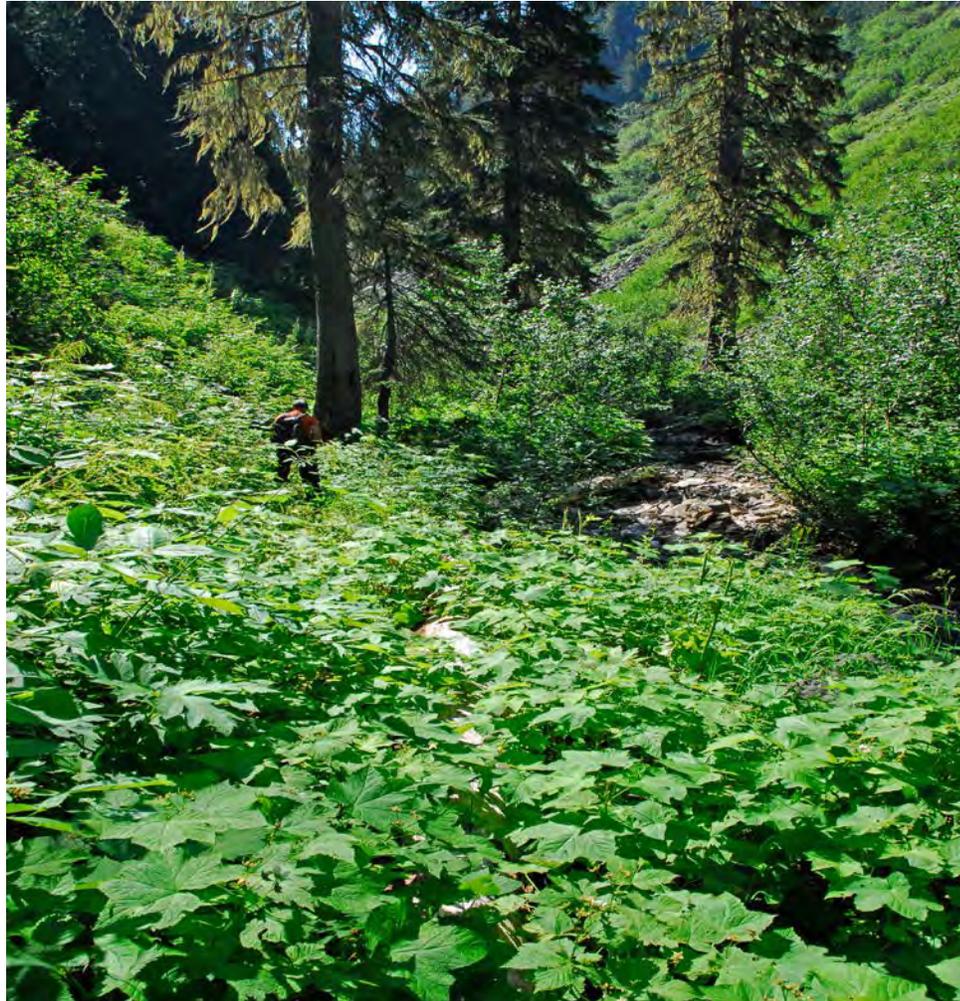


Joss Pass Trail

Environmental Screening Report-2011



Date: May 26, 2011

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Joss Pass Environmental Screening Report

Summary of Recommendations

Issues, hotspots, and values

The primary environmental issues to consider through Joss Pass are related to those trail sections that are in close proximity to wetlands. While the trail will be routed away from the wetlands there are still three main issues:

1. Destruction or degradation of habitat for wetland species, especially those at risk.
2. Enabling access into the wetlands by motorized traffic.
3. The introduction of invasive species into the wetlands.

These issues are especially sensitive in the small wetlands immediately south of Joss Creek. A review of existing biological information has revealed that there is one red listed frog species which was observed in the summer of 2010. An inventory will help determine whether any other listed animals or plants are present.

A secondary issue is the establishment of Wildlife Habitat Areas (WHA) within Joss Pass. These have been established by the Ministry of Environment in partnership with the Ministry of Forests and Range. The Identified Wildlife Management Strategy (IWMS) was established to provide special attention to wildlife Species at Risk and Regionally Important Wildlife. Identified Wildlife are to be managed through the establishment of WHA's. Joss Pass Trail passes through three Wildlife Habitat Areas.

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 and Animal Species at Risk

Conduct a simple reconnaissance inventory for plant species at risk and the presence of habitat features used by animal species at risk. 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 guidelines on inventory methods.

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. 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.

Recommendation #5: Wildlife Habitat Areas

The General Wildlife Measures for Wildlife Habitat Area 8-228 specifies no trails without an exemption from the Ministry of Environment. The trail through Joss Pass to Shuswap River was in place before the Wildlife Habitat Areas were established and the work done is in large part an effort to make the existing trail both sustainable and safe. Nonetheless an exemption should be sought in order to bring the trail into line with current regulations. The contact for the WHA's in the Okanagan (Area 8) is the wildlife biologist with the Ministry of Environment: Orville Dyer in Penticton (orville dyer@gov.bc.ca.) The trail through WHA's for grizzly bear habitat and mountain caribou habitat presents some questions that need discussion: What time of year might impact either species? What activities should be allowed in the area? Camping activities are very different than use of the trail as a hiking route to other locations.

