssp. *watsonii* (Barbey) Hoch & Raven

Flower Colour	Rose purple to white
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Flowering period

E Flora

<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Epilobium+ciliatum+ssp.+watsonii>

Western St. John's-wort



Scientific Name *Hypericum scouleri ssp. nortoniae*

English Name Western St. John's-wort

Plant type Herbaceous vascular plant

Plant family Clusiaceae

BC List Blue

IDF and ICH zone ICHwk

Habitat Type Estuaries and wetland edges

Habitat Description Moist to wet streamsides, estuaries, marshes and open slopes in all zones except alpine and steppe zones.

Plant Description Perennial herb from a long stolon and rhizome. Stems erect, branched above, glabrous 5-80 cm tall. Stem leaves oblong to rounded, unstalked, obtuse, 1-3 cm long, 0.5-1.5 cm wide, glabrous with black marginal dots.

Inflorescence up to 50+ flowered; petals pale to bright yellow, 7-12 mm long; sepals narrowly egg-shaped to triangular, obtuse, 3-4 mm long; stamens 75-100, united basally into 3 groups; styles 3, 3-5 mm long.

Two subspecies occur in Bcd:

Flower Colour 1. Stems few branched in the inflorescence, mostly 5-20 cm tall; leaves rounded; plants infrequent at higher elevations in S BC, most common in SE BC..... ssp. nortoniae (M.E. Jones) J. Gillett

1. Stems branched below the inflorescence, mostly 20-80 cm tall; leaves narrowly egg-shaped; infrequent at lower elevations in S BC, most common in SW BC.....ssp. scouleri

E Flora <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Hypericum%20scouleri%20ssp.%20nortoniae&redblue=Both&lifeform=7>

Loesel's Twayblade



Scientific Name *Liparis loeselii*

English Name Loesel's twayblade

Plant type Orchid

Plant family Orchid

BC List Red

IDF and ICH zone ICHmw

Habitat Type Calcareous fens and shorelines (in BC known only in Mara Meadows Ecological Reserve)

Habitat Description Calcareous fens and shorelines in the montane zone

Plant Description

Loesel's Twayblade is a glabrous, herbaceous perennial with naked stems that are up to 15 cm high arising from a bulb-like base. The two nearly erect, narrowly elliptic basal leaves are 5-15 cm long and have a broad petiole and a thickened midrib. Several flowers are borne on short stalks at the tops of the stem. Each white to greenish flower has 3 narrowly lance-shaped sepals that are 5-7 mm long, 2 nearly linear petals, and a strap-shaped lip petal that is 4-5 mm long and narrowed at the base. The petals and sepals are united together at the top of the curved, club-shaped ovary. The fruit is a narrowly elliptic capsule with numerous dust-like seeds.

Diagnostic Characteristics: *L. LOESELII* might be confused with species of *HABENARIA*, but flowers of the latter have a tubular spur and lack a short stalk. In addition, *HABENARIA* species that occur in our fens have leafy stems. Species of *LISTERA* usually do not occur in fens, and their two leaves are attached to the stem rather than being basal.

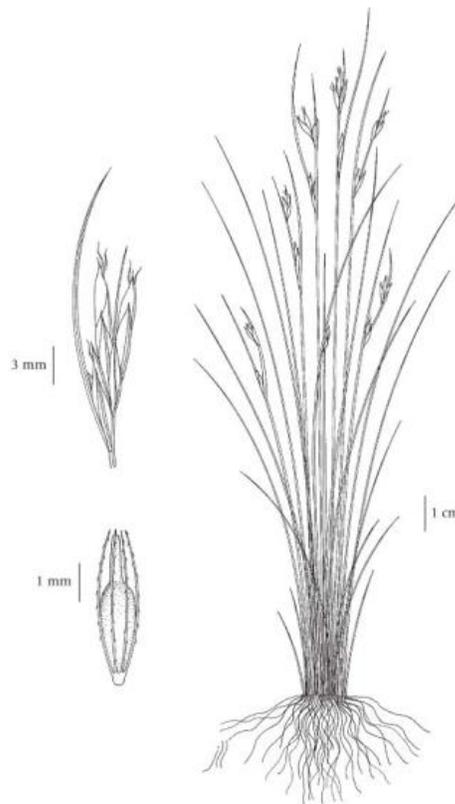
Flower Colour Yellow

Flowering period

E Flora N/A

Brown beak-rush

Scientific Name	<i>Rhynchospora capillacea</i>
English Name	brown beak-rush
Plant type	Sedge
Plant family	Sedge
BC List	Red
IDF and ICH zone	ICHmw
Habitat Type	Calcareous fens and shorelines