Part 1: Application

Action Description

This environmental screening report encompasses the two sections of trail through Joss Pass. Section one is the old Dominion Forest Service trail from the current trail head to where it leaves the pass to access Joss Mountain. This section has been well used and easy to find and follow. Parts of this section are not environmentally or structurally sustainable. Section two continues south down the pass to the East Fork of Shuswap River. This section is seldom used and is difficult to locate because of dense vegetation. This section of trail is an existing historical route. Trail activity and use is primarily hiking.

Purpose

Most users hike up to Joss Mountain Lookout but a small number venture through to Greenbush Lake using the south section. Residents of Salmon Arm, Sicamous, Enderby, Revelstoke and Vernon have been the primary users. Joss Mountain provides local residents with an opportunity to explore the alpine zone of the Interior Wet Belt. Wildflower meadows are extensive and some unique species can be seen in the pass. The Splatshin First Nation has a historical interest in the route as the trail was established by their ancestors. The purpose of the trail was to access the Monashee caribou herd. Berry picking may have taken place as the huckleberry crops can be large in this area. It was also a likely trade route through to Eagle Pass and the Columbia River watershed.

Location

The Joss Pass Trail is located north of Greenbush Lake in the north fork headwaters of the Shuswap River and south of Joss Creek in the headwaters of Wap Creek. Access from the south is the Greenbush Forest Service Road, then a rough route to the site of a former bridge across the East Fork of the Shuswap River. Access from the north is from 12K on Branch 4 of

the Wap Creek Forest Service Road. This is the most used trailhead.

Schedule

In 2010 the Splatstin First Nation rebuilt much of the trail to a more sustainable standard. This included a new bridge across Joss Creek , upgrading of several other watercourse crossings and new signage through the whole of the Pass. The trail section immediately south of Joss Creek should be re-routed along the sidehill on the east side of the valley as far as the small lake where the current trail starts to follow the sidehill instead of the middle of the valley. In following the middle of the valley the historic trail has created a creekbed. This can be mitigated by the realignment mentioned above. (See Figure 1) Winter use in the pass is restricted because of the high avalanche hazard here. The snow melts around the end of June and that would be a good time to do trail inspection and maintenance, dependant on grizzly activity in the pass.(There was a resident sow with two cubs in the spring of 2011.)

Activities

Trail construction activities consist of clearing blow down and brush on the trail corridor, falling danger trees close to the trail, digging and clearing the trail bed to conform to trail standards, constructing sustainable water crossings and installing clear signage.

Trail use will be non-motorized hiking in the summer, late spring and early fall. The Joss Mountain trail is used regularly but not by great numbers of people. The Greenbush trail has been used by very few people because of the difficulty of locating the route until now. I would anticipate greater use now that the trail has been upgraded. There is a new access route to Joss Mountain from the west side that will probably decrease the use of Joss Pass trail. Mountain bike use may occur but probably not in significant numbers.

Part 2: Environmental and land-use

Summary (issues, hotspots, and values)

The Joss Pass Trail is in the Shuswap Interior Cedar Hemlock biogeoclimatic zone, subzone variant ICHvk1 and the Shuswap Englemann Spruce-Subalpine Fir biogeoclimatic zone, subzone variant ESSFwc4. (See Figure 2) ICHvk1 is a very wet, cool subzone characterized by a forest floor dominated by Devil's Club. It is a subzone of the Cariboo and Columbia mountains occurring in a high elevation band. ESSFwc4 is a wet, cold subzone in the same range as ICHvk1 but at a higher elevation, just below alpine. Both zones form a high elevation corridor from the north in the Cariboo Mountains to south above the Arrow Lakes.

The section of trail from Joss Creek through the pass follows wetland areas close to the trail. Trail layout through riparian areas or close to riparian areas will be minimized. All new trails will be constructed using current best practices to avoid erosion and sediment control into water bodies. Old trail sections will be upgraded to sustainable standards on a priority basis as funding permits. Work in the summer of 2010 concentrated on upgrading stream and seepage crossing, bridging Joss Creek, brushing existing trails, and rebuilding portions of the south section of trail to reroute it above the wetland. Assessments for ecological communities and plant species at risk as well as a cursory inventory on the presence of

invasive plants will be used 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 in 2010.

Ecological Communities

There are 6 ecological communities listed on the BC status list that occur in these two BEC zones.. Four are yellow listed (not at risk). In ICHvk1 there is one red listed (extirpated/endangered/threatened) community: Slender sedge/common hook moss. The habitat for this community is bog, swamp, shoreline, marsh and fen. It will be worthwhile to check for this plant grouping where the trail intersects those habitats. Both species are easy to identify. As well one community in ICHvk1 is blue listed (special concern): Tufted clubrush/Common star moss. The Conservation Framework Summary rates the threat to both these communities as low. (See Table 1)

Table 1. Ecological communities at risk in Joss Pass biogeoclimatic zones.

English Name	BC List	Ecosystem Group
slender sedge / common hook-moss (ICHvk1)	Red	Wetland, Herbaceous
tufted clubrush / golden star-moss (ICHvk1)	Blue	Wetland, Herbaceous
subalpine fir / horsetails / leafy mosses (ICHvk1)	Yellow	Forest, Riparian
subalpine fir / white-flowered rhododendron / oak fern (ESSFwc4)	Yellow	Forest
narrow-leaved cotton-grass - white mountain marsh-marigold (ESSFwc4)	Yellow	Wetland, Herbaceous
western redcedar / devil's club / lady fern (ICHvk1)	Yellow	Forest, Riparian
western redcedar / devil's club / common horsetail (ICHvk1)	Yellow	Forest, Riparian
western redcedar - hybrid white spruce / skunk cabbage (ICHvk1)	Yellow	Wetland, Forest
western hemlock - western redcedar / falsebox / red-stemmed feathermoss (ICHvk1)	Yellow	Forest

Plants

The Joss Pass Trail has two types of plant habitat: palustrine (wetland) and terrestrial. There are 4 red listed and 8 blue listed species in the ICH and ESSF biogeoclimatic zones over those two plant habitats (wetland and terrestrial). Of these 12 species only three occur in the specific subzones ESSFwc and ICHvk of Joss Pass. (See Table 2) Special attention will be paid regarding these plants during trail development. As well I would recommend the area along the trail be carefully surveyed for these three plant species, and the two plant communities discussed above so that we have baseline information for long term adaptive management.

Table 2. Plant species at risk at risk in Joss Pass biogeoclimatic zones.

Scientific Name	Forest	BC List	Biogeoclimatic Zone
<i>Agoseris lackschewitzii</i>	pink agoseris	Blue	PALUSTRINE;TERRESTRIAL (ESSFwc)
<i>Dryopteris cristata</i>	crested wood fern	Blue	PALUSTRINE;TERRESTRIAL (ESSFwc,ICHvk)
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	Blue	PALUSTRINE;TERRESTRIAL (ESSFwc)

Wildlife

There is a varied range of species in Joss Pass including 27 species at risk in the Englemann Spruce Subalpine Fir and Interior Cedar Hemlock biogeoclimatic zones (all subzones and variants included) (See Table 3). Red listed species which may occur include badger, Lewis's woodpecker, Swainson's hawk, lark sparrow and western screech-owl. Special attention should be paid to these species and their habitat if observed.

Historically the Splat'sin First Nation accessed Joss Pass to hunt mountain caribou. The herd here belongs to the "Southern Mountain population" and is the Monashee band of the Revelstoke herd. The Revelstoke herd 2002 census found 174 animals, down from 362 in 1994. The southern portion of this herd which includes the Monashee band has declined the most from 113 animals seen in 1997 to as few as 25 seen in 2002. This species is on the BC List and is red listed. (Parks Canada www.pc.gc.ca Mount Revelstoke National Park of Canada "Mountain Caribou: Symbol of the Columbia Mountains.") The Mapped Wildlife Species Point Locations shows one sighting of caribou tracks in 2001 near the intersection of the trail and Joss Creek.

A blue listed species that also needs special observations for possible habitat is the fisher (dens in hollow logs). Tracks were seen in Joss Pass on October 10, 2010 that fit the description of fisher tracks. Another blue listed species that is worth looking for is Rockslide Checkerspot. The habitat description of this butterfly closely mirrors the rockslide areas

alongside the trail through Joss Pass.

One unlisted species that is a species of concern and which has been seen in Joss Pass is the Canadian (Spotted) toad, *Anaxyrus hemiophrys* (*Bufo hemiophrys*). Orville Dyer, wildlife biologist with the Ministry of Natural Resource Operations, Penticton has asked that sightings of this species be reported to him. The tadpoles of this species were observed in the small wetland pools just south of Joss Creek on several visits in the summer of 2010 and this was reported. It will be worthwhile checking those pools for this species in future summers. They are readily identifiable because of black larvae in large numbers in this habitat.

There is a hunting season for moose, deer, grizzly bear and black bear in Wildlife Management Units 8-23 and 8-24. Joss Pass trail goes through both these units. There are no mapped Wildlife Management Areas in Joss Pass.

Joss Pass Trail does go through mapped Ungulate Winter Range U 3 005. (See Figure 3) This 178,706 hectare area is a winter range for caribou. These areas are managed by the Ministry of Environment and show areas of high value habitat for mountain caribou.

There are three Wildlife Habitat Areas (WHA) in Joss Pass. (See Figure 4) They cover the whole distance of the Joss Pass trail. WHA 8-228 Joss Mountain Corridor to protect mountain caribou habitat covers the whole of Joss Pass and Joss Pass trail. The General Wildlife Measures for WHA 8-228 specifies no roads, trails, harvest or pesticides without exemption from the Ministry of Environment. WHA 8-233 is two Specified Areas, one to the north and one to the south of Joss Pass. The General Wildlife Measures for the two areas of WHA 8-233 are to provide "...suitable security and movement between winter ranges..." for mountain caribou, specifically mature trees and open forest. The Joss Pass trailhead and a short section of the trail is in WHA 8-233. A short section of trail across an old clearcut at the south end of the trail crosses the south section of WHA 8-233. WHA 8-232 is a Specified Area for grizzly bear habitat. The boundaries of this WHA are the same as WHA 8-228, the Joss Mountain Corridor. Again this area encompasses all of the length of the Joss Pass trail. The General Wildlife Measures prescribed for this WHA are designed to maximize berry (*vaccinium* ssp.) productivity for grizzly bear forage.

Table 3. Species at risk in the ESSFwc and ICHvk biogeoclimatic zones.