Rhynchospora capillacea

Habitat Description Calcareous fens and shorelines in the montane zone

Plant Description

Perennial, tufted herb, sometimes forming mats; stems more or less solid, triangular in cross-section, 10-40 cm tall. Leaves sheaths closed; blades in-rolled, threadlike, 0.2-0.4 mm wide. Flowers 1 or 2, compact, axillary or terminal heads, the terminal head egg-shaped, the lateral ones remote, nearly unstalked, each head with 2 to 10, reddish-brown to dark brown, erect or ascending spikes, the axillary heads each with 1 to 4 spikes; involucre bracts longer than inflorescence, 1-2 cm long. Fruits scales translucent on the margins, spirally arranged within the spikes; perianth bristles 6, finely barbed backwards, surpassing the achenes; achenes often obscurely marked with dark horizontal lines, broadest above the middle, conspicuously narrowed towards the bases, 2.5-4.2 mm long, less than 1/2 as wide, capped by tubercles, 1/2 to nearly as long as the achenes.

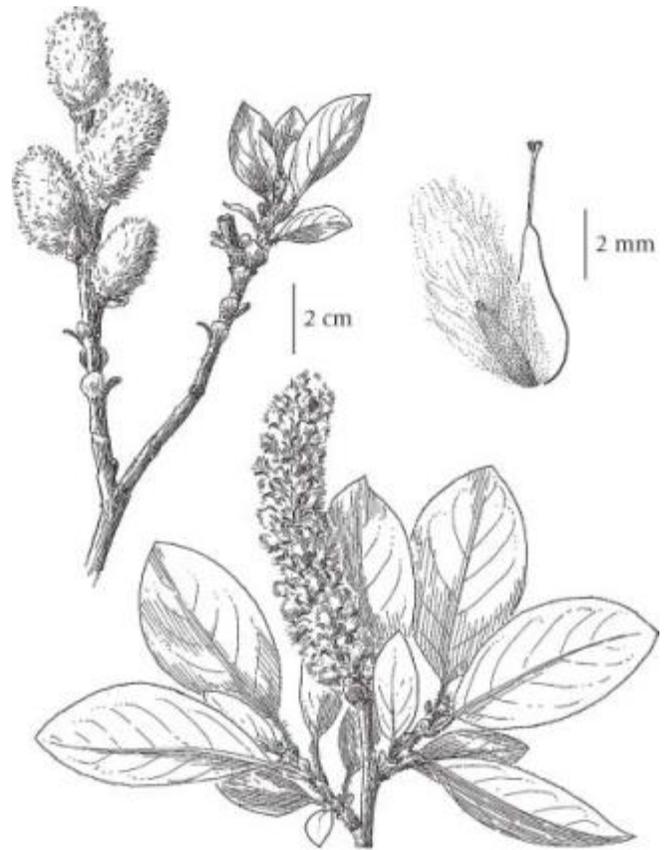
Flower Colour Brown

Flowering period

E Flora <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Rhynchospora+capillacea>

Tweedy's willow

Scientific Name	<i>Salix tweedyi</i>
English Name	Tweedy's willow
Plant type	Shrubby vascular plant
Plant family	Willow
BC List	Blue
IDF and ICH zone	ICHmw
Habitat Type	Moist streambanks and lakeshores



Salix tweedyi

Habitat Description

Moist streambanks and lakeshores in the montane zone

Plant Description

Dioecious shrubs, 1-3 m tall, not colonial; branches erect, flexible at base; twigs yellow-brown, sparsely to densely hairy. Leaves alternate, simple, elliptic or broadly elliptic, 3.5-10 cm long, 1.7-5 cm wide, lower surface glaucous or not, long soft-hairy, hairs white, upper surface dull, long soft-hairy to nearly smooth, margins toothed with coarse, spreading teeth or nearly entire, bases rounded or heart-shaped, tips pointed; leaf stalks not glandular at top; stipules leaflike, persistent. Flowers unisexual, lacking sepals and petals, borne in catkins which flower before leaves emerge, the catkins stout, unstalked; floral bracts dark, hairs straight or wavy; stamens 2; ovaries 1, smooth; styles 1.1-2.8 mm long. Fruits capsules which split open to release the seeds, each of which is surrounded by a tuft of hairs; stalks 0.4-1.5 mm long.

Flower Colour

Flowering period

E Flora

<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Salix+tweedyi>

White wintergreen



Scientific Name *Pyrola elliptica*

English Name white wintergreen

Plant type Herbaceous vascular plant

Plant family Wintergreen

BC List Blue

IDF and ICH zone ICHmw

Habitat Type Dry to moist forests

Habitat Description Dry to moist forests in the montane zone

Plant Description

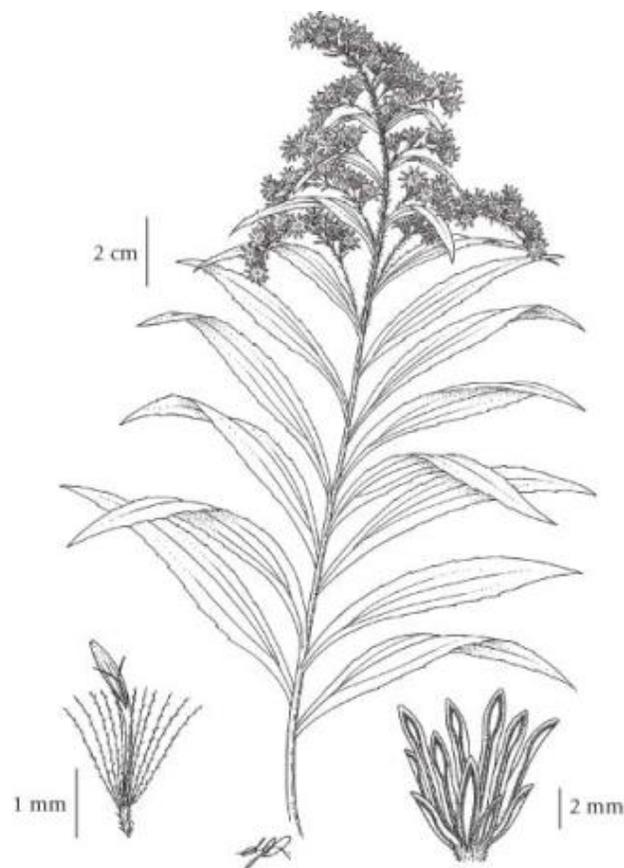
Perennial herb from a spreading, slender rhizome; flowering stems 15-25 cm tall, with many basal leaves. Leaves basal, evergreen, somewhat leathery, the blades broadly elliptic to oblong or egg-shaped, mostly 3.5-7 cm long and about 3/4 as wide, fine-toothed, thin, and dull; stalks rarely as long as blades. Flowers a 2- to 20-flowered terminal, cylindric raceme, the flowers weakly bilaterally symmetric, 10-12 mm wide; flower stalks 3-8 mm long, nearly equaled by the linear-lanceolate bracts; petals white or creamy, rarely pink-tinged, egg-shaped, spreading, 6-8 mm long; sepals longer than wide, triangular to egg-shaped, tips usually sharp-pointed and somewhat bent back; tubes of anthers short, usually somewhat bent back; styles declined, curved, 5-7 mm long, with a distinct collar below the stigma. Fruits capsules, depressed globe-shaped, 4-5 mm wide.

Flower Colour White

Flowering period

E Flora <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Pyrola+elliptica>

Smooth goldenrod



Solidago gigantea ssp. serotina

Scientific Name *Solidago gigantea ssp. serotina*

English Name smooth goldenrod

Plant type Herbaceous vascular plant

Plant family Aster

BC List Red

IDF and ICH zone ICHmw;IDFxh

Habitat Type Moist meadows, streambanks, forest openings

Habitat Description Moist meadows, streambanks and forest openings in the montane zone

Plant Description

Perennial herb from a fibrous-rooted, creeping rhizome; stems erect, solitary, branched above, the branches recurved and 1-sided, glabrous below, glaucous and fine-hairy in the inflorescence, 0.5-2.0 m tall. Basal leaves lacking or, like the lower stem leaves, reduced and soon deciduous; stem leaves lanceolate to elliptic-oblong, 8-15 cm long, 1.3-3.5 cm wide, alternate, simple, sharply saw-toothed or entire, 3-nerved, glabrous. Flower heads with ray and disk flowers, numerous in a dense pyramidal inflorescence; involucre 2-5 mm tall; involucre bracts lanceolate, often blunt, overlapping, glabrous; ray flowers 9-16, 2-2.5 mm long; disk flowers yellow. Fruits achenes short-hairy; pappus of numerous white hairlike bristles.

Flower Colour Yellow

Flowering period

E Flora

[http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Solidago+gigantea ssp. serotina](http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Solidago+gigantea+ssp.+serotina)

APPENDIX B : Fisheries and Oceans Canada Operations Statement for Clearspan bridges.

CLEAR SPAN BRIDGES

This Operational Statement applies to the construction of small-scale bridge structures that completely span a watercourse without altering the stream bed or bank, and that are a maximum of two lanes wide. The bridge structure (including bridge approaches, abutments, footings, and armouring) is built entirely above the **high water mark** (HWM). A clear-span bridge is preferred to a culvert as no structures are placed on the stream bed and therefore there is no alteration of natural channel processes.