Scientific Name	English Name	BC List	Breeding Bird
<i>Taxidea taxus</i>	American Badger	Red	
<i>Rangifer tarandus pop. 1</i>	Caribou (southern mountain population)	Red	
<i>Melanerpes lewis</i>	Lewis's Woodpecker	Red	Y
<i>Megascops kennicottii macfarlanei</i>	Western Screech-Owl, macfarlanei subspecies	Red	Y
<i>Chondestes grammacus</i>	Lark Sparrow	Red	Y
<i>Buteo swainsoni</i>	Swainson's Hawk	Red	Y
<i>Rangifer tarandus</i>	Caribou	Red	

<i>Ursus arctos</i>	Grizzly Bear	Blue	
<i>Pholisora catullus</i>	Common Sootywing	Blue	
<i>Ovis canadensis</i>	Bighorn Sheep	Blue	
<i>Numenius americanus</i>	Long-billed Curlew	Blue	Y
<i>Myotis thysanodes</i>	Fringed Myotis	Blue	
<i>Martes pennanti</i>	Fisher	Blue	
<i>Magnipelta mycophaga</i>	Magnum Mantleslug	Blue	
<i>Hemphillia camelus</i>	Pale Jumping-slug	Blue	
<i>Gulo gulo luscus</i>	Wolverine, luscus subspecies	Blue	
<i>Eremophila alpestris merrilli</i>	Horned Lark, merrilli subspecies	Blue	Y
<i>Dolichonyx oryzivorus</i>	Bobolink	Blue	Y
<i>Danaus plexippus</i>	Monarch	Blue	
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Blue	
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Blue	Y
<i>Chrysemys picta pop. 2</i>	Western Painted Turtle - Intermountain - Rocky Mountain Population	Blue	
<i>Chlosyne whitneyi</i>	Rockslide Checkerspot	Blue	
<i>Catherpes mexicanus</i>	Canyon Wren	Blue	Y
<i>Asio flammeus</i>	Short-eared Owl	Blue	Y
<i>Ardea herodias herodias</i>	Great Blue Heron, herodias subspecies	Blue	Y

Fish and fish habitat

While there are wetland areas along this portion of the Joss Pass trail there are no lakes. The trail crosses Joss Creek and proceeds south beside some small wetland pool before following directly down the centre of the valley to a small upland tarn. In high water periods there is a flow from the area of the small pools down this trail to the tarn. This section of trail should be rerouted as noted above. (See Schedule and Figure 5). The tarn does not have an outlet unless it is underground. The trail follows the upland area from the tarn to the height of the pass.

Soil and water degradation

The sections of the Joss Pass trail (Figure 2) concerned with this report are predominately through or along wetland. Sections near wetlands have been routed away from the wetlands where possible. Where this is not yet possible current standard best practices (Whistler Standards, International Mountain Bike Association) for trail construction related to grade and drainage will minimize any negative impacts of the trail on surrounding soil and water quality.

Current and historic land use

The Splat-sin band of the Shuswap First Nation utilized this area for hunting and gathering. The original trail through the valley was created by the Splat-sin to access the caribou herds in the Joss Pass area. Ancient trail signs in the pass include tree burls which may have been created as trail markers when they were saplings and a deeply trenched trail which indicates prolonged use. The trail followed up from the confluence of the east and north forks of the Shuswap river. There are signs of an historical trail continuing south to the confluence of the east and north forks of the Shuswap River. These signs are faint trails and markings on trees in the direction of the confluence from where the existing trail turns sharply east into the old clearcut. It is also likely that the trail continued through to the Three Valley Gap area as the Splat-sin do have historical connections to the Eagle Pass area just to the north of Joss Pass. The whole area of Joss Mountain, Greenbush Lake and the Shuswap River headwaters is an area of historical interest and claim by the Splat-sin people.

In more recent times the Dominion Forest Service established a forest fire lookout on top of Joss Mountain in 1921. The section of trail from the trailhead to Joss Pass follows the route used by the horse packers supplying the lookout. There are some remains of a cabin dating from that activity just south of Joss Creek. They can only be easily seen in the early spring before the lush growth that occurs in the pass covers everything. The lookout was used until 1930. The original structure has been voluntarily maintained and is reached by the trail from Joss Pass.

Logging interests along the proposed trail route are held by Federated Coop and Tolko. Both companies have been consulted regarding built and planned trail proposals. No trail sections are through recently logged areas or areas where logging is currently planned. The southernmost 500 metres of the trail, just before the guide outfitter's cabin at the delapidated bridge across the east fork of the Shuswap River, is through an older clearcut.

There is a guide outfitter operating in this area, Sugar Valley Outfitters, Scott Mackenzie, License 800751. There is a website detailing the services offered including a new grizzly bear hunt. (See Figure 5) There is a trapline license with an area centred on Joss Pass. The trapline license number is TR08237050. There has been no visible trapping activity through the pass, all trap boxes along the trail are delapidated. There are no range licenses along the trail route. There are no mining claims in Joss Pass, though there are mineral claims north and south of the pass.

Joss Pass is within the Okanagan Shuswap Land and Resource Management Plan. There are nine specific Resource Management Zones or other areas mapped along the Joss Pass trail: 1. Okanagan Shuswap Land and Management Plan:Legal 2. Tourism Areas: Large Backcountry 3. Fisher Areas 4. Fisher Habitat 5. Pine Martin High Capability Area 6. Martin Areas 7. Caribou RMZ (Resource Management Zone) 8. Mountain Goat RMZ 9. Grizzly Bear RMZ

Part 3: Mitigation and monitoring

This is the framework for long-term adaptive management planning:

- 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, 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. Trailhead signage should alert dog owners to the presence of wildlife, especially grizzly bears, thus the need to keep pets under control.
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

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

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). These are protected riparian areas of 10 metres around small creeks and up to 30 metres around wetlands.

- ✓ 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

Sexqéltkémc Lakes Division

Federated Co-op

Tolko Industries

Local motorized recreation groups???

Trapline Licensee???

Sugar Valley Outfitter's???=Pre-existing trail for 3 mentioned above?

BC Parks

Ken Gibson, MOTSA, Revelstoke

Checklist of potential impacts:

Avoid disturbance within riparian areas

Plant species at risk inventory prior to final trail location

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

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 March 8, 2011).

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.

Figure 1 Joss Pass Trail proposed re-route from Joss Creek to the large tarn.

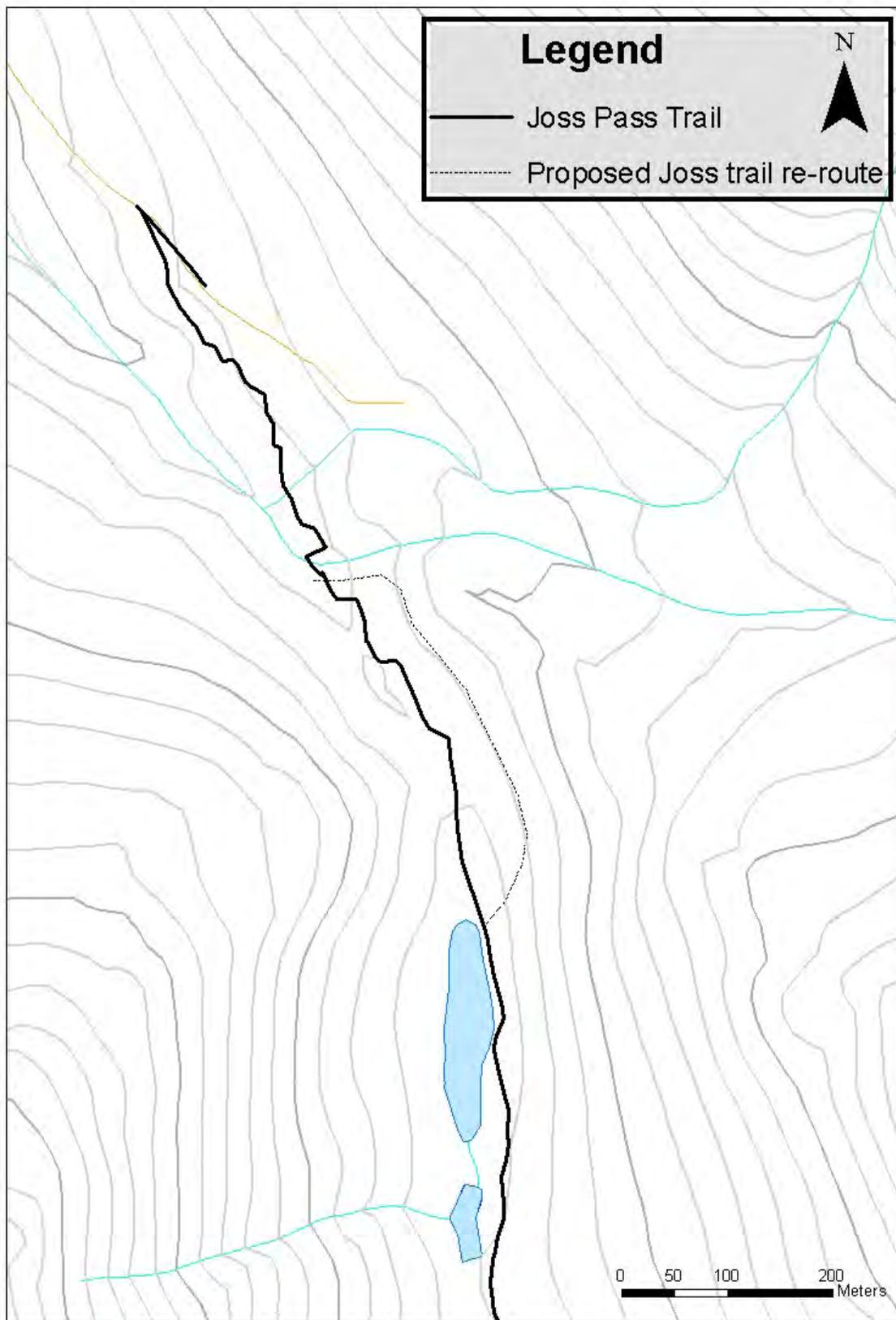


Figure 2 Joss Pass Trail is in the Interior Cedar Hemlock vk1(ICHvk1) and Englemann Spruce Subalpine Fir vc (ESSFvc) Biogeoclimatic Zones.