Clear-span bridge construction has the potential to negatively affect riparian habitat. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover and areas for spawning and food production. Only the vegetation required to accommodate operational and safety concerns for the crossing structure and approaches, within the right-of-way, should be removed. Stormwater run-off and the use of machinery can introduce deleterious substances to the water body and result in erosion and sedimentation.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat and maintain passage of fish. You may proceed with your clear-span bridge project without a DFO review when you meet the following conditions:

- the bridge is placed entirely above the high water mark (HWM), (<http://www.pac.dfo-mpo.gc.ca/habitat/Glossary-glossaire-eng.htm#HWM>),
- there is no alteration of the stream bed or banks or infilling of the channel,
- the bridge is no greater than two vehicle lanes in width, does not include sidewalks and biking lanes and does not encroach on the natural channel width by the placement of abutments, footings or rock armouring below the **HWM**,
- the work does not involve the clearing of riparian vegetation – removal of select plants with the road right-of-way can occur to meet operational and/or safety needs,
- your project does not require multiple bridge crossings over the same watercourse, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Clear-Span Bridges* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to comply with all municipal, provincial, territorial and/or federal legislation that applies to the work being carried out in relation to this Operational Statement. In British Columbia, please contact the [WaterStewardshipDivision, Ministry of Environment](http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html) (http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html) for information on the Provincial *Water Regulation* notification requirements when planning to construct clear-span bridges in or around BC waters.

The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act*. For general information on aquatic SARA species visit the following web site: <http://www.dfo-mpo.gc.ca/species-especes/regions/Pac/pacific-index-eng.htm> and/or contact DFO by email at: SARA@pac.dfo-mpo.gc.ca

If you have questions regarding this Operational Statement, please refer to the list of **Frequently Asked Questions** (<http://www.pac.dfo-mpo.gc.ca/habitat/os-eo/faq-eng.htm>) or contact DFO Regional Headquarters at 1-866-845-6776.

Please notify DFO 10 working days before starting your work by filling out and sending the Pacific Region Operational Statement **notification form** directly to DFO Regional Headquarters. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement. It is recommended that you keep a copy of the Operational Statement at the work site to demonstrate to Habitat and Fishery Officer staff that the conditions and measures, as outlined in the OS, are being followed.

Area of Application

This Operational Statement applies to the province of British Columbia and Yukon Territory freshwater systems only.

Measures to Protect Fish and Fish Habitat when Constructing Clear-Span Bridges

1. Minimize the riparian area temporarily disturbed by access activities along the adjacent upland property. Use existing trails, roads, or cut lines wherever possible to avoid disturbance to the riparian vegetation.

2. Avoid building on meander bends, braided streams, alluvial fans, active flood plains, or any other area that is inherently unstable and may result in the alteration of natural stream functions or erosion and scouring of the bridge structure.
3. While this Operational Statement does not apply to the clearing of riparian vegetation, the removal of select plants within the road right-of-way (ROW) may be required to meet operational and/or safety concerns for the crossing structure and the approaches. This removal should be kept to a minimum and within the road right-of-way. When practicable, prune or top the vegetation instead of uprooting.
4. Ensure that the clear span bridge is properly designed to address river and channel processes at flows above the ordinary high water mark.
5. Design and construct approaches so that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
6. Design the bridge so that stormwater runoff from the bridge deck, side slopes and approaches is directed into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the watercourse.
7. Generally there are no restrictions on timing for the construction of clear-span structures as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., crossing of watercourse by machinery), these should adhere to appropriate fisheries **timing windows** (<http://www.pac.dfo-mpo.gc.ca/habitat/timing-periodes/Index-eng.htm>).

Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Ford Stream Crossings* Operational Statement is also available.

- 7.1. To exercise this option, the stream bed at the fording site must be comprised of stable gravel or bedrock and the stream banks must be low and stable.
- 7.2. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
- 7.3. Grading of the stream banks for the approaches is not permitted.
- 7.4. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
- 7.5. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries **timing windows**.
- 7.6. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
8. Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into

the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

9. Operate machinery on land (above the **HWM**) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 9.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks, invasive species and noxious weeds.
 - 9.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 9.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 9.4. Restore banks to original condition if any disturbance occurs.
10. Use measures to prevent deleterious substances such as new concrete (i.e., it is pre-cast, cured and dried before use near the watercourse), grout, paint, ditch sediment and preservatives from entering the watercourse.
11. No debris to remain within the high-water mark or placed into a stream.
12. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
13. Vegetate any disturbed areas by planting and seeding with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. All seeding and/or planting trees should follow the DFO guidance on **Riparian Revegetation** (<http://www.pac.dfo-mpo.gc.ca/habitat/reveg/index-eng.htm>). If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 13.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

DFO REGIONAL HEADQUARTERS

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 Regional Habitat Manager
 200-401 Burrard Street
 Vancouver, BC V6C 3S4.
 Toll Free: 1-866-845-6776
 Fax: (604) 666-0417
 Email: dfo_epmp@pac.dfo-mpo.gc.ca

Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp