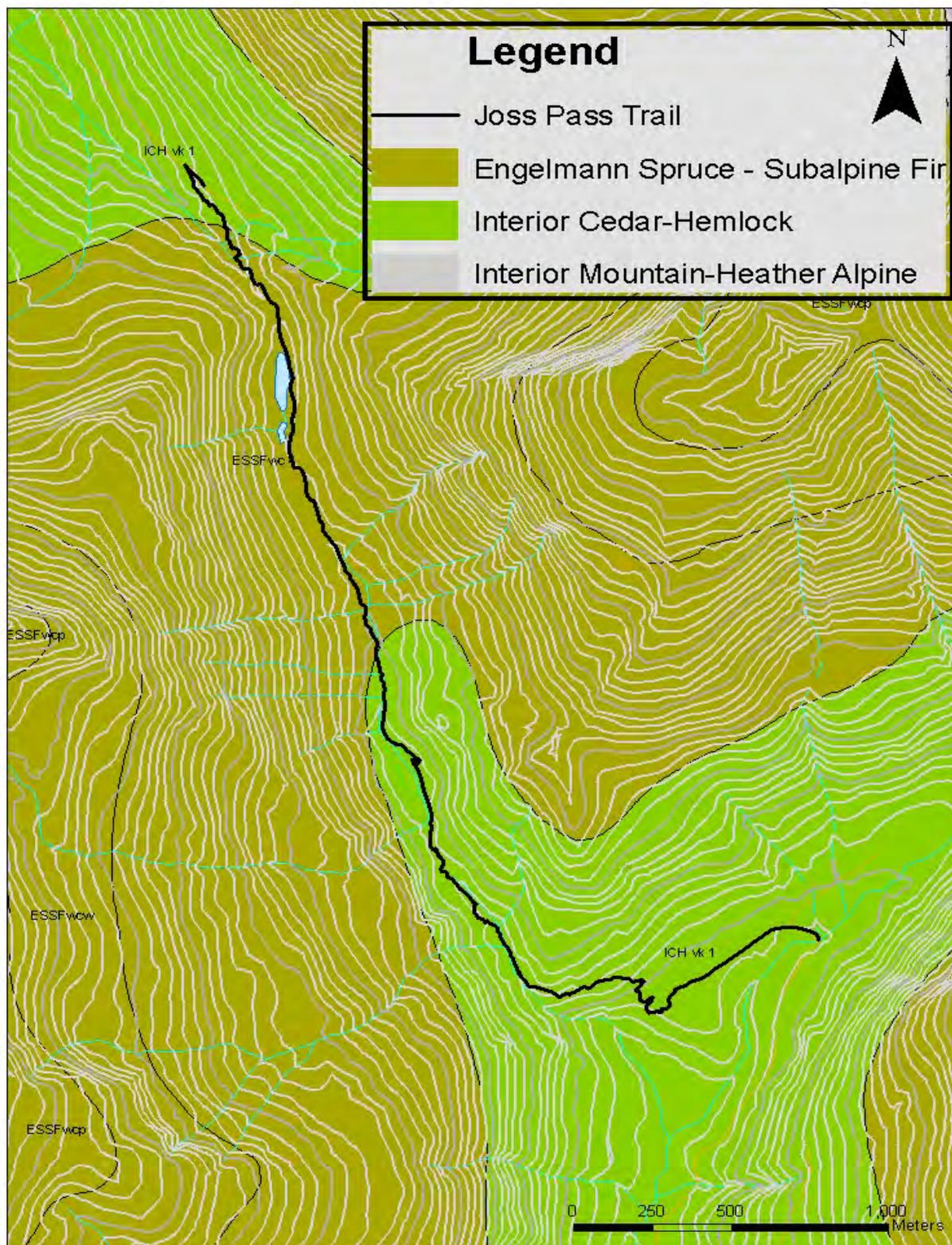


Figure 3 Ungulate Winter Range for mountain caribou in Joss Pass.

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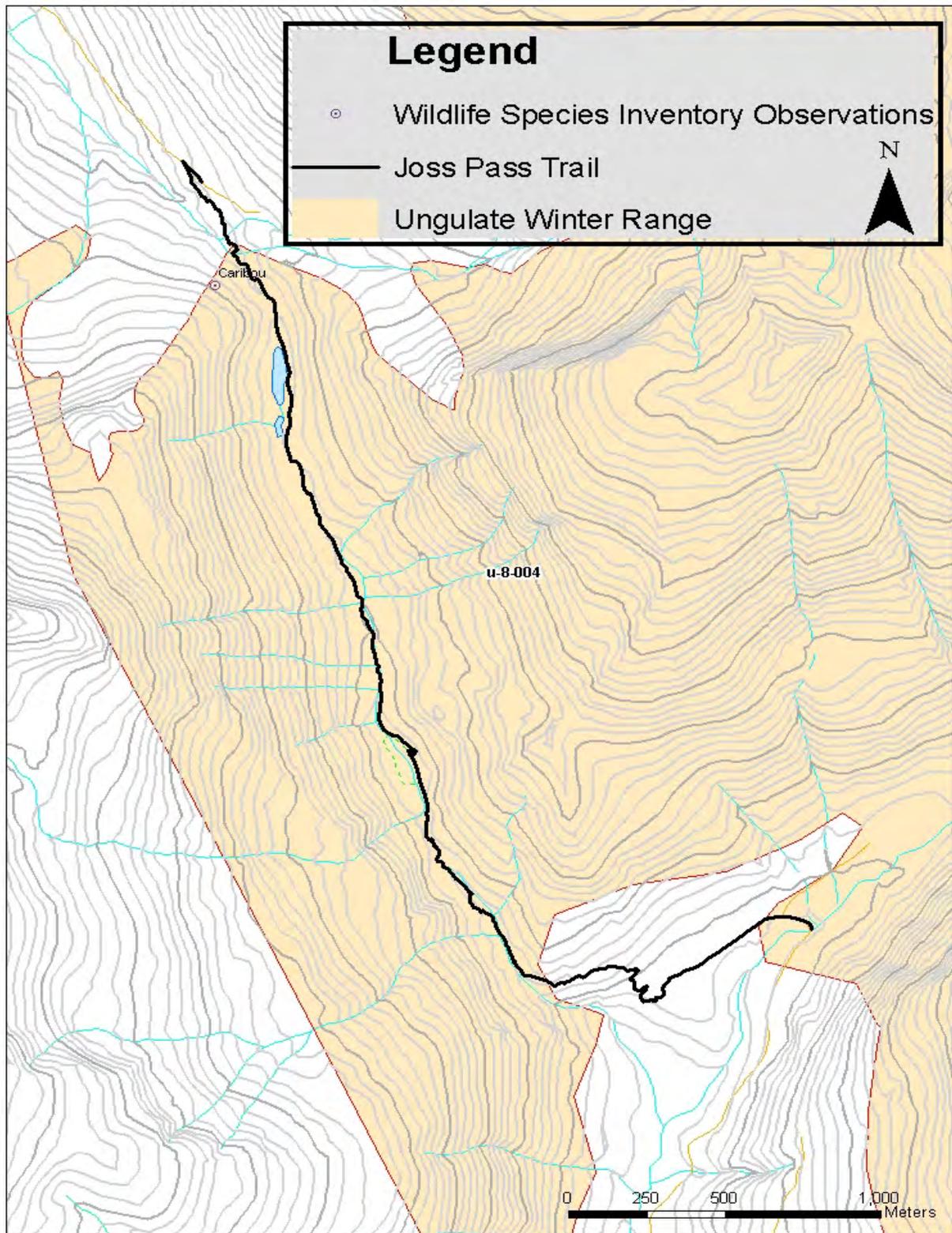


Figure 4 Wildlife Habitat Areas in Joss Pass.

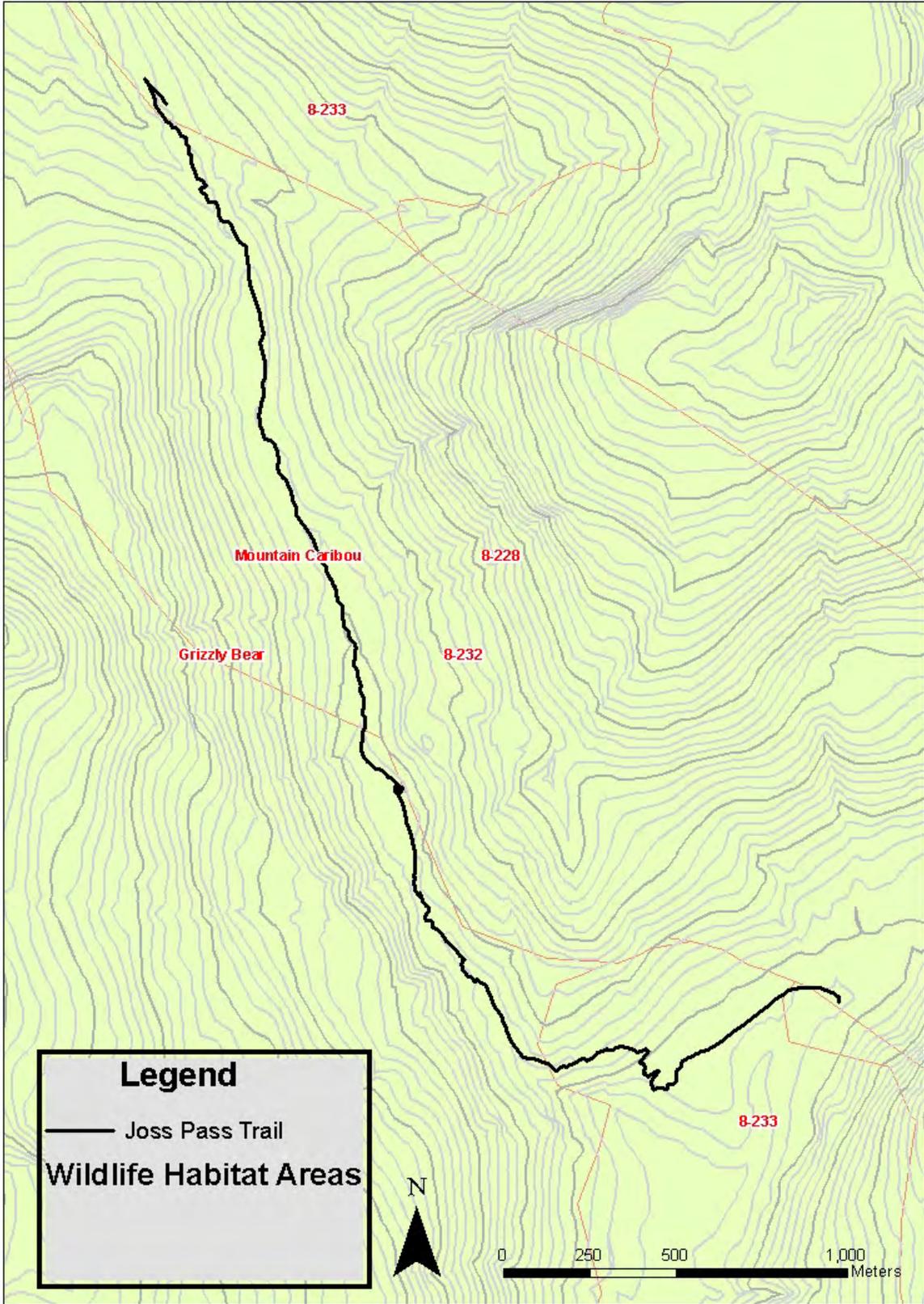
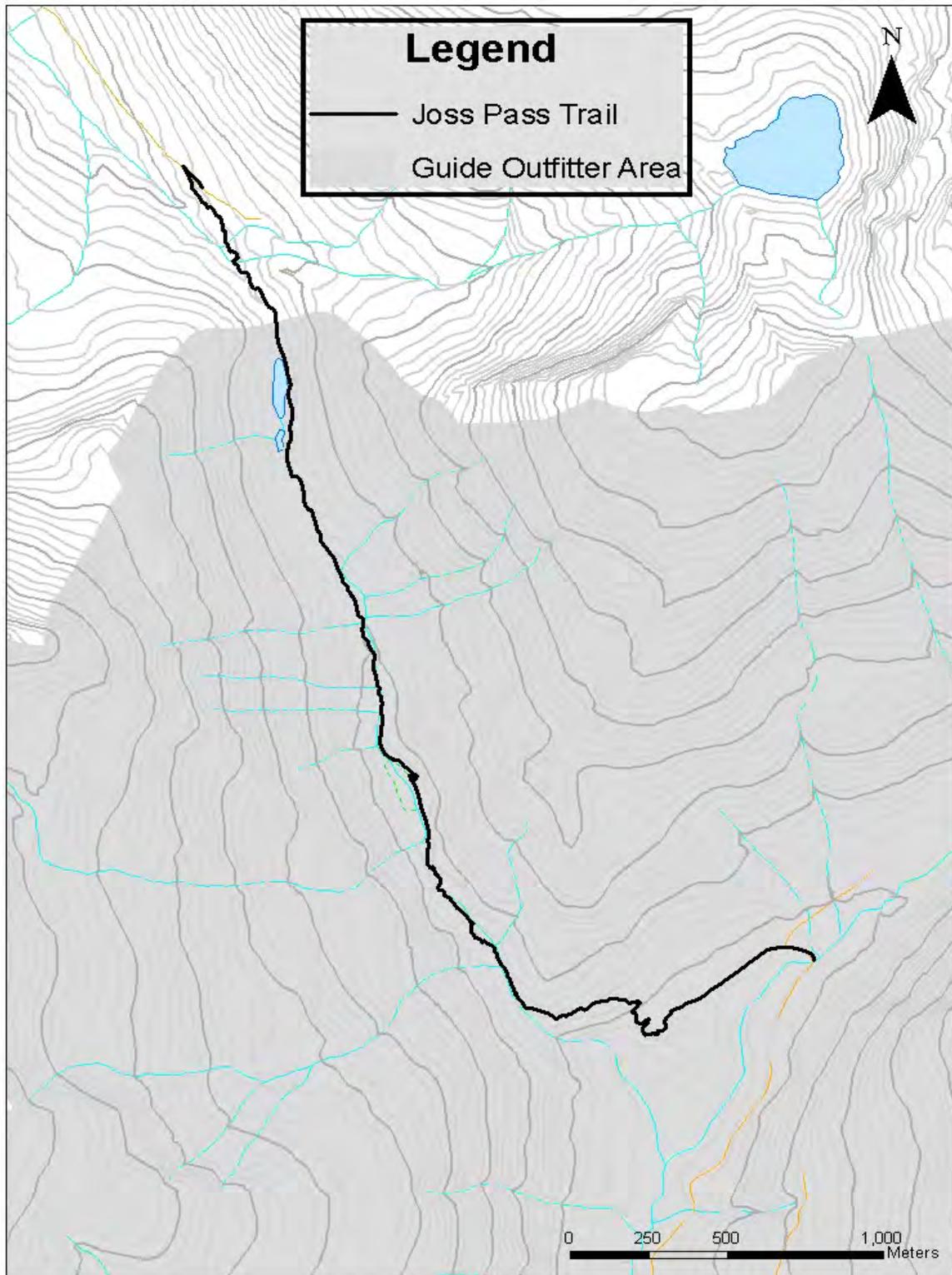


Figure 5 Guide Outfitter's Area in Joss Pass.



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

Joss Pass 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 Joss Pass 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 ICH and ESSF biogeoclimatic zones, overlapped with the Columbia-Shuswap and North Okanagan 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;IDFxh
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.

E Flora

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

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>

Pink Agoseris



Scientific Name *Agoseris lackschewitzii*

English Name Pink Agoseris

Plant type Vascular

Plant family Asteraceae

BC List Blue

ESSF and ICH zone ESSFwc and ICHvk

Habitat Type Alpine and subalpine.

Habitat Description Moist to mesic meadows in the subalpine to lower alpine zones.

Plant Description Perennial herb from a slender taproot and a simple or branched base; stems leafless, solitary to few, exuding milky juice when broken, 6-50 cm tall. Heads with strap-shaped flowers, solitary; involucre bell-shaped, 11-19 mm tall.

Flower Colour Pink

E Flora <http://linnet.geog.ubc.ca> Klinkenberg, Brian. (Editor) 2010. *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. [Accessed: 5/25/2011 10:08:28 AM]
